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The Journal of Independent Teaching and Learning is a peer-reviewed journal, which focuses on making a difference to educators at the primary, secondary and tertiary levels. It publishes original contributions of interest to researchers and practitioners in the field of education.

The following types of contribution will be considered for publication:
- research-based empirical, reflective or synoptic articles that would be of interest to the educational practitioner
- review articles that critically examine research carried out in a specific field
- discussion or advocacy papers suitable for publication in the section entitled 'Practitioners' Corner'
- book reviews that comprise a clear and concise evaluation of recently published books.

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Editorial

There has been a proliferation of academic journals in the field of education over the last twenty years. As a result the question might reasonably be asked: why launch yet another? One answer is that many of the new journals have catered for a specialised readership: to name but a few, *The Journal of Technology Education* (1987), *Education and Ageing* (2002), *The International Journal of Electrical Engineering Education* (1999), *The International Journal of Artificial Intelligence in Education* (1989/90). Indeed some concern has even been raised about the overspecialisation that has taken place.

The above does not apply to *The Journal of Independent Teaching and Learning*. It is wide-ranging in its subject matter and does not subscribe to a particular educational ideology. The journal's philosophical underpinnings are in the classical liberal tradition of Kant, Rousseau and Mill, which emphasises individuals' freedom to determine their future (albeit within the facticity of their situation) and to reflect critically upon ideas and not simply to follow custom. Concomitant liberal values of freedom of speech, tolerance of diversity, freedom of association and economic freedom are also embedded within the journal's philosophy.

The *Journal of Independent Teaching and Learning* was founded for a number of reasons. Firstly, and most importantly, to provide a forum for education practitioners that cuts across all levels of education. Secondly, it is anticipated that it will function as a conduit between practitioners and researchers. Thirdly, it is has a developmental aspect, i.e. to provide an avenue for young researchers to participate in the field of academic publishing.

The fourth *raison d'être* of the journal is to stimulate reflectiveness and sharing of good practice so that knowledge is advanced about the complex realities of education at all its levels in an increasingly globalised, albeit differentiated world. Whilst emphasis is placed on research and analysis, advocacy articles will be included that stimulate exploration of new ideas and innovative teaching and learning practices.

A fifth and interesting aim is to extend the traditional boundaries on what constitutes research and thereby research outputs. This will enable the creative impulse in education to be reflected upon and provide those involved in the visual and performing arts in education with an intellectual space in which to critically engage with practitioners from widely varying disciplines.

In this founding issue the above 'broad church' approach is reflected. In the first article, the author challenges the notion that in South Africa only state funded higher education institutions can contribute to the public good. She argues that few, if any, western public institutions can be deemed to be a pure public good. However, when the notion of 'public good' is revised, the author shows that both public and private

(independent of the state) institutions can be said in some sense to contribute to the public good. The next article discusses curriculum reform in South Africa as it pertains to the Sciences. The author argues that there is a need for learners and teachers to understand the philosophical underpinnings of the scientific enterprise, or 'the nature of science', in order to successfully engage with the requirements of the National Curriculum Statements. In the third article, the author tackles the thorny issue of quality in higher education from the perspective of academics in a science faculty. He concludes that there needs to be much more engagement with academics on the notion of 'quality in higher education' and managers need to ensure that quality arrangements are in place at all levels in the institution. In the fourth article, the author examines the notion of 'academic integrity'. He then presents the findings of a comparative study on the incidence of academic dishonesty between South African and American students. He argues that interventions need to be made to ensure that academic integrity is maintained. The next author presents an interesting discussion on learning styles before examining the results of a pilot study on preferred learning styles of a group of business students. The article in *Practitioners' Corner* affords us a glimpse into an often forgotten area in higher education institutions, that of creativity. The author, an artist and teacher, dispels commonly held notions surrounding creativity. He then explores how educators strive to unlock creativity by providing students with the space to embark on a process of self-discovery.

Professor Dolina Dowling
Founding Editor
May 2006

Convergent interests in South African public and private higher education institutions: Public and private good

Dolina Dowling - Bond South Africa

ABSTRACT

There have been a number of declarations on the role of higher education. The common theme is that higher education is necessary for the sustainable socio-economic development and growth of a country. And as such it is a public good. Implicit in this standpoint is the view that only higher education funded by the state can be a public good, whilst the private sector is about profit and self-interest. This paper shows why in South Africa at least this is not the case. Both public and private higher education institutions meet a form of public good as well as provide private benefits.

INTRODUCTION

In recent years there has been a flurry of debate on the role that higher education plays in the life of a country in an increasingly globalised world. This has resulted in a number of declarations on higher education; for example, the World Declaration on Higher Education for the Twenty-First Century: Vision and Action (1998), the Bologna Declaration (1999), the Declaration on the African University in the Third Millennium (2001), the Accra Declaration on GATS and the Internationalization of Higher Education in Africa (2004). The pre-eminent view is that higher education (through the generation, dissemination and application of knowledge) is necessary for the sustainable socio-economic development and growth of a country as well as increases its competitiveness in the global economy. And as such it is a public good.

However, there is another equally important position concerning the role of higher education. In South Africa, apart from endorsing the socio-economic benefits, the 1997 White Paper 3, 'A Programme for the Transformation of Higher Education' (Department of Education [DoE]) states that higher education has an obligation to 'help lay the foundations of a critical civil society, with a culture of public debate and tolerance which accommodates differences and competing interests' (#1.4).

In addition to these two views, there is another argument that runs through the debate, a dispute concerning public and private institutions. It is typically thought that in South Africa there is a disjuncture between public and private higher education institutions. A commonly held assumption is that public institutions are about the public good whilst private institutions are about profit and self-interest. This paper shows that this is not the case. There is no need for a polarization between these two sectors. The argument is that many of the socio-economic and cultural desiderata can be met by both kinds of institutions. The interests of public and private South African higher education institutions converge and so both contribute to some form of public good.

HIGHER EDUCATION IS DEEMED TO BE A PUBLIC GOOD

To many people it is self-evident that higher education is a public good. But what is a 'public good'? Broadly speaking, and in the clearest cases, it is a good 'that if (it is) provided at all, (it is) provided for everyone. People cannot be excluded from benefiting from it, and a person can benefit from it without reducing the benefits available to anyone else' (Backhouse, 2002: 283). The necessary and sufficient conditions for the application of the term 'public good' are (i) non-excludable, (ii) non-rival. True public goods, on this interpretation, seem to be limited to things like the services of a lighthouse, fireworks displays and national defence. To take the example of a fireworks display in a city centre, no one is prevented from seeing it, therefore it is non-excludable and one person's enjoyment does not diminish the enjoyment of another, therefore it is non-rival (Mankiw, 2001: 226-227).

Given that these conditions define the 'public good', how does higher education in South Africa fare with respect to its core functions – teaching, learning, and research (what was called earlier the generation, dissemination and application of knowledge)? Regarding teaching and learning, the non-rival condition does not seem to present a problem. One student attending a lecture does not prevent or reduce another student's participation. Similarly, a lecturer's knowledge used in assessing a student assignment or advising a postgraduate student does not diminish the knowledge available to another student.

The second condition, that of non-excludability, does not fare so well. In South Africa (as elsewhere) many people are excluded from higher education. Given the fragmented inequitable system that existed prior to 1994, this is not surprising. The legacy remains. Major barriers to access include finance and language. Regarding the former, the majority of would-be students cannot afford the fees, or if receiving a bursary, do not have the financial resources to maintain themselves during the study period. The government sponsored Financial Aid Scheme does not offer full financial support. It is an income-contingent loan and bursary scheme. Furthermore, numerous needy would-be students are turned away due to the scheme being insufficiently resourced. Thus the condition, non-excludable, is not met.

Regarding the latter, *viz.* the barrier of language, there are eleven official languages in South Africa yet English (and to a lesser extent Afrikaans) dominates the educational arena. From the early stages of their schooling, the majority of children are not taught in their home language. This places African children at a disadvantage compared to their white counterparts who learn in their home language. African children have to struggle to understand concepts in a second language before they have a firm grasp of their mother tongue. Furthermore, if a non-mother tongue language is used, the child's education can be totally unconnected with the cultural and social life of his or her community. It seems reasonable to suggest that the underlying message given to the African child is that the non-mother tongue is the important language and by extension the culture associated with it is what really matters. This causes the African child to grow up in a disempowering environment. Hence on both language and cultural criteria, African children's schooling disadvantages them so that they are less likely to attain the requisite certification to gain access to higher education (Dowling 2000). Language presents us with another way in which the condition, non-excludable, is not met.

As noted, apart from disseminating knowledge, higher education institutions are required to generate knowledge by engaging in research so that they contribute to the knowledge base of society. If higher education is a public good, the research that is carried out within the sector is subject to the same conditions. The condition, non-rival, does not seem to present a problem. One person's research does not usually diminish the opportunity of another's. But it is a different matter when we consider the condition of non-excludability. Not all research funds come from the public purse. When research has been privately funded, the sponsors may require that the research remain confidential and so the findings are not permitted to enter the public domain. In this way, knowledge gained through research by one person can be denied

to others. A similar situation may arise with sensitive research commissioned by the state. Access to knowledge generated by research can be another form of excludability. It should be noted that such situations are applicable to both public and private institutions.

It has been shown that while higher education can meet the condition of non-rival, it does not meet the condition of non-excludability. When this is the case, it only partially fulfils the desiderata for a public good. Nonetheless, there is a generally accepted sense in which higher education is deemed to be a form of public good. But what exactly is this sense? As noted, typically discourse on higher education and the public good has been about the economic development of society and the material benefits that this brings. But there is more to the matter than this. The Council on Higher Education Report (2000: 25), echoing White Paper 3 (*op cit*), states that 'higher education … has immense potential to contribute to the consolidation of democracy and social justice.' Simply put, the better the population as a whole is educated, the wider the public participation in the debate on societal and political matters will be. In addition, informed, engaged, reflective people strengthen democracy. The general point is that a society requires more than a flourishing economy; there needs to be a vibrant civil society with a strong value system in which the moral worth of persons is affirmed.

In South Africa the various policy documents, enacted legislation and the regulatory environment underscore this notion; for example, the Higher Education Act (DoE, 1997); the National Plan for Higher Education (DoE, 2001); the Report Towards a New Higher Education Landscape (CHE, 2000); South African Higher Education in the First Decade of Democracy (CHE, 2004). All stress the important role that higher education can play in meeting the goals of the government's transformation agenda, which includes, but is not limited to, growing the economy and increasing global competitiveness. In the light of this, the sense of public good used in this paper is of higher education 'contributing to consolidating democracy and social justice, producing critical intellectuals, developing knowledge and expanding and improving the economy' (CHE, 2004: 16). The question that now arises is: What mechanisms have been put in place to steer higher education so that it meets this sense of public good?

In the public sector, the state wields control through planning as well as through funding. The funding of a public institution is linked to the Department of Education's approval of its three year rolling plan (National Plan for Higher Education, DoE, 2001: 12) and not, as used to be the case, by past student numbers. There needs to be Department of Education approval for the programme qualification mix that an institution wishes to offer. Using funding and planning, the government steers public institutions so that they meet the weak sense of public good.

Before considering how private higher education institutions are steered by the state to meet the form of public good outlined above, it needs to be noted that private higher education in South Africa is not a homogenous sector. It mainly consists of two kinds. Firstly, there are those institutions whose aim is to deliver a particular kind of education for religious, philanthropic or egalitarian reasons. These are typically not-for-profit institutions. Donors or student fees - or a combination of both - usually fund them. The other type of private institution is 'for-profit'. Its aim is to deliver high quality education whilst making a profit either for shareholders in the case of a listed company or for the owners in the case of a private company. Whatever the case, their revenue is mainly from student fees. The common denominator in predicating 'private' to a higher education institution is that it is financially independent of the state. It is not funded by the public purse. Two points need to be noted here. (i) 'Not being funded by the state' does not mean that there is an absence of state control and regulation. (ii) The policy framework requires private and public higher education institutions to meet the same policy objectives.

In the case of the private institutions, the state does so through the legislative and regulatory environment – setting out conditions for registration as a private provider. Registration depends on financial viability,

quality of programme offerings, and the provision being in the public interest (Higher Education Act, DoE, 1997). The state also controls the programmes that are offered through its quality assurance system in which programmes have to be accredited in order to be lawfully offered, and an institution must be able to demonstrate efficiency, effectiveness, value for money and most importantly, show how it meets the sense of public good described above. This includes requiring private institutions (like public ones) to promote social responsibility through community service programmes (White Paper 3, DoE, 1.27.8).

The regulations are there for good reasons. The proliferation of private higher education institutions in South Africa after 1994 and before the appropriate legislation and regulations were in place caused surprise and uneasiness in many quarters (CHE, 2000: 20-21). Surprise, because this was an unforeseen consequence of economic liberalisation and the abrupt internationalisation that took place as the apartheid system collapsed; for instance, several foreign universities set up satellite campuses in some of the major cities. Unease, because there were no legislation and steering mechanisms in place to control the emerging private sector and there were concerns about the detrimental effect the emerging private institutions could have on the public sector.

Once the appropriate legislation and regulations were in place the state turned its concern to the quality of provision. And rightly so. If private institutions were allowed to operate in a *laissez faire* market environment, the sector could become exploitative. It could take advantage of the many years of educational deprivation suffered by the majority of the population by being merely a profit-making venture. Whilst legislation and regulation were needed to keep some order in the system, quality assurance mechanisms were also needed to ensure that the private institutions provided good quality higher education programmes. It was explicitly stated that quality assurance is 'an important element of the new form of governance proposed for higher education as well as one of the ways of drawing private higher education into the new system' (Higher Education Quality Committee Founding Document, CHE, 2001: 1.1). In ways like these private institutions are steered so that they meet the same desiderata as public institutions.

So far this paper has concentrated on higher education as a form of public good. It is necessary for sustainable socio-economic growth, and for cultural and civic growth. It has been pointed out that (i) public higher education does not meet the conditions for being a public good in the strict sense of term, (ii) private institutions cannot merely be about profit; (iii) both have to meet a range of societal goods and so (iv) both meet a weak sense of public good.

HIGHER EDUCATION AS A PRIVATE GOOD

Undoubtedly, higher education is also a private good. There is a range of private benefits that accrue to individuals who successfully complete a higher education programme. Academic certification is necessary for most positions of power, authority and prestige in society. It will usually enhance the graduate's prospect of a good job and the higher social status along with the material benefits this brings.

There is another important impact that higher education has on an individual. It plays a fundamental role in shaping an individual's life. Why? Through acquiring a broad range of generic and critical thinking skills, 'a knowledge of history, a recognition of the importance of social circumstances, an analytic capacity for making distinctions' (Said, 1983: 15), a person gains an understanding of the world and constructs his or her identity within it. This enables a person to make informed and thereby more satisfying choices about their lives. As a consequence of which, he or she is more likely to engage in creative projects and so be able to change the world in some lasting way. Noble (2002) puts the point aptly when he writes: 'Education … entails the utter integration of knowledge and the self, in a word self-knowledge. Here knowledge is defined by and, in turn, helps to define, the self. Knowledge and the knowledgeable person are basically inseparable.' In other words, it is through higher education that a person gains the power

and freedom to act effectively as a human being. (Of course, this is not to say that the formal route is the only way to become an educated person. Persons can structure their own learning in their quest for truth, self-understanding or knowledge.) Through gaining knowledge and self-understanding, a person can make informed choices and through this a person is empowered. Empowerment is the process that persons forge for themselves as they develop their self-understanding, talents and critical capacities. It is this ability that gives a person the power to participate at all levels of society. It is the means by which people gain transcendence and so they can be active, rather than passive, role players in the world and thereby achieve fulfillment.

In ways like these, higher education is a private good in that the individual receives direct benefit for him or herself. But there is another side to the coin. Human beings do not develop in isolation from others. As children, we are dependent on other people for our daily needs, as well as for their love and care. The same applies to our lives as adults. We depend on other people, not only in our families and friendships, but in a myriad of other ways – in the books we read, the music we listen to, the clothes we wear, and in most other aspects of our daily lives. We are part of a wider society. And our interdependence extends to every aspect of society's functioning. If it is to flourish, society needs independently minded engaged reflective citizens. This is the way a healthy democracy works. As social beings we can achieve a sense of fulfillment and happiness by participating in our communities and in society. People engage in public life 'not altogether from duty nor to serve their own interests but most of all because they enjoy the discussion, the deliberations and the making of decisions' (Arendt, 1960: 414). The point is: by satisfying private interests, public interests are also satisfied. By so doing persons help to create what Arendt (1960: 413-422) calls 'public happiness' or what we might call the 'public good'. By participating as a citizen in public affairs, a person not only meets their own need for self-fulfilment or happiness, he or she helps to create public happiness and meet the sense of public good described above.

When it comes to considering the individual who has enjoyed the advantages of higher education, there is no necessary incompatibility between public and private good. There is a convergence of private and public benefits. Whilst educated individuals achieve self-fulfilment through participation in all aspects of public life, there is a concomitant societal benefit in that there is an educated and skilled citizenry that contributes to the social, democratic and economic fabric of society.

PRIVATE AND PUBLIC HIGHER EDUCATION INSTITUTIONS COMPLEMENTARY

The next point that needs to be shown is how public and private higher education institutions are complementary and that there is no need for a polarization between these two sectors. Arguments against the existence of private higher education usually derive from the conviction that it is unfair that those with financial resources should be placed in a privileged position with regard to their education. When so few in South Africa have access to higher education, it is argued, there should be no special provision merely for those who can afford it. At this point another 'public good' principle becomes relevant; i.e. 'promoting what is good'. The fact is that there are some good private institutions involved in higher education, which successfully combine academic achievement with the kind of critical thinking and character formation desiderata discussed earlier. Different institutions, of course, have different missions, niches and modes of delivery. The quality of education in the best of these institutions is very good indeed.

One advantage amongst private contact-tuition higher education institutions is personalised tuition and small class sizes. Among the other advantages at good institutions, we find

- pedagogy that is reflective of participative learning techniques – structured exercises, challenging discussions, peer critiques, internships
- the incorporation of community engagement into the curriculum
- the guiding of campus activities so that they are not only social events but opportunities for student engagement and learning

- cooperation amongst students - syndicate work – sharing of their own ideas and responding to others.

For reasons like the above, the best private institutions contribute to redressing past inequalities, to meet pressing national needs and to respond to the needs of a knowledge and technologically driven economy and so contribute to a form of public good.

CONCLUSION

In this paper it has been shown that in South Africa, higher education is not a true public good as there are major barriers of access. This applies to both public and private higher education institutions. Due to the steering mechanisms set in place by government by way of legislation, regulations and the quality assurance system, both public and private higher education institutions meet the weak sense of public good outlined earlier in the paper. It was noted that while there are private benefits that accrue to educated individuals in the form of career paths, earning capacity and social status, there is an unnecessary disjuncture between public and private good. Individuals cannot be dislocated from the society in which they live and work. From this vantage point the convergence of interests between public and private institutions needs to be acknowledged so that between the two there exists a climate of cooperation. When they are working well, they can both occupy the still inadequately filled educational space in South Africa; they can both meet the same educational desiderata, namely benefiting the public and the private good.

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The nature of science and the National Curriculum Statements: Some philosophical issues

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ABSTRACT

South African curriculum reform has recently focused on the need for including the nature of science, indigenous knowledge and the influence of an African worldview in the teaching of science. New curriculum demands are often couched in terms of the rise of science, the reliability of its claims, its influence on values and priorities and its relation to social responsibility. In this paper it is argued that if educators are to respond to the challenges of these new curriculum demands, they need to have developed meaningful understandings of interpretations of the nature of science and have insight into the effect their own beliefs have on their interpretation of curricula and the way in which they go about teaching science.

INTRODUCTION

Eisenhart (Moss, 2001) argues that scientific literacy is the educational solution for many of the economic, social, and environmental challenges of the 21st century. He notes that many initiatives in science education reform explicitly state that achieving scientific literacy for all citizens is their overarching goal. However, a number of researchers in science education contend that the development of an understanding of the nature of science is a key element to achieving scientific literacy (Moss, 2001; Alters, 1997).

Traditionally, philosophers of science have argued that an understanding of the nature of science should be conveyed implicitly (Schwartz and Lederman, 2002). Nevertheless, there have been calls for the explicit teaching of the philosophy of science in the latter half of the twentieth century (e.g. Hodson, 1986). Although science curriculum reform worldwide is now beginning to focus on the nature of science (Schwartz and Lederman, 2002), it has been noted that science teachers remain surprisingly uninformed about issues in the philosophy of science, with their awareness running some twenty to thirty years behind contemporary developments (Elkana in Hodson, 1985).

The Revised South African Curriculum Statement (Department of Education [DoE], 2002a) forms part of a process of education transformation focusing on the introduction of Outcomes Based Education (OBE), and which is underpinned by a constructivist philosophy of teaching and learning (Moll, 2002). However, in stating the goals of the natural science curriculum, a number of current views on the nature of science are noted and attention drawn to their links to the promotion of scientific literacy. This represents a move towards the explicit teaching of the nature of science at school level and a return to the philosophical underpinnings of curriculum design as promoted by Dewey. This is despite these having been largely replaced by psychological frameworks of reference, particularly during the period when constructivism enjoyed unchallenged ascendancy (Linneman, Lynch, Kurup and Bantwini, 2002).

WHY DO WE TEACH SCIENCE?

Science teachers' knowledge about the nature of science is important because they play a key role in forming the image of science that is held by the general public (Gallagher, 1991). Hodson (1985) argues that although to be a skilled scientist does not need an understanding of arguments in the philosophy of science, it is essential for science teachers. Matthews (Moss, 2001) proposes modest goals when teaching the nature of science, saying that it is unrealistic to expect teachers or students to become competent philosophers of science. Nevertheless, Schwartz and Lederman (2002) believe that in order to teach the nature of science effectively, a teacher must not only have a firm understanding of the nature of science, but also have knowledge of effective pedagogical practices relative to the nature of science.

Unfortunately, many curriculum reforms in science education have failed to effectively incorporate the nature of science as central to an explanation of how scientific knowledge is developed (Donnelly, 2001). Rosenberg (1985) noted that such science curricula are not founded on sound ideas in the philosophy of science. Until recently, little has occurred to improve the situation.

WHAT IS 'THE NATURE OF SCIENCE'?

The 'nature of science' remains a difficult and problematic construct to deal with for a number of reasons. Firstly, there is no essential shared meaning for the nature of science (Alters, 1997) and there are a number of major schools of thought, e.g. apriorism, realism, empiricism/logical positivism and conventionalism. Secondly, the nature of science is fluid and dynamic and the extent to which schools of thought are prioritised depends on the cultural context. Thirdly, the cultural context can change over time, as shown by changing perceptions of the nature of science in the European context (Lederman and O'Malley, 1990; Lederman, 1992). Its interpretation in other cultures, such as those found in Africa, represents a further set of challenges (Jegede, 1989; Ogunniyi, Jegede, Ogawa and Yandilla, 1995).

Beliefs and values, especially when strongly held, introduce a worldview context that is likely to have its own influence on the interpretation of the nature of science (Cobern, 1992). Furthermore, individuals have the capacity to hold two diametrically opposed worldviews without experiencing any apparent cognitive conflict (Ogunniyi, 2002). It is therefore important to focus on the role of interpretation and personal meaningfulness to teachers.

South African curriculum reform has focused on the need for including indigenous knowledge and the influence of an African worldview in the teaching of science (Webb, Linneman and Lynch, 2001). The Draft National Curriculum Statement for Life Sciences for Grades 10 to 12 (DoE, 2002b) recognises this by stating that the 'recognition and valuing of indigenous knowledge systems is crucial for affirming a great majority of our people and that there are competing perspectives and worldviews from which to understand and make sense of phenomena.' However, there is a paucity of data on indigenous knowledge in South Africa as evidenced by the fact that it is an under-subscribed research focus area of the South African National Research Foundation.

There is no clear consensus as to what constitutes scientific method (Alters, 1997). White (Hodson, 1986: 219) regards this as 'inevitable in view of the complexity of the scientific enterprise, the myriad of possible starting points and the differences in knowledge and personality between individual scientists.' While this should not be interpreted as suggesting that science is a chaotic activity, it clearly indicates that there is not only one type of scientific method (Hodson, 1986).

Alters (1997) focuses on 39 basic tenets of the nature of science, which researchers believe are implicitly and explicitly stated in the science education literature from the past 15 years. Giddings (Alters, 1997:

40) justifies these tenets as having 'attained some degree of consensus within the profession.' A number of the tenets have implications for the teaching of scientific literacy in schools. To name a few: 'The tentative and temporary status of scientific knowledge' (Alters, 1997:41); 'New knowledge in science is produced by creative acts of the imagination' (Cleminson in Alters, 1997: 41); 'There is no one scientific method' (Lederman in Alters, 1997: 40); 'The methods of science are characterised by … the nature of values rather than techniques' (Giddings in Alters, 1997: 41); 'Science is a social activity, both influencing and responding to social needs' (Moss, 2001); and, 'Consensus among self-appointed experts is the basis of scientific knowledge' (Ryan and Aikenhead in Alters, 1997: 41).

The authors of the benchmarks for Project 2061 - the science education reform project of the American Association for the Advancement of Science (AAAS) - clearly stated some nature of science tenets (Alters, 1997). Students should know that

- Scientists assume that the universe is a vast single system in which the basic rules are the same everywhere, and that the rules can be discovered by careful systematic study.
- Science's ongoing processes lead to an increasingly better understanding of how things work in the world but not to absolute truth.
- There are different traditions in science about what is investigated and how, but they all have in common certain basic beliefs about the value of evidence, logic and good arguments.
- Scientists in any one research group tend to see things alike, so even groups of scientists may have trouble in being entirely objective about their methods and findings.
- In the short run, new ideas often encounter vigorous criticism. Theories are judged by how well they fit with other theories; the range of observations they explain; and how effective they are in predicting new findings.
- People from all cultures contribute to science.
- Science disciplines differ from one another in what is studied, techniques used and outcomes sought, but they share a common purpose and philosophy, and are all part of the same scientific enterprise.

Beliefs, values, worldviews and alternative conceptions all influence one's understanding of the nature of science, and this inherently has a direct impact on classroom practices (Solomon, 1994). It is, therefore, imperative that educators begin to think about the nature of science, with its constantly changing view of reality. Schwartz and Lederman (2002) state that just as scientific knowledge is tentative, so the nature of science itself is constantly evolving. They also note that there is not a single nature of science that fully describes all scientific knowledge and enterprises. Educators also need to draw learners' attention to aspects of the nature of science through instruction, discussion and questioning that makes it visible in classroom instruction (*ibid*).

The tenets of the nature of science, like science itself, are also tentative, in a state of constant development and are vigorously contested by researchers in the philosophy of science (Hodson, 1986). Jenkins (Donnelly, 2001: 190) analyses the curricular impact of the nature of science and when he 'highlights its pluralism and conflicted agenda' he brings into focus the importance of recognising the contested nature of the nature of science when developing a curriculum.

Donnelly (2001) criticises the way in which issues in the nature of science were addressed in the National Curriculum for England and Wales when he says it 'might be used as a case study in how not to proceed when dealing with contested intellectual matters which somehow need to be adapted and codified in the school curriculum.' He (*ibid*: 191) says that this is because issues such as the nature of science are often 'addressed in a piecemeal fashion by a series of *ad hoc* committees' and that 'intense academic debate surrounding these issues went un-acknowledged in the statutory text.' Another good example of this can be found in the original Curriculum 2005 document in South Africa, which makes cursory mention of the nature of science, where one of the specific outcomes of the original OBE document is to … 'demonstrate an understanding of the changing and contested nature of the Natural Sciences' (DoE, Specific Outcome NS-7, 1997).

THE SCIENCES IN THE REVISED NATIONAL CURRICULUM STATEMENT

The revised National Curriculum Statement for Natural Sciences Grades R–9 (DoE, 2002a) makes its case for teaching the nature of science by including three main areas of learning outcomes; scientific investigation; how science knowledge is constructed; science, society and the environment. These are reinforced by detailed explanations and assessment outcomes, which reflect some of the contemporary thinking about the nature of science.

In particular, the nature of scientific knowledge learning area contains some important contemporary nature of science tenets (DoE, 2002a), such as

- People from different cultures have contributed indigenous scientific knowledge.
- Scientific knowledge is tentative and subject to change as new evidence becomes available.
- The study of historical perspectives on the acceptance of scientific explanations highlights how scientific knowledge is tentative, how it changes by evolving over time, how knowledge is contested and accepted depending on social, political and religious factors.
- Learners must evaluate the explanatory power and limitations of scientific models and different theories to explain a phenomenon.

The National Curriculum Statement (DoE, 2002a) has attempted to demonstrate the current views around the nature of science in a reasonably objective way. This curriculum, for example, states 'scientific knowledge changes over time as people acquire new information and change their ways of viewing the world' (*ibid*: 4). It goes on to say that the different fields of science 'need very different data and use very different methods of investigation. While there are similarities in the ways scientists work, it is not possible to put all scientific knowledge and activity under a single heading' (*ibid*: 5). An important statement is that 'Empiricism fuelled the growth of modern science over the past 400 years and has been remarkably effective in generating accurate and reliable knowledge about the natural world … It is challenged by those who argue that pure empirical science does not concern itself with questions of meaning and value, and is therefore a limited way of understanding the world' (*ibid*: 11). These are important curriculum statements in terms of the current debates around the nature of science.

CONSTRUCTIVISM IN OUTCOMES BASED EDUCATION

Constructivism has occupied an important position in transforming education in South Africa. In Curriculum 2005: Towards a theoretical framework (Moll, 2002: 7), learners in the constructivist classroom are 'viewed as thinkers with emerging theories about the world.' The document also states: 'Educators seek the learner's point of view in order to understand learner's present conceptions for use in subsequent lessons.' Young (2000) argues that knowledge is socially constructed, and that the curriculum is therefore not a body of content, but the outcome of political struggles over what counts as knowledge. This appears to have never been truer than it is in the current South African educational debate. The key educational reforms in South Africa revolve around OBE and the revised National Curriculum Statements. These reforms represent a 'clean break' from the apartheid past and in particular its heavy emphasis on content. The form of OBE adopted has been associated with learner centredness and favours an activity-based approach, appearing to fit with the post-apartheid emphasis of democratic participation and access.

Constructivism can be viewed on a continuum from personal constructivism to knowledge creation through social influence and mediation. Personal constructivism, according to Confrey (Matthews, 1992) can be described as a theory about the limits of human knowledge, a belief that all knowledge is necessarily a product of our own cognitive acts. Confrey (*ibid*: 2) states that 'We can have no direct or unmediated knowledge of any external or objective reality. We construct our understanding through our experiences, and the character of our experience is influenced profoundly by our cognitive lens.' Similarly, Piaget's

genetic epistemology proposes that individual children construct knowledge through their actions on the world, i.e. to understand is to invent (Kitchener, 1986).

Vygotsky (Kitchener, 1986) stresses the influence of social factors on cognitive change and his view of social constructivism or social mediation emphasises that knowledge is socially constructed, with the influence of the learner's peers, social milieu and the teacher. Kitchener (1986) notes that constructivist teaching and learning is often expressed as a combination of both Piaget's and Vygotsky's views.

Smerdon, Burkam, and Lee (1999) describe constructivism as being based on the premise that learners actively construct knowledge and reconcile new information with previous knowledge. According to Taber (2001: 160) 'If a learner holds frameworks of understanding that are at odds with accepted knowledge, these alternative frameworks may act as suitable anchors for new knowledge.' Such alternative concepts make sense to the learner, and therefore it is important for educators to focus on these ideas in order to effect conceptual changes (Taber, 2001).

Children already have acquired considerable knowledge about the natural world, even before any science teaching takes place, and these views can be tenacious and resistant to change (Osbourne and Bell, 1983). They (*ibid*) refer to these understandings as 'children's science'. This differs from 'scientists' science' in that: children have difficulty with abstract reasoning; children are interested in particular explanations; and they use the everyday language of our society, which often leads to a distinctly different view from a scientist's view. Children, thus, may find it difficult to understand conceptions for which there is no observable evidence. As a result they tend to favour pragmatic explanations and not the coherent theories in which scientists are generally interested (Osbourne and Bell, 1983). Jenkins (2001) states that students' ideas about natural phenomena are too glibly described as theories and so suggests misleading parallels with scientific theories.

The development of scientific knowledge is a complex human process and learners need to be exposed to the failings of science, which often contributed to its rich history (Hodson, 1986). Hodson (1985) suggests that case studies and historical perspectives will assist children to see the part played by personal ambition and how scientists often followed blind alleys. He (*ibid*: 45) proposes the use of original writings rewritten for children in order to allow them to appreciate that science is not the 'humdrum, soulless affair described by many school science textbooks.' This supports the view that currently science education is very sterile and that it needs an injection of contextual and historical references in the classroom and in school textbooks in order to provide the opportunities for learners to obtain insights into how great scientists thought about things and how they generated knowledge (Hodson, 1986).

Hodson (1986: 219) makes it clear that science teachers should be 'encouraged to provide courses which exemplify the processes of science and put the learner in the position of "being a scientist".' The problem is that 'there is no general agreement on what constitutes scientific method' (Hodson, 1985: 34). The different fields of science 'need very different data and use very different methods of investigation. So, while there are similarities in the ways scientists work, it is not possible to put all scientific knowledge and activity under a single heading' (DoE, 2002a: 5). Nevertheless, a positive development for practical science is the move over the last twenty years towards the 'experience of science as a method of generating and validating … knowledge' (Hodson, 1985: 34).

Debates about constructivism as a theory of teaching and learning have become confused with philosophical disputes about the nature of science (Jenkins, 2001). According to Matthews (1992), constructivist educators and researchers see science for children as looking at the world and trying to find out whether their ideas and concepts make sense. As such, Matthews believes that constructivism has found itself in the grip of

attempting to be all things to all people. It is at once a theory of science, of human learning, and of teaching. However, what constructivism has not described is the 'process of learning as arrival on a foreign shore' (Solomon, 1994: 16), where the learner is confronted with sophisticated, often abstract concepts, in a scientific language that is often 'a code of meaning'. She (*ibid*: 5) asks, 'how do we teach those for whom our language 'has quite other meaning construction as theirs?'

It follows that when doing practical work in science, the danger exists that there is an assumption that theoretical structures can emerge from experimental data (Hodson, 1985). It is therefore important that when teachers prepare for learners to experience scientific practices that they draw a clear distinction between hypothesis generation, hypothesis testing, and the social processes of acceptance and recording of scientific knowledge. Hypothesis generation involves creative speculation, and hypothesis testing involves critical experimentation. This is a critical aspect of the philosophy of the nature of science; that the value of theories is their ability to explain observations and therefore theories are developed into hypotheses (*ibid*).

Hodson (*ibid*) concludes that learning and teaching are complex activities, which require the effective use of a whole number of learning and teaching theories, constructivism being an important one of these. Hodson (1986), in calling for the construction of a philosophically more valid science curriculum, has accommodated constructivism as a piece of the philosophy of science (or nature of science) puzzle.

THE CHALLENGES OF IMPLEMENTING THE AIMS OF THE NATIONAL CURRICULUM STATEMENT

Research has demonstrated the complexity of the transfer of nature of science knowledge into instructional behaviours. This transfer is influenced by a variety of contextual and personal factors, including classroom management, constraints of the curriculum or institution, time, concerns for student motivation and ability, and teaching experience (Abd-El-Khalick, Bell and Lederman, 1998; Bell, Lederman and Abd-El-Khalick, 2000; Hodson, 1993; Lederman, Abd-El-Khalick, Bell and Schwartz, 2002). Other factors relate to teachers' nature of science content knowledge and subject-specific pedagogical knowledge, such as teachers' discomfort with their understanding of the nature of science and ability to assess students' conceptions about the nature of science (Schwartz and Lederman, 2002). However, in-depth explorations of teachers' development of nature of science knowledge, instructional intentions, and approaches to nature of science instruction have not been the focus of much research (*ibid*).

The revised National Curriculum Statement for Physical Science for Grades 10 to 12 (DoE, 2002a) expresses some important goals for teaching about the nature of science in the classroom. However, the challenge lies in the implementation of these goals in disadvantaged schools in South Africa. As Gwimbi and Monk (2002: 38) conclude 'The availability and quality of resources like library books, together with a supportive social environment … are likely to be important factors in the shaping of teachers' attitudes towards the teaching of science and attitudes to the philosophy of science.'

CONCLUSION

The revised National Curriculum Statement for Natural Sciences for Grades R-9 (DoE, 2002: 5) indicates that education should help learners 'to understand not only scientific knowledge and how it is produced, but also the contextual, environmental and global issues that are intertwined within the Learning Area.' There is thus an imperative for including the nature of science, indigenous knowledge and the influence of an African worldview in the teaching of science (Linneman *et al*, 2002). South Africa's OBE curriculum reform is underpinned by a constructivist philosophy but it is important not to overstate its importance in the sophisticated, coherent theories in the minds of young learners. South Africa's Department of Education has introduced a training programme in preparation for the introduction of Outcomes Based Education

into the Further Education and Training phase. The intensive nature and the short duration of these training workshops poses the danger that the science education envisioned by the new National Curriculum Statement may fail to take root in many schools. In the light of the above, it is important that science educators in South Africa (i) take the lead in curriculum development and implementation by taking cognisance of the problems associated with OBE and its implementation and, (ii) share expertise and experience particularly with schools that may be disadvantaged by the process.

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Science academics' perceptions of quality and the practice of quality promotion and quality assurance procedures in higher education: A case study

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ABSTRACT

This paper investigates, through a case study, a forgotten aspect in quality in higher education, viz. the perception of academics. From this perspective, it explores general quality promotion (QP), quality assurance (QA), quality control (QC) and quality management (QM) strategies at the institutional level of a Historically Disadvantaged University (HDU), its Faculty of Science, four of its departments as well as individual academics. The study found that only 50% of the academics had some conception of quality higher education as described in the literature. The overall conclusion was that university-, Faculty- and department-wide QA systems and self-assessments did not exist. No formal QA or QC mechanisms and related strategies were in place at the institution, its Faculty of Science or the four investigated departments. Furthermore, the academics interviewed rarely practised formal QA, QP, QC and QM procedures.

INTRODUCTION

Many papers have been presented at conferences and articles published nationally and internationally on quality in higher education (QHE). However, no reports of higher education (HE) academics' perceptions of QHE have been discovered. This paper addresses that deficiency. The purposes of this case study were (i) to gauge the science academics' perceptions of QHE and (ii) investigate the general quality promotion (QP), quality assurance (QA), quality control (QC) and quality management (QM) strategies at the institutional level of the HDU, its Faculty of Science, four of its departments and by individual academics.

QUALITY IN HIGHER EDUCATION

It is difficult to define the term 'quality in higher education' (QHE). There are many perspectives, which are mostly set in differing academic, political and socio-economic contexts (Rear, 1992; Shippey, 1992; Retief, 1992; Harvey and Green, 1993; Birnbaum, 1994). Rear (1992: 87) observes that '… the meaning of quality is not clear' whereas to Shippey (1992: 380), '… the definition of quality is certainly not absolute.' Birnbaum (1994) notes that the idea of quality is based on the 'goodness' of specified educational characteristics and that the relative importance of these characteristics varies when viewed through the frameworks of the head of an institution, academics, parents or students. Birnbaum (1994) discusses various perceptions of quality, classifies them into absolutist or relativistic criteria and concludes that the various dimensions of quality often have structural or procedural requirements that are in conflict and so, finally leaves quality undefined.

Rear (1992) observes that a consideration of QHE involves standards ('standard' is defined as a chosen basis of measurement). Mambo (1992) adds that inputs such as the numbers and qualifications of full time

lecturing staff, student-lecturer contact hours, state of libraries and laboratories, staff turn-over, staff morale, quality of qualifying examinations, etc., do have an impact on QHE. Nevertheless, he criticises perceiving quality in terms of inputs. Instead, he suggests that quality should be assessed in terms of outputs such as diversity of programmes, examination results and satisfaction of the labour market.

Retief (1992) perceives quality in terms of a variety of factors: educational outcomes, educational processes and inputs, international demands of the discipline, goals and objectives of a specific programme, institutional regulation, measurable student achievements and completion or exit requirements. Shippey (1992), on the other hand, perceives quality in relation to the price paid and observes that as the state grant per student decreases, quality decreases. Within the South African context, quality is also perceived by some academics in terms of the historical contexts of the higher education institutions (HEIs). For example, Godden (1992: 40) succinctly captures this perception in his contention that, '… how the quality of institution, indeed, of faculties and departments within universities, is to be assessed, is historically specific.' Nonetheless, Ball (Shippey 1992) observes that a serious concern about quality itself in an institution is the best quality indicator.

It is evident from the above examples that it is rather difficult to define QHE. Fourie, Strydom and Stetor (1999: xiii) concur with this observation when they state '… there are vast methodological difficulties in defining quality in higher education, and these difficulties are exacerbated when comparing quality internationally.' Indeed, some academics argue that QHE should have different meanings in different cultures and contexts (Harvey and Green, 1993). Also, it has been argued that there would be nothing wrong in different stakeholders (such as academics, students, funders and industries) in HE emphasising different aspects in the definitions of QHE. Thus, attempts to give a single definition would be a futile exercise. As Brennan, de Vries and William (1997: 9) ask, 'is the quality of a lecture to be assessed in terms of the importance of its ideas or the clarity of its exposition? Of course, the answer is both but the balance between the two will be emphasised differently by different people … academic staff, students and administrators will all see and emphasise different things. And there is no more reason to expect consensus within groups than there is to expect it between them. Quality in higher education is a multi-dimensional concept and any attempt to legislate a single definition seems bound to end in failure.'

It has been seen that some academics see quality as 'implicit and indefinable' due to the absence of 'an absolute value or measure' while others see it as satisfactory 'conformance to some pre-defined standard'. The main problem is that quality is neither absolute nor static and so its components vary according to the area of study and the purpose of qualification. Nonetheless, quality ought to be an inseparable part of HE to enhance its effectiveness and efficiency.

Rather than looking for a single definition for QHE, one should look at the different perceptions it entails. In an attempt to summarise literature on defining QHE, Singh (1999: 7) cites what are termed as the 'five key approaches' to quality in education. It could be argued that the word 'perspectives' (mental views of the relative importance of things) or even 'perceptions' (intuitive recognition of truth) describes them rather better than the word 'approaches' (the way of dealing with a thing). These five key perceptions of quality in the definitions are cast in terms of: (i) *'exceptional'*, perception of quality as 'something special and is linked to excellence'. This is a rather traditional perspective of quality and is based on surpassing certain 'standards'; (ii) *'perfection'*, this perception relies on consistency and can be related to the slogan that the Matsushita Electric Trading Company of Japan (which manufactures the 'National' and 'Panasonic' trademark products) uses in their advertisements - 'zero defect', i.e. getting it right the first time and every time. This perspective focuses on processes and sets specifications to be met; (iii) *'fitness for purpose'*, perceiving quality as meeting the vision, mission, aims and objectives as stated or as fulfilling consumer (customer) needs; (iv) *'value for money'*, perception of quality to justify the high cost of education or as a return on investment, a perspective based on the notion of accountability to those who pay for education, the state, other funders, parents or students, who also may demand value for the time they spend; (v)

'transformation', perceiving quality in terms of the ability to bring about a change of institutional ethos, vision and mission, aims and objectives, teaching and learning styles, changes in assessment means and modes. This is a perspective based on enhancing the student and empowering them to be lifelong learners, i.e. to give students the ability to 'learn to learn' on the one hand, and changing the institution from an apartheid past to a 'democratic' future in the South African context, on the other hand. This is a much broader perception of transformation than the narrow one of seeing only the transformation of students, as portrayed in most articles on perceptions of quality internationally (for example, Harvey and Green, 1993) or nationally in South Africa (for example, Luckett and Kotecha, 2000).

Van der Merwe (2000: 82) observes that transformation involves much more than the reconstruction of social structures and institutions but also requires fundamental changes in respect of attitudes and relationships. 'These changes are not only between people, but also between man and his physical environment … essentially transformation requires a paradigm shift, the abandoning of old ways of knowing and doing and an adoption of a new, broader definition of reality.' Reddy (1998) as reported in van der Merwe (*op cit*) portrays the practical manifestation of transformation in the South African context as, *inter alia*, the empowerment of the unempowered, addressing race and gender inequalities, the balance of power and emphasising common interests rather than exclusive interests. The transformative perspective must ultimately originate and sustain in every individual; administrator, academic and student, for it to succeed.

In summary, the various perspectives of the concept of QHE cited in the literature are: excellence; high standards; consistency; a quest for zero defect in meeting pre-set specifications; fitness for purpose; achieving the vision, mission, aims, objectives and expected outcomes; value for money; accountability; and finally, transformation; enhancing and empowering the student.

OPERATIONAL DEFINITION OF QHE AND ITS JUSTIFICATION

For the purpose of the present paper, QHE is defined as 'the capacity to respond actively to the needs of local contexts within South Africa, making effective and efficient use of the available resources to achieve pre-defined goals and purposes for which students are enrolled, and to enable students to acquire a qualification that conforms to comparable national and international standards.' This definition broadly acknowledges the perceptions of quality in terms of 'transformation', 'fitness for purpose', 'value for money' and finally, 'perfection or consistency'. It acknowledges the need to maintain quality while achieving diversity. Diversity originates from a quest to redress past inequalities by expanding HE to enable previously disadvantaged (and excluded groups) to access the system. It is generally accepted that there is not going to be any notable change in the quality of students who apply and get admitted to HE. This being the case, there would be (and should be) a university-wide recognition of a transformative model of conception of quality rather than an absolutist conception of quality. The absolutist conception is based on a transmission model of teaching and learning where the academics deliver lectures and the students are passive receivers of knowledge.

A transformative model in which the conception of quality implies a facilitative model of teaching and learning should be the focus. In the facilitative model, academics are dialectically engaged in a process of transforming and constructing knowledge and the whole spectrum of teaching and learning is student-centred. In such a context, a two-way active feedback between the students and academics becomes significant. The students on the one hand, have opportunities to close broken networks in their knowledge and to construct and integrate knowledge, and on the other hand, academics re-design the ways in which they presently communicate to students. The teaching methods must conform to a transformative model of quality where academics take pains to grapple with the low level subject mastery with which students enter HE, go down to their level and promote student enterprise, student autonomy and enhance co-operative and consultative learning. Thus, the perception of quality as transformation became most significant in the specific context of the HDU in which the present research was done. The transformation concept should also continue to be the focus in post-1994 South African HE.

Furthermore, such a transformation model involves capacity building to enable academic staff to cope with transformation (Reddy, 1998). Imenda (1995) goes a step further and emphasises the need for enhancing capacity building for students to cope with HE demands, in order to ensure that more numbers should not mean decreasing quality. Imenda (1995: 181) echoes the need for institutional change when he observes, '… the notion that it is only the students who should strive to meet the requirements of academic institutions can not help universities, technikons and other tertiary institutions to cope with the task of giving students meaningful and appropriate instruction.' It is more important that institutions themselves change (through modifications to their programmes of study and the perceptions of academic staff) in order to accommodate the peculiar circumstances of their students, than for them (institutions) to continue to exert pressure on students to fit unchanging university standards. The contention is that in the South African context, capacity building of academics and students as well as institutional transformation, are pertinent for the transformative perspective to succeed.

THE CONCERN FOR QHE

The concern for quality, QA, QP, QC and total quality management (TQM) in HE has been gaining priority attention from educationalists and governments in recent years (Harvey, Green and Burrows, 1993; Singh, 1999; Fourie, Strydom and Stetor, 1999). Definitions and explanations of QA, QC and TQM in the context of HE are succinctly recorded in the literature (Ellis, 1993). The coordinated concern for QHE is evident internationally. Brennan, de Vries and Williams (1997: 171), for example, observe that, '… within Europe, both the European Commission (EC), and the Association of European Rectors (CRE) have initiated development work in this field. The Organisation for Economic Co-operation and Development (OECD), through its programme on Institutional Management in Higher Education (IMHE) has a project that extends from Europe to America and Australia. In addition, the United Nations Educational, Scientific and Cultural Organisation (UNESCO) has supported activity in this field at its European Centre for Higher Education (CEPES) and the various quality agencies have formed an international body, the International Network for Quality Assurance in Higher Education (INQAAHE).' The establishment of QA units has been gaining unprecedented support in recent years (South African Qualification Authority [SAQA], 1995; National Commission into Higher Education [NCHE], 1996). The SAQA Act (DoE, 1995), the NCHE Report (1996), and the subsequent establishment of the Higher Education Quality Committee (HEQC) have laid the foundation for QA in the post-apartheid South African HE.

THE NEED TO GATHER PERCEPTIONS ON QUALITY IN HIGHER EDUCATION

Each individual constructs a reality around him or her and operates and reacts to that reality. A person's own perceptions and opinions influence the way he or she acts and reacts. According to Cohen and Manion (1989: 27), '… (the) social world can only be understood from the standpoint of the individuals who are part of the ongoing action being investigated … .' As such, participants' perceptions are important to understand the context, process and the product of any human endeavour in general, and in the teaching and learning context in particular.

An understanding of the concept QHE by academics is important. Cohen and Manion (1989: 26) argue that '… man can and does construct theories about himself and his world; moreover, he acts on these theories.' Also, in a phenomenological perspective, looking beyond 'the details of everyday life to the essences underlying them' is crucial (Cohen and Manion, 1989: 31). The academics' perceptions on QHE is, therefore, a significant factor in understanding the way they act in performing their professional roles and duties. This is especially so in the context of the different perceptions of QHE and the concern for quality as HE academics' efforts are informed and influenced by their perceptions of QHE and their concern for quality. Nonetheless, as stated earlier, no literature could be found on HE academics' actual perceptions on QHE.

General QA, QP, QC and QM policies and practices for HE institutions, their Faculties, departments and individual academics

The distilled factors from the literature cited earlier, point to some general QA, QP, QC and QM and practices, *inter alia,* for HE institutions, their Faculties, departments and individual academics. Some general QA, QP, QC and QM factors at the institutional/Faculty level are, *inter alia,*

- conformity with the institution's/Faculty's vision statement
- conformity with the institution's/Faculty's mission statement
- evaluation of the institution's/Faculty's learning environment
- good selection procedure for academic managers (Dean, Vice-Dean, Heads of Departments (HoDs), and academics
- setting key performance indicators (KPIs) and measuring quality against KPIs and pre-defined standards
- Dean/Vice-Dean regularly monitoring the quality of academic activity in the departments in the Faculty
- Dean/Vice-Dean regularly monitoring the quality of student work in the departments in the Faculty
- institutional/-wide self-assessment
- student evaluation of academics
- clear statement of objectives and outcomes in courses and assessing if these were achieved
- facilitating participation of all stakeholders.

General QA, QP, QC and QM factors at the department level are *inter alia,*

- conformity with the institution's/Faculty's as well as department's vision and mission statements
- HoD regularly monitoring the quality of academic activity in the department
- HoD regularly monitoring the quality of student work
- good selection procedure to choose academics
- regular departmental reports on student absenteeism, good/poor performances
- constant monitoring of the moderation of assessment instruments and providing guidance
- active monitoring of the quality of academic-student feedback
- frequent self-assessment within the department
- reports from academics to the HoD on student absenteeism in academic activities
- reports on constant poor or sustained good student performance
- review problems in departmental staff meetings
- planned academic programmes
- department-directed monitoring of assessment instruments and guidance where necessary
- monitoring of student feedback and action and advice on the findings.

General QA, QP, QC and QM factors and procedures at individual academic's level are *inter alia,*

- regularly monitoring the quality of students' academic activities
- regularly monitoring the quality of student work
- regularly monitoring and recording student absenteeism
- reflecting on student performance and ways to improve it
- implementing good staff/student feedback and reflecting on how to cope with identified academics' and students' weaknesses.

METHODOLOGY

Research design and the sample

This research was a case study. Gathering data on opinions, perceptions and responses from the participants in the educational processes directly, by interviewing them where possible, was considered appropriate to provide insight into QA, QP, QC and QM. The data collected by direct contact between the researcher and participants ensures clarity in the meaning of questions and answers gathered. Furthermore, the direct

interactions between the researcher and participants provide an opportunity for them to learn from each other. Research methods, such as the interview where the researcher is an active participant, are considered as more appropriate in case studies than the methods used in experimental designs. For quality improvement, as an emerging discipline in HE, it is important to capture experiences, observations and opinions to add to the rapidly accumulating knowledge base in the discipline. The sample upon which the research is done is an important factor in social research (Cohen and Manion, 1989). As such, a description of the sample, including their gender, age and background, in any meaningful research is necessary. These aspects have influences and implications on the gathered data.

In 2000, there were 47 academics employed in the Faculty of Science in the four departments of the HDU investigated in this study: Physics (11 or 23%), Chemistry (15 or 32%), Zoology (10 or 21%) and Botany (11 or 23%). Out of the 47 academics, 28 (60%) participated in the study. Five academics refused to take part without giving any reason and amongst them was one Head of Department. In ascending order of participation of academics per department were: Botany (5/11 or 45%); Physics (6/11 or 55%); Chemistry (9/15 or 60%); Zoology (8/10 or 80%).

The population consisted of 31 (66%) male and 16 (34%) female academics representing a male to female ratio of about 2:1. The sample consisted of 20 (71%) male and 8 (29%) female academics representing a male to female ratio of 2,5:1. Thus, in terms of gender, the sample was highly representative of the population. The academics were aged between 26 and 65 years with a majority (17/25 or 55 %) in the 41 to 55 year age group. The distribution of the sample in terms of rank was as follows: Professor: 2 (7%); Associate Professor: 6 (21%); Senior Lecturer: 3 (11%); Lecturer 'A': 4 (14%), Lecturer: 6 (21%); Research Associate (also teaching): 1 (4%); Junior Lecturer: 2 (7%); Senior Laboratory Assistant: 3 (11%); Laboratory Assistant: 1 (4%). The distribution of the highest qualification in the field of the subject of specialisation, was as follows: Doctorate: 17 (61%); Masters: 7 (25%); Honours: 3 (11%); Bachelor degree: 1 (4%). Out of the 28 academics, eight (29%) also had qualifications in the field of education. The total teaching experience of the academics' sample ranged from less than 2 years to 10 years or more. Out of the 28 academics, 23 (82%) had at least ten years' teaching experience. In summary, there were 28 academics in the sample with a majority in the 41–50 age group. The male to female ratio was 2,5:1. The academics were well qualified; 60% had doctoral degrees. The academics were experienced: 82% had at least ten years' teaching experience.

Sampling

Hitchcock and Hughes (1989) observe that the two main ways to sample a population for interviews are quota sampling and random sampling. The former focuses on a specified percentage or quota from the population with respect to keeping proportional numbers of men and women, comparable ages and social backgrounds. In contrast, random sampling is based upon probability theory and refers to the procedure, whereby the research sample is randomly selected (with the assumption that all members of the population have an equal opportunity to be selected). Neither of the sample procedures put forth by Hitchcock and Hughes could be used in this study to select the research sample. The characteristics necessary for quota sampling or random sampling could not be applied as the population of academics was small, 50 in all. Hence, there were inadequate numbers within this small population to sample on the basis of gender, age, academic qualification and teaching experience. Therefore, the present researcher had to depend upon a sample of volunteering academics in the four departments. Nonetheless, every effort was made to gain the confidence and willingness of all the academics to participate in the research. The good personal relationships that existed between the researcher (then an academic at the institution where the research was carried out) and most academics in the four departments investigated, contributed significantly towards the majority of academics from the four departments participating in the study. It is gratifying that about 60%, i.e. 28 out of 47 academics took part in the study.

Instrument

There were two recent studies in South Africa, one on the quality of support units in an HEI (Parsons, 1999) and the other on assessment of quality in the management of instructional offerings (du Toit, 2001). Nevertheless, the researcher did not find instruments that could be employed to undertake an investigation of the present nature. The instrument used (see Appendix) consisted of a battery of one-to-one interview questions. As an existing questionnaire could not be found, a suitable one had to be designed. The initially designed instrument was used to interview eight colleagues, two from each of the four departments chosen through what Cohen and Manion (1989) denote as 'purposive sampling'. This sampling technique allowed the present researcher to handpick the academics to be included in the sample on the basis of his judgement of their typicality, thus building up a sample that was considered satisfactory to the specific need.

To collect data from academics, one-to-one interviews were employed. The term 'interview' as used in this research, refers to verbal interactions between the researcher who sought the information and a member of the sample who willingly supplied the information. Data collected through qualitative methods such as interviews can reveal the interpretations, meanings and perspectives, which the role players assign to concepts, events and situations to describe the state of reality (Hitchcock and Hughes, 1989; Cohen and Manion, 1989). Furthermore, discussions and deliberations help to bring forth more consistency in meanings than through a 'complete and return questionnaire' mode (Rolph and Rolph, 1989). Interviews with academics were preferred in this research rather than using a written questionnaire to elicit information because interviews provide more opportunities for probing information and for consolidating consensus in meaning and explanations of words and terms used.

The purpose of interviews at the initial stage was to check if the items in the instrument were able to elicit academics' responses relevant to an item. It was found that the items were valid in that they served the purpose for which they were designed. Through the pilot study, the present researcher was satisfied with the validity with respect to the content of relevant factors to answer the research questions (content-validity) and the validity with respect to achieving the research objectives (purpose-validity) in the instrument was satisfactory. Hence, no modification was made to the instrument used in the pilot study for its later use.

The instrument consisted of structured and open-ended items. While the structured items that were used to collect demographic data provided a systematic approach to data collection, the open-ended items provided opportunities for probing information, consensus in meaning and explanations of words used. The structured items were designed with fixed options for responses, some with two options and others with multiple options to choose from, depending on the nature and type of data to be elicited.

Data Collection

Data was collected through interviewing academics. An appointment for a period of 2 x 1½ hour sessions was made with each member of the sample for the interview for the mega study (Mammen, 2003) and the completion of the data collection took about 40 minutes in the first of the two sessions. Efforts were made to interview each academic in his or her office at a time most convenient to him or her. The researcher interviewed the academics using the instrument. An audio tape recorder was used to record the interviews. Responses were audiotaped only in cases where the interviewee gave consent. Three interviews were not recorded due to lack of consent. During the interview the interviewer entered all verbal responses of an interviewee by hand; those for the open-ended items and also for items with fixed options. The audiotaped interviews were useful for the researcher to reconfirm his written records.

For the sake of collecting as much information as possible, the researcher gave a verbal undertaking to each academic that the name of the academic would be coded and would not be revealed to anybody. During the initial part of the interview, questions were asked to gather demographic information such as

gender, age, qualification, work experience, etc., from the academics. The second part of the interview in the instrument focused on gathering data on their perceptions on QHE and general QA, QP, QC and QM policies in the institution, its Faculty of Science, its four departments and those actually implemented by individual academics.

The open-ended items supplied a frame of reference for interviewee's answers but the interviewer exercised restraint, if and when, an interviewee showed signs of digression. Otherwise, there was no restriction on the manner in which the interviewees responded. At the end of the interview and completion of data collection, the various perceptions of quality as described under the earlier heading 'QHE', the factors under the heading 'the concern for quality' in this paper as well as possible QA mechanisms and processes at institutional, Faculty, departmental and individual levels were explained by the interviewer to each academic interviewee on a one-to-one basis.

RESULTS AND DISCUSSION

Academics' perceptions of QHE

Table 1
Academics perceptions' of the concept 'Quality in higher education'

Exceptional (standards)	Other	No Conception	Perfection (consistency)	Fitness for Purpose	Fitness of Purpose	Value for Money	Transformation of Teaching/Learning (institution)
15 (45%)	10 (30%)	5 (15%)	0	2 (6%)	0	1 (3%)	0

* Percentages are per total number of responses

As shown in *Table 1*, only about 55% (18/33) academics' responses showed a conception of QHE as described in the literature, for example, Ellis (1993) or Singh (1999). The 18 responses were from 14/28 (50%) academics as some academics gave more than one perception. In a period of global transformation of HE, about 20% (5/28) academics had no conception of QHE. In an HDU that admits mostly disadvantaged students, no academic had the 'transformation' concept of quality. Ten out of the 18 'acceptable' responses reflected the generally 'global' (Ellis, 1993) conception of quality in terms of high standards. It was interesting to note that some academics had more than one perception.

Academics' perceptions of QHE in the South African context are important in terms of national policies. Efforts need to be made to make them literate in this aspect. A person's perspective directs his or her actions and clarity in the perspective is essential for purposeful progress. As Waghid (2000: 101) observes, '… as academics, we first need to clarify what it means for higher education institutions, more specifically universities, to organise their practices in meeting the demands posed by changing local, national and global educational contexts. To say that we can implement higher education policy frameworks is not sufficient without first developing a clear, more informed and rational opinion about the current shifts in higher education transformation in South Africa.'

In the above context, it is clearly a matter of concern that despite the age-wise maturity of the sample, high qualifications, which were also complemented with long-term experience in the HE field, only 50% of the sample held conceptions of QHE relevant in the literature. Inadequate opportunities for exposure of academics to QHE factors may be, *inter alia*, the cause of this finding.

General QA policies in the institution and Faculty of Science

Table 2
Quality assurance and quality control mechanisms in the Faculty of Science

None	Good selection procedure for staff	Dean/Vice-Dean regularly monitoring the quality of staff academic activity	Dean/Vice-Dean regularly monitoring the quality of student work	Regular departmental report on student absenteeism/constant good/poor performances	Regular monitoring of the moderation of assessment instruments and providing guidance	Regular monitoring of the quality of staff-student feed-back	Total
27 (96%)	1 (4%)	0	0	0	0	0	28

Table 2 depicts the data gathered on the QA and QC mechanisms in the institution and Faculty respectively. The data shows that 27/28 (96%) academics confirmed the absence of university- and Faculty-wide QA mechanisms. In this context only one academic pointed out good selection procedure for academic entrants to the Faculty as a relevant factor.

General QA policies in the departments

Table 3
Quality assurance and quality control mechanisms in the departments in the Faculty of Science

None	Review problems in staff meetings/planned academic programmes/tests & exams (1 each)	HoD regularly monitoring the quality of staff academic activity	HoD regularly monitoring the quality of student work	Regular staff report on student absenteeism/consistent good/poor performance	Regular monitoring of the moderation of assessment instruments and providing guidance	Regular monitoring of the quality of staff/student feed-back	Total
25 (89%)	3 (11%)	0	0	0	0	0	28

Table 3 gives data on some QA and QC mechanisms in the departments. Although 25/28 (89%) of the academics stated 'none', 3/28 (11%) pointed out that there were reviews in place: reviews of problems through staff meetings; planned academic programmes; and tests and examinations. Reviews and actions on the discovered weaknesses were useful but there could have been many others such as conformity with the department's vision and mission statements, and the HoD frequently monitoring the quality of academics' activity and student work.

Table 4 gives data on some QA, QC and QP procedures in the academics' work as educators and the number of academics' responses to each of them. The data shows that 23/28 (82%) academics responded that there was no formal QA mechanism in their work as educators. However, 5/28 (18%) stated that they adopted mechanisms that in some way contributed to QA. The 'other' mechanisms are shown in *Table 5* and may be regarded as informal QA mechanisms.

Application of QA mechanisms, quality directions and QP procedures by academics

Table 4
Quality assurance, quality control and quality improvement mechanisms
in the academic's work as an educator

Regularly monitoring the quality of the students' academic activities	Regularly monitoring the quality of student work	Regularly monitoring and recording student absenteeism/ good/poor performance	Reflecting on student performance and ways to improve them	Implementing good staff/ student feed-back and reflecting on how to cope with weakness	Other mechanism*	None	Total
0	0	0	0	0	5 (18%)	23 (23%)	28

Table 5
Classification of other quality assurance mechanisms in the academic's work as an educator

Reflecting if I gave my best	Reacting to student feed-back	Mental aim	Total
2 (40%)	2 (40%)	1 (20%)	5

Numbers and % out of a total number of responses

There were three comments. These are shown in *Table 6*.

Table 6
Classification of academics' comments in the context of quality assurance
mechanisms in the academics' work as educators

'Never thought about the quality of what I do'	'When I returned to the department (after a long spell in my other job, I struggled - it was very difficult - (also) had the same difficulty in understanding the ethos in the department'	'In the University of Botswana (where I worked), interactions with colleagues, cross checking and learning were more'
2 (33%)	2 (33%)	1 (33%)

*Numbers and % out of a total number of responses

One academic stated that he never thought of the quality of what he did. Another stated, '… when I returned to the department, after a long spell in my other job, I struggled – it was very difficult – (also) had the same difficulty in understanding the ethos in the department.' This comment implied that some QA mechanisms were in place, before he left for his other job. However, on further questioning, it was discovered that there was no formal mechanism in place before he left and the comment was a result of comparing the local state of affairs to what he saw at the other institution. He did not do anything to rectify the situation, so his department did not benefit from his experience at another institution. A third academic stated that at another university where he worked, there was good interaction with colleagues, more cross-checking of each others' work; and opportunities for interactive learning from each other. Nonetheless, despite being a HoD, he too failed to introduce such an ethos in his department and his good experience did not serve to benefit his department or the Faculty. One point that needs to be made is that academics need to share their rich and constructive experiences with their colleagues to improve the quality of the institution.

CONCLUSIONS AND RECOMMENDATIONS

The various perceptions of QHE as well as the concern for quality nationally and internationally have been discussed. The need for focusing on a transformative model without ignoring the other perspectives of QHE has been elaborated. Only 50% of the sample had some conception of QHE as described in the literature. It is clearly a matter of concern that despite the age-wise maturity of the sample, their high qualifications, which were also complemented with long-term experience in the HE field, only 50% of the sample held conceptions of QHE relevant in the literature. Inadequate opportunities for exposure of HE academics to QHE factors may be, *inter alia*, the cause of this finding. Also, the quality of HE implementation by academics who themselves do not have acceptable perceptions of QHE (on which HE is founded) as described in the literature may not do well for their employer, students, and the educational endeavour of the country at regional and national levels.

The overall conclusion was that university-, Faculty- and department-wide QA systems and self-assessments did not exist. No formal QA or QC mechanisms and related strategies were in place at the institution, its Faculty of Science and the four investigated departments. The academics rarely practised formal QA, QP, QC and QM procedures. The reported finding of the state of affairs, at least in one Faculty based on research data, should send a warning signal to the institutional management to review its staff development strategies, its QA, QC, QM and TQM policies, practices and procedures. Even small efforts such as those reported in this study (discussing perceptions of QHE and general quality practices and procedures) are useful in staff development as a large majority of academics indicated that the interview was either very useful or useful in educator development, understanding the concepts in the principle of quality assurance and making one a better lecturer/educator (Mammen, 2003).

Staff development workshops need to be organised within the institution to enable academics to become familiar with QHE. As this research focused only on one Faculty of an HDU, its findings cannot be generalised to other Faculties within the same institution or to other institutions in South Africa or elsewhere. Similar research needs to be extended to other Faculties within the institution and also to other institutions, regionally and nationally, to gauge higher education academics' perceptions of QHE. Data also needs to be gathered on the general QA mechanisms not only as policy documents but also as those actually implemented at institution-, Faculty-, and department-wide levels and by HE academics at individual levels while discharging their educator duties and obligations. Collating institutional, regional and national data can direct staff development activities, if need be, based on such valuable data.

National and international seminars and conferences on QHE rarely promote quality at grassroots level. Therefore, institutional management must insist that those who are fortunate to attend QHE conferences must serve as a catalyst for institution-, Faculty- and department-wide staff development activities on QHE. Structures and systems to promote QHE, if non-existent, must be created so that quality penetrates to the grassroots level in academics' activities. Furthermore, QA, QC, QP and QM activities are ongoing processes and the progress must be measured against pre-set KPIs within desirable timeframes.

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(Data collection instrument)

1. DEMOGRAPHIC DATA

1 Name:	Surname:	Initials:	2 Gender	M	F

* The name will not be released to anyone. However, your name is required to code it to a number, in case further investigations by the researcher are necessary. Notwithstanding the above, you are free NOT to give your name if you so wish.

2 Age	>65	61-65	56-60	51-55	46-50	41-45	36-40	31-35	26-30	21-25	<21
3 Rank	Prof.	Assoc. Prof.	Sr. Lect./ Sr. R- Assoc		Lect. "A"		Lect./Res.Assoc.		Jr. Lect.	Sr. Lab. Asst.	Lab. Asst.
4 Highest Qualification			4.1. Subject: Phys/Chem/Zoo/Bot				Ph.D. / M.Sc / BSc (Hons) / B.Sc/Dip			Other	Country
			4.2. Education: D.Ed / M.Ed / B.Ed / HDE (pg) / STC / STD / PTD							Other	Country
5 Total teaching experience					≥10yrs	≥8yrs	≥6yrs	≥4yrs	≥2yrs	≥1yr	≤1yr
6 Length of service (Unitra)					≥10yrs	≥8yrs	≥6yrs	≥4yrs	≥2yrs	≥1yr	≤1yr

2. PERCEPTIONS OF QUALITY IN HIGHER EDUCATION AND QUALITY MANAGEMENT/ASSURANCE MECHANISMS

2.1 What do you understand by quality in higher education?
2.2 What quality assurance mechanisms are in place?
2.2.1.1 in your Faculty?
2.2.1.2 in your dept.?
2.2.1.3 in your own work as an educator?

3. ACADEMICS' COMMENTS ON THE USEFULNESS OF THE INTERVIEW ON EDUCATOR DEVELOPMENT, QUALITY ASSURANCE AND MAKING ONE A BETTER ACADEMIC.

What are your comments on the usefulness of the interview on educator development, quality assurance and making one a better academic

THANK YOU FOR YOUR TIME, PATIENCE, CO-OPERATION AND ASSISTANCE.
IT WAS VERY KIND OF YOU.

* Relevant extract from Mammen (2003)

Academic integrity: South African and American university students

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ABSTRACT

This study explores the extent to which academic integrity is upheld in the academic endeavours of South African and American university students. The study further examines the degree of difference in the extent academic integrity between the two sets of sample was maintained. The prevalence of academic integrity was determined on the basis of the extent participants admitted to having engaged in plagiarism and academic misconduct in its various manifestations. The findings of the present study clearly confirm that indeed academic dishonesty is widely practised by both South African and American university students. The extent to which this held true varied from one item to another of the sixteen questionnaire statements with the highest score being in items related to plagiarism. Overall, 12% South Africans and 14% Americans engaged in academic dishonesty. The rate at which academic dishonesty was reported was very low compared to what has been reported in other studies not only in the US, but also in other countries. As low as it may be, it is serious enough to call for attention in the form of bringing it under control so that the highest academic integrity is assured.

INTRODUCTION

It is probably safe to say that all institutions of higher education regard academic integrity as a premium in all their academic endeavours. It is an unconditional expectation that both students and academics will uphold principles of honesty, trust, fairness, respect and responsibility. In view of this, numerous research studies in many countries the world over have explored academic integrity on the basis of academic dishonesty or cheating in tertiary institutions. Academic integrity goes beyond mere avoidance of dishonesty. It entails conscious intent to apply intellectual honesty, which is in keeping with academic excellence.

Academic dishonesty has many meanings, which may be identified as follows: misconduct, dishonest behaviour, unfair practice, irregularity, cheating and plagiarism (Lipton and Chapman, 2002; Park, 2003; Teferra, 2001; Cummings, Maddux, Harlow and Dyas, 2002; Mwamwenda and Monyooe, 2000). One of the major aspects of academic dishonesty is plagiarism, which involves literacy theft, stealing the words or ideas of someone else and passing them as one's own without crediting the source (Park, 2003; Athanasou and Olabisi, 2002). Apart from plagiarism, lack of academic integrity manifests itself in the form of:
- inventing data
- fabricating references
- taking notes into the examination room
- having advance knowledge of the examination

- manipulating academic staff for better marks
- allowing one's work to be copied by others
- copying another student's work with his or her knowledge
- submitting work that has been done with the assistance of another student
- doing course work for another student
- copying from another student during an examination without their knowledge
- copying in an examination with the knowledge of another student
- writing an examination for another student
- misplacing materials in the library
- changing research data to obtain desired results
- producing false medical certificates
- exchanging answers in the examination room.

Academic dishonesty has been a subject of interest not only in the US and UK, but also in many other countries, including; South Africa, Ethiopia, Nigeria, Canada, Russia, Germany, Austria, India, Pakistan, Bangladesh. (Teferra, 2001; Lupton and Chapman, 2002; Brown and Emmett, 2001; Mwamwenda and Monyooe, 2000; Millerville University, 2005; McCabe and Trevino, 1996; Hanson, 2003; Kennedy, Nowak, Raghuraman, Thomas and Davis, 2000). Commenting on academic dishonesty, Park (2003: 471) states that 'There is mounting evidence that students cheating in general, and plagiarism in particular, are becoming more common and more widespread' to the point that it has reached an epidemic level (Alschuter and Blimling, 1995). This holds true in many countries involving both undergraduate and graduate students irrespective of whether they are studying in a small or large, private or public institution of higher learning (Park, 2003). Cheating among university students in the past fifty years has been such a common phenomenon that students who have not engaged in such behaviour are referred to as 'exceptional and deviant' (Cummings *et al* 2002). Teferra (2001) reported that cheating goes beyond university to include a long chain of students, teachers, examination paper setters, examination-board officials, examiners, tabulators, invigilators as well as parents, law officers and politicians. Moreover, (*ibid*: 164) 'Academic misconduct in the West has evolved into more complicated and hard-to-detect schemes owing largely to the advancement and proliferation of high-tech gadgets and settings.'

LITERATURE REVIEW

From the review of literature on academic dishonesty, there is ample evidence that indeed there is a widespread academic unfair practice. In the US, it is reported that academic dishonesty is in excess of 70%. Such behaviour has been researched and reported for the past century resulting in over 200 journal articles (Lupton and Chapman, 2002). According to Cummings *et al* (2002) some studies in the US have reported that for every four students, three admit to having engaged in academic misconduct in one form or other at one time or other. Some of the academic misconduct listed was plagiarism, copying another student's test answers, sneaking crib notes into the examination room, doing homework with another student without the express permission of the instructor. At the University of Millersville (2005) in the US, it was concluded that 'overall, the number of college students who cheat in one way or another is getting very high.'

In the UK studies have shown that on the average, more than 50% of university students reported that they had engaged in academic dishonesty at one time or another (Mwamwenda and Monyooe, 2000; Newstead, Franklyn-Stokes and Armstead, 1996). In a study of South African students at Walter Sisulu University, there was clear evidence that academic misconduct was a common practice, not only in response to the questionnaire, but also on the basis of the observation of the researchers; who were members of teaching staff (Mwamwenda and Monyooe, 2000). Students acknowledged in their responses that they had cheated by not acknowledging the original author or source of information used, using false references, not acknowledging joint work, misplacing library reference books and journals and using false medical certificates for missed tests/assignments, examinations (*ibid*).

In Russia, it was reported that more than 80% of the students interviewed said they had cheated by using crib sheets during examinations, looking at other students' work while in an examination, using lecture notes in the examination, copying from another student's homework, buying term papers and engaging in plagiarism (Lupton and Chapman, 2002). In a comparable study of Russian and American students, 55% of American students admitted cheating comparative to 64% of Russian students (Lupton and Chapman, 2002). While Russian students did not think it was bad to cheat, American students thought otherwise. Partly on this belief, Russian students had a greater propensity to engage in academic dishonesty.

Teferra (2001) argues that academic dishonesty is not an unfamiliar phenomenon in Ethiopia, as there have been reports on irregularities such as stolen examinations, answers for sale, collusion of invigilators, impersonification, copying from other students with or without their consent as well as exchanging worksheets. In a study of 60 Ethiopian academics, 60% reported they had caught students cheating in the examination session (Teferra, 2001). About 25% reported having witnessed five students engaged in academic dishonesty. Overall close to 90% of those who participated in the study reported having detected students cheating. Only 6 of the 60 academics reported no incidence of academic dishonesty.

REASONS FOR CHEATING

Research studies on academic dishonesty have not only examined the prevalence of cheating among university students, but also have explored the reasons for its occurrence (Park, 2003; Teferra, 2001; Millerville, 2005; Cummings *et al*, 2002; McCabe and Trevino 1996; Mwamwenda and Monyooe, 2000). Some of the reasons why cheating occurs and is on the rise are as follows (Park, 2003):

- Some students engage in plagiarism because they are not familiar with rules governing quoting, paraphrasing, citing and referencing.
- Students plagiarise to save time as well as score good marks.
- Students are engaged in numerous activities at university for which there is not adequate time to do all that is expected of them and for this reason, they opt for cheating as a shortcut.
- There are students who cheat because they consider doing so as clever and adventurous. Moreover they see no reason why they should not engage in such behaviour.
- Some students engage in cheating as a form of defiance against authority.
- Some students cheat because they are of the view that their lecturers do not take students' work seriously and therefore may not even detect that cheating has occurred.
- Denial and neutralization. Some students do not accept the fact that they are cheating and instead project such behaviour to others.
- As a result of easy access to information through the internet, it becomes rather easier for them to copy the needed information. The digital sources of information are available 24 hours a day and can be downloaded from the comfort of their rooms.
- The risks of getting caught cheating are outweighed by the benefits derived from cheating and therefore they opt for cheating rather than academic integrity. This is even more so when 'they think there is little or no chance of getting caught and there is little or no punishment if they are caught' (*ibid*: 480).

In most developing countries, there are additional reasons for the occurrence of academic dishonesty (Teferra, 2001). To begin with, the importance attached to examinations is supreme. This is even more so where there is economic insecurity, competition and a prevalence of unemployment (Teferra, 2001). In fact, examinations serve as a passport to government and private jobs available on the labour market, which inherently facilitate and enhance one's social mobility and economic security. A qualification from university guarantees better job opportunities, better livelihood, better social value, personal development, life chances, earnings, status as well as lifestyle (Teferra, 2001). Given such a scenario, many students find it extremely tempting to engage in academic dishonesty (Hanson, 2003; McCabe and Trevino, 1996; Cummings *et al*, 2002).

STUDENTS WHO ARE VULNERABLE

It is further interesting to note that research has identified students who are likely to be vulnerable to academic dishonesty (Teferra, 2001; Cummings *et al*, 2002; Athanasou and Olabisi, 2002; McCabe and Trevino, 1996).

- Male students are more prone than female students to academic dishonesty.
- Younger students more than older ones are likely to engage in academic dishonesty.
- Urban students more than rural are likely to cheat.
- Students who are performing poorly, are frequently absent, or repeating, are more vulnerable.
- Students who are eager to score high marks are more likely to cheat.
- Students who are enrolled in larger universities are more likely to cheat.
- Students who attend universities more for the purpose of the degree than the knowledge gained.
- More students cheat when their instructors assume that they are honest.
- Cheating may be practised when students perceive that the chances of being caught and punished are rather slim.
- Students with a low level of moral reasoning are vulnerable to academic dishonesty.

McCabe and Trevino (1996) argue that cheating is carried out by students who have no understanding of the value of education. In the students' view, all that matters is obtaining a university degree in preparation for a career in the world of work. Similar reasoning is advanced by Millersville University (2005) where it is stated that one of the reasons cheating at the university level occurs is that students do not view university as a centre of learning and excellence, but assume that it is primarily there for conferring degrees.

ADVOCACY FOR ACADEMIC INTEGRITY

Academic dishonesty is not only incompatible with principles of education, but also erodes academic standard and integrity (Mwamwenda and Monyooe, 2000). Lupton and Chapman (2002) argue that academic dishonesty cannot be condoned on the following grounds:

- It devalues the educational experience.
- It leads to inequitable grades/marks.
- It is a misrepresentation of what the student has learned and can use following graduation.
- The academic qualification obtained is of a dubious nature.

Similarly, Park (2003) reaffirms that academic misconduct poses a serious challenge to academic integrity as well as a threat to institutional quality assurance. The credibility of a university is essential for the recognition of its degrees within the country, as well as outside countries where its graduates may seek employment or wish to pursue further studies (Teferra, 2001). This cannot be realised when dubious standards are practised with the condonation of the institution.

According to the University of Washington (2005) a number of reasons advanced against academic dishonesty are as follows:

- It hurts the university community as it undermines academic principles.
- Students who are honest feel frustrated by the unfairness of cheating that is not discovered and therefore not meted the appropriate punishment.
- Cheating leads to skewed scores favouring those who are cheating and disadvantaging those who worked hard.
- Cheaters deny themselves of the knowledge they would have acquired by genuinely learning it.
- The university image and value of qualifications offered are questioned when prospective employers and community gather that students cheat to get such qualifications.

MAINTAINING ACADEMIC INTEGRITY

Many years ago, Chinese punished cheating by death for both the examinee and examiner (Lupton and Chapman, 2002). While no one would advocate such a measure as a way of maintaining academic integrity, the point is made that academic dishonesty is a serious matter that ought to be given attention to deter it from being a common phenomenon in institutions of higher learning. Park (2003) emphasises that academic dishonesty must be addressed and punished where detected as a way of bringing it under control. In Ethiopia, cheating behaviour is punished by annulling all examination results or dismissing the misbehaving student from the university (Teferra, 2001). Similar methods dealing with academic dishonesty are used worldwide with varying degrees of success.

In response to the alarming rate of academic dishonesty, North American universities devised various ways of combating this scourge.

HONOUR CODES

A Center for Academic Integrity Consortium of 200 Universities was established at the University of Duke North Carolina. In this Centre the emphasis is placed on the fundamental values of academic integrity such as honour, trust, fairness, respect and responsibility (McCabe and Pavela, 1997). Students are given exposure to what is meant by academic integrity and why it is important in their academic work. This is concluded by encouraging them to sign a pledge to the effect that they will uphold the principle of academic integrity by ensuring that they will not knowingly engage in cheating behaviour of any form. Through the few years that the honour code has been in operation, significant difference has been observed. Park (*op cit*: 483) writes: 'There is mounting evidence that students in institutions with academic honour codes view the issue of academic integrity and treat cheating behaviours in very different ways to those at institutions without honour codes. Academic honesty is higher and levels of self-reported cheating are lower in institutions that have honour codes.'

In an Ethiopian study (Teferra, 2001) the majority of respondents indicated that cheating can be controlled through academic awareness. It was further proposed that more institutional commitment was crucial to the control of academic dishonesty. Introduction of an honour code was yet another measure to be considered in the control of the irregular behaviour. It was also suggested that examinations must be set in such a way that they are less prone to cheating such as may be the case with essay writing.

McCabe and Trevino (1996) point out, institutions that have established honour codes experience less cheating than is the case with institutions without them. It is important that students be provided with adequate familiarity with what is meant by cheating and plagiarism (Millersville University, 2005). According to Lupton and Chapman (2003: 24), 'Instructors should educate students on the virtues of not engaging in cheating and the penalties for cheating, with the hope that this will reduce the incidences of academic dishonesty.'

WHY STUDY ACADEMIC INTEGRITY

It is important for educators to understand academic dishonesty as practised by students as such knowledge will enable academics to communicate with students regarding the serious educational implications of such behaviour (Mwamwenda and Monyooe, 2000; Ashworth, Bannister and Thorne, 1997). Studying academic dishonesty familiarises all those concerned with higher education with what is going on so that appropriate measures can be put in place to control the occurrence of such behaviour.

It was with this in mind that the present study was undertaken. It sought to find out the extent to which both South African and American university students maintain academic integrity in their academic endeavours

in pursuit of their higher learning. The study also aimed at comparing and contrasting the extent to which academic dishonesty is prevalent between the two sets of students. It was expected that the findings of this study would be similar to what has been reported, though not necessarily in terms of the extent to which it has been reported.

METHOD

Sample

The participants of this study comprised 245 South African Education students and 60 American undergraduate students drawn from University of KwaZulu-Natal, Durban and New York Metropolitan College, New York City respectively. In both samples students were engaged in their second year of university studies. The South African sample consisted of 120 men and 145 women, whereas the American sample of 60 had only women as participants.

Procedure

During lecture time, students were requested to fill in the answers to a questionnaire, which took them about twenty minutes. Participants were asked to respond with a 'no' or 'yes' response. At the end of the allocated time, the completed questionnaires were handed in.

Questionnaire

The questionnaire started with a preamble, which stated as follows: 'This questionnaire aims at determining the behaviour of university students as regards writing assignments, research papers, tests, and examinations in pursuit of academic or professional qualification.' The students were asked to tick under 'yes' or 'no' the appropriate statement showing whether at one time or other, they had engaged in the described behaviour. In addition, participants were asked to indicate their gender and date of birth. For the purpose of confidentiality, they were forbidden from revealing their identity in any way. This was adhered to by all participants.

The questionnaire comprised sixteen statements covering most of the activities in which university students engage. The objective for each statement was to detect whether or not academic integrity is strictly observed and maintained. The questionnaire was the same as those used in similar studies carried out in many countries at numerous times. The questionnaire had to be similar given that the scholarly activities students engage in are of a universal nature.

Scoring

Scoring was simple and straightforward. For each participant both 'yes' and 'no' responses were counted against each statement and then tabulated for all the participants.

Results

On the basis of the tabulated scores for each of the sixteen statements, the total number of 'yes' responses was identified and scored as an essential element for statistical analysis. The total score was converted into a percentage to determine the magnitude of the participants who engaged in academic dishonesty. This is displayed in *Table 1*. Having calculated the percentage for each statement, an overall percentage was calculated for all the statements and the entire sample as displayed in *Table 1*. For each statement, a two-sided significance test for the difference between the two percentages was carried out.

Table 1

Performance of American and South African university students on academic integrity questionnaire

N = 245 South African   N = 60 American

Statement	South African N Yes	%	American N Yes	%
1. Paraphrasing material from another source without acknowledging the original author	70	29	19	32
2. Allowing own coursework to be copied by another student	54	22	17	28
3. Fabricating reference or a bibliography	80	33	8	13
4. Copying material for coursework from a book or other publication without acknowledging the source	48	20	17	28
5. Copying another student's coursework with his or her knowledge	47	19	18	30
6. Ensuring the non-availability of books or journal articles in the library by deliberately mis-shelving them so that other students cannot find them, or by cutting out the relevant article or chapter	29	12	6	10
7. Submitting a piece of coursework as an individual piece of work when it has been written jointly with another student	37	15	5	8
8. Doing another student's coursework	26	11	11	18 **
9. Copying from a neighbour during an examination without them realising	5	2	6	10
10. Lying about medical or other circumstances to obtain an extended deadline or exemption from a piece of work	42	17	8	13
11. Taking unauthorised material into an examination (e.g. cribs)	6	2	3	5
12. Illicitly gaining advance information about the contents of an examination paper	25	10	9	15
13. Copying another student's coursework without their knowledge	12	5	1	2
14. Premeditated collusion between two or more students to communicate answers to each other during an examination	12	5	5	8
15. Lying about medical or other circumstances to get special consideration by examiners (e.g. the Exam Board to take a more lenient view of results; extra time to complete the exam)	25	10	2	3
16. Taking an examination for someone else or having someone else take an examination for you	4	2	1	2
Overall percentage		13		14

** significant, p<0,01

University of KwaZulu-Natal

Table 1 shows the total number of participants who responded positively to each one of the sixteen statements. The responses in percentage ranged from as low as 2% in response to writing an examination for another candidate to as high as 30% in response to fabricating references/bibliography. The next highest number of responses was the number of respondents (26%) who indicated that they engaged in plagiarism in response to statement one. In response to allowing one's coursework to be copied by others, 20% of the students admitted having engaged in this behaviour. 18% copied material for coursework without appropriate acknowledgement. An identical percentage admitted that they copied other students' work without their condonation. A sizeable number of participants acknowledged lying about medical or other circumstances in order to be exempted from either meeting deadlines or submitting an assignment. In response to misplacing library reading materials, 11% of the respondents said they had done so at one time or other. There were those who admitted doing coursework for others. For each one of the sixteen statements, there was not one where some respondents did not indicate that they had engaged in the described behaviour.

The sixteen statement responses from the total sample were consolidated to work out the overall percentage of responses. This resulted in a percentage of 13%. Leaving the individual responses aside, 13% of the South African students engaged in academic misconduct.

New York Metropolitan College

The performance of American participants was comparable to that of South African participants. The responses in percentages ranged from 2% to 32%. In copying other students' work with their knowledge and assistance were 30%, which was similar in magnitude to 32% who engaged in plagiarism by not acknowledging the source of information as they paraphrased information from original sources. Another statement with a large number of respondents was allowing one's work to be copied by other students where 28% respondents admitted engaging in such behaviour. 28% participants admitted that they copied material from either a journal or book, but failed to acknowledge the sources of information. Other areas where 10% or more admitted engaging in academic dishonesty were: fabricating references/bibliography; misplacing library reading materials; illicitly gaining advanced information on an impending test or examination; producing false medical certificates to get an extended deadline or exemption from an assignment. The overall level of academic dishonesty was 14%. While responses to various statements were as high as 32%, overall it was much lower though still remained sizeable and worthy of being taken seriously.

DISCUSSION

In view of the numerous reports on academic dishonesty prevailing in higher institutions of learning particularly in the US, the present study explored similar practice between both South African and American university students as its first objective. The second objective aimed at a comparative study of South African and American university students for the purpose of establishing whether academic dishonesty would be just as prevalent among South African students as it is among American students. The rationale for undertaking such a study cannot be overemphasised from a societal and scholarly perspective. Academic dishonesty is the antithesis of academic principles and erodes academic excellence and integrity. The university as well as the community expects students to uphold the principles of trust, integrity, fairness, respect, responsibility and excellence. Through research such as this there will be quality assurance that there is fitness for purpose in higher institutions of learning.

On the basis of the objectives of the study and data analysis, there was ample evidence that academic dishonesty prevails between both South African and American students. Comparatively, there was hardly

any significant difference in the extent to which one is engaged in academic dishonesty. Overall, the findings were in keeping with the worldwide trend so far as academic misconduct is concerned.

It was clear from the findings that cheating was not at the same level in every aspect of academic activities. For example, very few respondents admitted involving themselves in taking an examination for someone else or they having someone else take an examination for them. Equally true, not many students admitted taking unauthorised material in the examination or copying from another student during an examination. However, there was as high as 30% admitting having engaged in academic dishonesty. The overall cheating rate for the entire South African students was as high as 13%, but which is much lower than what has been reported in previous studies carried out in other countries.

With the American sample, the pattern of academic misconduct was similar to the South African sample. Very few American students reported engaging in behaviour such as: taking unauthorised material in the examination room; copying other students' work without their knowledge; writing an examination for someone else or asking someone else to write an examination for them; lying about medical certificates. When it comes to plagiarism, the number of respondents acknowledging engaging in this was as high as the South African sample. For example, 32% said they paraphrased information without acknowledgement. In addition, 28% copied materials without acknowledgement while 30% copied other students' work with their assistance. The overall percentage was 14%, which is comparable with the South African one of 13%. However, it is nowhere near the extremely high percentage of students reported to be cheating in American colleges and universities.

An item-to-item analysis of the South African and American results showed that there were only two significant differences between their respective percentages. On item 3, which addressed the issue of fabricating references or bibliography, 33% of the South African students responded positively compared with 13% American participants, this difference being statistically significant (p,<0,01). Item 9, which focused on copying from a neighbour during an examination without them realising, also showed a statistically significant difference (p<0,01), with only 2% of the South African students admitting to their behaviour, compared with 10% of the American students. All other differences were not significant.

On the basis of previous research findings, there is no basis for disputing that academic dishonesty is common at the tertiary level of education. This has been confirmed in the present study. This is in agreement with Mwamwenda and Monyooe's (2000) South African study in which it was concluded that cheating was a prevailing factor in the area of plagiarism and other aspects of academic misconduct. Furthermore, the present findings confirm Teferra's (2001) study of Ethiopian respondents in which a range of academic dishonesty was revealed.

It can be further argued that the present findings are a confirmation of various assertions and findings that have been reported in countries such as the US, UK, Nigeria, Canada, and India (Brown and Emmett, 2001; Teferra, 2001; Kennedy et al, 2000; Park, 2003). The major difference between these studies and the present study is the level of cheating. Whereas most of the British and American studies report a range of cheating being between 40% and 75%, there was no evidence in support of this for either the South African or American sample. The level of cheating for the South African sample stood at 2%, whereas that of Americans stood at 12%. Neither of them was anywhere near the alarming percentage as reported by Park (2003); McCabe and Trevino (1996); Lupton and Chapman (2002); Cummings et al (2002), Alshuler and Blimling (1995).

Although it is true that the magnitude of academic dishonesty amongst the South African and American students who participated in the present study is very low comparatively, it is still a matter of concern. It

is the position of the author that there should be zero tolerance for academic dishonesty and that its presence in institutions of higher learning is an anathema and an enemy of higher learning that must be wrestled to the ground.

While the ancient Chinese method of dealing with academic misconduct was the most brutal method reported in the literature, there are other methods that are less harsh and have been employed by many universities. For example, at the University of KwaZulu-Natal, cheating may lead to expulsion and exposure to the university community. Teferra (2001) reported that in the case of Ethiopia, academic dishonesty is punished by either annulling examination results or expelling the student involved. These and others are appropriate punitive measures for dealing with academic misconduct. As useful as they may be, however, they are management by crisis and it is rather late to salvage the situation.

What would be most valuable would be the introduction of what is known as honour codes as used in a number of South African, Canadian and American institutions (McCabe and Pavela, 1998; Park, 2003; Lothammer, 2005). In this programme, the objective is to stop cheating and plagiarism and bring about a culture of academic honesty and foster values that embrace integrity in all scholarly endeavours (Lothammer, 2005). According to McCabe and Pavela (1997) in an honour code programme as used in the States, the emphasis is placed on the fundamental values of academic integrity such as honesty, trust, fairness, respect and responsibility. A similar programme is offered to students at the University of KwaZulu-Natal during orientation, when they are told what cheating and plagiarism is, and are expected to sign a pledge that they will not engage in academic dishonesty during their tenure at the university.

Since the introduction of such programmes in some of the universities in the US, follow-up studies have investigated the impact they have had on academic integrity. The results have been rather encouraging and positive. 'There is mounting evidence that students in institutions with academic honour codes view the issue of academic integrity and treat cheating behaviours in very different ways to those at institutions without honour codes. Academic honesty is higher and levels of self-reported cheating are lower in institutions that have honour codes' (Park, 2003: 483).

Academics have a responsibility of educating students on the virtues of not engaging in plagiarism and cheating in the hope that this will serve to maintain academic integrity and ensure academic dishonesty is brought under control. This can be realised through commitment, vigilance and determination on the part of all stakeholders, particularly students and academic staff.

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Preferred learning styles of business students: A South African perspective

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ABSTRACT

In accordance with recent government initiatives, higher education institutions in South Africa are being challenged to develop and implement new and innovative learning programmes. In terms of offering quality service to students, a specific goal is to employ quality teaching and learning practices. In addition, actively encouraging students to develop 'learning to learn' skills is believed to go some way towards providing a good foundation for lifelong learning. This paper offers an overview of the main issues related to the assessment of students' preferred learning styles. The results of a pilot study that examined the preferred learning styles of a group of business students are also presented and their implications discussed.

INTRODUCTION

In accordance with recent government initiatives, e.g. the White Paper on the Transformation of Higher Education (Department of Education, [DoE] 1997), higher education institutions are being challenged to develop and implement new and innovative learning programmes. In terms of offering quality service to the students, a specific goal is to meet the needs of the higher education sector and other market areas through quality teaching and learning practices. The development of quality learning among our students means that we need to know how they learn; this in turn will affect how we teach. In addition, actively encouraging students to develop 'learning to learn' skills is believed to go some way towards providing a good foundation for lifelong learning.

Most educators are aware that their students vary extensively in the manner and pace with which they assimilate and understand new information and ideas. In the multi-cultural and multi-lingual student groups that typify South African higher education, such variations are magnified and render traditional methods of uniform instruction largely ineffective. One possible reason for this situation 'lies in the mismatch between the instructor's teaching style and the students' learning styles' (De Vita, 2001: 165). Although there are numerous definitions of learning styles, the concept may be described as 'the ways in which an individual characteristically acquires, retains, and retrieves information' (Felder and Henriques, 1995: 21). That such mismatches between teaching and learning styles do occur has been well noted (Felder and Silverman, 1988; Lawrence, 1993; Oxford, Ehrman, and Lavine, 1991; Schmeck, 1988). If students are to become more effective learners and attain higher standards, it is important for lecturers to gain insight into the kinds of learning experiences most valued by their students. At the very least, this should lead to the development of alternative course structures that provide a better fit between the expected learning outcomes and the learning style preferences of the students.

Typically, three groups of students are at risk and may fail to learn when teaching styles do not closely match or accommodate students' preferred learning styles: (i) students whose learning styles do not match the lecturer's learning style; (ii) students whose learning styles do not match the orientation of the course; and (iii) students who do not match the class profile of preferred learning styles (Leaver, 1997). While it may be considered good practice during a course of study to accommodate all types of learning styles in a balanced way in order to achieve the laudable goal of improving the learning outcomes of all students, the lecturer is faced with a major problem: which model of learning styles should he or she choose?

LEARNING STYLES

The literature on learning styles is extensive, going back for a period of more than 30 years. It shows that learning styles research is beset by conceptual and empirical complexity as well as controversy. The numerous definitions of learning styles reflect the divergence of their theoretical bases, but the following definition offered by Keefe (1979: 4), despite its age and complexity, is one that is valuable as a benchmark by virtue of its comprehensiveness: 'learning styles are characteristic cognitive, affective, and psychological behaviours that serve as relatively stable indicators of how learners perceive, interact with, and respond to the learning environment.'

In terms of classifying learning styles and identifying individual learning preferences, scores of models and measuring instruments have been developed. Among the most well known are the Kolb Learning Styles Inventory (Kolb, 1976; 1984; 1999), Honey and Mumford's (1982) Learning Style Questionnaire, the Myers-Briggs Type Indicator (Myers and McCaulley, 1985), the Canfield (1992) Learning Style Inventory and the Dunn and Dunn Learning Styles Model (Dunn and Griggs, 2003). However, these models of learning styles are all underpinned by conflicting assumptions about learning, not to mention competing theories and techniques of measuring learning styles. So varied and contested are these ideas that 'simple choices about the most suitable approach are difficult to substantiate' (Coffield, Moseley, Hall and Ecclestone, 2004: 3).

In a broad review of learning style models, Coffield *et al* (2004) identified 71 different models, classifying 13 of them as major ones, included among which were the Dunn and Dunn, the Honey and Mumford, the Kolb and the Myers-Briggs models. All 13 major models were examined for evidence of satisfactory reliability and validity, with surprising and disappointing results; only one, the Cognitive Style Index of Allinson and Hayes (1996), could demonstrate internal consistency and test-retest reliability, as well as construct and predicative validity. Such limitations are daunting for any researcher wishing to enter the learning styles arena.

THE FELDER-SOLOMAN INDEX OF LEARNING STYLES

A learning styles instrument that was designed explicitly for classroom use is the Felder and Silverman (1988) Index of Learning Styles (ILS), with later developments and modifications by Felder and Soloman (1999a; 1999b). Although it was included in the 71-model database of Coffield *et al* (2004), it was not one of those selected for detailed examination. However, the ILS has been subjected to several analyses for the assessment of its reliability and validity. The indications so far are encouraging. The internal reliability of the ILS scales has been found to range from 0,53 to 0,70, while correlational and factor analysis indicated that 'the model scales assess separate qualities, as theoretically predicted' (Zywno, 1993: 11).

The ILS is a 44-item questionnaire that may be used to assess learning style preferences on four dichotomous dimensions: *active-reflective, sensing-intuitive, visual-verbal,* and *sequential-global*. It should be noted that Felder and Silverman's (1988) learning style model also included an *inductive-deductive* dimension, but this is not assessed by the ILS, having been omitted by Felder and Soloman (1999b) on conceptual and pedagogical grounds.

According to Felder (1993), students' answers to four broad questions may be used to focus on their preferred learning styles:

1. How does a student prefer to process information? Is it *actively* through physical activity or discussion, or *reflectively* through introspection?

2. What type of information does a student perceive by preference? Is it *sensory* through sight, sound and physical sensations, or *intuitive* through memories, ideas or insights?

3. How is sensory information perceived most effectively? Is it *visual* through pictures, diagrams, graphs, and demonstrations, or *verbal* through sounds, written and spoken words, or formulas?

4. How does a student progress towards understanding? Is it *sequentially*, in a progression of logical and small, incremental steps, or *globally* in large jumps, or holistically?

THE DIMENSIONS OF LEARNING STYLE

Active and Reflective Learners

According to Felder (1994), active learners are likely to understand and retain information best if they are actively involved with it, such as discussing or explaining it to others. Reflective learners, on the other hand, prefer to think quietly about the information first. Active learners tend to prefer group work more than reflective learners, who are more comfortable working on their own. Sitting in a lecture without doing anything active other than take notes is hard for both active and reflective learners, but especially hard for active learners.

Sensing and Intuitive Learners

Broadly speaking, sensing learners tend to be practical, while intuitive learners are likely to be imaginative. Sensing learners prefer to learn facts, solve problems by well-established methods and are unhappy with complications and surprises. By contrast, intuitive learners tend to like discovering relationships and possibilities, like innovation and dislike repetition (Felder, 1989). Sensing learners prefer courses that show a clear connection to the real world, while intuitive learners are more comfortable with abstractions, mathematical formulations, but tend not to like those courses involving routine calculations and a lot of memorisation.

Visual and Verbal Learners

Visual learners are more likely to remember what they can see, such as pictures, diagrams, graphs, demonstrations, and so on, whereas verbal learners tend to rely heavily on words, such as spoken and written explanations and mathematical formulas (Felder, 1993). Although good learners have the ability to process visual or verbal information, most people are visual learners. This is almost certain to present problems in lecture-based courses that are predominantly verbal.

Sequential and Global Learners

Sequential learners prefer to absorb information in small, linear steps, with each step following logically from the one before it. Global learners, on the other hand, tend to take in information in large, seemingly unconnected chunks, with understanding occurring in large holistic jumps (Felder, 1993). This is not the 'Aha' effect, or the sudden flash of understanding experienced by almost everyone. It is what happens before then that distinguishes sequential learners from global learners. Global learners may struggle and appear slow until they have a grasp of the total picture, while sequential learners are able to solve problems without necessarily having complete understanding of the material.

The four dimensions of learning style described above, although presented as dichotomous scales, should each be interpreted as a continuum and not as a strict either-or situation. For example, everyone is likely to be an *active* learner sometimes and a *reflective* learner at other times. A learner's preference may be marginal, moderate or strong and a balance of the two is usually desirable. A learner who always acts before reflecting is almost certain to make an error sooner or later, while a learner who spends too much time reflecting may end up not achieving anything.

A SOUTH AFRICAN APPLICATION

The ILS was developed and refined as a classroom application within the context of engineering education in the US and has been used effectively in a business management environment in the UK (De Vita, 2001). Despite the competing alternatives, the ILS was selected for use with undergraduate business students in South Africa, partly because it is a classroom centred instrument and partly because it provides a better indication of the preference profile of a group of students than individual learning preferences (Felder, 2004).

Procedure

The ILS questionnaire was distributed to undergraduate students during their regular class times. The details of the study were explained and attention drawn to the potential benefits of becoming aware of their own individual learning style preferences. Each student's anonymity was assured since names were not recorded on the questionnaires. Out of 110 students invited to participate, 106 (96,4%) completed the questionnaire, which was interpreted as an indication of the students' interest in and positive attitudes towards this research study.

Results

The profile of the 106 students who completed the ILS questionnaire is shown in *Table 1*.

Table 1
Profile of students n = 160

Gender	n	%	Home Language	n	%	Age	n	%
Male	51	48.1	English	69	65.1	18-21	64	60.4
Female	55	51.9	Not English	37	34.9	22+	42	39.6

The profile shows that there were slightly more females (51,9%) than males (48,1%), that English was the home language of the majority (65,1%) and that most students (60,4%) were in the 18-21 year old age group.

Table 2 gives the percentage distribution of learning preferences on each of the four learning style dimensions.

Table 2
Group profile: percentage distribution of overall learning style preferences

Active - Reflective	Sensing - Intuitive	Visual - Verbal	Sequential - Global
67.9% - 32.1%	72.6% - 27.3%	81.1% - 18.9%	57.5% - 42.5%

It may be clearly observed that both poles of each dimension are adequately represented. The group profile shows that the students had predominant preferences for *Active* rather than *Reflective* activities, for *Sensing* rather than *Intuitive* approaches and for *Visual* rather than *Verbal* inputs. In terms of dimension four, there was a preference for *Sequential* learning rather than *Global* learning, but this was not as strongly defined as the other three dimensions. These results are not greatly different from those reported by De Vita (2001) in the UK.

In a more detailed exploration of the results, the students' ILS scores were classified as Strong, Moderate or Marginal on each of the four bipolar dimensions and analysed according to the demographic variables home language, gender and age. No statistically significant differences were found between ILS scores on any of the three demographic variables. The means, standard deviations (SD) and coefficients of variation (CV), of learning preference scores are presented in *Table 3*.

Table 3
Means, standard deviations and coefficients of variation of ILS scores

| Scale	Mean	SD	CV
Active - Reflective	1.70	4.43	26.1%
Sensing - Intuitive	2.30	4.83	21.0%
Visual - Verbal	4.21	5.18	12.3%
Sequential - Global	1.32	4.35	32.9%

The mean scores show an overall clear preference on all four dimensions for a particular style of learning, while the standard deviations and coefficients of variation serve to confirm the variability among the student group as a whole.

The overall learning style preference profiles for each of the ILS dimensions are presented numerically in *Tables 4 to 7* and graphically in *Figures 1 to 4*. From *Table 4* and *Figure 1*, it may be seen that the students' scores were predominantly spread across the *moderately active*, *marginally active* and *marginally reflective* ranges of the *Active-Reflective* dimension. Overall, there is a noticeable preference for *Active*, as opposed to *Reflective*, styles of information processing.

Table 4
Distribution of ILS scores: Active-Reflective

Dimension	Strength	n	%
Active	Strong	6	5.7
	Moderate	29	27.4
	Marginal	37	34.9
Reflective	Marginal	25	23.6
	Moderate	5	4.7
	Strong	4	3.8

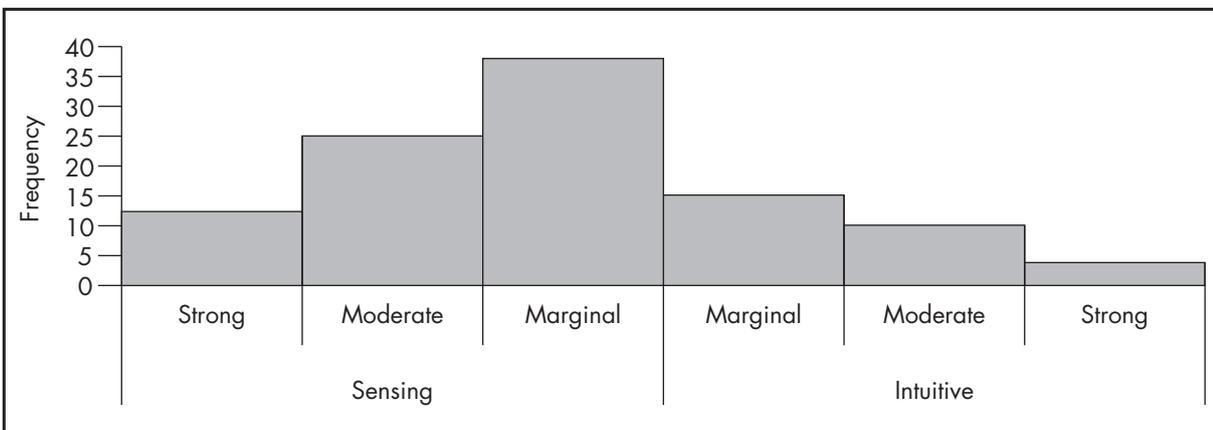*Figure 1*
Distribution of ILS scores: Active-Reflective
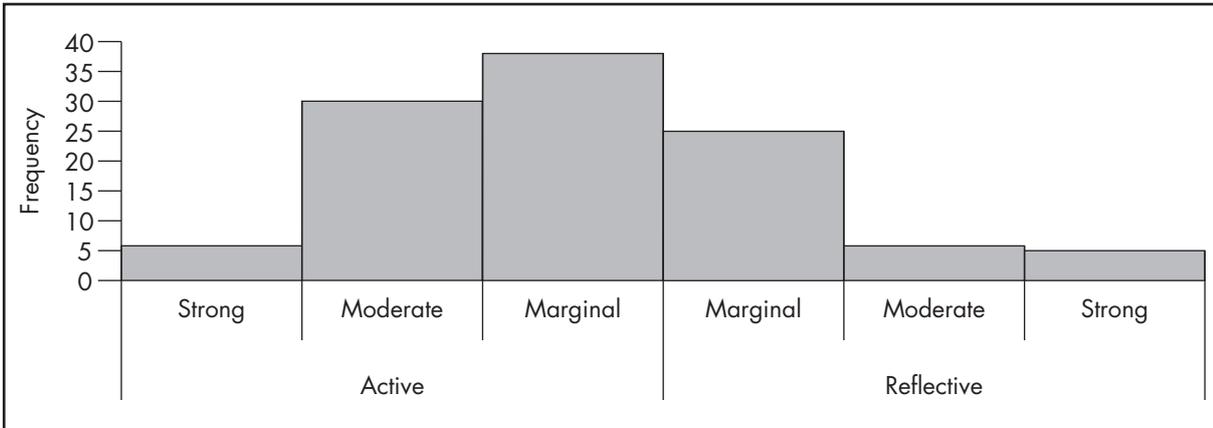
An examination of the students' scores in *Table 5* and *Figure 2* shows a distinct preference for *Sensing*, rather than *Intuitive* learning procedures. The students' scores were largely spread across the *moderately sensing*, *marginally sensing* and *marginally intuitive* ranges of the *Sensing-Intuitive* dimension.

Table 5
Distribution of ILS scores: Sensing-Intuitive

Dimension	Strength	n	%
Sensing	Strong	12	11.3
	Moderate	27	25.5
	Marginal	38	35.8
Intuitive	Marginal	16	15.1
	Moderate	10	9.4
	Strong	3	2.8

Figure 2
*Distribution of ILS scores: Sensing-Intuitive*

Turning to *Table 6* and *Figure 3*, students' scores demonstrate an overwhelming preference for the *Visual* over the *Verbal* mode of information processing. This is of particular interest in view of the diverse language

backgrounds of the students in the sample. For the 37 (34,9%) students whose home language was not English, written and spoken explanations that constitute the verbal style as measured by the ILS are in reality information presented to them in what is a second, or even third, language. The majority of the English home language students also appear to be learners with a strong preference for the *Visual* learning mode.

Table 6
Distribution of ILS scores: Visual-Verbal

Dimension	Strength	n	%
Visual	Strong	30	28.3
	Moderate	26	24.5
	Marginal	30	28.3
Verbal	Marginal	13	12.3
	Moderate	5	4.7
	Strong	2	1.9

Figure 3
*Distribution of ILS scores: Visual-Verbal*
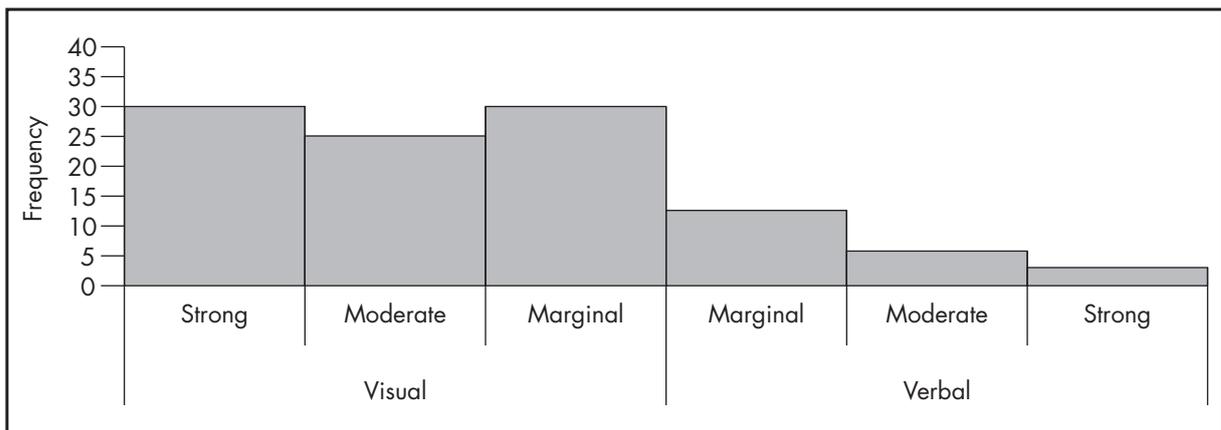
A possible explanation for the strong preference for *Visual* as opposed to *Verbal* modes of information processing is that the rapid advances in technology over the past decade have resulted in visual messages becoming powerful and pervasive communication media. This phenomenon was noted several years ago (Marx and Frost, 1998) and it is still quite likely that students continue to develop an improved comprehension ability through their increasing exposure to television, computers, video games and the growing visual capabilities of cellular telephones.

Table 7 and *Figure 4* show that the students have only a marginal preference for *Sequential* as opposed to *Global* learning procedures. As with the *Active-Reflective* and *Sensing-Intuitive* dimensions, the students' scores ranged mostly from *moderately sequential* to *marginally global*.

Table 7
Distribution of ILS scores: Sequential-Global

Dimension	Strength	n	%
Sequential	Strong	7	6.6
	Moderate	25	23.6
	Marginal	29	27.4
Global	Marginal	32	30.2
	Moderate	11	10.4
	Strong	2	1.9

Figure 4
Distribution of ILS scores: Sequential-Global
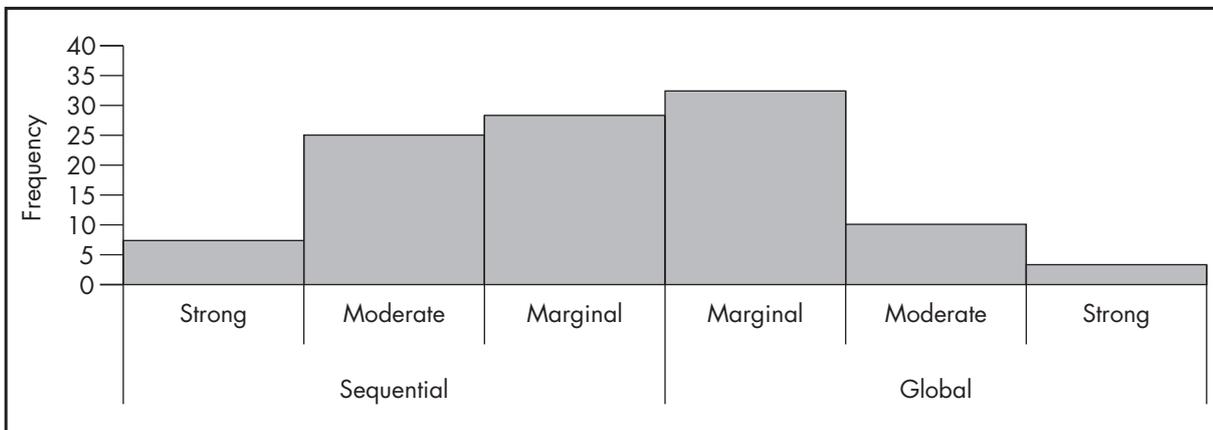
CONCLUSION

As already noted, the group profile showed that the students had preferences for *Active* rather than *Reflective* activities, for *Sensing* rather than *Intuitive* approaches and for *Visual* rather than *Verbal* inputs. In terms of dimension four, there was a preference for *Sequential* learning rather than *Global* learning, but this was not as strongly defined as the other three dimensions. Given the wide range of learning styles present among the 106 students in the sample, it is surprising that there were no significant differences between ILS scores on any of the three demographic variables home language, gender and age. In the study conducted by De Vito (2001) in the UK, there were notable learning style variations displayed by the non-English home language group. This was interpreted as being 'attributable to the many different cultural differences operating within the culturally heterogeneous sample' (De Vita, 2001: 170). There is no obvious explanation for this lack of differences among the South African sample.

So what do these results tell us about adapting teaching styles to learning styles? A possible option is to suggest that the students should adapt and match their own learning styles to that of the lecturer. At first glance, this is not unreasonable as lecturers would then teach from their strengths and not have to worry about trying out unfamiliar techniques, thereby risking the appearance of being less competent (Thompson, 1997). However, this approach is clearly at odds with the current government initiatives and the climate of opinion regarding the development of not just new innovative courses, but also the concomitant innovative teaching and learning approaches.

It is sensible to expect that good practice should be exemplified by lecturers who develop and use a variety of teaching styles that collectively address both sides of each of the learning style dimensions. However,

such a multi-style delivery implies that there will be a range of learning styles within each student group. It would be foolhardy to assume the existence of such learning style variations without first testing for them. The resulting class profile could then be determined, which would allow for some degree of course customization. Despite such an approach, it would still be desirable to expose students to learning situations that may not match their personal preferred styles, since this would have the effect of helping students to consciously choose a learning style that best serves the requirements of a particular task. Over a period of time, this will have the effect of reaching out and engaging all students who would then feel encouraged to develop their own repertoires of learning styles in a manageable way. The move towards a consciously embraced multi-style teaching and learning approach seems inevitable given the multi-cultural and multi-lingual educational environment that typifies South African higher education.

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Developing creativity and meaningful education in Creative Process at tertiary level

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ABSTRACT

Many misconceptions and assumptions exist about creativity; our ability to create, maintain and feed our creativity, and to formulate good ideas. This paper investigates the development of creativity and Creative Process at tertiary level. It provides some practices, techniques and models for developing creativity. The text is illustrated with examples of creative process work collected from tertiary students at Vega The Brand Communications School, in Sandton, Johannesburg, over a period of five years. Some practices of teaching Creative Process and critical thinking are discussed.

Creative intelligence in its various forms and activities is what makes man.
James Harvey Robinson

We often conclude that abilities are etched in stone, inexplicable, and unchangeable. This is, of course, false. Many creative people were told by a teacher, mentor, or educator somewhere in the course of their creative lives, that they are not 'good enough', and that they will never become a 'good' artist. Contrary to popular belief, I suggest, all people are creative. It is not the exclusive preserve of men. Women, children and even mentally challenged artists are capable of creating incredible works of art.

Almost a century ago, the psychotherapist Hans Prinzhorn published groundbreaking work in his seminal study, *Bildnerei der Geisteskranken (The Artistry of the Insane, 1922)* on the creative abilities of the 'insane'. One brilliant example is the work of the 'insane' artist Aloïse, whose work spanned a period of forty-five years. Jean-Louis Ferrier (1990: 119) states, 'Her work is to be regarded as a cosmic theatre in which she saw herself as demiurge. A born colourist, capable of juxtaposing bold colours and creating subtle harmonies, Aloïse shows certain affinities with the Fauves.'

Aloïse's work, *The King of Rome's First Steps* (exhibited in the Musée Cantonal des Beaux-Arts, Lausanne, France) is a wonderful example of her ability as 'insane' artist to communicate her artistic visions to the 'sane' world through her art. As Ferrier (1998: 203) writes, 'Aloïse, and many other mentally challenged artists prove that shifts in aesthetic standards always occur as a result of transformations of the civilization in question. We are made aware of the chaos in ourselves through the chaos in the work of 'psychotic' art. We are challenged, and many questions within us are raised by the art of the mentally disordered, by its very nature.'

Many misconceptions, presumptions, and assumptions exist about creativity. One of the most outrageous statements I have recently stumbled upon in my research, is one made by Wilson (1990: 100) when he

claims, 'Why there have been no great female artists in history is for the same reason that there have been no great female inventors or other creators in any other field: simply, because they were female and, thereby, lacked both creative faculty and a sense of beauty.' Any informed person would know that this is nonsense. It is not necessary to argue this point. One may merely look at works such as that of the brilliant Renaissance artist, Artemisia Gentileschi.

Furthermore, Janson *contra* Wilson (1986: 500) writes, 'We have not encountered a woman artist since ancient Greece. This does not mean that there were none in the meantime. On the contrary, Pliny mentions in his Natural History the names, and describes the work of women artists in Greece and Rome, and there are records of women's accomplishments during the Middle Ages.'

TEACHING: CREATIVE PROCESS

As creative process navigator at Vega The Brand Communications School, my method of teaching Creative Process is mostly based on *investment theory,* a psychological theory of creativity, taking into consideration that any one method could be consistent with many others. Many different views of creativity may lead to similar recommendations for developing creativity. In my teachings, I have witnessed that the flow of words, of visual associations, of scientific ideas, which are first experienced in the context of childhood wonder and games, are often part of the tools that give strength and support to mature individuals when struggling with the more complex aspects of their creative journey. I often employ the method of Creative Transformation, or in simpler words, visual association, as a tool in my classes to re-awaken and sustain the issue of childhood wonder in my students.

Creative Transformation is the process of transforming or simply changing an ordinary object through a series of simple drawings, in order to reveal and or discover new meanings derived from the original object. According to Collier (1985: 253), 'The creative imagination which gives rise to works of art – and theories of science – is a complex phenomenon; and yet there is some justification in delineating three basic directions taken by the creative mind in the arts: order, expression and symbol. I use these terms not for their historical or critical connotations in the literature of art, but simply to distinguish the three most constant ways in which the imagination shapes itself through our abilities to visualise and make works of art.'

Figure 1
Student drawings illustrating the process of Creative Transformation, Danielle Vinokur, 2001, Vega collection.

A good example of the use of Creative Transformation is *Figure 1*. A new logo for the Body Shop is designed through a process of transformations, of a flower, seed, leaf, or any other inspirational object found in nature. In this example, the student found inspiration in a seashell, and transformed the object numerous times through a process of spontaneous drawing. In doing so, she derived numerous possible logos, which could be refined conceptually to become a successful logo to be used in a new corporate identity for The Body Shop. Endless inspiration exists in nature and our natural surroundings; this is but one example. As Roger von Oech (1986: 33) advises, '… expect the unexpected. Open your mind up to things that have no connection with the problem you're trying to solve. This may lead to information that makes a big difference in the development of your idea.' He also claims that the most helpful ideas are often right in front of us. As the noted explorer Love (1986: 35) once put it, 'Only the most foolish of mice would hide in a cat's ear. But only the wisest of cats would think to look there.'

The fusion of the present and the past is an important aspect of the creative process. Creative and productive thought occurs through many bursts and cycles, nourished by encouragement and fuelled by both wonder and tension. In my experience, the incredibly critical art world often kills this wonder and tension and students give up before they have even started to truly explore their own creativity.

New work is born out of the ability to play and a freshness of perception that does not wilt after childhood. This can only happen if young creative students are nurtured and encouraged to make mistakes. I also now understand and agree with Auster (1997: 19) that it is about asking right questions, and not trying to give right answers. A young creative should also immerse him/herself into the artistic traditions of the past, and the distinctiveness of their own culture. True creativity is about honesty; an honest exploration of the young artist's shadow, and ego-consciousness.

Carl Jung (1978) wrote extensively about the importance of our shadow-consciousness as opposed to our everyday lives, the ego-consciousness, where we all wear masks 'to fit into' society, due to a variety of reasons. Jung (1998: 174) writes, 'The shadow is not the whole of the unconscious personality. It represents unknown or little known attributes and qualities of the ego – aspects that mostly belong to the personal sphere and that could just as well be conscious. In some aspects, the shadow can also consist of collective factors that stem from a source outside of the individual's personal life.' According to Jung (1997: 174-185), we have to embrace our shadow to be truly creative, take off the mask and search in 'the dragon's den' for the real us, without pretence and falseness. This leads to self-knowledge. As John-Steiner (1997: 75) puts it, 'Self- knowledge contributes to a life-long record of productivity and a high degree of self-criticism.' The better understanding we have of the Self and our past, the stronger, our creativity will eventually become.

Figure 2
Alon Chelchinsky, An example of a
puppet of the 'shadow', Vega, 2002.

Every year at Vega, I set my first year students a project entitled 'dancing in the dragon's den'. Their brief is to find and identify their 'shadow'. The understanding of 'the self' after completion of the project is amazing. I regard this as one of my most successful undertakings in releasing and discovering a true creative source in my junior students. The level of honesty and the process of self-discovery are astounding. What does this project involve? Students are required to create puppets of their 'shadow' after a serious self-analysis. The example in *Figure 2*, focuses on the controlling, determined personality of the student and his intense interest in sexuality. The puppet is dressed in a black suit, symbolic of control, and is wearing a black fetish mask and whip. The unclothed body of the puppet is covered with a collage of pornography and hidden underneath the suit, a clever way of concealing the true personality, with only hints visible on the outside. The suit is covering the body, but the mask is hiding the real person.

Creativity lies in the capacity to be brutally honest, see more sharply, and with greater insight that which one already knows or that is buried at the margin of one's awareness. The recognition of the shadow is an integral part of any truly creative individual. The

Figure 3
Elmarie Kruger, An example of spontaneous discovery
through play, Monoprint, Vega, 2005.

creation of art, and the construction of new knowledge, requires artists, creatives, and scientists, to take risks (John-Steiner, 1997). In the example in *Figure 3*, students are encouraged to play and take risks by creating abstract Monoprints. The Monoprint technique involves painting with oil paint on a sheet of Perspex. The painted image is then printed through a printing press onto wet paper. Students are taught to concentrate on emotional expression rather than intellectual logic. They are encouraged to experiment fearlessly, make mistakes, and discover endless possibilities through this spontaneous process. Many works are failures and so the process becomes a lot more important than the product.

This print reminds one of the vibrant works of the 1950s artist Jackson Pollock. The material and mark making, carry the meaning in the work, and not the subject matter. Also, among the invisible tools of creative individuals, is their ability to hold on to the specific texture of their past. According to John-Steiner (1997: 68) to some students, the birth of a creative idea is linked to memories reaching into childhood, to others it lies in the possibilities hidden in the future.

A project I used to address the importance of childhood memories, is called the 'Phoenix Fire Experience'. Students are required to box and decorate a specific memory (usually a memory blocking their creativity), in a container of their own choice. Students craft the project meticulously for four weeks, only to burn the final product at a special fire gathering, at the end of this period. The learning in this process is immense. They understand the importance of creative rituals in any creative field and learn not to be precious about any ideas. A brilliant idea might last for only a while and then the creator should be ready to engage in a next, equally brilliant, idea. The example shown in *Figure 4* serves as a great example for this creative tool.

Figure 4
Dominique Cuzen, Memory box, Vega, 2005

Figure 5
Bongiwe Ndlovu, Untitled, Linocut,
Vega, 2004

As an educator, I respect *Difference,* and allow each individual person his/her own journey of discovery. I see myself merely as a facilitator, never too critical of any idea; I respect my students and am often taught by them. According to John-Steiner (1997: 213), 'The young person may at first exhibit a preference for learning by movement, sound, vision, or language. It is a preference shaped by many circumstances: the culturally available and patterned activities; the interests, experiences, and resources of one's family and schooling, the role of mentors and distant teachers. All of these contribute to both the content and form of knowledge in the developing individual.' A culturally sensitive and unbiased education is of prime importance. All students should be encouraged to celebrate and explore their *Difference* as powerful creative sparks. *Figure 5* serves as a good example of this respect for *Difference*. It is evident in many of my students' work.

Creative education, especially in the arts, should be a two-way learning situation. The honest process of discovery is far more important than the production of the final product. Cultural background, sexuality, gender, etc., are therefore all very important aspects in the creative experience and the expression thereof. Creative students should be allowed to express their 'true self'. They should not feel afraid, or be treated like an outsider in the creative environment, as creative people are already considered to be outsiders by society at large. Wilson (1997: 203) claims 'The visionary is inevitably an Outsider. And this is not because visionaries are a relatively small minority in proportion to the rest of the community; in that case, rat-catchers and steeplejacks would be Outsiders too.'

Figure 6
Chris Diedericks, Rubbish!, Resin and mixed
media sculpture, Gesseau Art, 2005

In the course of creative endeavours, artists (and scientists) join fragments of knowledge into a new unity of understanding. This process is demanding. It calls upon all the inner resources of the individual; active memory, openness to experience, creative intensity, emotional courage, and an active involvement in culture and the world in which we live. It demands self-knowledge in the use of expansion of an individual's talents. John-Steiner (1997: 83) states 'Language is a highly conventionalised form of expression, but images – the constituent form of visual thought – are hard to standardise or define. There is no dictionary of images, or thesaurus of photographs and paintings. Imagery and visual expressions reflect the uniqueness of an individual's life.'

In conceptual creativity, the specific context and joining fragments of knowledge become extremely important in the creative process. In my latest exhibition, *Secrets and Lies: Her majesty's (Ivory) Tower,* I am still partly assuming the role 'artist as thief'. I use existing images, in this instance, original 1895 lithographs from a set of books titled: *Her Majesty's Tower*. I then change the

existing context and meaning of the lithographs, by using watercolours, and over-printing (linocut- and Perspex engraving). I also often refer to other recognisable mythological characters, saints, martyrs, literary and legendary characters. I have taken contexts with which viewers are familiar, but reworked them into a new amalgamated context which will hopefully create discomfort and hence, inquiry about identity and our assigned 'place/standing' in society. Queen Victoria becomes the leading character in this naughty narrative (*Figure 6*), which is often very humorous, and not to be taken too seriously.

CRITICAL THINKING IN CREATIVE PROCESS

Becoming a critical thinker is another essential ingredient in developing, maintaining, and feeding student creativity. Students as well as academics are constantly bombarded by biased views of journalists, reporters, and advertisers. Critical thinkers should be able to judge images, articles and other sources in terms of the validity and claims made, and how much credence can be given to them.

Ennis (cited by Lipman, 1988: 38) describes the process of critical thinking as 'reasonable reflective thinking that is focused on deciding what to believe and do.' Chiras (1992: 464)) defines critical thinking as 'a process by which one subjects research findings and theories to examination, looking for consistencies and inconsistencies in logic, alternative interpretations and subtle but persuasive biases that may have led to erroneous conclusions.'

Anyone striving to become a critical thinker should keep Chiras' (1992) eleven points for critical thinking in mind when they evaluate the validity of any consulted source or image. These are:
- gather complete information
- understand and define all terms
- question the methods by which facts are derived
- question the conclusions
- look for hidden assumptions and biases
- question the source of the facts
- do not expect all the answers
- examine the big picture
- examine multiple cause and effect
- watch for thought stoppers
- understand your own biases and values.

In the light of the above, the role of an educator in Creative Process (and art in a broader sense) should be embedded in the following:
- questioning assumptions and presumptions
- asking the right questions, rather than focusing on the correct answer
- encouraging idea generation
- cross-fertilising ideas
- allowing students time for creative thinking
- rewarding creativity in any form
- encouraging sensible risks
- tolerating ambiguity
- allowing mistakes
- identifying and surmounting obstacles
- promoting self-regulation
- delaying gratification

Figure 7
Encouraging play, Live Land Art performance at the Shakespeare garden
at Emmarentia dam, Vega students, 2003
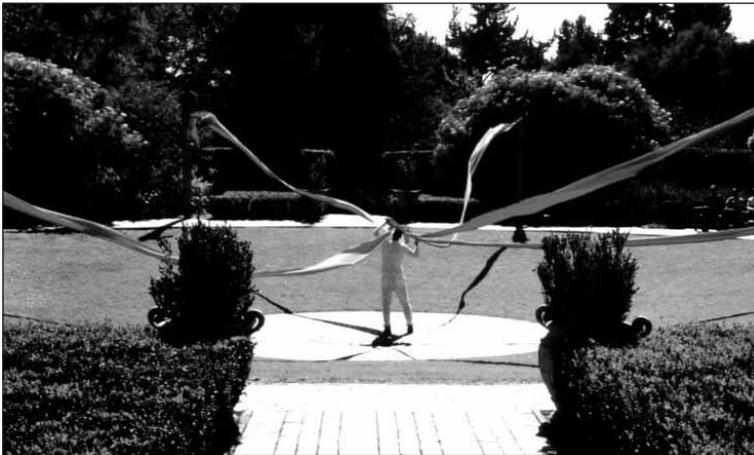
- encouraging creative collaboration
- imagining other viewpoints and therefore respecting *Difference*
- encouraging **play**! *Figure 7*
- seeking (and creating) stimulating environments
- implementing a lifelong process of reading images and narratives in a critical context
- establishing a solid and professional work ethic in the young creative person.

CONCLUSION

John-Steiner (1997: 87) writes 'great art (and great science) are gifts of the individual to the society in which he or she is born, and with which the struggling, solitary, triumphant being is inextricably joined.' This paper whilst challenging assumptions about creativity stresses the need for educators to provide a safe space for individuals, who choose to explore their creativity in the learning environment, and to find ways in which this can be achieved.

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