

**The impact of a supplemental HIV/AIDS module on
the knowledge and attitudes
of Grade 11 biology learners.**

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A dissertation submitted to the Faculty of Education, University of Pretoria, in fulfillment of the requirements for a Masters in Education: Curriculum and Instructional Design and Development.

Declaration

Abstract and keywords

I declare that this research report is my own unaided work apart from the assistance acknowledged. It is being submitted in fulfillment for a degree of Masters in Education: Curriculum and Instructional Design and Development at the University of Pretoria, in Pretoria, South Africa. It has not been submitted before for any degree or examination in any other university.

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Abstract

The purpose of this study was to evaluate the impact of a HIV/AIDS module, taught for approximately 24 hours over eight weeks in six schools, on the knowledge, behaviour and attitudes of grade 11 biology learners, and to identify problems their teachers had in teaching the module. The module contains detailed scientific content on HIV/AIDS and outcomes-based assessment activities. The answers written by each learner in a pre-, post- and retention test and questionnaire that included both open and closed questions on general and functional knowledge, attitudes and skills were analysed for significant changes. A narrative written by each learner was analysed to determine how the module had dealt with issues that affected his / her life. A structured interview was conducted with each teacher to identify difficulties he / she experienced in implementing the module. Classroom observations were used to monitor the implementation of the intervention in order to provide information to verify the findings of the tests, questionnaires, narratives and interviews.

Analysis of the tests and questionnaires showed a significant improvement in the means scored in the pre-, post- and retention tests. An ANOVA showed that the difference was unlikely to be attributable to chance.

Narrative analysis resulted in a number of common themes being identified. The learners were profoundly glad to have been taught this information and many of them provided evidence of how the module impacted on their lives and sexual behaviour. Their knowledge has empowered and motivated them to control their own lives.

The teacher interviews established some of the common difficulties that the teachers experienced in teaching the module. These were verified by the classroom observations. The main problems were the lack of facilities and limited time to teach about HIV / AIDS.

Keywords

Acquired Immune Deficiency Syndrome
Human Immunodeficiency Virus
HIV education
Biology education

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AIDS	Acquired Immune Deficiency Syndrome
DNA	Deoxyribonucleic acid
FET	Further Education and Training
FRD	Foundation for Research and Development
GIED	Gauteng Institute for Educational Development
HIV	Human Immunodeficiency Virus
HSRC	Human Sciences Research Council
IBE	International Bureau of Education
GP	General practitioner (medical doctor)
HOD	Head of Department
PPASA	Planned Parenthood Association of Southern Africa
RNA	Ribonucleic acid
SANPAD	South Africa Netherlands Programme for Alternative Development
STD	Sexually transmitted disease
STI	Sexually transmitted infection
UNAIDS	Joint United Nations AIDS Program
UNESCO	United Nations Educational, Scientific, and Cultural Organisation
UP	University of Pretoria
VCT	Voluntary Counselling and Testing

Chapter 1: Introduction to the problem and context of the study

1.1. THE PROBLEM OF HIV AND AIDS

“From medical curiosity to a pandemic of epic proportions” (Jones, 2003, p. 1).

In the less than 25 years since Michael Gottlieb noticed the scattering of men in San Francisco showing unusual symptoms, such as Kaposi's sarcoma and Candida, associated with a lack of T-helper lymphocytes, and the 20 years since Luc Montagnier discovered that HIV was the virus that causes AIDS (Lapierre, 1990) “the global HIV / AIDS epidemic killed more than 3 million people in 2003, and an estimated 5 million acquired the Human Immunodeficiency Virus (HIV) - bringing to 40 million the number of people living with the virus around the world” (UNAIDS, 2003, p. 1). Southern Africa has less than 2 % of the world's population, yet about 30 % of the world's people living with HIV / AIDS. (UNAIDS, 2003, p. 2).

1.1.1. The epidemic in South Africa

At approximately 5,3 million people infected (Lewis, 2004) South Africa has one of the highest numbers of HIV positive citizens of any country – the Nelson Mandela / HSRC household survey (Shisana, 2002) estimates that 11.4% of people aged two years and older are HIV positive, with an estimated 2000 more South Africans contracting the disease daily (Williams, Gouws, Colvin, Sitas, Ramjee, & Abdool Karim, 2000). While in some countries, such as Russia, HIV infection is linked to intravenous drug usage (Klesius, 2002) in South Africa the HIV epidemic is spread mainly by sexual intercourse (heterosexual). Harrison, Smit, & Myer (2000) state that it is unlikely that an effective vaccine against HIV infection will be widely available in the next 10 years, and even less likely that a cure will be found in this time. Antiretroviral medicines are unavailable to most South Africans because of their high cost, and the lack of effective infrastructure for dispensing them and monitoring their effectiveness. This is true even though some people are now getting free antiretrovirals in the government roll-out of antiretroviral treatment. In a presentation at the Fifteenth World AIDS Conference in Bangkok, it was reported that only 6000 of the 400 000 South Africans who need antiretroviral medicines are receiving them (Lewis, 2004). It is therefore advocated that **behaviour change** is the only viable means of limiting the further spread of HIV infection. Campbell (2003) states that knowledge of health risks is a key pre-condition for health-enhancing behaviour change (although she emphasises that it is only a part of the solution).

Epidemiological studies have shown that in South Africa the peak incidence (number of individuals infected in a set time period) occurs in young people aged 15 - 24 (Pettifor, Reed, Steffenson, Hlongwa-Madikizela, MacPhail, Vermaak, & Kleinschmidt, 2004, p. 12). The 2001 Department of Health Survey of HIV Prevalence cited in the HSRC Survey (Shisana, 2002) estimates that 28.4% of pregnant women in South Africa aged 20 to 24 years attending antenatal clinics are infected with HIV. Whiteside & Lyster, (1998) point out that if women of this age are HIV positive, then South Africans younger than this should be targeted for interventions that will increase their knowledge of HIV and change their behaviour. Buseh, Glass, McElmurry, Mkhabela, & Sukati, (2001a) provide evidence from UNAIDS and the Swaziland

Ministry of Health and Social Welfare that the incidence of HIV and AIDS in adolescents in Swaziland is rising. They state that if the average time for progression from HIV to AIDS is 10 years, UNAIDS researchers are suggesting that a large number of people may have become infected in adolescence. It is recommended that all educators should play a role in providing information about HIV / AIDS, as well as the inclusion of AIDS prevention messages into the curriculum, as being one of the most cost-effective ways of reaching the young population. (Whiteside & Lyerly, 1998) "The fact that HIV infection almost certainly results in serious illness and premature death, makes the stakes of HIV education higher than those educators commonly face" (Popham, W. J., undated a, p. 1). Whiteside & Lyerly (1998) also identify education establishments and staff as potential resources for outreach into broader communities. "Teachers are the cheapest AIDS drug" read a South African newspaper headline 24 November, 2003.

Kirby (2000) points out that there are a variety of reasons why schools can play an important role in reducing HIV risk behaviours amongst adolescents:

- they are the one institution in our society that most adolescents attend regularly
- almost all youth are attending school before they begin sexual activity and initiate sexual risk-taking behaviours
- schools are especially well suited to educate youth about a topic such as sexuality in which different concepts should be taught at different developmental stages
- schools are well suited to identify at-risk individuals and step in with interventions or referrals to the appropriate authorities (p. 85).

Evidence from the rest of the world shows that statistics of HIV incidence and HIV risk behaviour in young people is also high in some other countries e.g. Zak-Place & Stern cite statistics from a report released by the US Department of Health and Human Services in 2000 that estimated that at least half of all new HIV cases are among those under the age of 25. They also suggest that college students are in a developmental phase whereby sexual experimentation tends to increase, and quote a study by the American College Health Association that says nearly three quarters of all college students report being sexually active, with less than half of the college students reporting consistent condom usage. (2000, p. 229).

1.1.2. Factors that fuel the epidemic in South Africa

It is not always easy to explain why one country has a higher incidence of HIV than another, but there are many facts that do fuel the epidemic in South Africa, amongst which are:

- The tradition in some cultural groups of not talking to elders and parents about sex. This often means that the only information that adolescents get about sexual issues is the misinformation that abounds in groups of teenagers.
- "The barriers to adolescents using public sector services include feelings of embarrassment and discomfort, fear of chastisement and lack of confidentiality, fear of medical procedures, lack of

information and operational barriers such as operating hours that are inconvenient for young people” (loveLife undated a, p. 47). “even though free condoms are available from clinics and hospitals in Botswana and are for sale at many points, students are often very reluctant to make use of these outlets. They feel shy and often complain that ‘questions are asked’ or ‘remarks are made’ at the clinics” (Berkhof, 2003 p. 172).

- Migratory labour - a system prevalent in South Africa, that keeps family members apart for long periods of time.
- Unemployment - it is widely acknowledged that poverty and unemployment are contributing factors that for many reasons, such as lack of self esteem, lead to an high incidence of HIV risk behaviours
- Gender problems - women are not accorded equal status with men in many cases. “Another limitation in promoting the strategy of condom use is that women must be able to ‘negotiate’ this practice with their partners. In a male-dominant-decision-making society, there are a variety of interrelated factors . . . that hamper a woman’s ability to accomplish this” (Buseh, Glass, & McElmurry, 2002 b, p. 180).
- The high incidence of rape and abuse.
- The demographic transition of the population from rural areas to urban areas, where a higher prevalence of HIV infection occurs (Mbanya, Zebaze, Kengne, Minkoulou, Awah, & Beure, 2001). The prevalence in tribal areas in South Africa is 8.7 % and in rural areas is 7.9 %, while in urban formal it is 12.1 % and in urban informal 21.3 % (Shisana, 2002, p. 47).
- In some cultures in South Africa, there is a lack of family support for abandoning a relationship that puts a woman at risk (Mbanya et al, 2001, Molepe, 2003). A woman who knows her husband is unfaithful, but who is unable to negotiate condom usage, cannot rely on support from her family if she needs to go home to her parents.

1.1.3. HIV / AIDS and adolescents in South Africa

The National Survey of HIV and Sexual Behaviour among 15 - 24 year-olds conducted in South Africa in 2003 (Pettifor et al., 2004) contain some statistics that highlight the importance of HIV education in South African schools and of this study of the effectiveness of the Rainbow HIV / AIDS module as a HIV education programme. Of note are the following:

- HIV prevalence in the 15 - 19 year age group is 4.8 % (p. 29)
- HIV prevalence is higher in females than in males in the 15 - 19 year age group (and others) - 2.5 % in males and 7.6 % in females (p. 29)
- 31.2 % of females age 21 years are HIV positive (p. 30)

(Pettifor et al., 2004) found the HIV prevalence in young people in this age group to be distributed as indicated in Figure 1 overleaf.

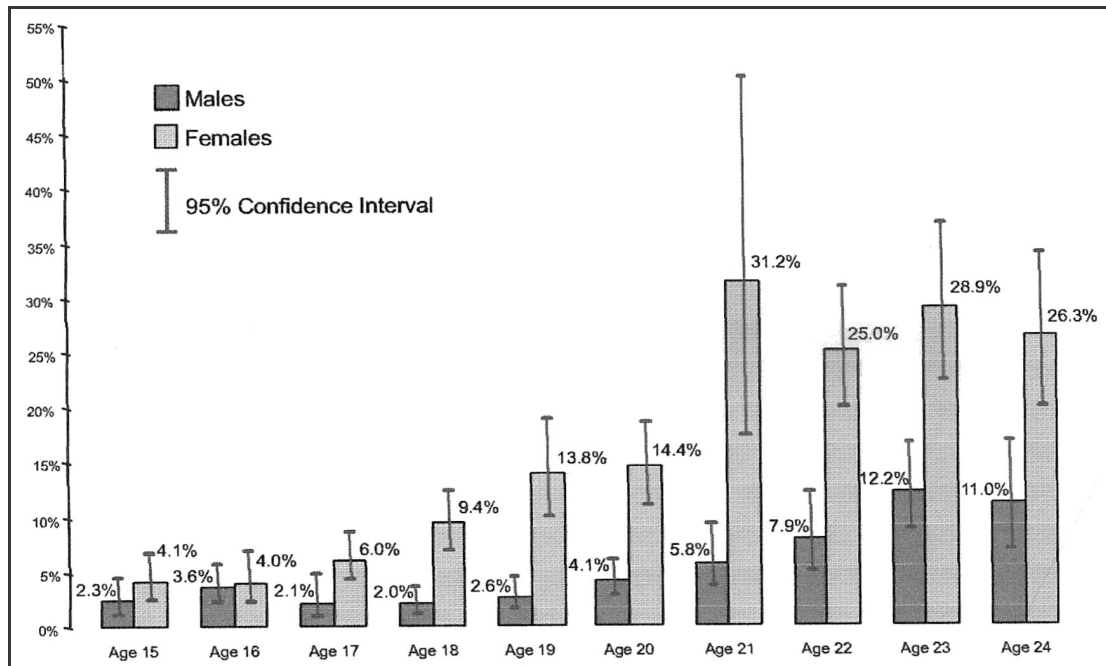


Figure 1: HIV Prevalence by age and gender in South Africans between age 15 and 24 years. From Pettifor et al, 2004. p. 30.

1.2. BACKGROUND TO THE STUDY

The Rainbow Biology Teacher Enrichment Programme has run five intensive workshops to train high school biology educators about HIV / AIDS and how scientific information on this subject can be taught in the biology classroom. Following the first workshop, some of the educators who attended the workshop developed a teaching module on HIV / AIDS that could be used to teach about HIV and AIDS in the context of biology.

The Biology HIV / AIDS teaching module provides biology educators with a way of teaching the science of HIV / AIDS and the factors that influence its transmission, so that their learners can become peer educators while also being empowered to make informed decisions about behaviour and having the knowledge to refute the myths about the disease that abound. The learners can thus play a role in promoting changed behaviour and reducing the spread of HIV in their communities. The module also includes a life skills component that serves to train learners in appropriate behaviour skills, such as the negotiation of condom usage.

Once written, the module was trialed by two high school biology educators with grade 11 biology classes, and modifications were made to it.

It was decided in 2001 to conduct a study to determine if learners, who were taught the module, showed any changes in knowledge, behaviour and attitude. A SANPAD grant to fund the study was applied for, and granted. The preparations for the study began in 2002, with the identification of appropriate educators and schools for the research, the obtaining of permission from the principals to do the work in the schools, the planning of a time line for the study, the development of the questionnaire and the interview schedule,

and the briefing of the teachers concerned. In 2003, the study began in the schools.

1.3. THE AIMS OF THE RESEARCH

All HIV education programmes aim to help students avoid becoming infected with HIV. The Rainbow HIV / AIDS programme attempts to do this by increasing knowledge of the learners about HIV and teaching them to recognise behaviours that could put them at risk for becoming infected with HIV. It attempts to prepare the learners to avoid such behaviours or, if they are already participating in such behaviours, the programme aspires to alter HIV-risk behaviours. In addition (unlike many programmes in other countries where HIV is not so prevalent) as many of the learners will come into contact with people who have HIV and AIDS, and even have to deal with people living with AIDS in their families or communities, the programme also teaches the learners how to live with and look after someone living with HIV or AIDS.

The research aimed to determine if, having been taught the module by educators who had attended a Rainbow Biology Teacher Enrichment Programme HIV / AIDS workshop, within the context of grade 11 biology, there was a significant change in the knowledge, attitude and behaviour of the learners and whether the module dealt with the real issues in around HIV / AIDS in the lives of the learners, i.e.:

- do the learners know about HIV and its infection routes?
- can the learners recognise behaviours that place them at risk of HIV infection?
- are the learners prepared to deal with behaviours / situations that place them at risk for HIV infection?
- do the attitudes and knowledge of the learners enable them to deal with those in their families and communities that live with HIV / AIDS?

In addition, the research wanted to identify any problems the educators might have in teaching about HIV / AIDS.

The benefits of evaluating the effectiveness of the module and identifying the difficulties the teachers might have in teaching it are threefold:

- to enable us to identify the HIV / AIDS programme's shortcomings so that we can improve the module
- to enable us produce an worthwhile teacher resource file
- to enable us to make decisions on whether to continue with, or even attempt to expand, the HIV component of the Rainbow Biology Teacher Enrichment Programme.

1.4. RESEARCH QUESTIONS

1. What changes in knowledge, behaviour and attitude resulted from the learners' exposure to the Biology HIV / AIDS module?
2. Did the module deal with the issues affecting the lives of the grade 11 learners to whom it was

taught?

3. What difficulties did the educators experience in the teaching of the module?

1.5. BRIEF OVERVIEW OF THE METHODS USED TO ANSWER THE QUESTIONS

The Rainbow Biology HIV / AIDS module was taught to grade 11 biology learners in 6 schools by their teachers. The teachers had all attended a Rainbow Biology HIV / AIDS workshop for high school biology teachers. As the senior researcher in the project, I observed all of the lessons in one school, most of the lessons in two others, and some lessons in the remaining two schools. A junior researcher from the University of Twente in the Netherlands, Lisette Vogels, observed most of the lessons in one school. A study begun by a third researcher in additional school during this period was abandoned for reasons described later. The observation of the lessons was done in order to give an additional perspective on changes in learners' knowledge and attitudes, as well as difficulties experienced by the educators. Notes were taken during the observation and some of the lessons were videotaped. The notes and video tapes were used to obtain information and corroborate findings, to help answer the research questions.

In each school the grade 11 learners taught by the biology educator involved in the study wrote a pre-test of knowledge prior to being taught the work in the module, followed by the same test as a post-test. In an attempt to determine if any change in knowledge demonstrated in the post-test was only a short term one resulting from having just been taught the work, the same test was written as a retention-test two months after the completion of the module. The answers in the pre-, post- and retention tests were compared and an ANOVA was used to determine if the changes in the answers for the three tests were significantly different. In addition a questionnaire to identify the attitudes of the learners to HIV / AIDS and to try and establish some idea of the sexual behaviour of the learners and their peers, was answered with the pre-, post- and retention tests.

As it is difficult to ensure that accurate information concerning sexual issues and the stigmatised disease of HIV, it was decided that when the learners wrote the retention test, they would also be asked to write a narrative on being taught the module and how it related to their lives. The narratives were read and reread in order to identify the themes they contained. A double blind analysis was done by a second reader to determine if the themes had been correctly identified.

This research was to gather evidence of outcome data of four types:

- Evidence of learners' knowledge regarding HIV and AIDS and behaviours that would put them at risk of infection with HIV.
- Evidence of learners' attitudes about HIV and AIDS.
- Evidence of learners' belief that they can take actions to reduce the likelihood of HIV infection.
- Evidence of the extent to which the learners or their peers engage in behaviours that would put them at risk of infection with HIV

(Popham, W. J., undated a).

In addition, structured interviews were conducted with five teachers to gather process data (Popham, W. J., undated a). These interviews were analysed to identify difficulties educators had with teaching the module.

1.6. THE IMPORTANCE OF THE STUDY

Fransen (1998) states that little empirical evidence has been collected about the effectiveness of various policies to bring about behaviour change and reduction of HIV transmission. The most effective ways of reducing the spread of HIV by sexual means are the reduction in high-risk sexual behaviours, the number of sexual partners and STIs, together with the use of male or female condoms. Harrison et al. (2000) cite several studies investigating the relationship between health education and behaviour to show that there is strong evidence for an increase in condom use and a decrease in high-risk behaviour linked to various behaviour-change interventions.

One study on behavioural interventions for adolescents in the United States found that 88% of the interventions increased knowledge of HIV / AIDS, 58% improved the participant's attitudes, 60% increased the intention of participants to use condoms, 73% increased condom use and 64% had led to a reduction in the number of sexual partners (Harrison et al. 2000, p. 285). However, Popham (undated a) points out that there is ample evidence that knowledge-only programmes typically have little influence on student's behaviours.

Harrison et al. (2000) also identify the common elements in interventions that had positive outcomes on behaviour change, one of which is that such interventions "emphasise the individual as a rational actor in altering behaviour" (p. 285). One of the intentions of the HIV / AIDS teaching module is to equip biology learners with the knowledge and skills to become 'rational actors'.

Harrison et al. (2000) point out that while there are many different initiatives that have increased awareness of HIV / AIDS in South Africa, such as *Soul City* and the *loveLife* national youth sexual health initiative, there have been few evaluations of HIV / AIDS education interventions in Africa.

Although there are now a number of HIV education initiatives in South Africa, there is no overall controlling body to co-ordinate or evaluate them. Some of these interventions have been designed and run by religious organisations, such as Scripture Union and the Catholic Education Initiative, and many of them only reach a limited number of schools. The main one is the programme to be taught in Life Skills in schools. However, the effectiveness of most of these programmes has either not been evaluated, or the reports of the evaluations have not been published.

This study into the effectiveness of the Rainbow Biology HIV / AIDS Module will contribute to what we know of the link between increased knowledge, changes in attitudes and practising skills to avoid behaviours that could lead to HIV infection, and behaviour change.

1.7. LIMITATIONS OF THE STUDY

- It is difficult to demonstrate that an HIV education programme has produced genuine and long term changes in the life of a learner. HIV is a stigmatised disease, sexual issues and behaviours are not talked about openly in many cultures, and learners may be less than truthful in reporting their attitudes or writing about their behaviours. The only way in which the true effectiveness of such a programme can be evaluated would be to monitor HIV infection rate amongst the learners to whom the programme is taught.
- It is not possible to exclude the effect of extraneous factors on the changes in the pre-, post- and retention test and questionnaire responses of the learners. During the time of the study learners might have been exposed to HIV / AIDS information in the media or people they know might have disclosed their HIV status (Popham, W. J., undated a). In addition, just doing HIV / AIDS education in their biology lessons might have made the learners more aware of information on HIV / AIDS that is always available in their environment, and so they might have gained more from this external information than they would have otherwise, and thus it might not only have been the information that they learned in the class that resulted in the changes in their results from pre-to post- tests.
- Nearly all surveys about knowledge, attitudes, beliefs and behaviours towards HIV / AIDS have the limitation that the responses are based on the self-declarations of the respondents. These might be affected by a “social desirability bias” - respondents might provide what they think are socially acceptable answers (Shisana, 2002, p. 31).
- It was not possible to eliminate the reactive effect caused by the pre-test, i.e. the pre-test may have alerted students to what they were expected to get out of the programme and thus they might have reacted differently to the programme that they would have otherwise as the pre-test let them know what was important in the programme. (Popham, undated a).
- Many of the learners involved in the study were not English first language speakers. It is possible that they did not understand all the questions in the tests and questionnaires and so their marks were not a true reflection of their knowledge or attitudes. In addition, their answers might have been worded in such a way that I misinterpreted what they meant to say.
- There is such diversity in the learners of South Africa when one considers different ethnic and cultural groups, different religious groups, different living conditions (rural vs. urban), and so it is not possible to generalise results obtained from a study in six schools to apply to all learners in South Africa.
- As the sample used in this study was not chosen randomly but was, rather, a convenience sample, (for reasons discussed later in this thesis) the results are also not generalisable.
- Non-response bias is a possibility. Pettifor, Reed, Steffenson, Hlongwa-Madikizela, MacPhail,

Vermaak, & Kleinschmidt, (2004) point out that in the results of their survey, there were youth who refused to participate, and also those who could not be found for the purposes of the study. It is possible that those learners who were absent on the days that the questionnaires were administered were absent on purpose to miss the test or the writing of the narrative. It is possible that their attitudes were different to those of the learners who did write the tests and the narrative.

- As Pettifor et al (2004) listed in their study limitations, “the attitude measurements reflected . . . are not exhaustive as they are based on a single or few questions for each attitude” (p. 26).

1.8. OVERVIEW OF THE CHAPTERS OF THE THESIS

Chapter 2 contains an outline of the theoretical models / theories of behaviour change relevant to sexual behaviour and HIV / AIDS, so that the theoretical perspective of this study can be put into the context of these models. The literature review gives a background to the HIV / AIDS pandemic in South Africa, and the behaviour of adolescents. The guidelines for a good HIV / AIDS education programme are provided. The current status of HIV / AIDS education in South Africa is reviewed and some HIV / AIDS programmes from Southern Africa are discussed.

Chapter 3 is an overview of the history of the Rainbow Project in order for the development of the HIV / AIDS module to be placed in context. The aims of, and the process of development of the HIV / AIDS module is described.

Chapter 4 describes the research paradigm used in this study, and describes the research methods chosen together with the reasons why they were chosen. The research design is described in detail.

Chapter 5 gives the data collected from the study together with an analysis and a discussion of the data.

Chapter 6 contains the conclusions reached and recommendations for further study.

Chapter 2: Theoretical perspective and literature review

2.1. THEORETICAL PERSPECTIVE

A number of social science behaviour change theories are particularly relevant to HIV education programmes. They all provide insights into how and why people change their health behaviours and so they are helpful in designing, developing and evaluating such programmes (Popham and Hall, undated). “Some ... were formulated in other domains and later applied to HIV preventive behavior, and some of which were formulated to focus specifically on behavior change in the HIV arena” (Fisher & Fisher, 2000, p. 4). However, King (1999) points out that most intervention reports often do not explicitly state the theoretical framework of the project, and that many interventions are not developed with an explicit intent to base them on behavioural change models.

There is an enormous amount of evidence that programmes based on the premise that an increase in knowledge about HIV and AIDS would lead to the adoption of safer sexual behaviours are not successful (King, 1999, Popham, undated a, Tolond, 2002, Campbell, 2003) and so those theories of behaviour change that presume this will not be considered here.

The models most relevant to HIV prevention programmes, their assumptions, their applicability to HIV education and their limitations in this context, are discussed in the following pages.

2.1.1. Social Learning / Social Cognitive Theory

The social learning / social cognitive model is rooted in Watson’s work based on his belief that directly observable events - stimuli and responses - influenced behaviour (Berk, 2000). Social learning theorists accept the principle that conditioning and reinforcement cause new responses in individuals.

Bandura and his colleagues showed that modelling is responsible for a wide variety of children’s new behaviours, and that children acquire responses by watching and listening to the people around them His most recent work stresses how children think about themselves and the behaviour of others, and gradually become more selective in who and what they imitate, and thus develop personal standards for their behaviour and responses - hence the Social **Cognitive** Model (Berk, 2000, Fisher & Fisher 2000). “Man is a thinking organism possessing capabilities that provide him with some power of self direction” (Bandura, 1971, p. 2). In the context of HIV education, this would involve self-efficacy - the belief of an individual in his / her own ability to perform risk-reducing behaviours in vulnerable situations (Harrison et al, 2000).

The main limitation of this model is that it is narrow when considering the factors that influence the behaviour of a child, as it tends to ignore the influences of the wider environment (Berk, 2000). However, Fisher & Fisher (2000) state that it has been successfully applied in a variety of health domains and they point out that according to Bandura the biggest problem with respect to behaviour change is not instructing people what to do, but rather imparting to them the social and self-regulatory skills and self-

beliefs necessary to use these skills across a variety of situations in different contexts (p. 23). “Without self-efficacy, people will not behave safely even if they know what constitutes safer behavior . . . and have the requisite skills . . .” (Fisher & Fisher, 2000, p. 23).

In terms of HIV education, while knowledge about HIV is necessary, it is not sufficient to reduce HIV risk behaviour, rather knowledge and reinforcing of the skills necessary in risky situations together with self motivation and self knowledge are necessary. (Fisher & Fisher, 2000).

King (1999) cites Greenberg (1996) as reporting on a study of 12 HIV risk-reduction interventions that used Social Cognitive Theory as their basis. Greenberg reported that all obtained positive changes in risk behaviour, and that the outcomes of some exceeded those obtained from other interventions that were based on other social science behaviour change theories.

2.1.2. Theory of Reasoned Action

The theory of reasoned action is based on the assumption that humans are rational beings, and they make use of the information available to them to make reasoned decisions. It focuses on the role of an individual in being aware of a risk, accepting that risk, and the acquisition of specific skills to reduce risk. The theory postulates that a “person’s intention is a function of two determinants:

- their attitude towards the behaviour
- subjective norms - what an individual believes others expect him / her to do”

(King, 1999, p. 7).

Cleland (1995) criticises the theory:

No explicit or implicit assumptions should be made that rational models of human behaviour offer complete or satisfactory understanding of change. Indeed the record of psychological models, associated with the work of Becker, Ajzen, Fishbein and others, in predicting behavioural outcomes is mixed. Furthermore, many factors . . . are likely to influence behaviours, not least attitudes towards the behaviours that require modification, external impediments to change and social pressures (p 158).

Tolond (2002) points out that what is ‘rational’ is highly cultural specific and that a universal rationality approach is not helpful in promoting behavioural change.

2.1.3. Health belief model

The health belief model holds that health behaviour is a ‘function of an individual’s socio-demographic characteristics, knowledge and attitudes’ (King, 1999, p. 6) and that in order to be able to change HIV risk behaviour, the individual must:

- believe that he / she is at risk for HIV infection

- perceive that HIV / AIDS is serious
- believe in the effectiveness of the new behaviour
- perceive the benefits of the new behaviour
- have “cues to action (witnessing the death or illness of a close friend or relative due to AIDS)” (King, 1999, p. 3).

An HIV behaviour change programme based on this theory must, therefore, change the individual's beliefs, so that they perceive the benefits of changed behaviour to outweigh the costs of that changed behaviour (King, 1999, Fisher & Fisher, 2000). Fisher & Fisher (2000) report that different studies have found mixed levels of support for the effectiveness of programmes based on the Health Belief Theory and HIV risk behaviour change. However, they do point out that if more information about the beliefs of the participants were collected before the programme was designed, then the programme could focus on modifying those perceptions of the participants that would lead to a more fruitful outcome rather on all their perceptions (p. 7).

In a study on the use of the Health Belief Model of Behaviour Change in three programmes to increase the knowledge of osteoporosis, increase health beliefs and increase the frequency of osteoporosis-preventing behaviours, participants went through a three week education programme. They wrote a evaluation instrument before and after the programme, and although the participants in all had significantly higher levels of knowledge after completely a programme, there was no change in behaviours (Sedlak, Doheny, & Jones, 2000). Would the same happen in the case of HIV interventions based on this theory of changed behaviour?

2.1.4. Transtheoretical model of change

The transtheoretical model of change suggests that people going to change their behaviour undergo a progression through stages of readiness to change behaviour, on their own, until reaching and maintaining the desired behaviour change (Kohler, Fish & Davies, 2004, Fisher & Fisher, 2000). In order to change a behaviour, the stages would be

- precontemplation (not thinking about changing the behaviour in the near future). People in this stage tend to avoid reading about, listening to information on, talking about their unhealthy behaviours
- contemplation (thinking about changing the behaviour in the next six months)
- preparation (getting ready to change the behaviour, usually in the next six months)
- action stage (actively achieving the behaviour)
- maintenance stage (continuing the new behaviour for a significant period of time)

Fisher & Fisher (2000) provide evidence of a number of HIV risk behaviour reduction programmes based on this model in which there has been significant change in behaviour, especially in the context of condom use and also state that “younger people are generally more advanced in their stages of change for safer sex than older people” (p. 21). They also point out that one of the advantages of this model is that it does not assume that all people in a group are at the same stage in the process of change. However they

criticise the model as being unclear on how all the stages interact with each other, and the fact that few longitudinal or experimental studies have been done to verify the use of the model in long term change in respect of HIV risk behaviour change (p. 23).

2.1.5. The AIDS Risk Reduction Model

The AIDS risk reduction model was developed specifically for the context of HIV prevention. It uses constructs from the health belief model, the social cognitive model and the transtheoretical model of change. It describes three stages a person goes through when changing HIV risk behaviours i.e.

- ‘behaviour labelling’ - knowledge about HIV and behaviours that are risky, and an awareness of how others perceive people who are HIV positive
- ‘commitment to change’ - perceptions of enjoyment, self efficacy, social norms and aversive feelings
- ‘taking action’ - all the feelings and emotions help people to make decisions to reduce HIV risk behaviour

(King, 1999, p. 8).

Thus behaviour change is seen as a series of changes that a person goes through, and many different factors affect the movement through a stage. Proponents of this theory, however, believe that many variables (e.g. knowledge) have inconsistent effects on the movement through a stage. They also believe that interventions, especially those that occur when the individual is late in a stage of change, help the person to progress to the next stage. Perceived cost and benefits are important determinants of commitment to change (Fisher & Fisher, 2000).

Although there is some evidence of the success of HIV programmes using this model, in a variety of different populations, there is also criticism as it focuses more on the milestones in the process of change than on how to make a person reach those milestones (Fisher & Fisher, 2000).

2.1.6. Social ecological model for health promotion

Urie Bronfenbrenner’s theory offers the most complete account of the influences of context on the development of the behaviour of an individual. His ecological systems theory views the individual as having a **biological disposition** and **intrapersonal factors** that develop within a **complex system of relationships affected by multiple levels in the surrounding environment**. He portrays the levels of the environment as a series of concentric layers around the individual. Bronfenbrenner also emphasises that, as in an ecosystem, the relationships are **bidirectional**, i.e. the person is affected by each of the elements in the environment, but in turn, the elements of the environment are affected by the person, and the elements are affected by each other. “The child invariably influences those who influence him” (Bronfenbrenner & Mahoney, 1975, p. ix). The environment is also not static and thus the environmental forces that affect the individual are ever-changing (Berk, 2000, King, 1999). Bronfenbrenner & Mahoney (1975) also point out that the other participants in the situation in which the child lives and develops are “not strangers but persons who have enduring roles and relationships vis-à-vis the child” (p. x).

A diagrammatic representation of the model as it applies to a secondary school learner is shown in Figure 2 below.

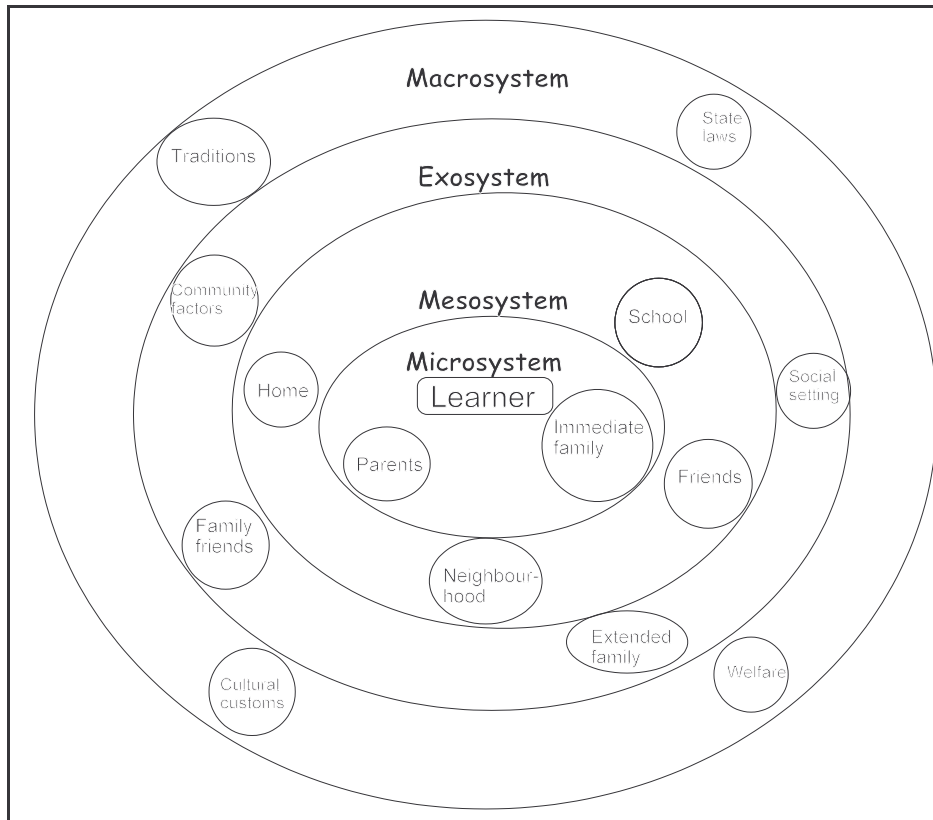


Figure 2: Bronfenbrenner's Social Ecological Model as applied to a school learner (adapted from Renn & Arnold, 2003).

The levels in the environment that play a powerful role in moulding the child are:

- **The microsystem**

The microsystem is the interpersonal processes and primary groups that form part of a person's life (interactions and relationships) in his / her immediate environment, e.g. in the case of a child, the parents, the immediate family, the child's interaction with the parents and the parents' interactions with each other.

- **The mesosystem**

The mesosystem is the institutional environment that is larger than the microsystem, but is still close to the individual. It consists of the home, the school / work and the neighbourhood. The mesosystem also has links with the microsystem, e.g. the parents might be involved in the learner's school life and the child's achievement in school will affect the way in which the parents behave towards him / her.

- **The exosystem**

The exosystem is that part of the environment that consists of the community factors and social settings such as the parents' workplace, the extended family and friends of the parents. It also includes such elements of the environment that might have an effect on the development of the child

such as the health care system.

- **The macrosystem**

The macrosystem is public policy, e.g the state laws or the customs, values and laws of the culture in which the individual is raised as a child, and lives.

(Berk, 2000, King, 1999).

This model de-emphasises the importance of the individual in behaviour change that is emphasised in the other models of behaviour change such as the health belief model and the transtheoretical model. The model recognises the importance of all parts of the environment and all the relationships within the environment, in the behaviour of the individual, i.e. “human behaviour is a function not only of the individual or his or her immediate social relationships, but as depending on the community, organisation and the political and economic environment as well” (King, 1999, p. 11).

An examination of the reciprocal interactions between students and their environments provides a lens for understanding individuals in multiple, layered, and interacting environments, only some of which they encounter directly. An ecology model allows for analysis of individual experience as well as the creation of peer groups and processes of peer cultures (Renn & Arnold, 2003, p. 264).

While I accept that in the process of changing behaviour, each individual has to go through stages, as outlined in the transtheoretical model of change or the AIDS risk reduction model, it is this **social ecological model for health promotion** that I am using as the theoretical framework of this study, as, to me, it is this complex model that most effectively explains the intricate interweaving of factors that lead to human risk behaviours of learners that defy rational understanding despite all the education and knowledge about the HIV pandemic. Figure 2 on the previous page illustrates the model as it could apply to a secondary school learner.

It is only this model, and none of the others that could explain why, even though adolescents know the risk of HIV infection, the following observations can be made:

- the female respondents in Toland’s study (2002) said “it was just not their place to carry a condom. They were afraid of what others might think and they preferred to leave it to their male partners to initiate condom use” (p. 26) even though they acknowledged the risk of HIV infection.
- 44 % of the 15 - 19 year-olds in Pettifor et al’s study (2004) reported not having used a condom when they last had sexual intercourse (p. 44).

“Just as many people continue to smoke despite knowledge of smoking’s adverse health affects, (sic) many teenagers continue to engage in unprotected sex despite knowledge of the risk behaviors associated with HIV transmission” (Hingson, & Strunin, 1992, p. 21.). That adolescents continue to exhibit high HIV-risk behaviour, despite their knowledge of the dangers of such behaviour, can surely only be explained by the **social ecological model for health promotion**.

2.2. LITERATURE REVIEW AND OVERVIEW OF HIV EDUCATION PROGRAMMES

The field of adolescent behaviour and HIV / AIDS education programmes and their evaluation is enormous. I am limiting the field of this literature review to:

- statistics of adolescents with regard to HIV / AIDS
- some information on adolescents, and how they think and behave
- general information on HIV / AIDS education programmes
- what makes a good HIV / AIDS education programme
- HIV / AIDS education in South Africa - some programmes and their evaluations
- HIV / AIDS education in some Southern African countries

2.2.1. HIV / AIDS statistics

The National Survey of HIV and Sexual Behaviour among 15 - 24 year olds conducted in South Africa in 2003 (Pettifor et al., 2004) reveals some of the statistics that highlight the importance of HIV education in South African schools and of this study of the effectiveness of the Rainbow HIV / AIDS module as a HIV education programme. I have listed those statistics so that this study can be seen in context and in perspective.

HIV / AIDS education programmes are taught in this context:

- HIV prevalence in the 15 - 19 year age group is 4.8 % (p. 29)
- HIV prevalence is higher in females than in males in the 15 - 19 year age group (and others) - 2.5 % in males and 7.6 % in females (p. 29)
- 31.2 % of females age 21 years are HIV positive (p. 30)

Statistics that are indicative of HIV-risk behaviour

- 48 % of the respondents in the 15 - 19 year age group reported being sexually experienced (p. 8). Figure 3 overleaf shows these statistics according to age.

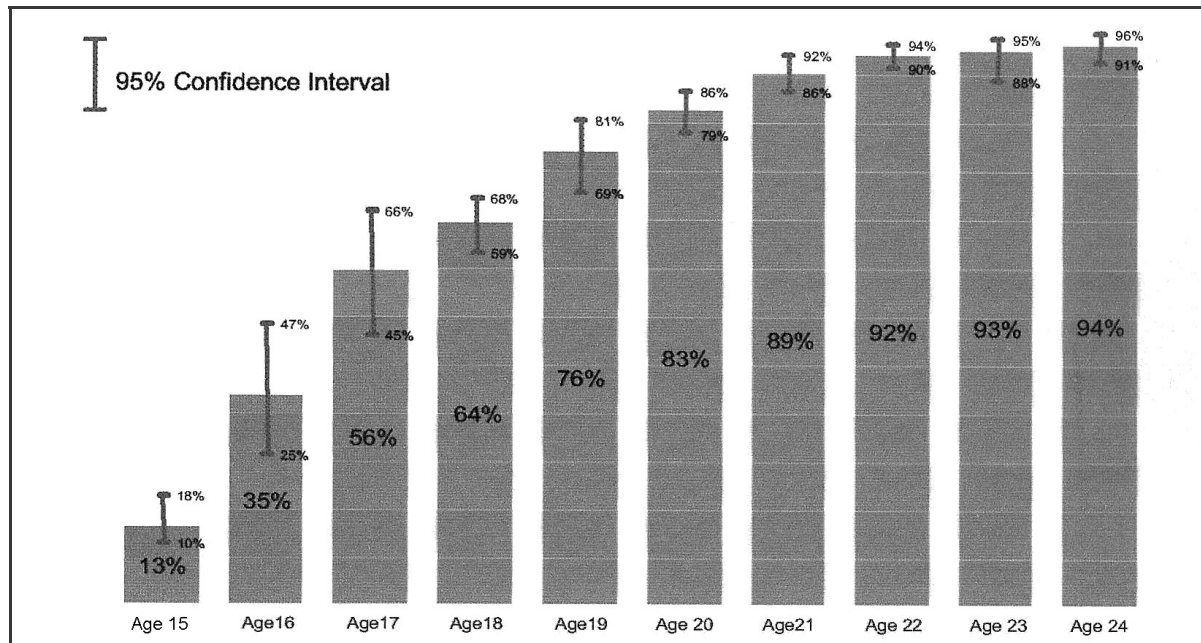


Figure 3: South Africa youth who report ever having had sex, by age group. From Pettifor et al. (2004), p 37.

- 62 % of those already infected (who tested HIV positive in the survey) stated that they thought they had no chance or a small chance of contracting HIV (p. 57).**
- the reported median age of first sex was 17 years, but 8 % of those surveyed reported having sex at age 14 or younger (p. 8). This is backed up in the statement by Smith, cited in Coetzer (2004) “there is no doubt that younger and younger teenage girls are presenting with diseases like human papilloma virus, cervical cancer and pelvic inflammatory disease - a sure indicator of sexual activity and multiple sex partners” (p. 30).
- of the respondents who reported having had sex in the previous 12 months, 8 % of males and 10 % of females said that they had sex more than 5 times in the past month (p. 39). The higher the frequency of engaging in sexual intercourse, the greater the risk of HIV infection.
- 15 % of the sexually experienced males age 15 - 19 years reported having had more than 5 partners (p. 42). The higher the number of sexual partners, the greater the risk of HIV infection.
- only 52 % of the sexually experienced respondents reported having used a condom the last time they had sex, and this figure was higher in males (57 %) than in females (48 %) (p. 43).
- youth with consistent partners were less likely to use condoms with their partners - only 32 % of those who reported having been sexually active with a consistent partner in the past 12 months reported having always used a condom (p. 46). Considering that in the course of the study of the Rainbow Biology HIV Module, 93 % of the learners indicated in the pre-test that using a condom every time one has sexual intercourse is the best way to prevent getting HIV and also that 55 % of the learners in the retention test agreed that having one partner only prevented the transmission of HIV (see Chapter 5), this is a very low figure of condom use.
- 6 % reported having been forced to have sexual intercourse (p. 41).
- only 59 % of the sexually experienced females reported that they were willing to have sex the first time that they did so (p. 41).

- 27 % of those who reported having had sexual intercourse in the last 12 months indicated that they had had more than one sexual partner in that time (p. 9).
- 24 % stated that they had had sex while under the influence of alcohol (p. 49). Coetzer (2004) reports on a film of the experiences of the life of 13 year old American girl - 'what was striking about her sexual encounters was how they were preceded by the consumption of drugs and alcohol (p. 29) and some of the narratives written by learners in this study (see chapter 5) report the same.
- only 3 % of those reported as sexually experienced reported having transactional sex (sex in exchange for money or material possessions) (p. 50). This perception is contrary to the opinions expressed by some learners in their narratives (see Chapter 5) and the personal communications of the teachers (Molepe, Mashamite and Matladi - April, 2003).
- 14 % of the respondents perceived themselves at high risk for HIV infection (p. 10).
- when asked what they had done to change their behaviour, 37 % reported not having changed their behaviour (p. 52).
- only 17 % of the sexually experienced respondents reported that they had not had sexual intercourse in the previous 12 months (this is considered a key indicator to track behaviour change) (p. 38).
- those respondents who reported secondary abstinence (being sexually experienced in the past, but currently not sexually active) most commonly gave the reason for this as lack of opportunity or not having a sexual partner, rather than as an active choice to protect themselves from HIV (p. 39).
- 10.2 % of those respondent that are HIV positive reported never having had vaginal or anal sex (p. 33). Assuming that this is accurate, the route of transmission must be via contaminated needles or low risk HIV behaviours such as oral sex. This highlights the importance of teaching learners about all routes of HIV transmission.
- while oral sex is not considered a high HIV risk behaviour, it is a route of transmission, and many girls in South Africa engage in fellatio. I have no evidence that this is across all cultural and socio-economic groups, but personal communications with my GP, some of my learners and the school counsellor over the last two years have lead me to believe that it is a common practice amongst learners in schools in the northern suburbs of Johannesburg. Coetzer (2004) reports "the ease with which young teenage girls engage in fellatio means that multiple sexual partners figure in their lives a great deal earlier than might be the case with full penetration" (p. 29). She also quotes Robinson - a psychologist working in the northern suburbs of Johannesburg - as saying that there is also a big shift to anal sex to avert the chance of pregnancy (p. 30). Anal sex is a high HIV risk behaviour and so, while the teenagers are protecting themselves from pregnancy, they are putting themselves at a great risk for getting HIV. In a presentation at the Fifteenth International AIDS Conference in Bangkok, Lane reported that a significant number of young Africans are becoming HIV infected through anal sex, and that anal sex is more common in Southern Africa than previously thought. He also stated that current prevention programmes encouraged the misconception that anal sex is relatively safe, and so data had shown that condoms were not used as consistently in anal sexual intercourse as in vaginal sexual intercourse (Gadd, 2004, p. 1 - 2).

However, some of the statistics in the survey are positive, and some do indicate that HIV / AIDS programmes are having some good results.

Some encouraging statistics from the 2003 National Survey of HIV and Sexual Behaviour among 15 - 24 year olds

- 63 % of the respondents indicated that they had changed their own behaviour to avoid HIV (p. 52)
- 44 % of the respondents indicated that they had spoken to their parents or guardians about HIV / AIDS (p. 53)
- 32 % of the respondents cited school as the source of their HIV knowledge (but this includes peers at school) (p. 54)
- 60 % of the youth surveyed indicated that they would like to be tested for HIV (p. 56)
- most of those surveyed were optimistic about their future, with 92 % reporting that they had long term goals, and 69 % reporting that they were in control of their lives (p. 61)
- 55 % of young people believed that the most serious issue facing South Africa today is HIV / AIDS (p. 61)
- of the 15, 414 eligible youth approached to take part in the study, only 5.9 % refused on the basis that they felt uncomfortable discussing personal issues or HIV / AIDS (p. 19)
- when asked what they had done to change their behaviour, 20 % reported that they used a condom, 14 % reported that they had reduced their number of sexual partners, 13 % reported having abstained, 11 % reported that they were faithful to one partner, and 7% said they were delaying having sex for the first time (p. 52)
- 68 % reported they receive no pressure from their peers to have sexual intercourse (p. 60)

Attitudes to condoms amongst youth

Using condoms the correct way every time sexual intercourse occurs is widely acknowledged as the best way to prevent getting HIV during sexual intercourse (The American Red Cross, 1995, Ward, 1999), so the following data are a concern:

- Pettifor et al (2004) report that 31 % of youth still believe that using condoms is a sign of not trusting your partner.
- While 90 % of the respondents reported that they were confident that they could talk to their partner about using condoms, only 43 % were confident that they could do this after drinking or taking drugs (p. 61).

“If condoms are to be promoted as the primary barrier against infection it is imperative that we examine condom use specifically, looking at the norms and stigmas surrounding their use” (Tolond, 2002, p. 5).

Tolond (2002) in her study on why AIDS education failed to change high-risk sexual behaviour to the levels that were originally anticipated found the following:

- “within the context of a long-term relationship a condom signifies a lack of trust and an accusation of infidelity” (p. 10)
- society constructs male and female sexuality and that “men are encouraged to seek sexual pleasure for its own sake and sex is not seen as real sex unless it is pleasurable for the male . . . ‘a condom stops you getting that feeling, so you can say that the condom is not natural’ . . . so again condoms are associated with deviance and promiscuity” (p. 17)
- female subjects in her study said that they felt uncomfortable carrying condoms: “ ‘condoms would ruin your reputation’ if a boy saw a girl take out a condom the boy would automatically presume that the girl was ready for sex” (p. 20)
- as carrying a condom means that a girl is ready for sex, it also makes it more difficult to negotiate sex
- as carrying a condom means that a girl is ready for sex, it implies that a girl is prepared and that she is a “slut” (p. 20)
- carrying a condom implies that a girl is ready for sex, and this goes against the romantic ideology that girls have of being “carried away by love” (p. 20)
- sex is unplanned and spontaneous, and the fun of being “caught up in the heat of the moment” is a fundamental component of adolescent sexuality. “It is imperative that future intervention strategies take cognisance of the unplanned, spontaneous nature of adolescent sex so that interventions can move away from a concentration on rational decision making and focus more on the unplanned, non-rational features of sex” (Tolond, 2002, p. 26)

When looking at the findings of Tolond’s study, it is clear that for adolescents, one can see that theories of behaviour change that rely on rational thought, such as the theory of reasoned action, is not applicable to adolescent sexuality.

2.2.2. New research on the adolescent brain, and the way in which some teenagers perceive their risk

Until a current study carried out by Giedd at the National Institutes of Health Clinical Center in Bethesda (Wallis, 2004) most scientists believed that by age 12 the human brain was largely completely developed structurally and in the ability to operate as an adult. Giedd’s work involves doing a longitudinal study on a group of adolescents that includes doing a series of MRI scans on their brain. Giedd describes how the study has shown that not only is the brain of the adolescent far from mature, but both grey and white matter undergo extensive structural changes well past puberty. When he started the study, he planned to follow the subjects until age 20, but now he says the work should continue until the subjects are 25. What he has found could account for the typical adolescent behaviour including reckless risk taking and rule breaking. He says that the wild conduct once blamed on “raging hormones” is now being seen as the result of two factors -the surfeit of hormones and “the paucity of the cognitive controls needed for mature behaviour” (p. 51). Giedd also suggests that the development of the brain is controlled by genes, experience and environment. His study has shown that the last part of the brain to develop is the

prefrontal cortex - what he calls “the area of sober second thought”, “the home of the so-called executive functions such as planning, setting priorities, organising thoughts, suppressing impulses, weighing the consequences of one’s actions” (p. 51). The study has found that in processing emotional information teens rely more heavily on the emotional centre of the brain - the amygdala. Tolond (2002) quotes one of her respondents as saying “if you were to think logically, out of the situation, it would be different but once you’re in that situation its like you lose your head” (p. 25). Sowell, cited in Wallis (2004), describes it as “scientists and the general public had attributed the bad decisions teens make to hormonal changes . . . but once we started mapping where and when the brain changes were happening we could say ‘Aha, the part of the brain that makes teenagers more responsible is not finished maturing yet’” (p. 51). Dahl, a psychiatrist, cited in the same article says that teenagers are actively looking for experiences to create intense feelings (p. 51).

Steinberg, a psychologist, cited in the same article, did a study on judgement and risk assessment. He found that both adults and teenagers made safe choices when alone, but in group play, teenagers started to take more risks in the presence of their friends, while those over 20 years showed little or no change in their choices when in the company of others. Bjork of the National Institute on Alcohol Abuse and Alcoholism in Bethesda cited in the same article, has also used MRI to study motivation. One region in the prefrontal cortex motivates humans to seek rewards. He has found that this region is immature in teenagers, and so to motivate them requires a really high excitement factor, or a really low effort, or a combination of both (p. 52). The results of these studies all go a long way to explaining why the HIV incidence is the highest in the group 15 - 24 years, even though there have been many HIV education programmes, and why adolescents continue to report high HIV-risk behaviours even when they show evidence of functional knowledge of HIV and they perceive that they have the skills to negotiate safe behaviours.

It is during adolescence that individuals experiment with and “formulate their sexuality. This sexuality is negotiated and constructed within an environment of social pressures, social norms and peer expectations”. (Tolond, 2002, p. 6). MacPhail cited in Tolond (2002) proposes that if HIV preventative behaviour can be made to appear the norm, adolescents may readily adopt safe sex practices as the social norm, thereby reducing the escalating rate of infection (p. 6).

Many adolescents perceive themselves to be invincible and thus not susceptible to the virus. Some also feel that HIV is ‘their disease’ i.e. belonging to another group in the population and not to them. “Many adolescents thus perceive AIDS as a threat to the socially deviant and thus not a threat to themselves.” (Tolond, 2002, p. 8).

2.2.3. HIV / AIDS education

2.2.3.1. The objectives of HIV / AIDS education programmes

The most common aim of HIV / AIDS education programmes is to teach learners knowledge, attitudes, skills and behaviours that will enable them to recognise and avoid high HIV-risk behaviour. In addition, it is important that the school environment nurtures the youth and make them feel confident and motivated. Newton, cited in Coetzer, 2004, says “when it comes to teen sex, it’s the kids who are emotionally needy who are most at risk. All children need to belong and be nurtured, and it’s the ones short on those who

are vulnerable” (p. 29). In South Africa, where the prevalence of HIV is so high, many of our learners are affected by HIV / AIDS in their communities (as is shown in the reporting of the narratives, Chapter 5). When asked what the objective of education is, we glibly say it is to prepare children for life, and so in South Africa, our HIV / AIDS programmes should also aim to ensure that the learners are prepared to cope with infected people in the home and the community. Freeman (2003) spoke of the helplessness and depression that is felt by those affected by HIV / AIDS, and we also need to prepare the learners to deal with that.

HIV / AIDS education is as essential as teaching little children to look before they walk into the road - it is a matter of life and death:

Solomon and De Jong, quoted in Page (1990) say “Research on sexually transmitted disease education has found that the point of diagnosis represents a ‘teachable moment’ when the patient with the sexually transmitted disease is at his / her most susceptible and will take cognisance of the educational message to avert the recurrence of the disease” . . . However, for AIDS prevention the diagnostic moment is too late (p. 12).

Interventions to stem the spread of HIV throughout the world are as varied as the contexts in which we find them. . . . sexual behaviour, which remains the primary target of AIDS prevention worldwide, is widely diverse and deeply embedded in individual desires, social and cultural relationships, and environmental and economic processes. This complex nature of sexual behaviour makes prevention of HIV, which could be an essentially simple task, enormously complex, involving a multiplicity of dimensions (King, 1999, p. 5).

During the course of the HIV epidemic, many different HIV education programmes, with many different objectives, have been designed and implemented in many different settings and in many different cultures in many different countries. Most have been funded, designed and implemented by the public health sector and in schools most have been funded by government education departments. “In many jurisdictions there are laws mandating that HIV education be provided but without stipulations concerning how this should be done” (Fisher & Fisher, 2000, p. 3). Many education programmes only attempt to influence students’ knowledge regarding HIV. Yet ample evidence indicates that knowledge-only programs typically have scant influence on students’ behaviors’ (Popham, undated a, p. 10). “Primary and secondary educational institutions generally have fielded extremely weak, atheoretical interventions designed not to offend the religious right wing, with content that is highly unlikely to effectively change HIV risk behavior”, and “most have focussed primarily - and in many cases solely - on providing information about HIV” (Fisher & Fisher, 2000, p. 3), which evidence shows is not effective in changing HIV-risk behaviours. King (1999), however believes that many “second-generation interventions were developed based on individual psychosocial and cognitive approaches that educate individuals in practical skills to reduce their risk for HIV infection” (p. 5) as researchers and developers have come to realise that complex behaviours take place in a context. “Drawing on various models and modifying them to suit the populations and the context has been critical to implementation of prevention projects, especially in international settings, as nearly all theories were developed in the West” (p. 20).

2.2.3.2. Characteristics of HIV / AIDS programmes that are effective

HIV / AIDS education programmes are varied in theoretical underpinnings, their duration, their nature and in the people whom they target. However, studies have shown that programmes that have effective outcomes have certain characteristics. King, (1999) identified some of these as:

- they provide accurate functional knowledge about the risks involved in unprotected sex, enabling informed decisions to be made about sexual behaviour
- they include modelling and practice in communication skills that lead to self-efficacy in negotiating HIV-safe behaviours
- activities are conducted in small groups
- the programme involves a minimum of 14 hours of contact
- they provide many opportunities for the learners to personalise the information
- they address the pressure that peers put on learners to engage in HIV-risk behaviour and strategies to deal with these
- they reinforce supportive group norms and appropriate values of individuals to enable them to choose safe behaviour
- extensive training is provided for teachers or other presenters of the programmes

(p. 19).

Other characteristics of effective programmes have been identified as follows:

- the programme should have a narrow focus on reducing sexual risk-taking behaviours that might lead to HIV or STD infection and spend relatively little time on other issues such as gender roles and dating (Kirby et al, 1994)
- the programme is based on accepted social learning theories (Kirby et al, 1994, Popham & Hall, undated a)
- the programme includes activities that address media influences on sexual behaviours (Kirby et al, 1994)
- the programme should help learners realistically appraise their personal vulnerability regarding HIV infection (Popham & Hall, undated)
- the programme should promote positive attitudes towards methods of avoiding HIV-risk behaviours (Popham & Hall, undated)
- the programme should be designed to fit the cultural, gender and developmental issues of participants (King, 1999) as well as take the social context of the community into consideration (Harrison et al, 2000).
- the programme should be chosen after considering the pre-knowledge of the learners (Popham & Hall, undated)

One concern that is often expressed by various people is that by teaching sex education and condom use, sex education and HIV / AIDS education programmes encourage sexual activity and experimentation. It is, however, widely acknowledged in the literature that this is not the case, and that in fact effective programmes promote responsible sexual behaviour and delayed onset of sexual debut (King, 1999).

2.2.3.3. HIV / AIDS education in the USA

A report from the Centres for Disease Control and Prevention in the United States of America states that in a nationwide study of school districts “67 % required HIV education for students, 90 % provided teacher preparation in the area of HIV education, and 71 % reported that a school / community advisory committee had been established for the review of HIV education materials” (CDC, undated, p. 1). In addition, the National Health Objectives of 2000 call for “reducing the proportion of adolescents who have engaged in sexual intercourse by age 15 and by age 17 . . . reducing the proportion of ever sexually active adolescents who abstain from sexual activity for the previous 3 months . . . and increasing the proportion of sexually active adolescents who used a condom at last sexual intercourse” (CDC, undated, p. 1). However they state that despite the considerable effort that is being expended on developing and implementing these programmes, there is little data on their effectiveness in reducing HIV-risk behaviours by decreasing sexual activity and increasing condom usage (CDC, undated).

2.2.3.4. HIV / AIDS education programmes in South Africa

2.2.3.4.1. HIV / AIDS education programmes in schools

- **The Life Skills Programme in schools**

The Departments of Health and Welfare, and Education initiated a HIV / AIDS programme that was supposed to be implemented in schools as part of the subject Life Skills.

IBE (2003) has evaluated the content of the programme as follows:

Strengths:

- The documents manage to present in a pedagogic way a thematic area that is very difficult to teach
- These documents meet all the criteria of the IBE and constitute a true model for most of them.

Relative weakness:

- A relative lack of inclusion of cultural context of South Africa with the consequence that these manuals give the impression that they address mainly pupils in urban areas, with few traditional specific practices.

Master trainers from each province and district were trained to train two teachers from each secondary school in the country, empowering these trainees so they could return to their schools and train other teachers - so that, in a cascade effect, a lot of teachers would be trained and be able to co-ordinate and implement the programme. (Visser and Schoeman, 2001, Harrison et al, 2000). Harrison et al (2000) discussed the work of MacIntyre, who looked at the outcomes of the Life Skills programme and concluded that there have been difficulties in implementing the programme - these included the lack of teacher

training and the lack of time to implement the programme within the school curriculum.

Communications with high school biology teachers to whom I have spoken, make it clear that the Life Skills HIV / AIDS programme is not taught in many schools, the teachers are not well trained to teach it (teachers who were trained initially have left, and the cascade process of passing on knowledge has not been effective). There is also limited time allocated to Life Skills, and it has a very full curriculum, which leaves very little time to teach the HIV / AIDS programme thus reducing its effectiveness (Personal communication, David Mbetse, 2003.09.21., personal communication, Joan Dommissie. 2003.10.27., personal communication, Jyothi Chabilall, 2003.10.02). Lack of support of the principals and other members of staff, as well as conflicting goals in the school system are mentioned by Visser & Schoeman (2001) as contributing to the programme not being implemented in schools. James (2003) reported that in schools where the full programme was run, students showed a significant change in outcome variables, but has not provided information to back up this claim.

Coombe (2001) sums up the Life Skills controversy:

It is time to re-examine some of our basic tenets about life skills teaching. The fact is that many teachers are uncomfortable teaching sexuality issues. Why assume teachers are knowledgeable about HIV and its transmission; that they are willing to talk about intimate matters with young people; that each teacher will make an acceptable counsellor and mentor; and that male teachers who abuse females will fight the disease? Why require that teachers - already struggling to deliver core curricula - assume yet more responsibilities? Why pretend that teacher development programmes can train 400 000 teachers in the intricacies of AIDS-related behaviours.

We need to identify teachers who, trusted by young people, are appropriate candidates for counseling training. We also need to find leverage points - among school heads and in teachers' associations, embedded in teaching service regulations and codes of conduct, in education legislation, in our pre-service and in-service training programmes - that can change the way teachers serve the psycho-social needs of children and young people (p. 4).

- **HIV / AIDS Life Orientation Modules for FET developed by GIED in cooperation with the Gauteng Provincial Government**

The HIV / AIDS Life Orientation Modules for FET are still in the development phase. This phase involves research into the development of education materials on HIV / AIDS, the development of Illustrative Learning Material comprising of three modules to be taught in each of grades 10, 11 and 12. Each module should take about eight to ten teaching hours. Once the modules have been developed, they will be field tested in schools. The project will also develop guidelines regarding HIV and AIDS across the curriculum.

The material in the modules is very much life-skills based as can be seen in Table 1 that follows.

Table 1: The information covered in the FET life skills modules developed by GIED

Grade	Module one	Module two	Module three
10	Finding out about sexually transmitted infections	Understanding sexuality (including gender issues and the issue of rape)	Making healthy choices
11	Testing and treatment	Caring and supporting people infected with and affected by HIV and AIDS	Learning about the impact of the HIV / AIDS epidemic in South Africa
12	Reading media messages about HIV / AIDS	Parenting skills	Knowing your rights and responsibility

The material is designed so that the teacher will not have to use all of the modules and can choose which activities within the modules will be covered. Annexures will include a list of places where educators can get advice and support, and a list of additional resources and where these can be obtained.

The process of writing the modules includes a peer review of the first draft and of the second draft. A field test was carried out in grade 10 and 11 in approximately 10 schools in August 2003. This field test involved a baseline assessment with the educators on attitude, knowledge and OBE skills before the materials were distributed. The material developers paid two site visits to the schools during the implementation. Teacher focus groups will be run, and report-back workshops will be held.

- **Other school based programmes in South African schools**

Two religion-based programmes that are run in a limited number of South African schools are the Catholic Institute of Education Programme - Courage to Care, and the Scripture Union Programme. Neither have been evaluated for effectiveness.

2.2.3.4.2. *The loveLife Programme*

While the research into the impact of the Rainbow HIV / AIDS module is a study of a school based education programme, a study of HIV / AIDS education programmes in South Africa would not be complete without looking at the loveLife programme, as it is such a visible, and probably the best known, programme.

General information about loveLife

loveLife was launched in September 1999. It is an intervention aimed at adolescents nationally in order to promote behaviour change to reduce the rate of STIs and HIV infections, and pregnancy in this age group. Specifically it aims to reduce high-risk sexual behaviour among young people by delaying initiation of sex, reducing the number of sexual partners, managing STIs, and increasing condom use (loveLife, undated b).

The programme has a multi-pronged motivational approach that includes a multi-media campaign, a toll-free help line for teenagers and one for parents, local community outreach e.g. loveLife Games, improved access to adolescent-friendly clinics and health services for youth, and Y-centres.

loveLife targets a group that is particularly vulnerable - the 12 to 17 year olds. They consider this group as the pre- and newly-sexually active adolescents. Their approach is to address the underlying factors that fuel the spread of HIV, teenage pregnancy and sexually transmitted infections. They are working on reducing society's reluctance to address youth sexuality, peer pressure and sexual coercion, the sense of pessimism, poverty and those factors that keep young people away from the public health clinics.

The core values that the campaign teaches are love for self and one's partner, respect for self, others and elders, and dignity and responsibility.

Evaluation of loveLife interventions

The loveLife programme and its impact is being extensively monitored on an ongoing basis by researchers from the Reproductive Health Research Unit of the University of the Witwatersrand and the Medical Research Council of South Africa, with an independent external review being conducted by an external panel. (loveLife, undated a). The 2003 National Survey of HIV and sexual behaviour among 15 - 24 year old South Africans was commissioned by loveLife.

Baseline information is collected from a sample of participants in all the loveLife activities. Research methods include behavioural surveys and taking of biological samples. These are used to track sexual risk behaviours, HIV and STI prevalence, and pregnancy rates. This information is used, together with data from the large scale national surveillance study conducted every two years, to measure the effectiveness of the loveLife programme (loveLife, undated a, loveLife, undated b).

A nationally representative survey of 12 to 17 year old South Africans conducted in 2001 showed very positive results, with "67% of the respondents reporting making behavioural changes as a result of the loveLife programme. These changes included delaying or abstaining from sex". (loveLife, undated b, p. 2) and 78% saying that loveLife has caused them to use condoms (loveLife, undated b). What isn't evident from the reported results though is how sustained these changes are, and how consistent the use

of condoms is. A similar survey conducted in 2002 found that 70% of the respondents who had heard of loveLife reported that the programme made them think about safer choices and about 60% reported positive behaviour changes (loveLife, undated a).

2.2.3.5. Some HIV / AIDS education programmes in Southern African Schools

2.2.3.5.1. The Stay Alive Programme, Maun Secondary School in Botswana

Berkhof (2003) describes a HIV / AIDS programme in the school at which he is the HIV / AIDS coordinator in Maun, Botswana. He reports that although Botswana is the country with the highest infection rate (36% prevalence) in the world, the majority of schools in the country do not have structured HIV awareness programmes, although some do have AIDS clubs that reach a limited number of students. Typical of developing countries, Botswana has a young population with more than 60% being younger than 30 years. 23% of first time antenatal clinic patients are teenagers, and 6% of these are younger than 15 years old.

Berkhof reports that in Tswana culture, it is taboo to discuss matters of a sexual nature with parents and so children receive their information on sexual matters from the media and from peers, with the result that their knowledge is very flawed and full of misconceptions - a fact that is borne out by information received in personal communications with the researcher by both Vanita Molefe (02.08.2003) and an social anthropologist Dr. Marianne Brindley (03.08.2003). He recommends that teachers in primary and secondary schools should give children the information and guidance they need about HIV / AIDS, sexuality and relationships (Berkhof, 2003).

The programme was introduced in 2000. 50 teachers presented lessons fortnightly during normal lesson time. The programme began with lessons on the biology of HIV, and then moved on to discussions about making choices, taking responsibility, sexuality and relationships.

Prior to beginning the programme, all students answered a questionnaire to assess their knowledge and to obtain information about their sexual activity, behaviour and attitudes. Their answers showed amongst other things that:

- 53% of students were sexually active
- 10% of these students had been treated at least once for an STI
- 23% of the students never used or only sometimes a condom when having sex
- 10% of the sexually active girls had been pregnant at least once

Myths abounded:

- it is not possible to fall pregnant from having sex standing up

- it is not possible to fall pregnant after having sex only once
- HIV was always there
- HIV could be cured by traditional doctors but cannot be cured now because of lack of belief in traditional doctors
- people with HIV/AIDS look sick and can be avoided

A second survey was carried out when the programme has been running for a year. This survey showed that sexual activity had dropped by 9.5% for male students and 6.3% for female. Students indicated their appreciation for the free and open atmosphere of the lessons and the chance to discuss sexuality and obtain advice on sexual relationships.

The results of the second survey also showed increased self esteem and increased assertiveness, as well as a number of girls saying that they now found it easier to say no to sex or no to sex without a condom.

2.2.3.5.2. *HIV / AIDS education in Namibia*

Campbell & Lubben (2002) reported on HIV / AIDS education programmes in Namibia where, by the end of 1999 the prevalence of HIV was the fifth highest in the world. HIV / AIDS education is part of the curriculum through the inclusion of sex education in Life Science and the introduction of a Life Skills course. They identify the lack of effective training of teachers, health policies in schools and availability of condoms as being problems.

2.3. CONCLUDING REMARKS

HIV / AIDS statistics for the youth in South Africa show that there is cause for concern and a need for effective HIV / AIDS education for this age group. Adolescents do not necessarily think and behave in a logical way, and are affected by their environment and their peers. It has been shown that programmes that rely on learners making logical behaviour choices, because they have knowledge of HIV-risk behaviours, are not effective. A plethora of HIV / AIDS education programmes now exist. Some have been evaluated for effectiveness but others have not. While some countries have made HIV / AIDS education a part of the curriculum, others have not done so. Where it is part of the school curriculum in Southern Africa, it appears that teacher training is a problem. It requires particular skills to teach an HIV / AIDS programme effectively, and not all teachers can or want to teach it.

Bronfenbrenner's social ecological model for health promotion postulates that it is not only the intrapersonal factors that determine how an individual will behave, but all aspects of the individual's environment as well as all the interactions between the aspects of the environment and the individual, also have an effect. This study investigates the effect of the Rainbow Teacher Enrichment Programme and the HIV/AIDS module on some of the intrapersonal factors of adolescents, such as perceived self efficacy and knowledge of condom use, as well as some of the environmental factors such as peer pressure, the

ability of the teacher to teach effectively, and attitudes towards HIV / AIDS.

Chapter 3: The history of the Rainbow Project and the writing and development of the HIV / AIDS module**3.1. THE HISTORY OF THE RAINBOW PROJECT**

Biology, as it is taught in South African schools, is a subject whose content changes more quickly than that of many others. It is also a very wide-ranging subject that includes content from botany, zoology, chemistry, biochemistry, geography and physics. These two aspects of the subject make it extremely difficult for teachers of Biology to keep their knowledge up-to-date. Textbooks also become obsolete very quickly but, for financial reasons, it is not feasible for schools to replace them when they do become out-of-date. In South Africa, there is no structure or process in place in education that fully addresses these problems. In the United States of America, every teacher has to obtain 6 credits every 5 years to renew his / her teaching licence. A credit can be anything from attending a weekend workshop to taking a week long course during the school vacation. In this way, it is possible for teachers of biology to ensure that their knowledge is constantly updated.

In the early 1990s Estelle Nel, then a teacher at Greenside High School, collaborated with Professor van Schaik, head of the Genetics Department at the University of Witwatersrand, to run development programmes for biology teachers. The aims of these workshops were to upgrade the knowledge and skills of educators in the field of natural sciences; to introduce educators to the latest cutting edge research being done in the natural sciences; and to develop practical activities in natural sciences which would allow learners to acquire scientific skills (Nel, 1999).

In 1996, Professor Raymond Kessel of University of Wisconsin approached the acting head of the Genetics Department of the University of Witwatersrand, Dr Freda Roussouw, with a view to forming links between the University of Wisconsin and educators in South Africa. As the economy of the State of Wisconsin is largely based on agriculture, the University is very biology oriented - it has one of the highest concentrations of biological scientists in the world and runs a very successful summer school for biology teachers. Professor Kessel is the director of this Teacher Enrichment Programme. In June 1996 Dr Roussouw and three biology teachers, including Estelle Nel, travelled to Wisconsin to participate in various summer school courses, and to explore possibilities for a partnership between the Universities.

During this time, genetics and biotechnology were identified as two cutting edge aspects of biology. Many teachers in South African schools taught little or no genetics. That which was taught was simple Mendelian genetics, and genetics today is so much more than this. Nel and Roussouw, in collaboration with Kessel, planned a genetics and biotechnology workshop for biology teachers, to be run at the University of Witwatersrand in January 1997. Funding for the workshop was provided, in part, by the FRD. Kessel, Nel and Roussouw identified those areas of the subject in which teachers most needed to be updated, and designed a programme for the workshop. They found experts who were prepared to lecture to the teachers on those topics and contacted teachers who had good teaching ideas on the topics that they were willing to share with other teachers. Dr Donna Daniels, who runs a number of the genetics courses that form part of the Teacher Enrichment Programme at the University of Wisconsin, joined the

group and ran many of the sessions. I first became involved in the workshop as I had extracted DNA from onions with my learners. As this was a process that had not been done in South African schools until then, I was asked to join the group that ran the first workshop, and to share the protocol for that process with the other teachers. The teachers who attended the workshop learned much new content matter and many new teaching ideas, and they went away from the course rejuvenated and enthusiastic.

As a result of my involvement in that workshop, I was invited to attend some of the classes in the summer programme at the University of Wisconsin in July and August of 1997. Two of the classes I attended were a DNA science course and a biotechnology course.

In 1997, Dr Roussouw left the University of Witwatersrand. The Departments of Biological Science at the University of Wisconsin and the University of Pretoria (UP) signed a formal partnership agreement, and so the Teacher Enrichment Programme was moved to UP and merged with a curriculum design project being run by the Centre for Science Education at UP. The Rainbow Biology Teacher Enrichment Programme was the outcome. "The goal of the Rainbow Biology Project is to promote excellence in the teaching of biology in line with the aims of Curriculum 2005 ... by means of a series of workshops, which provide for both the professional development of teachers and the development of curricular materials" (Rogan & Nel, 2000 p. 467). The specific objectives of the Project included "to improve the content, method of teaching and assessment of biology at the FET level ... to develop a viable model for the assessment of critical and specific outcomes in Natural Sciences at the FET level, to facilitate sustained change in teaching practice by developing exemplary curriculum materials and providing opportunities for ongoing professional development" (Rogan & Nel, 2000, p. 467). One of the intentions of Curriculum 2005 was to change the role of teachers from those who use materials designed by others to those who develop their own materials and thus become partners in the process of curriculum development (Rogan & Nel, 2000).

The first genetics workshop for biology teachers was held in January 1998. The 'Making genetics and biotechnology work in the classroom' workshop was held concurrently in three venues: the University of Pretoria, the Centre for Science Education in Soweto and in Seshego, Polokwane. About 70 teachers attended the three workshops. The teachers came from a variety of different school types, including private schools, ex-model C schools, township schools and rural schools.

Teachers attending the course identified a need for up-to-date teaching materials on the topics and in April, 1999, a group of 8 educators who had attended the Enrichment Programme met for four days at the University of Pretoria to design two outcomes-based type classroom modules - one for genetics and the other for biotechnology. The group split into two teams, each led by the teacher who had led the January workshop (Rogan & Nel, 2000, p. 468). Both modules were designed to "reflect the intent of Curriculum 2005 and provided a model for the assessment of outcomes" (Nel, Page, Moshoeshe & Moremi, 1999, p. i). The activities that were included covered a range of the skills that biology learners are expected to master.

At this materials-writing workshop it was suggested that a 'story line' should be used for the modules. A

story was developed for each of the modules, and the parts of the module and the activities in the module were linked to it. The story that ran through the genetics module was that of a young couple - Thabo and Thandi - who were mugged, and in the process Thandi was raped. Some of the processes of genetics today are very complicated, e.g. genetic fingerprinting, but in module, the process was explained as part of the process to find out whether the father of Thandi's unborn child was her husband (Thabo) or the rapist. The story line for the biotechnology module is that of an island where the increase in the population outstrips the production of food. Again the module links the use of biotechnology in food production to this story line.

At the time I thought that using a story was quite juvenile for the grade elevens for whom the modules were developed, but a year after the first trial of the module in schools, two team members and I visited two Polokwane schools at which the genetics module had been taught. The object of the visit was to talk to the teachers who trialed it, and to the learners who had worked with the material. The students to whom we spoke had enjoyed working through the module and it was clear that they remembered content in the module. We were surprised to see that the learners to whom we spoke could remember details of very complicated processes. In each case they did so by linking it to a part of the story of Thabo and Thandi. The learners certainly made more sense of genetics by relating it to a story that is part of their everyday lives. So the decision was made that future modules would also contain a story line to link all the parts together.

At the end of the writing workshop the materials were given to a professional editor who polished them, added illustrations and compiled a suitable layout. In July of 1999, seven of the eight teachers who had been involved in the development of the modules, and fourteen other teachers who had attended the workshop and who had volunteered to pilot the materials, met at the University of Pretoria to work through the materials in the two modules. Some modifications were made as a result of recommendations made at that workshop, and the teachers designed some of the assessment materials to be used in conjunction with the module.

The first drafts of the modules were pilot tested in approximately 17 schools and then revised. A teacher's file was compiled for the genetics module. It contained overhead transparencies, enrichment articles, marking rubrics for the activities and assessment materials, hints for the teachers for preparing materials for classroom activities and answers for all the questions and assessment activities.

Funding for the workshops and the development and testing of the modules was provided by the FRD. The modules were received enthusiastically and the teachers reported that the learners were "very positive" and "found the work interesting" (Rogan & Nel, 2000, p. 471).

Figure 4 overleaf is a flow chart that puts the history of the Rainbow Project and activities associated with it into perspective.

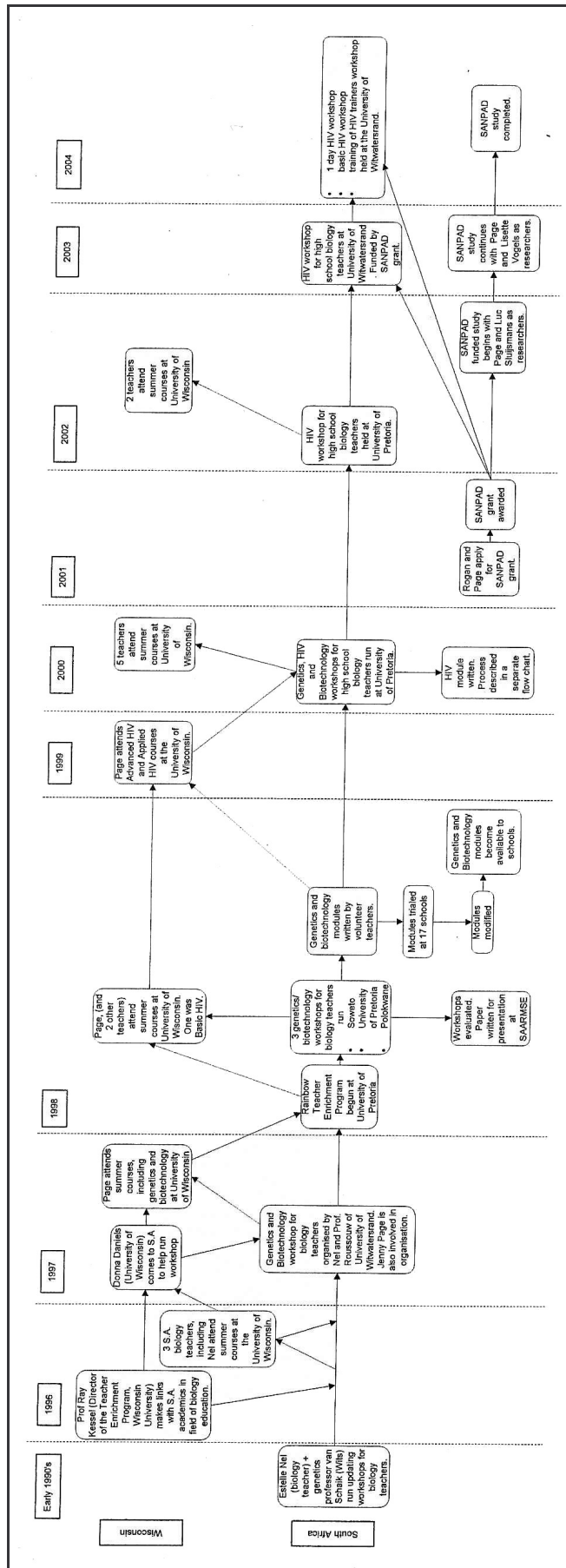


Figure 4: The history of the Rainbow project

In the evaluation of the Rainbow workshop held for the writing of the genetics and the biotechnology modules, the teachers commented on the value of collaboration in the writing process.

'I have learned a lot from people of different backgrounds.'

'Writing is an adult skill and this team effort eases the difficulty.'

'Group discussion contributed a lot. Every member of the group came up with his / her own view until we reached an agreement'

(Rogan & Nel, 2000. p. 470).

In 1998 I again attended courses at the University of Wisconsin. One of the courses I attended was the HIV / AIDS course. This course was later to form the basis for the design of the HIV / AIDS workshops run as part of the Rainbow Teacher Enrichment Project. In 1999 I returned to Wisconsin and took two advanced courses on HIV / AIDS, the second of which involved designing a workshop for teachers in South Africa, including the development of activities that could be used by the teachers in the classroom. The workshop was to follow the same design as our previous Rainbow workshops - I planned a programme that contained the content that biology teachers needed to know and found experts in all the different areas of HIV / AIDS who were prepared to talk to the teachers. In 2000 we ran the first HIV / AIDS workshop. It was attended by 38 biology and guidance teachers from five different provinces. At the end of the workshop, the teachers were asked if they wanted a module to use in the classroom, similar to that developed for genetics and biotechnology. Their response was that they needed such a module. The group was asked for volunteers to help write a teaching module.

3.2. THE WRITING AND DEVELOPMENT OF THE HIV / AIDS MODULE

- **Target group for the module**

It was decided that the module should be designed to be taught in grade 11, as in order to fully understand the science of HIV, preinstruction knowledge of a number of the concepts taught in grade 11 biology, such as DNA, RNA, transcription, translation and viruses, is necessary.

- **The composition of the group of writers and planners**

In September of 2000, a group of high school biology teachers, all of whom had attended the first HIV/AIDS workshop, together with Prof John Rogan spent a weekend brainstorming the contents of the module. Dr Mary Crewe of the Centre for the Study of AIDS was there for the initial brainstorming, as was the first editor of the process - Kim Draper. One of the teachers who attended and helped with the writing was Nikki van der Westhuizen - a Physical Science teacher who had been trained by ACET, in London, to go into schools as part of HIV education and training programme. ACET trainers are volunteers who use ACET materials to teach students about HIV and skills in an attempt to reduce HIV-risk behaviours in students. In anticipation of her contribution to the writing of the module and its activities, she had

received permission from ACET for us to include some of their materials and activities in the module.

- **The process of producing the outline of the module**

In the initial brainstorming session, I shared the outline I had planned for the module with the teachers, and asked for input. It was decided that the module would have 8 parts, joined by a story line. It would contain activities that would help both to reinforce knowledge and understanding of HIV and AIDS, and life skills that would help learners to choose to avoid HIV-risk behaviour.

The parts were:

- An introduction to viruses and bacteria
- The immune system
- Transmission of HIV and how to prevent transmission
- Testing and counselling
- Treatment
- Living with HIV / AIDS
- The social and economic impact of HIV / AIDS
- Myths and cultural issues

As with the genetics and biotechnology modules, a story line was developed to link the various parts of the HIV / AIDS module. The story in this module was that of a young couple - Phumla and Vusi. Vusi contracted HIV from a lady he had had sex with while on a business trip. The story follows his discovery of his HIV status, breaking the news to his pregnant wife, the progress of the disease, looking at the issue of mother-to-child transmission.

A broad outline of the content of each part was compiled, and activities that could be included with each part were identified.

- **The choice of activities for inclusion in the module**

Materials written for the Rainbow Biology Project included outcomes-based activities that were very carefully selected. Biology students are not only expected to know and understand the content of the subject, but also to master a number of different skills (see Table 2 overleaf).

However, when members of the Rainbow Biology Project team visited schools to observe lessons, it became evident to us that learners lacked a number of these basic skills, such as recording information in the form of a table. In some cases, it was also observed that the teachers were unable to help their learners acquire the skills, as they too did not have them. It must be remembered that until a decade or so ago, biology students were simply expected to know the content of the subject and be able to regurgitate it back in tests or examinations. Teachers who trained before that time were also never taught these skills, let alone how to teach them.

Table 2 : Skills that biology students should master

Category		Details of skills required	
1	Practical skills	a	Observe
		b	Develop manipulative skills
		c	Design and conduct experiments
		d	Follow instructions
		e	Work safely.
2	Thinking skills	a	Analyse
		b	Apply information
		c	Make decisions
		d	Solve problems
		e	Evaluate
		f	Synthesise
		g	Draw conclusions
		h	Answer questions and interpret data
3	Data gathering	a	Obtain information from a variety of sources
		b	Differentiate between relevant and irrelevant information or data
		c	Summarise and make notes
		d	Identify appropriate resources
4	Data manipulation	a	Record data - write reports, tabulate, draw, write essays and draw graphs
		b	Transform data
		c	Summarise
5	Social skills	a	Be honest in reporting results
		b	Work co-operatively
		c	Conform to laboratory rules
		d	Offer and accept constructive criticism
6	Communication skills	a	Follow instructions
		b	Use mathematical processes
		c	Communicate in a variety of ways
		d	Use scientific language
		e	Listen to instructions

It is only in the last decade that, without the teachers going for retraining, they have been expected to teach their students all sorts of skills. So an attempt was made to include activities that were appropriate and varied in nature, but that also reinforced as many of these skills as possible. The teacher's file and,

where appropriate, the learner's module, included the guidelines for these skills.

Examples of activities in the final module that teach or reinforce important biological skills:

Activity 1.4 (an activity on thought experiments) and the section on scientific process that preceded it, were included so that learners could revise the important aspects of designing an investigation before they went on to the condom investigations.

Activity 2.2 requires the learners to communicate information, using scientific language, by means of a docudrama.

Activity 2.5 - an activity on interpreting graphs - revises some of the important aspects of the structure of graphs, graphs with two sets of data on them, and graphs with two Y axes, before the learners are asked to answer questions on the graph showing the relationship between viral load of HIV and CD4 count as time following infection progresses.

Activity 3.7 requires the learners to gather data from a number of different sources, using a questionnaire, and then transforming and summarising the data before presenting it.

Activity 3.11 - a logic puzzle - involves all the thinking skills of analysis, applying information, synthesising and drawing conclusions.

The reasons for the inclusion of the condom investigations

In addition to developing and reinforcing biological skills and content knowledge, many of the activities in the module also had other objectives e.g. Activity 3.2 *Investigation to compare the strength of three different types of condoms* and Activity 3.3 *Investigation to compare the effect of different storage conditions on the strength of condoms*. These two activities involve a scientific investigation where a condom is threaded through a short section of conduit pipe, which is then clamped onto a retort stand. Lead shot is then poured into the condom until it bursts. The amount of shot that caused it to burst is calculated. The amount is tabulated and the relative amounts of lead shot required to burst condoms of different types / stored in different conditions is compared and a conclusion can be reached.

Figures 5 and 6 over the next four pages shows activity 3.2. so that sense can be made of the discussion about the activity that follows the illustration.


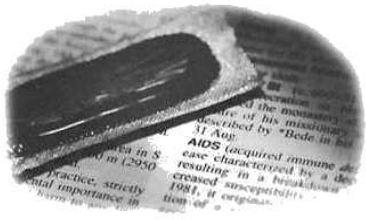

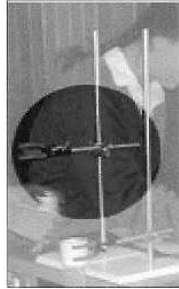
Activity 3.2 To compare the strength of three different types of condoms	
<p>Your activity objectives</p> <ul style="list-style-type: none"> to help you feel more comfortable with condoms by working with the condoms in a scientific way 	<p>This activity addresses the following skills</p> <ul style="list-style-type: none"> following instructions observing accurately measuring accurately drawing conclusions recording data 
For you to do	
<p>Assemble the following apparatus you will need for the experiment:</p> <ul style="list-style-type: none"> 3 condoms of different makes 3 clamps 3 retort stands 1 large bucket 250 cm³ measuring cylinder 5 kg of lead shot 3 short pieces of conduit piping 1 funnel 	
	<p>Method</p> <p>Make sure that you know the rules of drawing a table before you try this.</p> <p>Read the instructions on the next page.</p>
	

Figure 5: The introduction for the first of the condom activities.

Instructions for the experiment to compare the strengths of three different types of condoms

Setting up the retort stand and clamp



1.

Clamp each clamp on to the retort stand. Place the retort stand on the desk, with the clamp turned outwards, suspended over the floor, as is shown in the figure.

Suspending the condom through the conduit pipe and placing the pipe in the clamp



2.

Feed the open end of a condom through the conduit piping, fold it back over the outside of the pipe and then clamp the folded end of the conduit piping tightly in the clamp. The sheath of the condom should be suspended through the piping.

Filling the measuring cylinder and recording the volume of lead shot



3.



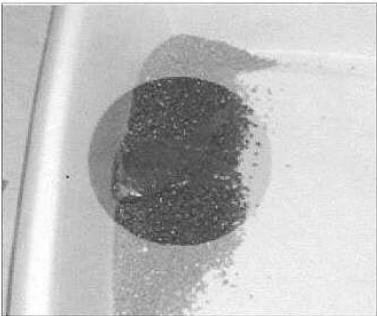

Fill the measuring cylinder with lead shot. Record the exact volume of lead shot.



4.

Use the funnel to slowly pour the lead shot into the condom. The condom will stretch. Hold the bucket, very firmly, right up underneath the stretching condom. If the condom becomes too full and you cannot pour more shot into it, but it doesn't burst, put your hand under the bottom of the condom and gently lift it up and then lower it. This should re-distribute the lead shot so that the filled condom changes shape, from being long and thin to having a wide, bulbous end.

Pouring lead shot into the condom

	<p>5.</p> <p>When the condom bursts, the lead shot falls into the bucket with great force - be ready for this by making sure that you are holding the bucket high up, close to, but not touching, the end of the condom. Hold the bucket firmly.</p>
<p><i>Making sure that the bucket is held firmly below the bulging condom</i></p> 	<p>6.</p> <p>Measure the volume of the lead shot that remains in the measuring cylinder. Calculate the mass of the leadshot that the condom held before bursting by subtracting the amount remaining in the cylinder from the amount that was in the cylinder originally. Record this volume.</p>
	<p>7.</p> <p>Collect the lead shot from the burst condom and use the measuring cylinder to pour it back into the measuring cylinder.</p>
 <p><i>Repeating the process with the two condoms of different makes</i></p>	<p>8.</p> <p>Repeat the process with the other two condoms.</p>

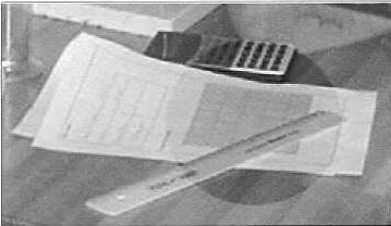




	<p>9.</p> <p>Record the results in the form of a table.</p>
	<p>10.</p> <p>Draw an appropriate column graph to show your results.</p>
	<p>11.</p> <p>Write up a conclusion about the comparative strength of the three types of condom.</p>
	<p>12. Answer these questions:</p> <p>a. What is the independent variable in this investigation?</p> <p>b. What is the dependent variable in this investigation?</p> <p>c. List four variables that were controlled / fixed in this investigation.</p> <p>d. Suggest two ways in which this activity can be altered to make the conclusion you reach more valid.</p> 

Figure 6: Instructions for the activity 3.2 to compare the strength of three different types of condoms

There are a number of scientific skills in the two condom activities, but the main reason why they were included in the module is that they help to change the perception that the learners have about condoms. Condoms are perceived by the youth as things to be giggled or whispered about, or talked about in groups of adolescents of the same gender. In activities 3.2 and 3.3, condoms together with the measuring cylinders, the retort stands and the lead shot, are a piece of scientific equipment. They are opened in the

group, experimented upon and conclusions are reached about their strength. One of the interesting things about these two experiments is that it is quite amazing how much lead shot the condoms hold before they burst. When the learners first pick up the bottles of lead shot, they are surprised at the mass of the bottles. So that when they have poured six or seven 500g bottles of lead shot into a condom, and the condom is stretched to about a metre long, they are really very excited, and talking openly amongst themselves. They are keen to have the strongest condom, they call across the room to other groups, comparing their results with the results of the other groups. By the end of the activity, the learners are not shy about condoms and they talk openly about the different makes, and which is strongest. They can also talk without embarrassment to the teacher - an adult - about issues to do with the condoms. In addition, at least in co-educational schools, the activities are done in groups of mixed gender, which also means that they have been spoken about in front of members of the opposite gender. In this way the sexual 'ice' around the issue of condoms has been broken, and it is hoped that the learners would be more easily able to talk about condoms in a situation where they are negotiating condom usage. Another positive result of the activities is that the learners discover how strong condoms really are, and they become more confident that condoms are less likely to break during sexual intercourse.

More than one of the levels of Bronfenbrenner's social ecological model for health promotion is influenced by the condom activities - the learner's knowledge and perceptions of condoms change, but the mesosystem is also changed - school colleagues are also influenced by the work done, and the interactions between the adolescents in the class will be different from here on. As many of the learners reported talking to their family and extended family, as well as friends and other community members about what they had learned in the module, the sphere of effect of the module is not limited to the learner only.

The HSRC / Nelson Mandela Household Survey of 2002 found that over 90% of the youth in South Africa indicated that they could obtain condoms with ease from public sector clinics or hospitals. They also reported that the incidence of reported 'ever' condom use amongst 15 - 19 year old women had increased from the reported incidence of 28.4% found by the South African Department of Health Survey (SADHS) of 1998 to 69.6% in the HSRC survey of 2002. In addition, in the same group 48.9% reported condom use at last sexual intercourse compared with 19.5% at the SADHS of 1998 (Shisana, 2002). MacPhail, cited in Tolond (2002) states, however, that in South Africa, condoms are stigmatised and perceived negatively. Tolond conducted research into why South African adolescents have a low rate of condom usage during sexual intercourse (Tolond, 2002). She found that one of the reasons was that condoms are stigmatised because of their close association with deviance and promiscuity, and she recommended that an important intervention would be to make condoms appear the natural and inevitable choice. Another reason given by her respondents was that carrying a condom labelled a female as being "prepared" and "willing to engage in sex" (p.20) which meant that they were "cheap" and "easy" (p. 22), while for the female concerned it is merely a precautionary measure. One of the recommendations that was made by a number of female respondents in her study was that condoms should not be confined to clinics and supermarkets. They suggested that condoms should be handed out together with prizes at night clubs. The logic being that condoms should be found in places where sex is thought about and negotiated (p. 30). Badcock-Walters (2002) in his discussion on HIV and Education in South Africa, puts

it into perspective “it should be noted that one-third of all HIV-infected persons were infected during their school years, while a further third were infected within two years of leaving school. This confirms schools as a high-risk environment” (p. 95). So the activities within the module that make learners more comfortable with seeing, touching and talking about condoms perform an important role - that of placing condoms in the ‘high-risk environment’ of schools, and making them something ‘natural’, as recommended by Tolond’s respondents.

The questionnaire administered by Sluijsmans to 63 respondents after the first and second trial of the module included the opportunity to comment on what the learner enjoy the most and the least. Of the 31 who did comment in response to this question, 13 specifically mentioned how they enjoyed the condom experiments.

The experimentation part of the module was my best.

Doing the experiments really taught me a lot.

I wish it never had to end. What I enjoyed the most was the part where we had to do experiments about condoms.

(Sluijsmans, 2002, pp.116 - 120)

Once the outline for the module was completed, the teachers divided into groups, each one of which was responsible for researching and writing as much as they could of a section of the module.

At the end of the weekend, the editor was given all the work we had done thus far and charged with putting it together and fleshing out the work written that weekend into a module. She was also to work on the layout.

When the editor had completed her work, she passed the product back to me. I checked and updated the information and also analysed the activities to ensure that they covered a range of different types and skills.

- **The pilot test of the module**

The first trial of the module was started in January 2002. I taught the module to the 46 learners in the two grade 11 biology classes at school at which I am employed. This is a well-resourced, private school in Sandton. The learners were very positive about the work. During the trial I identified a few problem areas and mistakes, and changed these.

In January 2002 Luc Sluijsmans, a Masters student from the Department of Curriculum at the University of Twente in the Netherlands, was sent as a junior researcher to help with the study. As his field of expertise is in the development of educational materials he was looking at the module from this point of view, rather than with the understanding of a biologist. His study involved monitoring and evaluating the

first and second trials of the module to identify how he could improve upon the module.

Several methods and instruments were used in his study: interviews, document analysis, observations, a questionnaire and a pre- and post-test.

The questionnaire contained items on:

- opinions about HIV / AIDS education in general
- opinions about the module
- opinions about the activities in the module
- opinions about the way in which the module was taught
- application of the learners' experiences in their environment

It also included space for suggestions and other comments by the learners.

The purpose of this was to provide information to help improve the material. As a result of this part of his study, Sluijsmans made some changes to aspects of structure, layout and instruction of the module, and a second draft of the module was developed.

The second draft was trialed by a teacher who had attended a Rainbow HIV / AIDS workshop and then also been sent by the Rainbow project to the University of Wisconsin where he attended, amongst others, another course on HIV / AIDS. This teacher had also been involved in the development of the module. The school at which the second trial was conducted was a black government school, poor in resources, in a semi-rural area. Sluijsmans also monitored the teaching of the module by this teacher, and administered a pre- and a post-test, and interviewed the learners in that class. Unfortunately, as a result of a full curriculum, the material had to be taught to a group of 17 volunteers after school hours. Following this trial, Sluijsmans made some more changes to the layout of the module.

Changes Sluijsmans made to the module were:

- **Structural improvements**

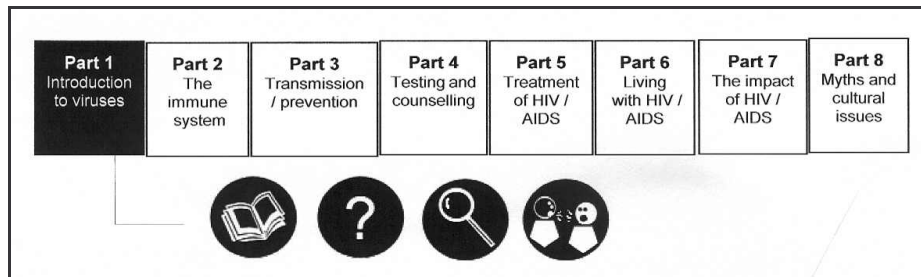
1. A content list of the parts of the module was added at the beginning of the module, together with the pages on which each part began.
2. A header was added to each page.

<i>Rainbow Biology Project</i>	Part 1
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3. A footer incorporating the number of the page, was added to each page.

<i>HIV / AIDS Learner's Book</i>	-10-	Introduction to viruses
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4. A list of the contents and activities in each part, and the pages on which each began, was included at the beginning of each part of the module.
5. A series of blocks with the headings of each part, was added at the beginning of each part. This illustration highlights the specific part in the module, and an arrow indicates the skills covered in that part of the module.



6. Each activity was given a number that reflected the part to which it belonged and also the number within that part. e.g. the crossword puzzle of infections was changed from 2 (reflecting that it was the second activity) to 1.2 reflecting that it was the second activity in part 1.
7. Headings and subheadings were highlighted in boxes e.g.

Activity 1.2 Crossword puzzle - viral infections

8. Each activity was given an icon indicating the most important skill in that activity e.g.



was the icon used to represent 'work as a group to...'

- **Layout improvements**

1. Fonts were changed.

In the first draft of the module, Technical font was used to differentiate text said by Phumla and Vusi. This was changed to two handwriting fonts - Augie for Vusi and GE HandyScript for Phumla so that learners could differentiate between what was said by Phumla and what was said by Vusi.

The Arial font of the rest of the text was changed to Futura Lt BT.

2. Graphics in the original module were replaced by photographs of real people to try to increase the level of identification with the information.

e.g. Phumla in draft 1




Phumla in the modified module



3. The information was organised into squares making better use of contrasts and spacing to achieve a module that was easier to read. Two examples of this are given below.

There are **three** ways in which HIV is spread i.e.:

	<ol style="list-style-type: none"> 1. Through unprotected (without a condom) sexual intercourse. 2. Through HIV-infected body fluids entering the body of another person. 3. From an HIV-infected mother to her child during pregnancy, birth or during breast-feeding.
---	--

and

Activity 3.1 Infectious body fluids	
<p>Your activity objectives</p> <ul style="list-style-type: none"> • to produce a visual comparison of the number of viral particles in different body fluids 	<p>You will use these skills in this activity</p> <ul style="list-style-type: none"> • recording data in the form of a graph
<p>For you to do</p>	

The table above shows the number of HIV particles in 1 cm³ of some body fluids. Use the information given in the table to do the following:

1. Which body fluid listed in the table contains the highest percentage of HIV particles?
2. List the fluids that contain insufficient HIV particles to cause an infection.
3. Use the information given in the table to draw a bar graph of the number of HIV particles in 1 cm³ of infected fluid. Make sure that you know the rules of drawing a bar graph before you try this.

4. Some of the scientific diagrams that had lost clarity in the scanning or photocopy process were redrawn, with the labels done in a more legible font.

• **Instructional improvements**

1. The original module had instructional illustrations where appropriate in the text, the revised module replaced each one in a box next to the instruction, to allow better visualisation of the instructions, e.g.

good water based lubricant is K-Y Jelly. Lubricants with an oil base such as Vaseline, cooking oil or baby oil, should never be used, as they damage latex condoms and cause them to break.




- ✓ Do not use a pair of scissors or teeth to tear open the condom covering, as these might cut it, and it will not be effective.
- ✓ Use a new condom every time you have sexual intercourse.
- ✓ Always put the condom on the penis before intercourse begins.

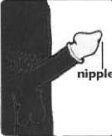
- ✓ Put the condom on only after the penis is erect.
- ✓ In putting on the condom, squeeze the nipple or empty space at the end of the condom to remove the air. Do not pull the condom tightly against the tip of the penis; leave the small empty space at the end of the condom to hold the semen (if this isn't done correctly, the condom might



became





1. Use a new condom every time you have sexual intercourse. Do not use your teeth or a pair of scissors to tear open the condom covering. You might cut the condom inside, and it will not be effective.



2. Always put the condom on the penis before intercourse begins. Put the condom on only after the penis is erect. Do not pull the condom tightly against the tip of the penis; leave the small empty space (sometimes referred to as the 'nipple' of the condom) at the tip of the condom to hold the semen. If this isn't done correctly, the condom might break.

2. Where appropriate, photographs became incorporated into instructions for activities.

<p><i>Filling the measuring cylinder and recording the volume of lead shot</i></p> 	<p>3. Fill the measuring cylinder with lead shot. Record the exact volume of lead shot.</p>
 <p><i>Pouring lead shot into the condom</i></p>	<p>4. Use the funnel to slowly pour the lead shot into the condom. The condom will stretch. Hold the bucket, very firmly, right up underneath the stretching condom. If the condom becomes too full and you cannot pour more shot into it, but it doesn't burst, put your hand under the bottom of the condom and gently lift it up and then lower it. This should re-distribute the lead shot so that the filled condom changes shape, from being long and thin to having a wide, bulbous end.</p>

• **Elements added to the module**

1. An attractive front cover, that included photographs Sluijsmans had taken of learners doing the activities, was added.
2. The introduction was revised to include a summary of what the module will address.
3. A question section was added to the end of each part. This consists of a place for each student to record 5 questions to ask about the content of that part. This reinforces the information learned and is also a time for students to identify queries they might have about a part. Once this been done, learners are instructed to allow friends to answer their questions while they get an opportunity to answer the questions listed by their friends.

Sluijsmans revisited the schools where the two trials had been conducted, and the learners were shown the revised module and asked to comment. The comments were positive.

I feel the module is so cool and more appealing.

They were also asked to comment on how they felt about the module they had experienced during the try out. The comments were extremely positive.

I think that doing this module was a really worthwhile activity. It has made me look at the HIV / AIDS situation totally differently. I may now be able to give someone else some advice about HIV / AIDS.

I was really impressed with the whole exercise generally. It was definitely needed and greatly appreciated. The youth today is extremely close-minded to what is actually out there and we all needed our eyes to be opened.

My only comment is that I just want to say it was great it was educating and great fun.

Thank to the module I am now informed.

A few of the comments made were unrealistic.

I would like you to add a brighter colour to the module so it can be attractive.

The module should be introduced in all eleven official languages.

I found it frustrating when some of my questions had to go unanswered because the lack of knowledge about HIV / AIDS.

Some of the comments showed that you cannot please all of the people all of the time, and some students had opinions that were opposite to the opinions of others, e.g.

I enjoyed building the model the most.

and

The T-virus exercise was not necessary.

...the stories like Phumla and Vusi did not have a huge impact on me.

Leave out the Phumla and Vusi story

and

The stories about Phumla and Vusi made me feel I could relate to them, that is good.

I really enjoyed the Vusi and Phumla story.

(Sluijsmans, 2002, pp.116 - 120).

- **Reevaluation of the module**

At that point John Rogan and I reevaluated the whole module, its contents, its length and whether it fulfilled its objectives.

One of the concerns was the length of the module - it had grown to 158 pages, which made it expensive to print, and lengthy to teach it. We considered dividing it into two separate units i.e.:

- a **scientific module** containing
 - ▶ viruses
 - ▶ the immune system
 - ▶ transmission of HIV and prevention
 - ▶ testing and counselling and treatment

- a module that contained most of the sections with **social issues**
 - ▶ living with HIV / AIDS
 - ▶ the social and economic impact of HIV / AIDS
 - ▶ myths and cultural issues

After careful consideration, this was decided against. It was decided that the information provided in the sections on social issues was just as important to learners, many of whom had not had any instruction on HIV / AIDS in life skills, as were the scientific sections. For those who were affected by HIV / AIDS, or who might be in the future, this module would provide an extremely important resource on such issues as what to feed a person with AIDS or why drinking alcohol when HIV positive is harmful.

It was also decided that the activity of learners constructing and administering a questionnaire on HIV / AIDS so close to the beginning of the module was not ideal. HIV / AIDS is a very sensitive issue. Being a disease that is mainly sexually transmitted means that it is difficult to talk about. In addition, in South Africa it is a disease that carries stigma. In many of the communities of this country sexual issues are not talked about freely, (Berkhof, 2002, Molefe, 2003, Brindley, 2003). At the beginning of the module, the learners are also not as comfortable talking about issues of a sexual nature as they might be further after covering more of the module. The questionnaire activity expected the learners to compile a questionnaire, and to administer it in their community. For all of these reasons, it was decided to move this activity to part three. At this point, learners would have done all the condom activities, and done some role playing and discussions, and should feel more confident to talk about sex or condoms.

It was also decided to take out the building of the T-bacteriophage virus model. Initially it was introduced to help learners understand the structure of a virus, but as it was not a HI virus, some of the learners did not see the point of doing the activity. It was also time consuming, and so it was considered a costly exercise for the gains that were achieved. It was decided, however, that if ever a template for the building of a model of a HI virus was located, the modified activity could be reintroduced.

A graph of CD4 count and viral load following time of infection with HIV, together with some hints on the interpretation of graphs, especially those with two lines of data, and two Y axes, and some questions about the graph, was included in the module. This information is crucial to the understanding of the progress of HIV infection, the difference between HIV and AIDS, and also the latest information on when antiretroviral medicines should be administered.

Information on scientific process and experimental design was included, together with an activity on

designing some thought experiments, in order to help with activities 3.2. and 3.3 and their associated questions.

- **Finalising of the module**

An artist was commissioned to draw some of the scientific drawings, and permission from the publisher of a medical pamphlet was sought and given for the use of the life cycle drawing, which was also modified to produce a drawing of where each type of antiretroviral works.

In November and December of 2002, Lesley Emmanuel did a English Second Language edit to the module and recommended that a number of other changes be made to it to make it more reader friendly. The changes that were made as a result of this edit were:

1. Grammar and spelling errors that had crept in as a result of changes that Sluijsmans had made to labels and text were corrected.
2. The English was simplified to make it easier for the learners, especially the English second language learners, and some changes were made to overall content structure for the same reason.
3. The font was changed from Futura Lt BT back to Arial as Futura Lt BT has a peculiar question mark (?) that Emmanuel thought that English second language learners, who were already struggling with difficult terminology, would find difficult.
4. The photographs representing Phumla and Vusi at different stages of their life were not all of the same people. It was recommended that they were changed to be of the same person. For this reason, the same photo is now repeated over and over again. This is not ideal, as the photographs should show different situations, moods or times in the lives of the couple, but in the absence of a suitable alternative and expertise, it is a compromise.
5. Other recommendations included changing of the presentation of the information on the antiretrovirals. The original instructions gave the tablet name, followed by all the information - its pharmacological classification, when to take it, how often to take it, its appearance and its side effects - which was confusing. The recommendation was to change this so that the information was laid out more like the insert of a medicine package, i.e. separating all the categories of information for each medicine.

Antiretroviral information in the original module is seen in Figure 7 overleaf, while the information as given in the final module is seen as figure 8 on page 54.

Information concerning some of the antiretroviral drugs in the four regimens used in activity 1.

Norvire: protease inhibitor. A large capsule. Must be kept in a refrigerator. Take with food. Side effects - nausea and headaches.

Zerit: a nucleoside reverse transcriptase inhibitor. A capsule.

3TC: a nucleoside reverse transcriptase inhibitor. Traditionally people who take this develop a skin rash.

Nevirapine: a non-nucleoside reverse transcriptase inhibitor. Side effects - skin rash, liver problems.

Bactrim: antibiotic.

AZT: reverse transcriptase inhibitor. Side effects - anaemia, nausea, vomiting, fatigue.

Viramune: this is the same as Nevirapine.

Videx: needs an empty stomach for two hours before taking and one hour after taking. Side effects - nausea, diarrhoea, pancreatic problems.

Ritalin: for attention deficit. Has a good effect with the energy levels of the patient.

Saquinivir: eat within two hours of taking when taken in the morning. Side effect - headaches.

Nevavir: take with food.

Combivir: = AZT and 3TC.

Oxycodone: a narcotic.

A lot of fluids must be drunk with all of these tablets.

Figure 7: Antiretroviral information given in the draft module

Information concerning some of the antiretroviral drugs in the four regimens used in Activity 5.1		
AZT	<i>Pharmacological classification</i>	A reverse transcriptase inhibitor
	<i>Side effects</i>	Anaemia, nausea, vomiting, fatigue
Bactrim	<i>Pharmacological classification</i>	An antibiotic
Combivir	<i>Pharmacological classification</i>	A combination of AZT and 3TC
Nevavir	<i>Directions for use</i>	Must be taken with food
Nevirapine	<i>Pharmacological classification</i>	A non-nucleoside reverse transcriptase inhibitor
	<i>Side effects</i>	Skin rash, liver problems
Norvir	<i>Pharmacological classification</i>	A protease inhibitor
	<i>Side effects</i>	Nausea and headaches
	<i>Directions for use</i>	Must be taken with food
	<i>Identification</i>	A large capsule
	<i>Storage instructions</i>	Must be kept in a refrigerator
Oxycodone	<i>Pharmacological classification</i>	A narcotic
Ritalin	<i>Indications</i>	For attention deficit, improves energy levels
Saquinavir	<i>Pharmacological classification</i>	A protease inhibitor
	<i>Side effects</i>	Headaches
	<i>Directions for use</i>	Must eat food within two hours of taking this.
3TC	<i>Pharmacological classification</i>	A nucleoside reverse transcriptase inhibitor
	<i>Side effects</i>	Skin rash
Videx	<i>Pharmacological classification</i>	A nucleoside reverse transcriptase inhibitor
	<i>Side effects</i>	Nausea, diarrhoea, pancreatic problems
	<i>Directions for use</i>	Requires no eating for two hours before taking and one hour after taking
Viramune	This is the same as Nevirapine	
	<i>Pharmacological classification</i>	A non-nucleoside reverse transcriptase inhibitor
	<i>Side effects</i>	Skin rash, liver problems
Zerit	<i>Pharmacological classification</i>	A nucleoside reverse transcriptase inhibitor
	<i>Identification</i>	A capsule.
A lot of fluids must be drunk with all of these tablets.		

Figure 8: Antiretroviral information given in the final module.

- **Teacher guide**

In January 2003, I made a start on compiling a teacher guide for the module along the lines of the guides developed for the Rainbow genetics and biotechnology modules i.e. a guide that gave guidelines for all the biological skills, additional and background information to the topics, included overhead transparencies, some guidelines for teaching the work, answers to the questions and guidelines and rubrics for assessing the activities. However, since spending time at the schools in the study, I realised that most of the schools do not have electricity, and so including well-made overhead transparencies was not much use for many of the teachers. This is discussed in more detail in chapter 5 with the discussion of the interviews conducted with teachers to identify problems they have with teaching about HIV / AIDS.

Figure 9 below is a flow chart that outlines the process of the development of the module.

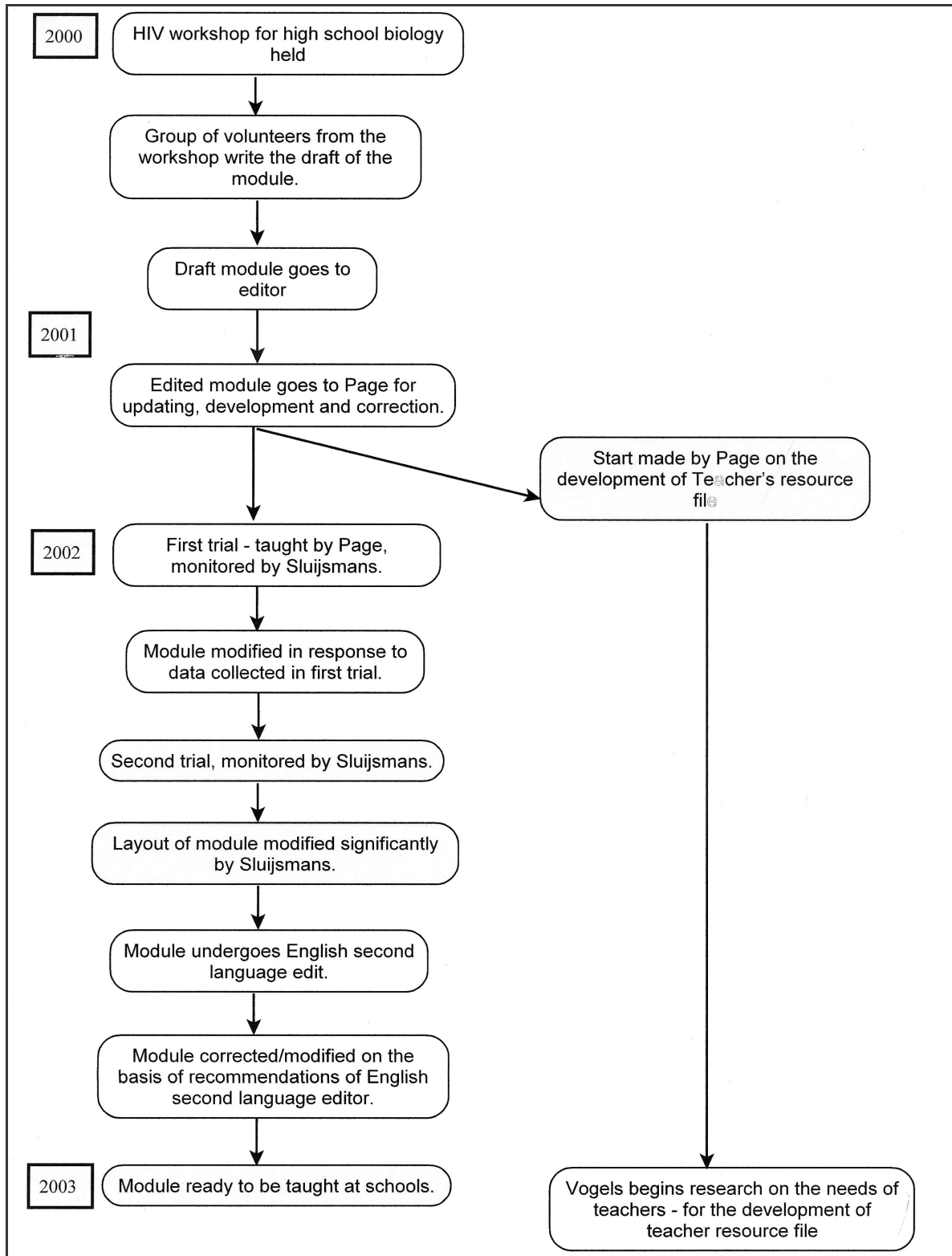


Figure 9: Flow chart showing the development of the module

3.3. THE STUDY

During 2001, Prof John Rogan approached the South Africa Netherlands Programme for Alternative Development (SANPAD) as a possible source of continued funding for the HIV / AIDS project. SANPAD is a South African organisation that dispenses money that is donated by the Netherlands. He suggested that we apply for a grant to study the impact of the module on the learners to whom it is taught. The proposal he submitted stipulated that I would evaluate the effectiveness of the module for a Masters degree in Education. It also stated that a junior researcher from the University of Twente in the Netherlands would help with the research. A grant was awarded for the study, but it came through too late in 2001 for me to take leave in 2002, and so the study was postponed until 2003.

In January 2003 I met with the six teachers who were participating in the study in 2003, to workshop the module and the rudimentary teacher guide. The teachers were also given information about the study, and what would happen and when it would happen.

In January 2003 a second Masters student from Department of Curriculum at the University of Twente, Lisette Vogels, came to South Africa to assist with the study as a junior researcher. Her brief was to identify what teachers needed in a teacher guide. She collected data for the study during her time in South Africa, and has returned to the Netherlands to analyse the data and write the recommendations. The compilation of the teachers guide will continue when time permits, and with cognisance of the recommendations made by Vogels.

Chapter 4. Research design and methods

4.1. RESEARCH, AND THE PURPOSE OF EDUCATIONAL RESEARCH

Research is defined by Fraenkel & Wallen (1990) as “the formal, systematic application of scholarship, disciplined inquiry, and most often the scientific method to the study of problem” (p. 481). Educational research is the scientific and disciplined inquiry using quantitative and qualitative approaches to develop knowledge in order to improve educational practices (Schumacher & McMillan, 1993). Schumacher & McMillan characterise good educational research as:

- being objective - the data collection and analysis procedures are such that only one meaning or interpretation can be made from them
 - using precise language - language with exact meanings
 - allowing verification - the results can be confirmed in subsequent research
 - leading to ‘parsimonious’ explanation - simple statements
 - being empirical - “guided by evidence rather than by opinions”
 - having logical reasoning
 - involving probabilistic thinking - thinking that does not offer certainty
- (Schumacher & McMillan, 1993, pp. 10 - 11).

Research design and research methods

Research design is described by Schumacher & McMillan (1993) as “the plan that describes the conditions and procedures for collecting information” (p. 597) while they define research methods as “systematic and purposeful” (p. 9) “procedures used to collect and analyze data” (p. 597).

4.2. RESEARCH PARADIGMS

“There are two well-established and clearly delineated paradigms associated with conducting inquiry, namely the quantitative and qualitative paradigms” (Matimolane, 2004, p. 31). Each of these two paradigms reflects the beliefs of social reality of the researcher.

4.2.1. Quantitative research

This is research in which the research questions tend to be focussed and narrow, and seek to “obtain measurements and observable data on variables” (Cresswell, 2002, p. 56). The information is normally collected as numbers. The quantitative research paradigm is characterised by the “objectivist approach” (Cohen and Manion, 1985, p. 8) - the belief that “factual reality exists” (Matimolane, 2004, p. 31) and the relationships between variables can be discovered through research. The collection of pre- test results and comparing these with post-test results are an example of a quantitative research method.

The literature review plays a significant role in quantitative research - it allows the researcher to identify prior research done in the field of interest, the methods used and the results obtained. It also provides a major direction for the research questions.

The strengths of this type of research method are that data collected as numbers can be subjected to statistical analysis to prove or disprove the hypothesis. If a rigorous quantitative research design has been used, then the results are valid. "It offers useful information describing a large number of people" (Cresswell, 2002 p. 566). The weaknesses of this research paradigm include the strengths of qualitative research - it does not allow for the collection of rich, unexpected data - and the data is close-ended.

4.2.2. Qualitative research

The qualitative research paradigm is characterised by the "subjectivist approach" (Cohen & Manion, 1985, p. 8) - the belief that reality is man-created, and that there are "multiple realities" (Matimolane, 2004, p. 31) some of which can be found through research. "These methods of research usually refer to the systematic collection and analysis of descriptive subjective information" to provided detailed, in-depth, rich information - what Ryan and Russell Bernard call the "good stuff" of social science" (Ryan & Russell Bernard, 2000, p. 769) - about something from the "perspective of the participants" (Gilliam, undated, p. 1). There are many advantages to using qualitative research, such as the collection of unanticipated and unique results that do not fit into predetermined, standardised categories. The qualitative research paradigm is characterised by the belief that "multiple realities exist" (Matimolane, 2004, p. 31).

The use of interviews, observations and narratives to obtain information are examples of qualitative research methods.

In qualitative research the literature review may be used to justify the research, or to find out what prior research has been done in this field, but, unlike in quantitative research, it does not provide the major directions for the research questions. The purpose of this type of research is much more open-ended.

The advantages of this research paradigm is that the information gathered is rich and in-depth. The disadvantages are that although the results are valid, this is 'external validity' as there is a problem transferring or generalising them to other populations (Marshall & Rossman, 1989). Qualitative research methods can determine more about the unique diversity of the individuals within the programme, and identify unanticipated outcomes of the programme.

In HIV research, Cresswell (2002) cites Connelly & Clandinin as being concerned that participants may "fake the data" especially as the study is about HIV / AIDS and sexual behaviour, both of which are sensitive issues, traditionally not spoken of much, especially to an older person (the researcher) (p. 532). He also expresses a concern that participants may not be able to tell the real story when experiences are "simply too horrific to report or too raw to recall" as could obviously be the case when the research is about HIV / AIDS in South Africa (p. 532). Dr Melvyn Freeman (2003) pointed out that communities in South Africa affected by HIV / AIDS, and especially those children who had lost parents to AIDS, showed the emotional consequences of that, including hopelessness, anger, anxiety and depression. This provides

evidence that the concerns expressed by Connelly and Clandinin could well be an important factor in research on HIV / AIDS education in South Africa. Scrimgeour (2003) however, when describing her use of narratives with cancer patients in a hospice, spoke of narratives as therapeutic. Her research had shown that writing narratives had allowed the participants to express feelings that they were often unable to express otherwise. She also felt it allowed the participants to make order out of something in their lives that is normally too painful to think about as, to be able to write about it, means thinking about it and making meaning out of the experiences.

4.2.3. Mixed method research design

Mixed method research design is eclectic as it includes the best elements of the quantitative and the qualitative paradigms (Matimolane, 2004, p. 31). There is a collection and an analysis of quantitative data, but, in addition, a wider and deeper perspective of the results is obtained by collecting subjective data. This research design “captures the best of both methods” (Cresswell, 2002, p. 567) and it provides powerful results. The validity of the results is enhanced by the use of triangulation of the results obtained by the two different methods in order to verify them (Marshall & Rossman, 1989) - this has been done in the Results and Discussion section in Chapter 5. The disadvantages of both methods are overcome, in each case, by the advantages of using the other method.

4.3. CHOICE OF RESEARCH PARADIGM AND EPISTEMOLOGICAL VIEW

4.3.1. The choice of a research paradigm and design

The paradigm and research design chosen by a researcher is determined by the research questions that need to be answered.

All research begins with a problem - the problem in this study is the high incidence of HIV infection in South Africa, especially amongst teenagers. The Nelson Mandela / HSRC household survey (Shisana, 2002) estimates that 11.4% of people aged two years and older are HIV positive, with an estimated 2000 more South Africans contracting the disease daily (Williams, Gouws, Colvin, Sitas, Ramjee, & Abdool Karim, 2000). The 2001 Department of Health Survey of HIV Prevalence cited in the HSRC Survey (Shisana, 2002) estimates that 28.4% of pregnant women in South Africa aged 20 to 24 years attending antenatal clinics are infected with HIV. A group of teachers under the auspices of the Rainbow Biology Teacher Enrichment Programme had written a module to teach grade 11 biology students about HIV. The broad question to be investigated when the study began was ‘would being taught the module decrease HIV-risk behaviours amongst the learners to whom it was taught?’ and this evolved in the course of the study.

The initial research design was a mixed method design that used both quantitative and qualitative methods. Teachers who had attended a Rainbow Biology Teachers’ workshop on HIV were to teach the module to their grade 11 classes. In order to determine if the module changed the learners’ knowledge, behaviour and attitudes, a one-group pre-test, post-test method would be used. This meant that a pre-test with questions of knowledge, and a questionnaire with questions on attitude and behaviour would be administered before the module was taught. The module would be then be taught and followed by the

post-test and questionnaire. This is illustrated in Figure 10 overleaf:

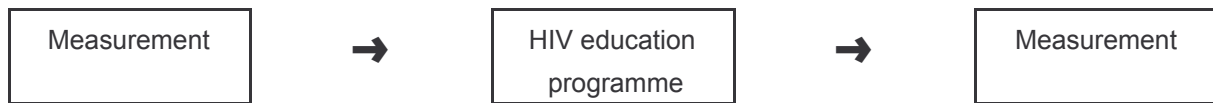


Figure 10: A one-group pre-test, post-test design (Adapted from Popham, undated a, p. 17)

The answers given in the pre-and post-tests would be statistically analysed to determine if they differed significantly, and the answers in the questionnaires would be examined for evidence of change.

A two-group pre-test, post-test research design involves two groups, with only one initially receiving HIV education, while group 2 begins as an untreated control group for the purpose of comparison of post-test results. This research design is shown in Figure 11 below.

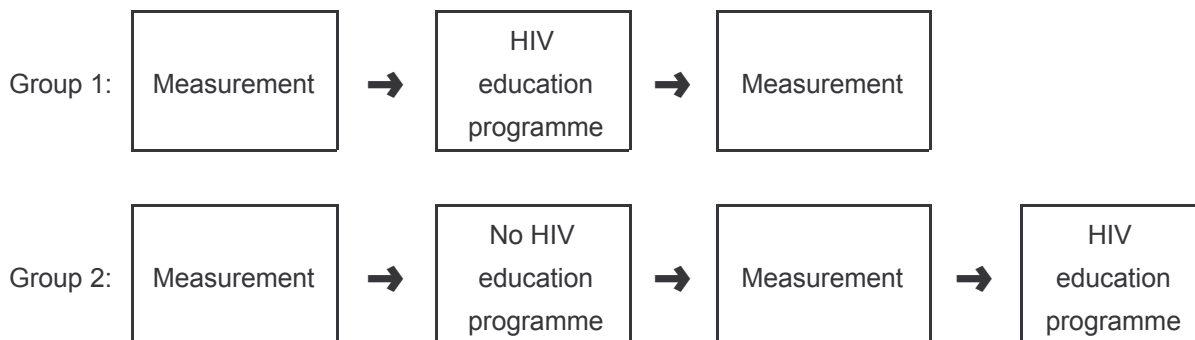


Figure 11: A two-group pre-test, post-test design (from Popham, undated a, p. 17)

As it is unethical to leave a group of learners without giving them as much HIV education as possible, group 2 is given the same HIV education programme on completion of the research. This type of research design could have been chosen as it provides very convincing results; however, to have taught the HIV education programme to the control group after completion of the study would have disrupted the school programme even further, and was not feasible. For this reason, a one-group pre-test, post-test design in this study was a better option, with the effect of the programme being determined by the comparison of the pre-test and post-test results of a single group.

It was then suggested that almost anyone who is taught something should remember some knowledge they were taught if asked about it on completion of a section, and that the important criterion here is would the learners remember what they had learned a few months later? Thus it was recommended that the learners should also write a retention test and a follow-up questionnaire two to three months after they had completed the module, and these results should be added into the comparison and analysis. (Sanders, 2002). Classroom observations, accompanied by note taking and video taping, would help to provide field text to corroborate the evidence obtained from the tests and questionnaires. At that time I was also involved in writing the teacher file that would go with the module, and it was decided that teacher interviews should also be conducted to help identify the problems teachers had in teaching the module,

so that the teacher file compiled could help to meet their needs.

It became increasingly clear during the development of the instruments for the test and the questionnaire that it was not an easy matter to ask questions on such a sensitive and stigmatised disease as HIV that would get honest and valid answers, or even the information that was needed to answer the research questions. The Educational Psychology Department of the University of Pretoria was approached for advice. Dr Liesel Ebersohn, the Research Coordinator: HIV/AIDS of the Department of Educational Psychology was appointed as a co-supervisor to the study, and it was at her suggestion that the learners were also asked to write a narrative when they did the retention test.

While the reporting of quantitative research is not personal, qualitative research is written up in a far more personal and lively style. Initially when writing up the study, I found that I was writing parts up in a style true to my training as a science teacher - impersonal - but then the parts describing the history, the narratives and the observations were impossible to write up in a formal, scientific style, and so the decision was made to adhere to a more personal and informal style for the whole thesis.

4.3.2. Epistemological view

The issue of sexual behaviour in adolescents is a very complex one, and the research design combined both quantitative and qualitative methodologies in order to obtain the richest data in an attempt to understand adolescents in the midst of the HIV / AIDS pandemic. There are many factors that determine how a person will respond in a sexual situation - knowledge, traditional values, self efficacy, peer pressure and material needs are just some of these. It is not possible to draw conclusions from this data that will always hold true. There is no such thing as real truth here - that if we teach the learners certain material and train them in certain skills, that they will behave in an HIV-safe way. It is widely accepted that knowledge and HIV-safety skills are necessary for a person to behave in an HIV-safe way, but, as Bronfenbrenner's social ecological model shows, each person's behaviours are dependent on so many factors that are specific to that person, and this is very true of sexual behaviour. So, while I believe that it is possible to measure and statistically analyse the increase in knowledge and improvement in attitude shown by learners who have been taught the module - a positivist stance - I also know that the knowledge, attitudes and skills an individual has learnt are just part of the person's ecosystem. The way in which each person behaves sexually cannot be predicted. The positivist philosophy "cannot deal with the complexity of meaning and context in social life" (Haplin, 2003, p. 2). The interpretivist worldview "advocates that truth is relative and socially constructed" (Habron, undated, p. 1). However, the complex phenomenon of sexual behaviour requires a richer understanding than can result from either the positivist or the interpretivist worldviews alone. My epistemological view in this study uses some of both the positivist and the interpretivist philosophies. I believe that knowledge, good attitudes and skills are essential for rational behaviour, but a lot depends on the individual and their social circumstances, and no-one can predict exactly how a person will behave in a particular sexual situation - it is too complex. "I seek simultaneously to provide the positivist goals of explanation, prediction and control whilst also accomplishing the

interpretivist goal of understanding” (Habron, undated, p. 1) the environment of the learner as each learner will have perspectives of their ecosystem that are different from mine.

4.4. SAMPLING

The selection of the schools for this study was not done by random sampling but rather by convenience sampling. The criteria for selection were

- the teachers must have attended a Rainbow Biology HIV / AIDS workshop
- the teachers must be willing to participate in the study
- the teachers must teach at least one grade 11 biology class
- the principal and the school must be prepared to allow the study to occur
- the time that the implementation could occur in the school had to suit both the school and the time-line of the study

There were **6 cases of implementation** (with one teacher involved in each) of the module in the course of this study. Two of the schools were in urban settings - one was a government, ex-model C school (#1) and the other was a private college situated on the boundary between an industrial area and an informal settlement (#3). Two of the schools were township schools (# 2 and # 6), and two of them were rural (# 5 and # 7). The parallel study started at school # 4, as discussed in Chapter 3 - the history of the Rainbow Biology Project and the development of the module, that was going to produce results that would be used in this study, folded within two weeks. The first implementation was the pilot test - the results from this school were not used in the analysis of the data but were rather used to refine the instruments used in the study.

The characteristics of the schools part of the study varied in the schools as can be seen in Table 3 below.

Table 3: The location and type of school, together with the number of classes involved in the implementation in each school

School number	School location	Type of school	Number of classes involved in the study

1	urban	government, ex-model C	1
2	township	government	1
3	urban - located between an industrial area and an informal settlement	private	1
5	rural	government	2
6	township	government	2
7	rural	government	1

Within each school, all the grade 11 learners in the classes taught by the teacher that was part of the study were taught the module and wrote the pre-, post- and retention tests and questionnaires. On completion of the module, each learner also wrote a narrative and the teacher participated in a one-on-one interview. Throughout the study, lessons were observed in the schools to provide more in depth information for the study.

214 learners wrote the pre-test and questionnaire, **235** wrote the post-test and questionnaire and **177** wrote the retention test and questionnaire, and the narrative.

4.5. RESEARCH DESIGN

The final research design used in this study was as shown in the flow chart shown in Figure 12 overleaf.

4.5.1. The test of knowledge and the questionnaire of attitude (see Appendix A)

The purpose of the test of knowledge and the questionnaire of attitude

These were administered in order to obtain data to answer the first research question - 'What changes in knowledge, behaviour and attitude resulted from the learners' exposure to the Biology HIV / AIDS module?' Some of the data would help in answering the second research question - 'Did the module deal with the issues affecting the lives of the grade 11 learners to whom it was taught?' - although the bulk of the data that was used to answer this question would come from the narratives. The data obtained would provide insight mainly into the intrapersonal, the microsystem and mesosystem of the learners as described by Bronfenbrenner's social ecological model for health promotion.

The development of the test and questionnaire

The problem with creating an original assessment device is that wording questions to assess behavior, skills, and attitudes is extremely tricky. Most educators have substantial experience in developing

knowledge tests, but those sorts of assessment instruments are far easier to create than the other three types. Unless the researcher has training and experience in the development of assessment instruments, it makes much more sense to use existing ones (Popham, undated a, p 11).

At the time, easier said than done! I spent weeks looking for information, searching the Internet, and e-mailing hundreds of organisations and education departments worldwide to try and find out how best to design an assessment instrument and what questions to use - with very little response!

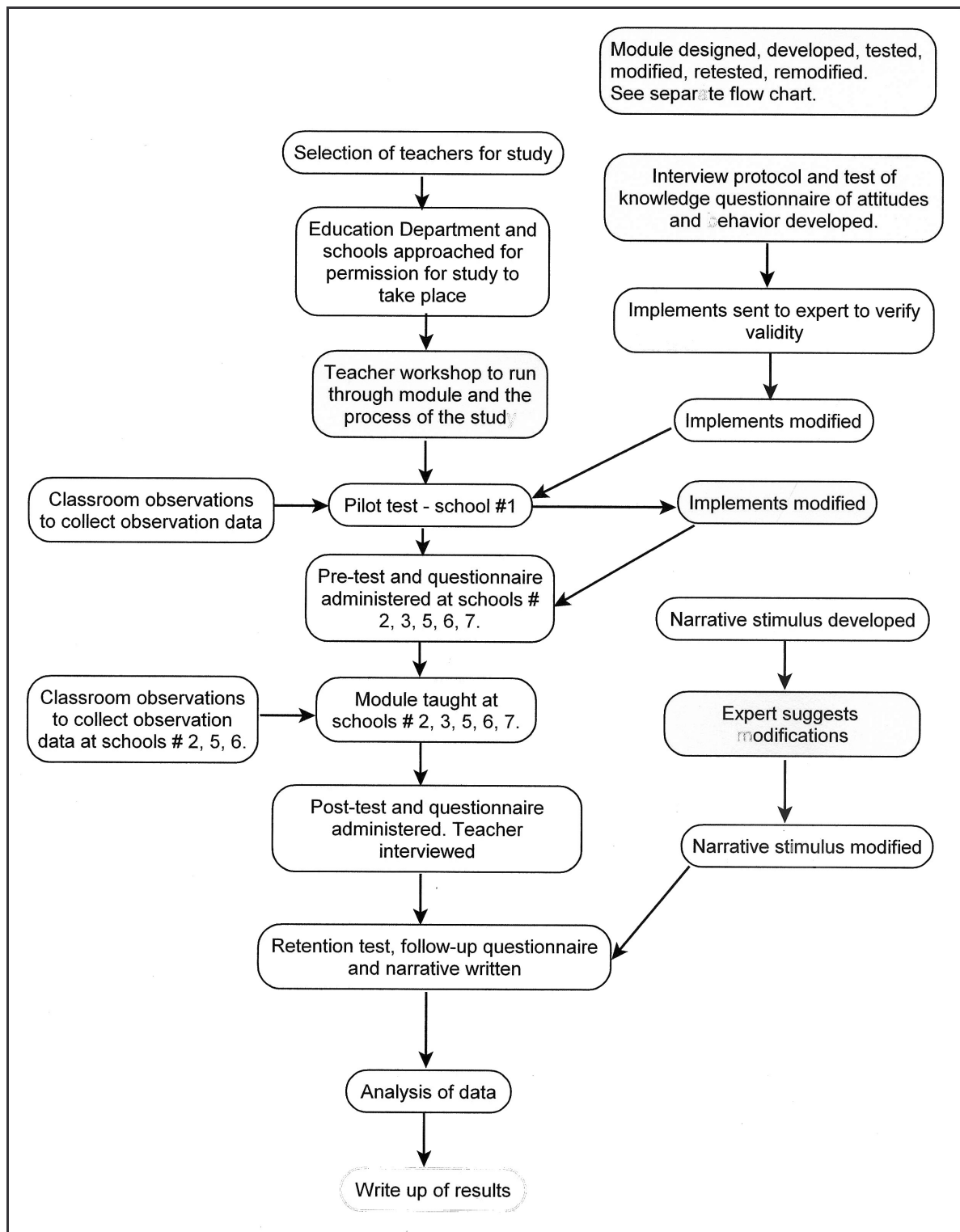


Figure 12: Flow chart of the research design used in the study

I used the instrument used by the junior researcher Sluijsmans in his study (Sluijsmans, 2003, Sluijsmans, Page, Rogan, & van den Akker, 2003) to form the basis of the test and questionnaire. It had been designed for his formative evaluation of the Rainbow HIV module in 2002. During his time in South Africa, he designed the instrument, I modified it slightly, it was tried out in one school, modified according to the comments of the learners about the lack of clarity of some of the questions,

and then used in second school. As the questions in his instrument would not have gleaned all the data I needed to answer the research questions for my study, I had to change it significantly. I also consulted the test / questionnaire used by Campbell and Lubben (2002) in their research on HIV / AIDS education in 42 senior secondary schools in Namibia to ensure that there was nothing that I had left out that should be included, and also to help me with the wording of some of the instructions and the items. Although I was keen to obtain as much information from the test as possible, it was important that the test was not too long or too complicated in order to avoid participant fatigue or stress (Cresswell, 2002, p. 183) which would affect the validity of the scores.

Finally the test and questionnaire went to an expert who face-validated the questionnaire to ensure that:

- the instructions were clear
- the questions were unambiguous
- the questions would gather the data needed to answer the research questions

(Matimolane, 2004).

The test and questionnaire were pilot tested at school # 1 in January 2003. From this pilot test, some problems were identified, and these items were modified. In addition, at the suggestion of the expert, some questions to try to determine more detailed information on attitudes and sexual behaviour were added to it.

The structure of the test of knowledge

- **General information**

The test began with a section of general questions to establish age and gender, and also to establish if learners had been given any prior HIV / AIDS education, and if so in which subjects and grades this had happened.

- **Multiple choice section:**

This consisted of twenty items, each with four alternatives from which to choose an answers, to determine knowledge - both general HIV knowledge and functional knowledge (knowledge needed to avoid or reduce their risk of becoming infected with HIV) (Popham W.J. undated b). Questions on general knowledge were 1, 2, 4, 9, 10, 11, 12, 14 and 15 while those determining functional knowledge were 3, 5, 6, 7, 8, 13, 16, 17, 18, 19 and 20 (see Appendix B).

- **True or false section:**

This consisted of twenty statements, mostly of functional knowledge. The learner had to decide whether each was true or false. In order to attempt to determine if the learner just guessed the answer, a category of certainty was included where the learner had to indicate for each item whether he / she was sure of the answer, or merely thought it was so or had, in fact, guessed the answer.

4.5.2. The questionnaire of attitudes, belief and behaviour (see Appendix A)

- **Ten statements of attitude with a 5 point Likert scale** were used to obtain data about learners' attitudes and beliefs about their ability to behave in a way that would reduce the chance of infection with HIV.
- **Three questions about the perceived sexual behaviour of friends and peers** were used to try and determine more about the sexual practices of the group of participants.
- **A question to determine who / what influences the thinking of each learner on HIV and AIDS** was included.
- Three questions on **strategies to help curb the spread of HIV / AIDS amongst adolescents** were added after the pilot test.

Adults have tried many different strategies and education programmes to try to reduce the incidence of HIV infection amongst adolescents, yet many of these have had little impact. These three questions were asked to try and ascertain which strategies these learners felt were effective, and whether they could suggest more effective strategies.

If I were to administer the questionnaire again, there are questions that I would add. Two extra questions that I feel would be particularly relevant and useful are:

1. Can a person avoid AIDS or infection with HIV by changing his / her behaviour?
2. Have you made any changes in your behaviour or way of life as a result of what you have learned about AIDS?

(Cleland, 1995, p. 177).

- **The method followed when administering the test and questionnaire**

In the writing of the tests, the questionnaire and the narrative, both anonymity and confidentiality were ensured in order to increase the likelihood of getting truthful responses from the learners. (Popham, undated a). This was done as follows:

- Prior to the conducting of the pre-test, a class list with the names of all the learners was obtained from the teacher.
- All the tests were numbered with a
 - school number
 - candidate number
- Learners were each given a test instrument
- The class list was circulated around the class for each learner to enter his / her candidate number onto it

- For the duration of the study the class list of names and candidate numbers was kept by a responsible member of the class selected by the other class members so that any learner who forgot his / her number could look it up for the post- / retention test
- Learners entered their candidate number on the post- and retention tests and questionnaires, as well as their narrative
- At no stage was the class list ever given to the teacher or to me as the researcher
- The learners were assured that the tests, questionnaires and narratives were being written for the study, and that the only person who would see them was the person conducting the study, and that at no stage would any of the work they wrote be given to the teachers
- As I do not teach the learners there was no possibility that I would recognise their handwriting and therefore be able to link a piece of work to a particular learner
- The teachers were not present during the writing of the tests, questionnaires or narratives

The method was carefully explained to the learners before any of the tests were administered, so that they would know, before they began, both that their answers were anonymous and that confidentiality was ensured.

Ideally the learners should have been seated so that there was no chance that any learner's work could be observed by another learner, but crowded classrooms and lack of furniture meant that this was not always possible.

- **Directions for administering the tests and questionnaires:**

1. The purpose of the study was briefly described to the learners in order that they would know why they were doing the work.
2. It was emphasised that the tests and questionnaires were not an examination or a test and that they did not count for marks.
3. The learners were told that they were not to write their names on the work, and the method of numbering for them to remain anonymous was explained to them.
4. The learners were told that they would have approximately 30 minutes to complete the test and questionnaire, but that if they required more time, they could have some more. They could work at their own pace. (This was controlled to a certain extent when I went through the instructions and examples at the beginning of each section of the tests and questionnaires, as I ensured that all learners had completed the previous section before continuing. By doing so, I set a reasonable pace).
5. The tests / questionnaires were distributed, together with a pen, to each learner.
6. The learners were instructed to follow along while the front page instructions were read to them.

7. I worked through the questions on the front page with the learners e.g. gender, prior instruction on HIV / AIDS.
8. With each new section on the test / questionnaire the learners were instructed to follow along while the instructions were read to them and the two examples were answered together.
9. The learners were instructed to complete each section according to the written and verbal instructions.
10. If any learners had any questions during the process, they were answered.
11. Once all the learners had finished, the tests / questionnaires were collected.
(Popham et al. undated b).

- **Analysis of the results of the tests and the questionnaire**

The multiple choice, true or false, attitude and strategy questions were coded and their results entered into a computer. Percentage means were obtained for the multiple choice and true or false sections and these were tested by an ANOVA test to determine if the change in the means from the pre- to the post- and retention tests was statistically significant.

The answers given by each learner for the statements on attitude with the Likert scale were also entered and the percentage of learners who checked each attitude for each question was calculated so that the percentages could be compared when the results were analysed.

The suggestions that the learners gave for a strategy for help curb the spread of HIV / AIDS in the school and community were all recorded and later read and reread to determine if any of them were feasible or valid.

As has been commented upon in the results and discussion chapter, the absentee rate in some of the schools where the study was conducted was quite high. During all the lessons that I observed at school # 6, there was never a complete class at school. Therefore none of the sets of tests was written by a full complement of learners. The other tests written by any of the learners absent for one of the tests were not discarded, and their results were included in the calculation of the mean.

The analysis, and discussion of the tests and questionnaires are in Chapter 5.

4.5.3. The narrative (see Appendix B)

- **The purpose of the narrative**

The narrative was administered to obtain the bulk of the data required to answer second research question - did the module deal with the issues affecting the lives of the grade 11 learners to whom it was taught?

Narrative research seeks to understand and represent experiences through the stories that individuals tell. Unlike quantitative research it focuses less on literature and rather explores meaning by focussing on the individual's personal and social experiences as told in their own words (Gall, Borg & Gall, 1996). The advantages of narrative research are that these stories provide information in rich detail, from the perspective of the writer, and that might otherwise have escaped the notice of the researcher. The voluminous data collected is both an advantage and a disadvantage as it is very time-consuming to analyse it all. However, the insight that it gave me into the lives of the learners and adolescents today, and the impact of the intervention in the micro-, meso- and exosystems of the learners, could never have been obtained in any other way!

- **The development of the stimulus material for the narratives**

Together with the Senior English teacher at my school, I clarified the purpose of the narratives - to gather as much relevant information as possible of the learners' personal and social experiences of HIV / AIDS and also the HIV education programme. We carefully worded a stimulus that would encourage the learners to write in-depth details of the information. An expert read through the stimulus, and suggested some changes. The stimulus is available as Appendix B.

- **The method used to administer the narratives**

As the learners had already written the pre-, post-, and retention tests and questionnaires, they had been informed about the purpose of the study. Most were used to Lisette Vogels or me observing their lessons and so appeared to be comfortable with writing the narrative.

- Each learner was given a piece of lined A4 paper and a piece of paper with the stimulus material printed on it.
- The purpose of the narrative was explained to them.
- The learners were told to work at their own pace during the time available (approximately one hour), and to write approximately 2 sides of the A4 paper.
- At the end, the narratives of all learners were collected.
- As this was the last time I would see the learners, I thanked them for their participation in the study and all the work they had done for it, as well as for making me so welcome in their classes.

- **Analysis of the narratives**

Analysis procedures of the narratives consisted of six steps:

- reading, rereading and reading the narratives yet again to identify the categories, themes and patterns that learners have written about
- second blind reading of the narratives to determine if the categories and themes identified were accurate
- making notes and ‘cleaning up’ the information obtained (Marshall & Rossman, 1989, p 114)
- analysing the narratives to determine the frequency with which each theme and sub-theme were written
- testing the results gleaned from the tests and questionnaires against the themes that emerged from the narratives
- writing the report

The analysis and discussion of the narratives are in Chapter 5.

4.5.4. **One-on-one semi-structured interviews with the teachers** (see Appendix C - the instrument - and Appendix D - the transcripts).

- **The purpose of the interviews with the teachers**

The teachers were interviewed in order to obtain data to answer the third research question - what difficulties did the educators experience in the teaching of the module? The data obtained would provide information about the intrapersonal (the learners themselves), the micro- (the families from which the learners came), meso- (the school that the learners attended and the teacher who taught them biology) and exosystems (the community in which the learners lived), of the ecosystems in which the module was taught.

One-on-one interviews were held with each of the teachers after the module had been taught. The interview protocol for the semi-structured interviews can be found as Appendix D. The interview was tape-recorded, so that it could be transcribed for analysis later. This method of recording was chosen over the option of detailed note taking as it was perceived as being less disruptive and allowing the interview to flow more smoothly, as well as reducing “reporter bias in what is written” (Gilliam, undated, p. 9). Brief notes were taken during the interviews as these would later give “information that was unspoken but was required in order to analyse the transcripts” (Hull, 2003, p. 56). The third approach - the reporter “draws on memory alone to expand or clarify his or her notes immediately after . . . individual interviews” (Gilliam, undated, p. 9) - was simply not an option in my case.

The interview was semi-structured as it contained both close-ended and open-ended questions. The advantages of this are that the predetermined close-ended questions allowed me to gather the data that I needed, while the open-ended questions allowed the participant time to comment, explain and share their personal experiences that were outside or beyond those identified in the close-ended questions (Cresswell, 2002). Interviews allowed me to find out that which I could not directly observe i.e. to “capture

the perspectives” (Gilliam, undated, p. 2) of the teachers such as attitude changes, satisfaction, suggestions and thoughts about the programme in general. As the interview was semi-structured, it allowed me to explain questions, ask additional questions and to clarify the answers given so that I could obtain useful information from them.

Some disadvantages of the one-on-one interview method are that it “only provides information filtered through the views of the interviewer as the researcher summarises the participants’ views in the research report. It may be deceptive and provide the perspective the interviewee wants the researcher to hear or the presence of the researcher may affect how the interviewee responds” (Cresswell, 2002, p. 205). The facial expressions, tone of voice and the body language of the researcher, especially when these are in response to answers given by the participant, all give clues about how the answers are being received (Melville & Goddard, 1996, p.44).

The interviews were transcribed (see Appendix E) i.e. I listened to the tapes and typed a verbatim account of all that was said. **R** represents what was said by the researcher and these comments and questions are not in italics. **I** refers to the responses given by the interviewee. The responses and comment are in italics. Words in brackets indicate the meaning of some of the sounds, such as ‘mm’, made by the interviewee and also indicate some of the actions made by the interviewee.

This method worked well, with the exception of one or two words or phrases that were unintelligible and these were indicated as [unclear].

- **The development of the interview protocol**

- The purpose of the teacher interviews was clarified, i.e. the need for information about the teaching of the module and problems teachers experienced whilst teaching it. In addition, I needed the perspective of each of the teachers about the module.
- To this end, I drew up the questions for the interview protocol.
- The Senior English teacher at my school went through the questions and checked that they were worded correctly and that they were in a logical sequence.
- An expert in the design of interviews also reviewed the protocol to see that the items were worded correctly.

The method used during interviewing

- The teacher and the researcher were settled comfortably in a quiet place, all the while chatting casually to help make the teacher more comfortable (Hull, 2003, p 59)
- The purpose of the interview was explained to the teacher
- The teacher was told the approximate length of the interview
- The tape recorder was switched on
- The questions were asked with the answers being recorded and brief notes being taken where appropriate i.e. to indicate some of the actions made by the teacher
- Probing questions were asked if these were needed to tease out or clarify the answers given by the

teacher

- On completion of the interview the teacher was thanked for his / her participation in the study and also in the interview

Analysis of the interviews

Content analysis was used - the responses of each teacher were organised by areas of concern. Comments on the same issues were put together and then interpreted and conclusions drawn from the trends of the answers, and in accordance with the objectives of the research question 3 - what difficulties do teachers have in teaching the module? Triangulation of data from classroom observations helped to verify the comments of the teachers, and also helped in the reaching of conclusions.

The analysis and discussion of the teacher interviews are in Chapter 5.

4.5.5. Use of classroom observations

- **The purpose of the observations**

Many of the lessons were observed during the implementations. I observed lessons in schools # 1, # 3, # 5, # 6 and # 7, while junior researcher Lisette Vogels observed those at school # 2. I observed most of the lessons during the pilot implementation at school # 1 to help give me an insight into the process of implementation and also the questions that could be asked in the teacher interviews. Only one lesson was observed in schools # 3 and # 7, but almost all the lessons were observed and notes were taken during the implementation in schools # 5 and # 6. The lessons at school # 6 were also videotaped. These observations, especially those at schools # 1, # 5 and # 6 allowed me to better understand the context (mesosystem and exosystem) in which the programme operated and the process, while also allowing me to see things that the teachers and the learners might not be aware of. (Gilliam, undated). They also gave me insights into the learners themselves (the intrapersonal of Bronfenbrenner's model), that I would otherwise never have had.

The video tapes were watched and re-watched, while I took notes, and these, together with the notes that I took during lessons, to help verify the information I got from the tests, questionnaires, narratives and teacher interviews.

4.6. THE VALIDITY OF THE RESULTS

In order for the results of research to be of any use, the research methods must be reliable and the results they yield must be valid. Reliability "means that the measurements are consistent; if they same experiment is performed under the same conditions, the same measurements will be obtained. . . the term validity means that the measurements are correct. This means that an instrument measures what it is intended to measure, and that it measures it correctly" (Melville & Goddard, 1996, p. 37).

The following steps were followed to ensure that the results obtained from this study were reliable and

valid:

- The use of a variety of research methods to obtain data meant that the results could be triangulated to verify their validity.
- The use of some test and questionnaire items from other instruments that had given reliable results in prior studies.
- The pilot testing of test and questionnaire, followed by a review of them.
- The determination of the face-validity of test and questionnaire instrument, narrative stimulus and the interview protocol by experts.
- Procedures documented to increase validity were followed in the drawing up and administering of the instruments.
- A double blind reading of the narratives was done to ensure that the themes and sub-themes were correctly identified.
- Anonymity and confidentiality of the learners was assured in order to obtain the most honest answers possible.
- Rigorous statistical tests, documented as being valid, were done on the quantitative data, and standard procedures for the credibility and reporting of qualitative research were observed.

4.7. ETHICAL CONSIDERATIONS

Collecting data, especially data concerning sexual behaviour and / or HIV / AIDS, as this is such a stigmatised disease from any person raises ethical concerns such as “avoiding harm to people, having due regard for people’s privacy, respecting people as individuals and not subjecting people to unnecessary research” (Melville & Goddard, 1996, p. 45). All efforts were made to ensure that this study was done in an ethical manner. Learners’ answers in the tests and questionnaires, and their narratives were written anonymously and their data is confidential. The teacher’s interviews were also confidential. All participants were treated with respect, as was their privacy.

As described in section 4.3 of this chapter, a two-group pre-test, post-test research design could have been used to obtain convincing data. This could not have been done for ethical reasons as it would not have been possible to teach the HIV education programme to the control group at the end of the study.

4.8. CONCLUDING REMARKS

The mixed method design used in this study gleaned a large amount of useful and varied types of data. The information obtained from each of the instruments could be used for triangulation and thus verify the validity of the results. The results from each instrument and their analyses are discussed in Chapter 5.

Chapter 5: The results and discussion

Analysis of the questionnaires of attitudes and tests of knowledge, and the narratives showed a pleasing increase in both general and functional knowledge, and also in desirable attitudes amongst the learners following the teaching of the module as can be seen from the means for each section reflected in Table 4 below. The narratives gave rich insight into the impact of HIV / AIDS on the lives of the learners and how much they valued having been taught the module. The interviews with the teachers pinpointed the importance of training teachers to teach this sensitive subject, and also highlighted some of the problems they have with teaching this material.

Table 4: A summary of the means obtained in the knowledge and attitudes sections of the tests and questionnaires.

Section	Mean obtained by the learners (Percentage)		
	Pre-test / questionnaire	Post-test / questionnaire	Retention test / questionnaire
Multiple choice	43.55 %	51.85 %	51.55 %
True or false	67.5 %	71.5 %	71.0 %
Attitudes	63.8 %	68.5 %	68.5 %

5.1. THE QUESTIONNAIRE AND THE PRE-, POST- AND RETENTION TESTS

The number of learners writing the tests and questionnaires varied: 214 wrote the pre-test and questionnaire, 235 the post-test and questionnaire and 177 wrote the retention test and questionnaire.

5.1.1. The aim of administering pre-, post- and retention tests and questionnaires

Learners answered a pre-test containing a range of questions aimed to determine their knowledge, and a questionnaire with the intention of gauging HIV-risk behaviour and attitudes to HIV / AIDS, prior to being taught the HIV / AIDS module. On completion of the module, the same test and questionnaire was given as a post-test to determine if there was any change in knowledge, behaviour and attitude, and two months later the test was written as a retention test to determine if the changes in knowledge, behaviour and attitude, that were observed on completion of the module, were sustained.

5.1.2. The pre-, post- and retention tests

5.1.2.1. Information on prior HIV education

The data given in answer to the two questions about prior HIV / AIDS education in schools is summarised in Table 5 on the following page.

Table 5: Information given by participants, in the current study, about prior HIV / AIDS education in school

School number	Total number of respondents per school	Number who answered that had received HIV education at school	Number who answered that they had studied HIV / AIDS education in Life Skills	Percentage of respondents who answered that they had studied HIV in Life Skills	Main other subjects where the respondents wrote that they had studied HIV
2	38	33	26	68%	biology, English and vernacular
3	21	16	9	42%	biology
5	79	46	14	17.7%	biology and English
6	35	27	2	5.7%	biology and English
7	31	16	3	9.6%	biology
Totals	204	138	54	26.4%	

The personal communications reported in chapter 2 on the teaching of HIV / AIDS in life skills education in some South African schools are borne out by the responses to the following questions 'Have you received HIV / AIDS education at school before this?' and 'If you answered yes to the question above, in what subject/s have you learnt about HIV / AIDS?' In the questionnaires administered in this study, only 26.4% of the students answered that they learnt about HIV / AIDS in Life Skills. The subjects most commonly mentioned as those where the respondents learnt about HIV / AIDS were biology and English, with others mentioned vernacular subjects and agricultural sciences. This information is reflected in Table X above. Another statistic that is clear from the answers to these two questions is that not all schools teach HIV / AIDS to the same degree in Life Skills. It is clear that schools 1 and 2 placed enough emphasis on HIV / AIDS in Life Skills for a significant number of students to remember that they did cover the topic in that subject (68% in school # 1 and 42% in school # 2), but while a few other students did remember having covered HIV / AIDS in Life Skills in the other 3 schools, it obviously did not make an impact on the majority of students if so few remembered having done so.

5.1.2.2. Multiple choice questions of knowledge

The questions in this section of the test varied in the type of content they were testing. Some questions for example 2 and 14, tested general knowledge of the science of HIV / AIDS, while others for example 10, tested general knowledge of HIV, and others for example 6 and 16, tested functional knowledge of transmission of the virus.

When the means (as a percentage) obtained by learners in the three tests were compared, they showed an increase from 43.55 % in the pre-test, to 51.85 % in the post-test, followed by a slight drop to 51.55

% in the retention test as can be seen in Figure 13 below.

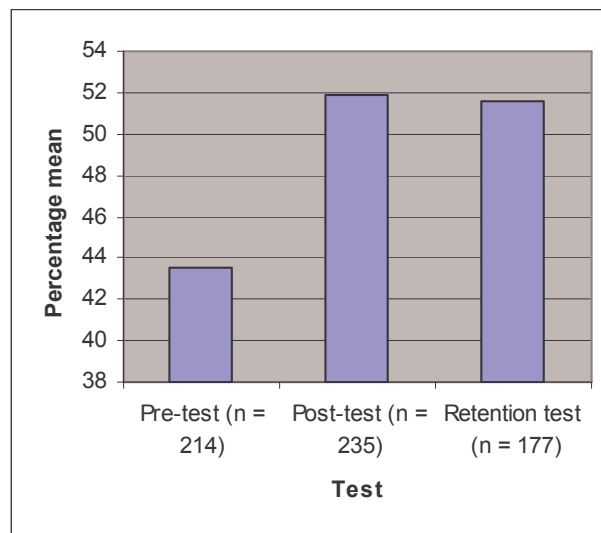


Figure 13: Bar graph comparing the means obtained in the multiple choice section of the pre-, post- and retention tests

An ANOVA was used to determine the statistical significance of this difference and found $p < 0.00$, i.e. the difference in the means is statistically significant and probably should not be attributed to chance.

An analysis of the answers given for each of the multiple choice questions shows that there is a range in the percentage of learners who gave the correct answer in all three of the tests, as is shown in Figure 14 below.

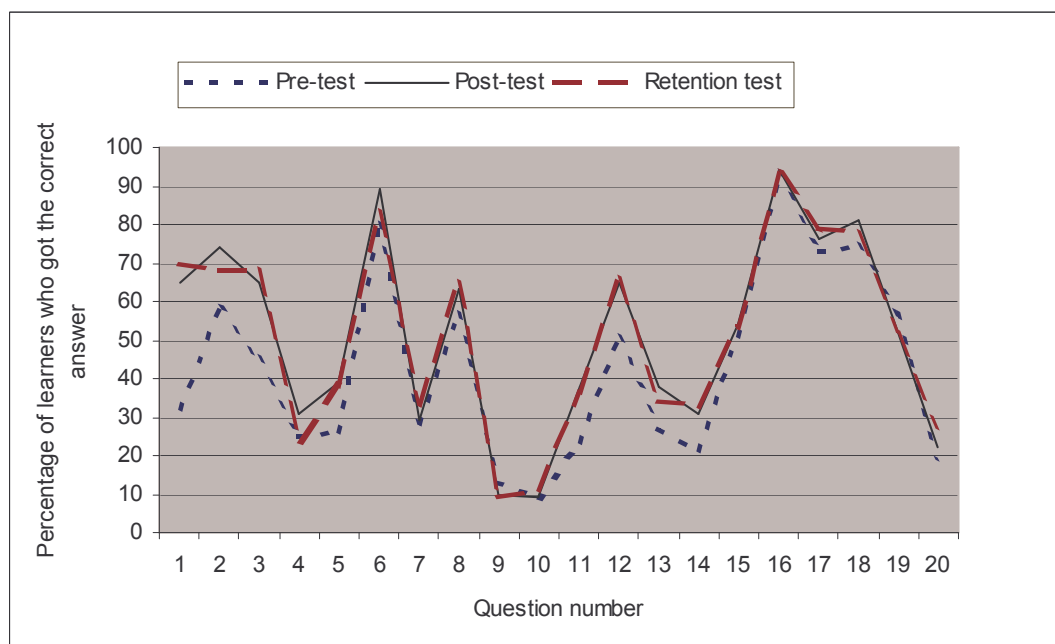


Figure 14: Line graph comparing the percentage of learners giving the correct answer for each question in the pre-, post- and retention tests

The graph in figure 14 on the previous page shows that even though the means in the three tests were significantly different, the trends were the same, i.e. the same questions were answered well in all three tests, and the same questions were answered badly.

It is interesting that in the pre-test, the answers to some of the multiple choice questions showed that the learners were already very knowledgeable about certain aspects of HIV and AIDS. These questions were about aspects of the disease that seem to relate to the daily lives and experiences of the learners - the micro-, meso- and exosystems of the learner according to Bronfenbrenner's social ecological model. Research done by Pettifor et al (2004) on South African 15 - 24 year-olds, also found that they were knowledgeable about certain aspects of the disease. In response to a question on what could be done to prevent HIV / AIDS, "77% reported that you can use condoms during sex, 41% reported you should not have sex, 10% said you can have one faithful partner, and 7% said you cannot have many sex partners" (p. 51). The percentage of learners who answered some of these questions correctly in the pre-test is shown in Table 6 below.

Table 6: The percentage of learners who answered certain important multiple choice questions of functional knowledge correctly in the pre-test

Question	Correct answer	Percentage of learners who answered correctly n = 214
Safe sex is sex which involves	using a condom the right way, every time	80%
What is the best protection against getting HIV by sexual intercourse?	condoms	93%
Which drug is currently the most effective at reducing the transmission of HIV from a mother to her unborn child?	Nevirapine	73%
Does HIV only affect homosexuals?	no	74%

The questions in which the learners fared worst in all three tests were questions 9 and 10 - both questions of general HIV knowledge.

Question 9 was a scientific question that asked 'HIV tests most commonly done in South Africa test for the presence of which of the following in the blood?', with 'antibodies to HIV' being the correct answer. Table 7 overleaf shows the percentage of learners who selected each of the options in the three tests.

Table 7: Changes in the percentage of learners who selected each of the options in answer to question 9 in the pre-, post- and retention tests

Options as answers to question 9	Percentage of learners selecting each option		
	Pre-test n = 214	Post-test n = 235	Retention test n = 177
The Human Immunodeficiency Virus	17 %	22 %	22 %
Antibodies to HIV	13 %	10 %	9 %
Infected CD4 cells	19 %	33 %	39 %
Infected blood cells	46 %	29 %	27 %
Question not answered	5 %	6 %	3 %

There seems to be no consistency in the options chosen, except that the number of learners choosing the correct option was significantly lower than the number choosing each of the other options in all three tests. I can offer no explanation for this feature.

Question 10 was a historical question that asked when HIV was first recognised as the virus that causes AIDS. The correction option was '1983'. Table 8 below shows the percentage of the learners selecting each option in the three tests in answer to this question. Again the only consistency in answering is that a low percentage chose the correct answer in all three tests, with a surprising number of learners showing that they thought the discovery was as recent as 1990.

Table 8: Changes in the percentage of learners who selected each of the options in answer to question 10 in the pre-, post- and retention tests

Answers as options to question 10	Percentage of learners selecting each option		
	Pre-test n = 214	Post-test n = 235	Retention test n = 177
1980	34 %	42 %	40 %
1983	9 %	9 %	11 %
1987	10 %	13 %	11 %
1990	44 %	32 %	35 %
Question not answered	3 %	4 %	3 %

Questions 5 and 17 asked about similar content and were used for triangulation - to try and corroborate whether the learners really knew the answers or if they were guessing. When comparing the answers given to question 5 and 17 in the pre-, post- and retention tests, as can be seen in Table 9 below, it is

interesting to see the percentage distribution of the answers.

It is difficult to explain why almost a quarter of the students in all three tests gave the answer for question 5 that Nevirapine is not effective in reducing mother-to-child transmission, yet almost 75 % of them answered in question 17 that Nevirapine is the drug that is most effective at reducing mother-to-child transmission. However, it can also be seen from Table 9 that the number of learners who gave the answer to question 5 that Nevirapine reduces transmission rate significantly did increase from 26 % in the pre-test to 39 % in the post-test. Does the fact that 28 % of the learners answered Nevirapine is toxic to the child in the pre-test show the power of the media in spreading this message?

Table 9: Percentage of learners answering each option for questions 5 and 17 in the pre-, post- and retention tests

Question number, question stem and answer options	Percentage of learners selecting each option		
	Pre-test n = 214	Post-test n = 235	Retention test n = 177
5. The use of Nevirapine to reduce the transmission of HIV from a mother to her unborn child			
• is not effective at all	26 %	29 %	24 %
• is not available in any South African hospitals	16 %	12 %	14 %
• is very toxic to the child	28 %	17 %	21 %
• reduces transmission rate significantly	26 %	39 %	38 %
Question not answered	2 %	3 %	3 %
17. Which drug is currently the most effective at reducing the transmission of HIV from a mother to her unborn child?			
• Nevirapine	73 %	76 %	79 %
• AZT	14 %	14 %	15 %
• Antibiotics	8 %	6 %	1 %
• Norvir	1 %	0 %	2 %
Question not answered	4 %	4 %	3 %

The answers given to the question 'Did you understand all of the multiple choice questions or were there some that you did not understand?' show clearly that English comprehension is a problem for many of the students as can be seen from Table 10 overleaf. In addition, the complicated new biological terminology applicable to this subject matter must have been confusing to learners, especially in the pre-test.

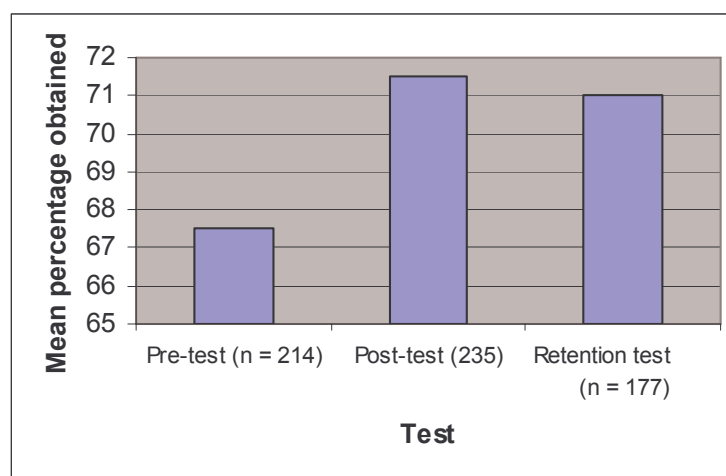
Table 10: Percentage of the students in the pre-, post-, and retention tests who did not understand some of the multiple choice questions

Option	Percentage of learners selecting each option		
	Pre-test n = 214	Post-test n = 235	Retention test n = 177
I understood all of the questions	13 %	23 %	19 %
There were one or two that I did not understand	35 %	42 %	51 %
There were at least five that I did not understand	25 %	20 %	19 %
I didn't understand at least half of them	13 %	7 %	5 %
Question not answered	14 %	8 %	6 %

5.1.2.3. True or false questions of knowledge

As was the case with the multiple choice questions, the questions in this section of the test varied in the type of content they were testing. For example, some questions for example 24 and 29, tested knowledge of the science of HIV / AIDS, while others for example 22, tested knowledge of transmission of the virus and others tested beliefs, for example 32.

When the means (as a percentage) obtained by learners in the three tests were compared, they showed an increase from 67.5 % in the pre-test, to 71.5 % in the post-test, followed by a slight drop to 71.0 % in the retention test. This can be seen in Figure 15 below.

**Figure 15:** Bar graph comparing the mean percentage obtained by learners in the true or false items of the pre-, post- and retention tests

An ANOVA was used to determine the statistical significance of this difference and found $p < 0.0318$, i.e. the difference in the means is statistically significant and probably should not be attributed to chance.

Some interesting answers and statistics in the True or False section, and my comments were as shown in Table 11 below.

Table 11: Some items in the True or False section that showed interesting answers

Statement	Percentage of learners who got the answer correct			My comment
	Pre-test n=214	Post-test n=235	Retention test n=177	
AIDS can be caused by poverty	53 %	64 %	69 %	It is pleasing that the number of learners who realise that this is a myth has increased so much but it is, nevertheless cause for concern that such a high percentage of learners (31%) still believes that it is true!
It is possible to get infected with HIV through oral sex	73 %	61 %	60 %	It is of concern that the number of learners with the correct answer here dropped as, although this is not a high risk behaviour, it certainly is a risk behaviour.
HIV is mainly a disease of homosexuals	47 %	60 %	61 %	There is a pleasing increase, but it is interesting that in a similar multiple choice question in the pre-test, 74% of learners answered that HIV is not a disease of homosexuals only.
There is a cure for AIDS	60 %	72 %	67 %	This is cause for concern! There are still myths in which almost 30% of the learners believe.
Most of the people worldwide now living with HIV don't know that they are carrying the virus	80 %	76 %	77 %	It is pleasing to realise that so many learners, even in the pre-test, know that there are many people infected with HIV who don't know that they are infected.
There is a risk of HIV transmission when having a tattoo or body piercing	55 %	62 %	62 %	There is a pleasing increase in awareness, but it is worrying that the overall percentage of learners who know that this is a possibility is still not closer to 100%.

Table 11 continued: Some items in the True or False section that showed interesting answers.

Statement	Percentage of learners who got the answer correct			My comment
	Pre-test n=214	Post-test n=235	Retention test n=177	
If you are fit and healthy you won't become infected with HIV	87 %	89 %	91 %	Pleasing!
If you stick with one partner you won't become infected with HIV	39 %	54 %	55 %	Although there is an increase in the percentage of learners getting this correct, it is still a low percentage for something that is so important!
Mosquitoes or other blood sucking insects can transmit HIV	38 %	51%	54 %	It is interesting that so many learners still believe that this is possible, even though the percentage of learners getting the answer correct increased from the pre- to the post- and retention tests.

In an attempt to determine whether the learners simply guessed the answers in the true or false section, there was a category with each question where the learners were asked to indicate whether they were sure of their answer, or whether they thought the answer was correct, or whether they were just guessing the answer. In all three tests most of the learners who answered correctly indicated that they were sure of the answers as is indicated in Table 12 below, while fewer were not certain and some indicated that they had guessed the answer.

Table 12: The percentage of the learners who got the true or false questions correct and the degree of certainty that their answers were correct

Degree of certainty	Percentage of learners who got the true or false questions correct and their degree of certainty		
	Pre-test n = 214	Post-test n = 235	Retention test n = 177
I am sure	42 %	48 %	48 %
I think so	12 %	11 %	13 %
I am guessing	12 %	11 %	9 %

The answers given to the question 'Did you understand all of the true or false questions or were there some that you did not understand?' again show clearly that English comprehension is a problem for many of the students, as can be seen from Table 13. In addition, as was also the case with the multiple choice questions, the complicated new biological terminology applicable to this subject matter must have been confusing for the learners, especially in the pre-test.

Table 13: Percentage of the students in the pre-, post-, and retention tests who did not understand some of the true or false questions

Option	Percentage of learners selecting each option		
	Pre-test n = 214	Post-test n = 235	Retention test n = 177
I understood all of the questions	13 %	23 %	19 %
There were one or two that I did not understand	35 %	42 %	51 %
There were at least five that I did not understand	25 %	20 %	19 %
I didn't understand at least half of them	13 %	7 %	5 %
Question not answered	14 %	8 %	6 %

The improvement in knowledge about HIV / AIDS (both general and functional) bodes well for changes in the intrapersonal factors of each learner as postulated by Bronfenbrenner in his social ecological model. As this was a module taught to all the grade 11 biology learners, it also means that there are changes in the school, and possibly friends and neighbourhood components of the mesosystem. All of these components play a role in how a person behaves in any given situation, and as they have also shown increased knowledge about HIV / AIDS, all the components could combine to encourage HIV-safe behaviour in the group.

5.1.3. Questionnaire of attitudes and perceived sexual behaviour of peers

The items on attitudes in the questionnaire were included in order to ascertain if being taught the module resulted in any change in the learner's attitude to HIV / AIDS and people living with HIV / AIDS. The average percentage of learners expressing desirable attitudes was 60.5% in the pre-questionnaire, 66.2% in the post-questionnaire and 65.7% in the retention questionnaire. As it is difficult to ask direct questions about the sexual behaviour of each learner and get honest answers, the questions on perceived sexual behaviour of peers were asked to obtain information about the sexual behaviour of the learners who participated in the study, and of their peers. The majority of the learners reported that they knew of only a few of their peers who had sexual intercourse, or had had more than one partner, or had had sexual intercourse without a condom. Despite the relatively high level of knowledge amongst South African

adolescents about HIV / AIDS, the ways in which the virus is transmitted and the ways to prevent transmission, HIV continues to spread in the population, and so the last questions were asking for the opinions of the learners about the most effective way to persuade their peers to behave in an HIV-safe manner. No feasible or new strategies were suggested by any of the learners.

5.1.3.1. 'Do you agree' questions

Even in the questionnaire given with the pre-test of knowledge, the attitudes many learners showed to HIV / AIDS and people with HIV / AIDS expressed in the Likert-scale categories in response to the 'Do you agree' items are pleasing. The number of learners expressing desirable attitudes and a perceived ability to use negotiation skills increased in the questionnaire given with the post-test and the retention test, as can be seen in Table 14.

Table 14: The percentage of learners expressing the desirable attitude in the pre-, post- and retention questionnaires

Item	Desirable attitude	Percentage of learners expressing the desirable attitude / knowledge in each questionnaire		
		Pre- n = 214	Post- n = 235	Retention n = 177
41. I have no problem with using the same plate and cutlery as someone who is HIV positive	strongly agree or agree	72 %	73 %	73 %
42. I know all the ways in which a person could become HIV positive	strongly agree or agree	67 %	73 %	68 %
43. I am confident that I know how to negotiate using a condom if I were to have sexual intercourse	strongly agree or agree	69 %	79 %	81 %
44. If somebody in my household had AIDS, I would know how to look after them and nurse them	strongly agree or agree	67 %	72 %	72 %
45. I feel that I have the right to negotiate using a condom if I were to have sexual intercourse	strongly agree or agree	77 %	82 %	87 %
46. It is possible for a mosquito to transmit HIV	disagree or strongly disagree	30 %	45 %	40 %

Table 14 continued:

The percentage of learners expressing the desirable attitude in the pre-, post- and retention questionnaires

Item	Desirable attitude	Percentage of learners expressing the desirable attitude / knowledge in each questionnaire		
		Pre- n = 214	Post- n = 235	Retention n = 177
47. I feel comfortable touching someone who is HIV positive	strongly agree or agree	55 %	56 %	56 %
48. If I were unmarried and sexually active, I would use a condom every time I had sexual intercourse, even if I knew the person well	strongly agree or agree	80 %	84 %	79 %
49. Having a monogamous sexual relationship with someone protects a person from getting HIV	disagree or strongly disagree	20 %	23 %	25 %
50. I feel confident that I would know the best advice to give a friend who is sexually abused by someone that we suspect might be HIV positive	strongly agree or agree	68 %	75 %	76 %

It is interesting to note the high percentage of learners who agreed that if they were unmarried and sexually active, they would use a condom every time they had sexual intercourse, even if they knew the person well - Pettifor et al (2004) state that 31% of the sexually active youth report that they had not used a condom with their most recent sexual partner, and that almost a third of the respondents in Pettifor's survey believed that using a condom meant that you 'do not trust your sexual partner' (p 72). The female respondents in Toland's study (2002) said 'It was just not their place to carry a condom. They were afraid of what others might think, and they preferred to leave it to their male partners to initiate condom use' (p 26) even though they acknowledged the risk of HIV infection.

In the pre-test of knowledge 80 % of the participants answered that safe sex was sex that involves using a condom the right way every time, and 93 % answered that condoms were the best protection against getting HIV by sexual intercourse; in the narratives, such phrases as '*now is better I know all the things about it how it is transferred from one person to another person*' were written, yet, also in the narratives, the learners wrote '*Most people in my age group thinks that sex with condoms is not the sex which they likes most, they says you cannot eat a sweet with its cover, is that using a condoms the used most of their sperms*' or '*Many girl don't want to use condom. They say is like when you eat the sweet that is covered*'.

There are also significant numbers of young girls who are falling pregnant (and thus obviously having sex unprotected by a condom) in order to get the social welfare grant (Personal communications - Matladi, March, 2003, Mashamite, April, 2003, Molepe, April, 2003) - the influence of the macrosystem's welfare system on behaviour as postulated in Bronfenbrenner's model. Pettifor et al (2004) reported that 15 % of South African 15 - 19 year olds reported having ever been pregnant (p. 34).

In response to the retention item asking if each learner had found these 'Do you agree' questions easy or difficult to answer and to give a reason with their answer, it was pleasing to note that with each questionnaire, the learners found the items increasingly easy to answer. In the pre-questionnaire, 42% of the learners said they found them easy to answer, while 53 % chose this option in the post-questionnaire and 54 % chose it in the retention questionnaire. The reasons given for each learner's choice varied. Some of those given with the pre-questionnaire included:

It is the things that we see.

Every where they are talking about it and how to treat and prevent it.

In the post-questionnaire some of the reasons were:

I was taught about HIV and AIDS

I have done all the practically with my teacher

In the retention questionnaire some of the reasons were:

I read a module and I think I have whatever it takes to protect my family and my community

Because every day I learn more about HIV and AIDS

Reasons that learners gave when they had said that the questions were difficult were:

with the pre-questionnaire:

Some of the questions I don't understand

I don't know what AIDS is and I have not seen a person who has HIV

with the post-questionnaire:

I do not understand this question that you ask me

Because I am afraid when people talking or teaching AIDS is a curable disease it is killing people

With the retention questionnaire:

I have never ever touched an HIV person or shared something with them

5.1.3.2. Questions about perceived sexual behaviour of friends and peers - item 52

These questions were asked in an effort to find out, without asking the question directly, how many of the learners had been sexually active, had had more than one partner, and were having unprotected sexual intercourse.

It is obvious from the results in Table 15 below that in the pre-, post- and retention questionnaires, the biggest group of individuals perceive their peers (and by inference themselves) in the following ways:

- a few of their peers have had sexual intercourse more than once
- a few of their peers have had more than one sexual partner
- most believe than none of their peers has sexual intercourse without using a condom

Table 15: The distribution of answers to the items in the questionnaire on the perceived behaviour of the learners' peers

Item: To the best of your knowledge, how many of your classmates or friends in your age group do the following?	Percentage of learners that gave each of the options as an answer											
	Pre-test n = 214				Post-test n = 235				Retention test n = 177			
	none	a few	about a half	most	none	a few	about a half	most	none	a few	about a half	most
Have had sexual intercourse more than once?	31%	39%	14%	16%	23%	38%	13%	26%	25%	37%	16%	22%
Have had more than one sexual partner?	34%	42%	11%	13%	31%	39%	15%	15%	26%	40%	19%	15%
Have sexual intercourse without using a condom?	47%	31%	10%	12%	39%	29%	16%	16%	40%	26%	13%	21%

However, it is interesting to see the change in perception from pre-, to post-, to retention questionnaire of

each item. Did this mean that the learners spoke to each other about sexual issues more as a result of doing the module, or have passed through four to five months in the life of a grade 11 learner - a lifetime in sexuality terms. Do they actually change this much over this time? Certainly, in terms of having had sexual intercourse more than once and having sexual intercourse without a condom, there are fewer learners saying 'none', and more saying 'most', as time progressed. Pettifor et al (2004) reported that 48 % of those 15 - 19 year olds they surveyed reported having had sexual intercourse (p. 37), 44 % reported that the last time they had had sexual intercourse they had not used a condom (p. 44) and 27 % who reported to having had sexual intercourse in the previous 12 months reported that they had had more than one sexual partner in that time (p. 43). It can be inferred from Pettifor's statistics that the data concerning perceived sexual activity of the learners surveyed in the Rainbow study are not a good reflection of actual sexual activity, although the sample in the Rainbow study is obviously much smaller and more localised than that in Pettifor's survey.

5.1.3.3. Question on who / what influences each learner's thinking about HIV / AIDS - Item 54

When asked who or what influences their thinking about HIV / AIDS, the learners responded as shown in Table 16 below:

Table 16: Who or what influences the thinking of the learners on HIV / AIDS?

	Percentage of learners who indicated that each of the sources influence their thinking on HIV / AIDS		
	Pre-questionnaire	Post-questionnaire	Retention questionnaire
Peers	4 %	6 %	5 %
TV	25 %	20 %	14 %
Newspapers	9 %	11 %	10 %
Magazines	13 %	14 %	18 %
Teachers	14 %	17 %	16 %
Minister of Health	12 %	10 %	11 %
Parents	9 %	9 %	9 %
The President	2 %	4 %	1 %
Question not answered	12 %	9 %	16 %

Pettifor et al (2004) reported in the 2003 national survey of HIV and sexual behaviour among young South Africans age 15 to 24 years that when asked from which one source they had learned the most about HIV / AIDS 32 % reported having learned the most from school (teachers, classmates or in the classroom)

followed by 19% saying the TV, 17 % saying the radio and only 4% reported having learned the most about HIV / AIDS from their parents / guardian (p. 54). In terms of Bronfenbrenner's social ecological model of behaviour, this underlines the importance of ensuring that the learners get accurate and well-planned information about HIV / AIDS at school and via the media as these components of their ecosystems are influential in changing the behaviour of the learners.

5.1.3.4. Question asked to identify the strategy most likely to help curb the spread of HIV / AIDS - Item 55

This item was a multiple choice question that asked:

If you were appointed to help curb the spread of HIV / AIDS in your school and community, which of the following messages do you think would be the **most** effective? Circle the letter of your choice.

Three options were provided and the frequency of the options chosen in the pre-, post- and retention questionnaires are shown in Table 17.

Table 17: Frequency of the options given in answer to item 55 in the pre-, post- and retention questionnaires

Option	Percentage of learners who chose each option in each of the questionnaires		
	Pre- n = 214	Post- n = 235	Retention n = 177
A. Persuade all classmates to abstain from sexual activity as advocated by tradition and religion.	23 %	25 %	24 %
B. Persuade all classmates to always use condoms when having sexual intercourse.	46 %	48 %	50 %
C. Persuade all classmates to be tested for HIV so that their HIV status can be checked before having sexual intercourse.	22 %	17 %	16 %
Question not answered	9 %	10 %	10 %

In a personal communication about her research into learners' perceptions of the Life Skills HIV / AIDS programme in South Africa, Roux reported that many learners indicated that they would prefer to be taught about the possibility of abstinence rather than being taught how to use a condom correctly (22 July, 2004).

Reasons that the learners gave for their choice of option in answer to item 55 in the questionnaire varied, but within each choice category, they were more or less the same, no matter whether the questionnaire was answered before or after studying the module. Some of the reasons are given below.

Reasons given for choosing option A in the questionnaire included:

As a young person in order to reach your dream, you have to abstain because a million people die every day in South Africa.

In anyone reads the bible it clearly states that you must not have sex before marriage.

Reasons given for choosing option B in the questionnaire included:

Many people die, so we must use condoms.

Most of us don't follow religion and tradition so we must use condoms.

Because teens think alike and the advice given to them would be effective because they know it is for their own good. But neither say use condoms than saying abstain because they are already involved in sexual intercourse.

Many of the comments given with the choice of option B included the information that sexual intercourse is natural, and that most teens are having it (contrary to the information given in answer to item 52, in which only 22 % of the learners believed most of their friends had had sexual intercourse), e.g.

I won't tell them to abstain nowadays there is no teenager who don't have sex. There are a few of them.

Reasons given for choosing option C in the questionnaire included:

If they know their HIV status, they would know that they should protect the ones they love and condomise when having sexual intercourse.

Many people like to have sex without using a condom. That is why I say we must go to test ourselves because if we don't do so, HIV will spread rapidly.

The last quote reinforces the findings of Torland (2002) and Pettifor et al (2004) that even though adolescents know that condoms are the way to prevent HIV transmission through sexual activity, they are not keen to use them.

5.1.3.5. Question asking for suggestions of strategies to help limit the spread of HIV / AIDS - Item 57

Many of the learners left this item out.

This item asked 'Do you think that there are better (more effective) strategies than those listed as possible

answers to question 55 above?

Table 18 below shows the distribution between the answer yes and no in this item. It was more or less consistent from the pre-, to the post-questionnaire and there was no change in opinion from the post- to the retention questionnaire. It also shows that the learners are almost divided in half in their opinion, especially after they had completed the module.

Table 18: Percentage of learners choosing each 'no' or 'yes' when asked if they could think of a better option to persuade learners to have safe sex

Questionnaire	Percentage of learners who answered each option	
	No	Yes
Pre- (n = 167)	44 %	56 %
Post- (n=163)	48 %	52 %
Retention (n=131)	48 %	52 %

Very few learners answered that item as it was intended. Most of the answers were completely irrelevant or simply repeated the options already given, e.g.

These questions make me feel uncomfortable.

The question give ideas on how to protect yourself.

Its good to abstain and follow tradition, religion and culture.

When you abstain, the possibility of getting HIV / AIDS will be there by accidents like helping people with AIDS, blood, wounds etc.

The few answers that did include suggestions not given as options fitted into the following categories:

More education, more publicity is needed e.g.:

A number of learners said that the media and clinics should play a bigger role in informing people about the dangers they face.

People need the help of doctors, TV, newspapers and radio to be convinced that HIV / AIDS is something we have to expect in order to face the future.

Start teaching young people about this disease because it affect most of young people. Start having workshops at clinics and may be at the church about HIV / AIDS. At schools we must have guidance teacher to give us some tips about everything that is danger.

Making drama about HIV and AIDS. Going to different schools showing the videos about people who are infected. Forming safe community at school that will help students about what they are facing at school and their relationships.

We need to communicate more about this danger, e.g.:

To protect others we must tell them everything that we know.

Remain faithful to one partner, e.g.:

Have one boyfriend or girlfriend in your life so that life can be more good.

Young people should keep their minds off sex by participating in sport or school clubs - mentioned by two learners:

By playing games like soccer and netball after school, you avoid AIDS.

Having them to be part of their communities representatives or school would allow them to have as little time as possible to re-think about sex.

By seeing how much people with HIV / AIDS suffer:

By taking them to the clinics and give them a strange person and show them an infected person who is about to die. It will change their minds because they will fear death.

By talking to people with AIDS so that they can see or feel how painful and difficult it is to live with HIV and AIDS.

Separate schools for learners of opposite gender:

I think all over the world they should make school for girls and boys separate so that they don't see each other because it will be the better way to prevent them from this disease.

Two learners wrote that masturbation is safer than sex:

There are many ways of avoiding sex like masturbating.

Two learners emphasised that the best option would be if a cure could be found:

We must work hard to find the cure because it is killing our youngest sisters and brothers.

A number of learners emphasised how important it is to talk about HIV / AIDS and the dangers:

Because parents are afraid of talking to their children about this virus. Children must have workshops on information about HIV / AIDS.

Forming help clubs at different schools to talk about it because it may help us youths to talk to others about sex, HIV and AIDS.

and

Because when we are afraid to talk about this disease, we are not going anywhere.

One learner suggested that the problem could be solved if the rape of children by adults was stopped:

The reason why I say yes is because adults normally rape children and I think that must stop.

This was a difficult question - if experts worldwide cannot find an effective solution to change sexual behaviour, and reduce HIV infection rate amongst learners, it is difficult to expect a teenager to find the answer. Certainly none of the suggestions contains new solutions, or solutions that have been proven to be effective.

5.1.4. Concluding remarks about the tests of knowledge and the questionnaires on attitudes

The means obtained by the students in the test of knowledge increased after the implementation of the HIV / AIDS education programme, and the answers given in the retention test showed that the improvement was sustained with time. The ANOVA showed that the change was statistically significant. Careful consideration of the answers given by the learners for each of the items in the tests showed that both general knowledge and, more importantly, functional knowledge, of HIV / AIDS had improved. Learners were more knowledgeable on how HIV is transmitted, and also about how to prevent infection. Some of the answers did show that there was still a lack of knowledge in certain areas, but these were areas of general knowledge - such as the year in which it was discovered that HIV is the virus that causes AIDS - knowledge which is not critical to the HIV-safe behaviour.

The questionnaire also showed, that with increased knowledge, there was a pleasing improvement of attitudes towards people with HIV / AIDS. The answers also showed that the learners perceived that their level of self-efficacy was high; they were confident that they know how to use a condom properly, that they know how to negotiate condom usage, and very importantly, that they feel that they have a right to negotiate condom usage before agreeing to sexual intercourse. All of these factors fall into the intrapersonal sphere of Bronfenbrenner's social ecological model for health promotion. Bronfenbrenner also acknowledges that the components of the ecosystem all interact with influencing one another. If all the grade 11 biology learners have undergone these intrapersonal changes in knowledge, attitudes and behaviour, they can influence each other, other learners, the teachers, their family members and the members of their communities to adopt HIV-safe behaviours.

5.2. THE NARRATIVES

Narratives were written by 238 learners. These were analysed to identify their main themes. The learners seemed to be very open in their writing of the narratives. Anyone who is a teacher knows that when a group of students is given a task to do, those who finish last are not happy when others have finished and start to get restless, and so they immediately go about finishing off themselves. Yet, when I was with the learners while they wrote their narratives, many of them were so engrossed in what they were writing, they were unaware that others had finished. I found the information and feelings shared in the narratives quite overwhelming as students shared their experiences of a life affected by HIV and AIDS. When I think back on Scrimgeour's personal communication of 4 August, 2003, where she described narrative writing as therapeutic, I think that many of the participants did find that the writing of the narratives helped them to make meaning of the information in the module and how it related to their lives, and I hope that writing them was therapeutic for those who know the raw pain of being affected by HIV and AIDS.

A number of main themes and sub-themes were identified in the narratives.

5.2.1. Feelings about HIV / AIDS

It is obvious that for many learners HIV / AIDS is an integral part of their ecosystem. For some, it has impacted on their immediate family (the microsystem), while for others it is part of the community - the meso and the exosystem.

The disease is real, it kills and there is no cure.

54.6% of the learners wrote about the reality of HIV and AIDS in their lives - that the disease is here, there is no cure (13.0%), and it kills:

We are always a friend of death because of HIV / AIDS and every Saturday is a funeral for a person that died by HIV / AIDS.

12.18% mentioned that the disease does not discriminate:

This disease killing the nation all over the world white, blue, black, pink or what so ever it doesn't choose it is killing us all.

HIV / AIDS is everybody's disease.

It does not choose whether you are black or white and rich or poor, it infects all.

5.2.2. Emotions about HIV / AIDS

Many of the learners expressed different emotions about the disease.

Anger

0.8% said that they are angry about the disease;

I fell very angry because there is no cure of this disease

Pain and sadness

Many others (28.1%) feel pain and sadness for those who are infected and affected:

It happened at my street at home some one who is now late because of that virus then I begin sad and fill pity for a poor human who left alone with her two daughters. Unfortunately not so long that poor human was also taken by that virus and she was also buried. I was always thinking about death saying how will that happen a very strong man can turn to be tiny and die.

People who are infected I no longer see things the way I used to see them now I do know how is that pain that is in that person's heart that he/she can dies anytimes.

I know in rural areas like my area there is a lack of knowledge. People are just dying like animals. I love my nation. I feel ashamed for the blacks because are the most dying people with Aids.

At house if you HIV positive your friend will not loves you at all time. And you speaking in your own. Many people was not loves you at the end of your time. They will run away. Full time you loose mind in your sick you sick and sick

Helplessness

Others feel helpless:

It was like I was lost before the module was introduced to us.

Fear

Yet others feel afraid:

I think if I go to blood test then I know that I am HIV / AIDS sometimes I will kill my self because one word come in my mind is when I'm going to die.

I feel so scared because this different virus and disease. People die almost everyday and everytime.

Denial

19% of the learners mentioned that people deny that there is such a thing as HIV or AIDS or they just

ignore it and do not want to hear about it:

Juring school holidays I took the book to my friends were we meet and dicous about it. It took us almost a day to get my points about the book and life, what I so is that most people don't belive that there is a sickness that is called HIV/Aids.

There are many people who say Aids is not their and they not want people to talk about it. In the classroom we also talk about it and how can we prevent it and their are others who still don't want to talk they are still afraid.

At my community some listened but other they really don't want to hear about it.

Telling my aunt about the project that I was doing at school she only answered me that I'm wasting my time listening to stupid things. She just said that all of us are going to die so why waste any breath teaching about it.

Some of the students even denied it themselves and would have preferred to ignore the disease (the precontemplation stage of the transtheoretical model of behaviour change):

I was pretending there is no AIDS but now I can see AIDS is there.

I can't finish this book because I don't really want to read about HIV / AIDS in my life.

5.2.3. Lack of knowledge

4.0% described how people lack appropriate knowledge:

I know in rural areas like my area there is a lack of knowledge.

I feel very painful for those who affected by AIDS. Some of them were not aware of it. They were never hear about it ever before. They hear about it when it was too late.

Now I have fill very well because some of this thing have'nt know.

5.2.4. Misconceptions

Learners also described how people have basic misconceptions about the disease and who it affects:

If I were to talk about aids they tell that I have aids.

I tried to explain to them that it's not about foreigners, it is all about you been sexual activate with more then one partner.

They believes that AIDS is a plane for people not to have children.

5.2.5. Perceptions of how people behave and some of the reasons for the behaviour

A number of the learners described how many of the youth are sexually active:

Our parents sometimes tell us how people are dying but we as youth we take them easy. Our parents tell us that we may have one partner because is not easy to tell someone to abstain. Teenegers take the serious things and play with it. Instead of plays soccer, netball and cricket they play with sex.

5.4% described how young people have sex for money and material possessions such as cell phones and clothes. This shows the influence of the social setting of the exosystem on the behaviour of the individuals.

I know some girls they have eight boyfriends one boy friend is for air time another one is for clothes etc.

And most of old mans are like a young girls and he talk to her and they promise a money, cell phone and to enjoy with his car

Many people have AIDS because of money. In this South Africa the people they want money to be a have sex with the any person who have money. And then they doesn't use condom.

5.0% link the use of alcohol to irresponsible sexual behaviour:

The people you drinking alcohol so your body is release so the boy you must rape and don't use condom.

And I don't drink alcohol because I don't want to do a bad things such as to sleep with anybody who liked.

This perception is reflected in the 2003 study of HIV and sexual behaviour among young South Africans: a national survey of 15-24 year olds Pettifor et al (2004) report that while 90% of the youth surveyed were confident that they could talk with their partner about using condoms, only 43% felt that they could use a condom after drinking or taking drugs (p. 61). Ferry (1995) cites several studies that show the relationship between alcohol use and sexual risk practices, including one conducted in Zimbabwe by Paul, Crosby, Midanik and Stall, in which a positive correlation was found between days when alcohol was consumed and sexual intercourse, and a negative relationship between alcohol consumption and the use of condoms during sexual intercourse with non-regular partners. They pointed out that the vast majority of contacts with sex workers occurred when the man had been drinking, and that most of the workers seek their clients in bars (p. 194).

Many are angry with the opposite gender, and blame them for the spread of the disease through sexual intercourse:

Many girl dont want to use condom. They say is like when you eat the sweet that is covered. (written by a male)

And I love man without a woman because woman love anything is expensive life.

Many girls are die because of HIV/AIDS and they like money so that why she gets this disease.

So Aids, I know you are a kill I don't want you in my body because you are so dangerous, but I don't trust condoms because boys is very clever and in your life please don't trust a boy. And don't sure that one boy is yours because you don't if you sleeping at home during the night you don't know what he do. Maybe he have some many girls during that time you don't know.

5.2.6. Learners' attitudes towards learning about HIV / AIDS

And so, it was with these feelings that the learners started the module. Many people including teachers have told me that learners are tired of being told about HIV and AIDS, that there is an overkill of the message that 'HIV is there, use a condom', and that the learners just switch off. So it was pleasing to read such statements as:

At first a though that this book is going to be boring but as it come we realy find it enjoy. It touch us of an important virus.

Further on this learner wrote:

It was a pleasure doing this module with you. Please go to another school so that they can now more about HIV.. thank you.

I was not interested in this module because I was thinking that the is know such disease, but after doing this module I felt like I am in Paradise. This Rainbow Project brought me joy.

5.2.7. What the students learned from the module

As was shown by the increased mean percentage obtained in the post- and retention tests, the learners learned a much of both general and functional knowledge from the module.

5.2.7.1. General knowledge

9.6% of the learners wrote about their increased content knowledge:

Now is better I know all the things about it how it is transferred from one person to another person. Before we learned about HIV / AIDS I thought people get it only when they sex with a person who

is infected. But now I do know that you can get it when you changes body fluids. Now I know that HIV / AIDS you don't get infected by eating with a person who is HIV infected and by using the same toilet, by staying at the same house.

During a recent visit to my GP, the a nursing sister told me that they are seeing more and more elderly women presenting with HIV. These are women who are becoming infected during the process of looking after people with HIV/ AIDS in their homes, because they don't know how to protect themselves from body fluids that contain the virus (Maskell, 2004). It is important that information about how to care for AIDS patients is dispersed through the community, and so it was gratifying to read how many of the learners took their modules home to let friends and relatives read them, and how many shared their knowledge with so many other people.

I am very thankful because before being taught about the disease, I then didn't know anything at all, I used to think that the disease infected people when they touched talked or learned together. And I used to think that if you are infected with AIDS you were going to die sooner, But now I'm very convinced that everything I thought was not the truth.

I just knew that AIDS is a very dangerous disease that can kill a person. I was just hearing from the radios, televisions and newspapers about that. I wasn't hundred percent about that. But after having a module I just started trusting that. I was just thinking that it is just a big book with nothing inside it. It helps a lot. Now I feel over the world because I know much about this rude disease that killed many people.

They wrote of how important it is to know this information:

After receiving a Rainbow Project Education I felt that it is better if I change my life because I didn't take HIV / AIDS importantly and now I realised that it is important to know all the facts about HIV and Aids.

All the significant models of HIV risk behaviour change, such as the AIDS risk reduction model and the health belief model, stress the importance of knowledge before behaviour will change. The individual's increased knowledge will also affect the interactions that person will have with all other factors within his / her ecosystem.

5.2.7.2. The importance of knowing one's HIV status

7.5% of the learners wrote of how important it is to be tested and to know one's status and 5.4% expressed a desire to know their own status:

Look at that person and say to her we are going to blood test befor we share anything. If she run away know that is not the right guy. Wait for the right one who can go to the blood test. When you found him you will know is the right one.

I come from hospital for test blood I am lucky I don't have any diseases.

I go to the hospital after every five months to test the blood.

Pettifor et al (2004) cite three sources: Zachariah, Spielmann, Harries, Buhendwa & Chingi, Allen, Meizen-Derr, Kautzmann et al, and Robles, Matos, Colon, Marrero & Reyes as having found that "Voluntary Counselling and Testing for HIV infection is one strategy that has been shown to reduce high risk behaviour and increase health seeking behaviours among adults" (p. 56). Shisana (2002), also emphasises this. In the national youth survey reported in Pettifor, 60% of the youth aged 15 -24 indicated that they were interested in knowing their HIV status. However, one concern expressed was that 27% of the youth that tested positive for HIV in the survey were not interested in knowing their HIV status!

5.2.7.3. The knowledge to refute misconceptions and myths about sex and HIV / AIDS

5.8% mentioned that the knowledge that they have enables them to refute myths and misconceptions about sex and the disease.

If you can think back on discussion we had with our friend about sex we were all curious about sex & sexuality, you could think of two or three pieces of information which we thought there were facts but later learned in life that they are nonsense.

In terms of the virus passing from one person to another I did not know the truth, I use to believe all those myths that people are spreading for example that you can get infected by HIV / AIDS by touching an infected person or by sharing a toilet seat.

People used to tell myth about this kind of virus, you don't have to believe them they are telling you a lie. I don't believe people's lies I believe in real things that are happening in real life.

5.2.7.4. Knowing what to do when a person is sexually abused

1.6% of the learners stated that they now know what to do if raped, or how to help someone who has been raped or abused, and one student described how she had been able to help a friend who had been sexually abused. As rape is a big problem in South Africa, this knowledge will be very valuable for the learners.

I'm now saying congratulations to my new life because I know how to help someone who has been raped or someone who is HIV.

Now I know how to give advice to someone who has been abused or raped.

If you are sexually raped just go straight to the hospital and ask for test. And you must go before 24 hours. After you may go and report it to the police.

I did helped someone, who came to me seeking for help, and I made it sure that I will be there for her and I advise her. And I was glad to hear her saying that I really helped her through her problem. I know say that to myself that is the new me and I can help anyone who seek for help.

Pettifor et al (2004) state that in the 2003 national HIV and sexual behaviour survey among 15 - 24 year old South Africans, 28 % of the females surveyed who had had sexual intercourse reported that their first sexual encounter was unwanted and 29% state that 'there are times when they have sex with their partner even when they do not want to' (p. 62).

5.2.7.5. Knowing how to look after or advise someone who is HIV positive

21.8% of the learners wrote that they were confident that they could now give useful advice to someone who is HIV positive on how to live a healthy life, or could look after someone who was HIV positive, or would be able to live a healthy life themselves if they found themselves to be HIV positive:

My new knowledge has influenced my life because now I understand everything about HIV / AIDS. I know how to live, communicate and advice a person who lives with the disease. I now know how to make my own choices, because of the diseases.

I never knew I could nurse a person before I thought it was hard works but know I see it in the different way. I can take care of an HIV / AIDS person.

What I have learned from the module is so helpful that I can be ready if someone in my family can be diagnosed, I'll be able to take care of that person and I'll know where to go for extra help

By my knowledge and understanding I have diducted that being HIV positive is not a death sentence one can live up to 20 years having this disease in his body eating the right food, supplimenting to the right pre-ception and excersising.

There might be no cure but it does not mean it is the end of the world if you eat proper food and excercise regularly you will be healthy and being healthy means living longer. I would like to tell the whole universe that you are infected, you are not dead and you wont die unless you don't eat properly.

5.2.7.6. Knowing the implications of physical contact and living with a person who is HIV positive

13.8% said that they were confident that they could sit with, live with or touch people with HIV / AIDS, and use utensils or cutlery used by them, safe in the knowledge that HIV is not transmitted in these ways:

I feel comfortable touching someone who is HIV positive

I was having problem for using the same plate and cutlery as someone who is HIV positive, but how

I have no problem for that. I know all the ways in which person could become HIV positive.

5.2.7.7. Acknowledging the importance of talking openly about HIV and AIDS

25.2% shared their conviction of the importance of talking about HIV and AIDS, and some also said that people who are positive should talk about it too:

I am not shy to say it any more in front of people that my sister was killed by HIV / AIDS because I know more about it and if people talk lies about it I know how to defend myself with true points.

The module has made me realize that talking about this is better than keeping them on your self.

Pettifor et al (2004) state that one of the premises of the loveLife campaign is that more open communication about HIV / AIDS and sexuality will “challenge social norms and lead to positive behaviour change such as delaying age at first sex and increasing safer behaviour” (p. 53).

Increased knowledge is only one aspect that the literature says is necessary for behaviour change, but it was clear from the narratives that the learners not only had increased knowledge, but also they had learned and practised HIV-safe skills and were confident that they were able to use those when necessary. Their writings expressed self-belief and motivation that both the health belief model and the AIDS risk reduction model stress are needed for behaviour change.

5.2.8. Changed perspectives

The perspectives of many of the learners were changed by the module:

I don't know how can I thank the Rainbow project I feel much different from the older day.

My life is complete I have all the knowledge I was looking for.

Now I can spread the news about HIV / AIDS because I know many things about it. Some people when they see me they are so amazed because they don't know me they I am. The see difference of the past and of these days. And me too I never thought that things can be improved like these.

5.2.8.1. Changed attitude towards people living with HIV / AIDS

13.0% of the learners wrote of their change in attitude towards people who are HIV positive:

I thought if a person had HIV / AIDS was a sex worker or a 'bitch' which is not true.

At first I used to say most people who have HIV and AIDS they deserve to “die” cause many TV programmes, newspaper they talk about AIDS. But now I know how to give an advise to friend who

don't have much information about AIDS...

Some expressed increased respect for people living with HIV / AIDS:

I was saying that people living with the disease ... I used to discriminate them thinking that they not human beings enough for us to live with them.

And someone who is affected these virus has got the right to talk about it to the tribe.

8.4% of the learners saying that it was important that people living with HIV / AIDS must talk.

Being HIV positive doesn't mean that you have to exclude your self from other people. But communicate as much as possible because it takes your mind off other disasterous thing you think of doing when you are alone.

5.2.8.2. Learners were emotionally changed

Pride

19.3% of the learners wrote of their pride in having done the module and the knowledge they had after doing the work. They are proud that they can share their knowledge with others:

My life have changed now I can sit down to talk to my mother face to face and the other way around I could teach my mother more about HIV / AIDS. My mother sat with me down and wanted to talk to me about sex and HIV / AIDS the next thing it was me teaching her about sex.

I can teach my younger sisters and brothers about HIV / AIDS.

My aunt is a nurse and I impressed her very much.

I am proud that I know more about the diseases that is facing the world right now.

Now I can spread the news about HIV / AIDS because I know many things about it. Some people when they see me they are so amazed because they don't know me they I am. The see difference of the past and of these days. And me too I never thought that things can be improved like these.

The pride shown by the learners is an important aspect of change of the individual. This will filter through all aspects of the individual's ecosystem.

Happiness and hope

25.2% wrote of the happiness and hope they now feel:

I feel so free because when I started to involve to fall in love I will make things step by step because I have learned about life, and no body can try to sleep with me without a condom.

Now I am feeling relieved and comfortable. Before I get these education I got other one from Bochum and I didn't understood it very well. As far as the module is concened I have understood many things.

All that I can say is that the book has just touched me in so many ways and I don't know what to say but all I can say is that please keep up your good job and stay teaching youngsters about this disease AIDS and how it is killing the world especially the youth the young generation like me.

Really the lesson that I got from the module you provided for me it was really shocking for the first time that I started to read, but it has certainly increased my chance of been aware of how does this spreadful, strong and uncured deasease affects people I mean human beings. Since I started to read the it certainly incouraged me and it also influenced to such an extent that I can even be able to tell the whole of my family to go for an HIV blood test.

Confidence

47.8% of the learners wrote with confidence about their lives and their knowledge:

Now that I have my new knowledge about HIV and AIDS I feel much better. I found it easy to talk to other people about it and feel free about it.

The module that I was read at school it teaches me about life. How to be safe in the country that I am living in. It teaches me about Aids and other viruses. That Aids is the and its a killer hat we must abstain so that we can have a better generation as the young youth.

Presently I feel comfortable but not 100 percent comfortable that I know everything about HIV / AIDS because in every new day of our lives there is a new thing to our minds. I am 16 years of age but don't thing I know all about HIV / AIDS but I know much about it.

Now I can expirence that the more you get information the better you protect your life.

Power

Learners wrote of the power that the knowledge has given them:

Wern the Rainbow Project came to my school this now days I can take time to share the problem of HIV /AIDS and now my brother and my sister are very happy because he / she now many things about syndrom.... now I know learning and schooling is the power because Rainbow Project it come to my school to teache about a dieses and effecting of dieses.

On my behalf it change me. I change a lot. I was shy to talk about everything to my sisters, brothers about safe sex. And I was afraid to ask something that I don't understand about sexual intercourse. It was dark on my front. But after getting this education, now a can tell you something. I can tell the different between safe sex and not safe sex. I can sit down with my brothers, my sisters to discuss about sexual intercourse. Now I am open to everyone to talk about his particular things. And this project it gives me a lot of power.

Now feel very very confident because I have power against it.

Control over one's life

Pettifor et al (2004) say that 'without a sense of future, youth may have little motivation to protect themselves from becoming infected with HIV' (p 58), so it is pleasing that 16.3% of the learners expressed confidence in the control they have over their lives - that they know that there are choices, and they perceive that they know how to make the correct ones:

My new knowledge has influenced my life because now I understand everything about HIV / AIDS. I know how to live, communicate and advice a person who lives with the disease. I now know how to make my own choices, because of the diseases.

Nobody is responsible for my life except me. And that life is still about choices.

Now I know a lot about HIV/ AIDS and how to prevent myself from getting infected, and how to protect myself if I want to have sex.

But now I know that I am doing the right thing of preventing myself from HIV / Aids and I know all the ways in which I can protect myself and all other people.

The importance of these personal changes in each learner cannot be overemphasised - it is clear that many of them felt empowered by the work that they had done. Self-efficacy is essential for HIV-safe behaviour.

5.2.9. Changes the learners have made in their behaviour

Many learners provided evidence of how they had used their new knowledge and skills to make changes in their behaviour.

5.2.9.1. Personal changes

Some of the learners spoke about the changes they have made in their lives:

As I know that many partners can you / I get HIV very easy, I have reduce my partners as far as I knew.

And now I know what to do and what I can't do that will harm my life. I was a kind of girl who likes to sleep around but now I have change. Now more sleeping around cause I know what will be the circumstances of sleeping around thanks to the people of Rainbow project to come to our school and give us some lessons about HIV Aids. If it was not them maybe I would fall under those who have HIV-Aids.

Abstinence

15.1% of the learners wrote about choosing abstinence to protect themselves:

I would like to say this Rainbow project it has make me feel much stronger to remain faithful for abstaining. I like this project very much.

I would like to say this Rainbow project it has make me feel much stronger to remain faithful for abstaining. I like this project very much.

... that having sex I know is a gift from God especially made for married guys but cause we young teenagers also goes through the process we must be very careful through the process by using condoms but the way it influence me I think the better way is to abstain from the process.

I use condoms

28.1% wrote of the importance of using condoms to protect themselves:

but now before I have sex with you I want to use a condom

Now that I know the consequences of HIV / AIDS ... negotiating with my partner about it is no more a problem at all.

Aids is so dangerous I want to protect my life with condoms.

I was having a boyfriend and he didn't like using condoms and I was always agree with but after having a knowledge I realised that I'm so stupid like a donkey and I'm also killing myself. I too my module one day and give it to him, he read but he disagreed. I realised that if I can continue with this I can't reach my goal life so we broke up.

You have the right to say no sex without a condom. (written by a male learner)

5.2.9.2. Learners have encouraged others to change their behaviour (48.7%)

Encouraged abstinence

I tooked my module and gave it to one of my friends, she read after she asked me to help her with something. She said that she had a boyfriend and her boyfriend had more than one partner so she didn't knew how Aids can affected because she trusted him. I told her that the better way for a better life is to abstain or to use condoms because with Aids there is no trust. After a few weeks she came back and tell me that she now uses condoms.

If we can just abstain we can be good parents of tomorrow and we will be able to talk to our children about this monster. then there will be a good and healthy generation.

Encouraged condom use

Youth remember a coffin is too expensive than a condom. A condom is free.

Encouraged a reduction in the number of sexual partners (13.4%)

First of all have one partner because more of a partner you cannot control it.

What I can say to my friends just have sex with one partner.

It was clear from this aspect of the narratives that the learners are not keeping their knowledge and skills to themselves but discussing and sharing with their friends and family. In this way, each learner is affecting people in more than one level of his / her ecosystem -the micro, the meso and the exosystem: - "the child invariably influences those who influences him" (Bronfenbrenner & Mahoney, 1975, p. ix).

5.2.10. Talking about sexuality and HIV / AIDS, and sharing this knowledge with others

Most of the learners wrote with pride about sharing their new knowledge with others. They were confident that they knew what they were talking about and were keen to help others in their communities:

I think this knowledge saved my life as I am going to pass it to those who don't know and tell them to do the same as I did to them. I think this knowledge and condoms etc is the saviour of our lives.

5.2.10.1. Talking to their friends

37.8% of the learners wrote about sharing the knowledge with friends:

I can sit with my friends to talk about safe sex. We can now crack a joke about sexual intercourse.

Juring school holidays I took the book to my friends were we meet and dicous about it. It took us almost a day to get my points about the book and life, what I so is that most people don't believe that there is a sickness that is called HIV/Aids.

5.2.10.2. Sharing the knowledge with their family

36.1% of the learners described how they had told members of their families about the work they had learned. Family members who were mentioned were siblings, mothers (15.1%), fathers (13.4%) and even aunts and grandmothers. This is really significant as Pettifor et al (2004), cite the findings of research done by Jaccard & Dittus, and also by Rafefelli, Bohenschneider & Flood, that young people who have spoken to their parents about HIV are more likely to engage in safer sexual behaviour.

Most of my family have read the book they found it interesting for them because they found more tips about life and how there body gets infected with the disease.

Nowadays I am free to talk to anybody about HIV / Aids and even my parents.

So I would like to thank those people about the information they had supplied to me and also my Friends and Classmate not excluding my Parents at home because where every I got information about HIV Aids I have to share it with my parents so that I will not loose them at the end.

7.1% wrote of how their parents did not talk with them about sex or HIV / AIDS and some described the difference having learned the module has made in their communication with their families:

We know according to many cultures it is a taboo to talk to children about sexuality and that inhabit the transfer of information because wrong information get passed from one person to the other and we as children could not afford to have secretive convesation about HIV / Aids & sex with our friend so these project has helped a lot because now I have a confidence to got to my parent and ask them about sex and HIV starts and they feel open now because of me & these project I've told them about. Before these project I couldn't talk about sex or HIV / Aids cause I felt like I was making a great sin thill this project came and I realised talking about his things gives us an open mind.

and the most interesting thing is that I can talk to my teacher or my parent if I have any problem. But before they teach about AIDS and sex, I couldn't talk to my parent about this, just because I was scared that what will my parent say when I ask them some question's about AIDS and sex now I have

new knowledge...

5.2.10.3. Sharing the knowledge with others

32.3% of the learners described how they had shared their new knowledge with others, some of whom were strangers met in taxis, the shops or on the streets:

Another thing is that I have told the tribe of the village where I came from. Some believed me and some didn't. Because in real life we cannot have the same characteristics.

I make sure that the sun will not set until I've spoken or showed someone about the HIV / AIDS epidemic. Though it was not an easy journey to go. I've had some problems with people you'd say things to me that really hurt my feelings, but in the end I had to actually hold my head up high and not give up.

The sharing of knowledge amongst friends, family, peers and members of the community means that each learner is helping to shape the factors in his / her ecosystem that influence his / her behaviour. I certainly never expected the extent of sharing in the community that the narratives show has happened.

5.2.11. Misconceptions

As was shown in the questionnaire, when only 45 % of the learners in the post-test disagreed with the statement 'it is possible for a mosquito to transmit HIV', some learners still have misconceptions. In the narratives 2.5% of the learners unfortunately still expressed misconceptions such as being able to get HIV from mosquitoes or from eating off the same plate as another person who has HIV / AIDS:

A person who is sexually assaulted by an HIV positive because they were a rapist can significantly reduce the chance of becoming HIV positive by bathing or showering as soon as possible after the rape because if they don't wash her immediately that disease they were going inside to her

While 1.6% specifically stated that it is possible to get HIV even if one is married or faithful to one partner, 4.6% wrote that if one is married, monogamous or faithful to one partner, one cannot get HIV:

There is a difference between people who are married and people who are unmarried. Married people I think he / she know about their wife or husband. Unmarried people did not know anything about their boyfriend or girlfriend.

Now I know AIDS is a dangerous disease if you have sex without using a condom if you did not get married.

5.2.12 Concluding remarks about the narratives

The narratives were a source of rich information about the lives, the ecosystems and the feelings of the learners. The learners are very aware of HIV / AIDS, that there is no cure for the disease and that it kills. I was overwhelmed by the depth of feeling shown in many of the writings, and how positive the learners felt about the HIV / AIDS module. Learners were motivated to behave in an HIV-safe way, they were extremely proud of what they had learned, they expressed how empowered they felt by their knowledge and they were sharing it with family, friends and even strangers in the community.

Many learners wrote of changes that they had made (or intended to make) in their behaviour, and how they had encouraged their friends, siblings and parents ensure that they were safe from HIV. Some learners wrote of their intention to delay sexual intercourse, and also of intended secondary abstinence, until they were older or married. Most of the learners expressed an intention to use a condom when they had sexual intercourse.

The writings showed how important the teacher is - the learners trust what the teachers tell them. This has implications for both the selection and training of HIV / AIDS teachers.

Many learners expressed appreciation for the programme and suggested that we take it to other schools where there were no such programmes.

The narratives gave me insight into the intrapersonal, micro-, macro- and exosystems of the learners. The learners include those who are living with HIV and AIDS in their communities and lives, people who are affected by HIV / AIDS almost every day. 39.4% of the learners wrote that learning this work had changed their lives:

According to me I have learned and changed like I have never been naughty before I use to be a girl who used to go out with old guys not to say that only old guys can give me an AIDS even the young ones like me because you might never know is he / she is sleeping around. To me it was just a big challeng to lean about this disease known as AIDS. I was shocked thinking that it does'nt affect youngsters like me.

I think that this book has just changed me and teached me to love my self and abstain till I am old to be a wife of my house having all the good thing that I have always dreamed of then I can now have sex married with a man who loves me.

And it has touched my heart and even my mothers because she did'nt know how to change my life but thank God somebody did that only by reading a book talking about AIDS and how does it affect a person and how bad does a person dies.

27.3% expressed their appreciation of the module:

When I started to read the Rainbow project, my problem are started to be right all the time because this book have a good advice to children.

For myself the Rainbow Project have made my life easier because I did not know much I only knew that ther is a desease colled Aids I did not know the risks, I wanted to know more.

6.3% asked that we take it to others, so that they too might benefit from it, so that we can get rid of this disease that is killing us:

It was a pleasure doing this module with you. Please go to another school so that they can now more about HIV.. thank you.

(and this was from the student who started 'At first a though that this book is going to be boring')

I think you must go through all schools with this modules because it really helps. There are many school, their teachers don't teach them about sex, HIV and stuff like that. ... and I think you should also teach it even on television so that everyone may know that HIV is a killer.

I think this program need to be done in many school not as only the whole of South Afrika so that they must have much knowledge they should know that AIDS or HIV its alive and it doesn't choose who you are or what you eat its there alive.

Many of the narratives touched my heart and encouraged me to carry on with the Rainbow Project, even when it was difficult to do so, but the quotation that sums it all up is:

All that I can say is that the book has just touched me in so many ways and I don't know what to say but all I can say is that please keep up your good job and stay teaching youngsters about this disease AIDS and how it is killing the world especially the youth the young generation like me.

'Motivation feelings can be divided into those that involve sensing some degree of energy, potential, and activity and those of the pleasure-pain value of the moment' (Edwards, 1999, p 17). Many of the learners have reflected a changed perspective on life as they have feelings of happiness, confidence, courage, and pride. They acknowledge that they have choices and they feel that their knowledge gives them the power and the courage to make the choice that gives them a future. Their changed perspective and feeling of being empowered provides motivation for them to make choices that reduce HIV-risk behaviours. The learners have not kept their knowledge, feelings and skills to themselves, but shared with friends, peers, family and community members, and in this way, they have affected other elements in their ecosystems. This will increase the chances that they can behave in HIV-safe ways.

5.3 TEACHER INTERVIEWS

Note:

- Where (line and a number) are given, it refers to the numbered line in the interview transcripts - Appendix E.
- Where # and a number is given, it refers to the number of a school / teacher in the study.

5.3.1. Aim of the teacher interviews

The interviews with the teachers were conducted to help address Research Question 3: “What problems do teachers have with teaching the module?” The teachers involved in the study were questioned to find out whether they had any problems, and the nature of such problems, so that an attempt could be made to rectify or assist with these in the future during workshops, revisions of the module or in the teacher’s file. The interviews were structured to derive information on particular problems that teachers had spoken about, or that I had observed in the classrooms, such as whether they had control over teaching a section, such as HIV and AIDS, that is not officially in the grade 11 biology syllabus.

I have classified the information gathered from the interviews into the following categories:

5.3.2. Time for teaching grade 11 biology and the time it takes to teach the module

These questions were included in the interview schedule, as I was trying to establish how long it took the teachers to teach the module, and whether the length of time the module took to cover would affect their willingness / capacity to teach it. This would obviously be affected by the amount of teaching time allocated to biology each week.

5.3.2.1. Time allocated to grade 11 biology class per week

The amount of time that the five teachers each had to teach the grade 11 biology class ranged from one school with three hours per week (# 3), to two schools with four (# 2) and four hours and five minutes (# 7) each, and two schools with five hours (# 5 and # 6). Over an academic year with approximately 30 teaching weeks, the teacher with five hours a week gets 60 hours more teaching time than the teacher with 3 hours per week - a considerable difference!

The difference in teaching time could seriously affect whether a teacher is able / willing to teach content matter, over and above the prescribed curriculum, to a class. The prescribed grade 11 biology curriculum is very long. Schools within some regions write common examinations and the learners’ results in these examinations are important as they are seen as a reflection on the school, the teacher and the learners. This means that the teacher has to cover the whole of the prescribed curriculum very thoroughly; therefore, adding in a comprehensive HIV module is a problem. While HIV is meant

to be taught mainly in Life Skills and Life Orientation, it is the policy of the National Education Department that Life Skills and HIV education should be integrated into every subject (personal communication, Sophia Ngcobo, Provincial Life Skills and HIV / AIDS Co-ordinator for KwaZulu Natal, 25 June, 2003). However, it is not very easy to include it in a meaningful way, if there is no time to do so. The new curriculum which should be implemented in grade 11 in 2006 does include the teaching of HIV, but there are four knowledge areas to be covered in the year, one of which is tissues, cells and molecular systems, and for grade 11 the content to be covered in this knowledge area is:

- micro-organisms (viruses, bacteria, protists and fungi)
- diseases for example rusts, blight, rabies, HIV / AIDS, cholera, tuberculosis, malaria, thrush
- immunity

This makes HIV / AIDS a relatively small part of the new curriculum, and thus again, difficult to teach in enough detail to make it meaningful.

5.3.2.2. Length of time required to teach the HIV / AIDS module

Of the five teachers interviewed, only two (# 3 and # 7) thought the module was the right length to be taught in 5 to 6 school weeks for which the module was planned. What was interesting is that these were not the two schools where the teachers were allocated the most time for teaching grade 11 biology; rather they had 3 hours, and 4 hours 5 minutes respectively. One of these teachers (# 7) justified the length as being acceptable by saying she had combined certain sections together when teaching the module:

when I look at the module I find that it is big but when you teach it in your classroom its very easy to teach two topics at the same time as you cannot cut it short when they overlap with one another. So the time that was given for teaching that module I find that it more or less accurate. You can even do it at a faster pace than 6 weeks.

The other three teachers (# 3, # 4 and # 5) found the module too long to be taught in the planned 5 to 6 weeks, and recommended 8 weeks, even though two of these teachers have 5 hours per week to teach grade 11 biology:

I think it was too long. Because certain parts of the module I had to leave out, especially some of activities I had to leave out. If you do all the activities, you probably won't complete it within five weeks.

A recommendation that the I would like to make is that a comment should be included in the introduction to the module or, at least in the teacher's file, that the module does not have to be taught completely but can be adapted to suit the class, the teacher or the time available. This is a suggestion that is now emphasised during the Rainbow HIV / AIDS workshops when the teachers are introduced to the module.

5.3.3. Parts or activities left out in the teaching of the module and the reasons for which they were left out

Only one teacher (# 3) did not leave anything out when teaching the module. The parts left out by the other teachers and the reasons for leaving them out, varied.

Teacher # 2 left out those activities which she felt would take much time, for example, the compiling of the questionnaire (lines 13 - 21):

We had one activity where learners had to build the structure of a virus and then there was one activity where they were actually supposed to compile a questionnaire, which I thought will take a lot of their time.

She also left out those which could be done at other times of the year:

And there was one activity where they were supposed to draw I think graphs which I think is part of what you are supposed to do and I thought I can leave that out because I will definitely do it with them in our lessons when we do portfolio work

The condom investigation had to be left out, as one of the pieces of equipment was not delivered in time.

Teacher # 5 left out the last three sections - parts 6, 7 and 8, while teacher # 6 coped with the time limitations by only discussing generally those parts of the module that she felt that the students already knew such as the use of condoms, counselling, the use of drugs (antiretrovirals) and testing:

There were some that we just discussed under general and the learners know them.

Teacher # 7 left out those activities that required the learners to be able to use English with confidence - the debate and the role playing. The reason she gave is that they feel embarrassed when having to express themselves without shyness (lines 469 - 471):

The problem of language which we are having in our school whereby we find that the second language which is English is giving them a problem in each and every subject. Although we are trying our best to communicate with them, but its really, its is a problem.

Role playing wants active students who will talk freely without any shyness, but because they couldn't express themselves they felt embarrassed.

She also left out the simulation of taking antiretrovirals, the reason being that the students did not take the activity seriously. From the time she gave them the sweets, they just played the fool (lines 458 - 463):

that one of drinking pills they were, when I was giving instructions they were not carrying instructions

as I word unclear you see they were making fun out of it too much, not concentrating on what they were supposed to do like when they see sweets they were just playing and when I say 'when I do this you must drink your first pill' they were just doing it at their own pace, laughing, wasting all the time.

Again, I must emphasise that the teachers who teach the module must adapt the contents of the module to suit the needs of the students and the materials that are available. Not all activities have to be covered.

5.3.4. Availability of materials for those activities that required materials other than those provided in the module

The materials for the activities were all provided by the study. All five of the teachers interviewed would have had a problem obtaining some of the materials required for the activities in the module.

The lead shot and the conduit piping were materials listed by all teachers as being a problem, while retort stands, measuring cylinders and buckets were a problem for teachers # 3, 5, 6 and 7:

The retort stands and the materials needed for that experiment, the condom experiment.

It is to be noted that schools # 3, # 5, # 6 and # 7 did not have laboratories. School # 7 is in the process of building a laboratory, but it is also not yet equipped.

cylinders together with the retort stands, I would not have enough retort stands, together with the lead and also the buckets, I won't have the buckets.

Obtaining the chemicals for the simulation of transmission of HIV was a problem for schools # 5, # 6 and # 7.

We would have a problem because we do not have a laboratory and then we also we do not have the chemicals that we are supposed to use.

None of the teachers mentioned obtaining condoms as a problem and teacher # 7 mentioned that she could get them easily.

- **Sweets for the antiretroviral activity**

It is obvious that for many schools, the purchasing of sweets to simulate antiretrovirals is not feasible, but there are alternatives, where learners could use commonly eaten foods, such as cooked beans and mealie seeds, to represent the medicines.

- **Equipment for the condom investigations**

Lead shot is an expensive item (currently R18.72 per 500g, with approximately 4kg needed per group,

and therefore 24kg needed for a class divided into 6 groups which means a cost of R898.56) and it is often spilled and lost during the course of the two investigations in which it is used. In an effort to find a cheaper alternative which is more readily available, we tried a number of different materials (water, mealie meal, sand, marbles), but none of them worked. Table 19 below shows the results of the alternative substances used in the condom investigation.

Table 19: Alternative substances used to try to stretch a condom and the effectiveness of each

Substance	Result
water	condom did not stretch, and the water simply overflowed the top of the condom
sand	the bursting of the condom could not be attributed to the amount of sand placed in it as the sharp edges of the sand particles tore the condoms
marbles	condom did not stretch
mealie meal	condom did not stretch

I also asked a group of science teachers to see if they knew of a heavy, but cheaper material, but they could not suggest anything feasible. So, lead shot remains a problem for which I see no solution, other than the teachers' leaving out the two condom investigations, this would be a great pity as the students really learn a great deal from them. In the study done by Sluijsmans (2002), students' comments on the module included:

Doing the experiments really taught me a lot

What I enjoyed the most was the part where we had to do experiments about condoms

Teacher # 5 also commented:

But that one it was one of the most interesting activities.

Having personally watched many classes and also teachers in workshops doing the condom investigations, I feel that it would be a pity to leave them out. The participants undergo a perceptible change during the course of the experiments. Many start off quiet and shy, and a bit loathe to handle the condoms, but by the end of the first investigation most of the students are fully involved, at ease working with the condoms, and all keen to know which make of condom is the strongest. After that, most of the learners are comfortable with talking about condoms during lessons, and hopefully also in sexual situations where it really matters.

Measuring cylinders for the condom investigations are quite expensive (R58.70 for a large plastic cylinder), but they are durable and last for years. An alternative would be a cheaper measuring jug, or different size bottles to measure the volume of lead shot used to burst the condom. The latter solution is not as accurate, and would mean that the skill of measuring volume accurately would not be reinforced.

The other items needed for the condom investigations are not such a problem. Conduit piping and funnels are cheap items. Funnels are readily obtainable in supermarkets, and a few metres of conduit piping can be bought for less than R50 at a building or plumbing supplier and sawed into suitable lengths and the surfaces sanded smooth. However, while I might perceive these items to be easily obtainable as I live in a large city, this might not be the case for teachers working in rural schools.

Other containers for example large tins or cardboard boxes can be used instead of buckets. The suspended condom could be held rather than using a retort stand and clamp, although this would be exhausting for the learner who has to do the holding.

- **Equipment for the simulation of transmission of HIV**

Tap water and cups can be used for this investigation. Learners can pour the solution from one cup to the other during the 'exchange of body fluids', rather than using droppers, although there is more chance of them spilling the fluid on themselves. Safety precautions of washing will have to be emphasised.

NaOH is relatively cheap - R21.57 per 500cm³, and as only about 20cm³ is used for a class of 20 learners, 500cm³ would last a few years. Phenolphthalein indicator currently costs R54.00 per 500cm³, which would last a few years, even at a school with many grade 11 biology students. It is, however, not as easy for teachers in rural areas to obtain either NaOH or phenolphthalein as it is in the cities where there are biological supply companies.

Possible solutions to the problem of availability and cost of materials

There are possible solutions to these problems, but their feasibility would have to be investigated.

- The subject facilitator at the district office could keep a supply of the materials and chemicals and these could be booked out, like a library book, when they are needed.
- A group of schools could pool together to buy the materials, and then take it in turn to use them.

It is essential that the HIV / AIDS Teacher's file should include all the hints and alternatives given above.

5.3.5. The adequacy of the knowledge of the teacher for teaching the module.

All five of the teachers involved in the study had attended a workshop run by the Rainbow Teacher Enrichment Programme. In addition, teachers # 2, # 5, # 6 and # 7 have each attended an HIV / AIDS workshop at the University of Wisconsin, and teacher # 7 had attended a teachers' training programme with PPASA. All five of the teachers felt that their knowledge was good enough to teach the module effectively:

Yes, before I started teaching this, because I went to.... I attended a teacher's a training programme with the PPASA whereby they were training teachers on how to teach modules or on HIV / AIDS so I did have some knowledge before because I attended many training courses for teachers before.

Ja, er, I attended some workshops subsequently that have helped me a lot.

The researcher did, however, observe teacher # 6 making a number of content errors while teaching the module, and both accepting incorrect answers from students as correct, and saying that correct answers given by learners were incorrect.

Teachers # 2 and # 7 were confident enough in teaching the work that they rearranged the order in which they taught the work and combined work from different parts together (lines 39 - 42 and 406 - 409):

I actually had to combine certain parts of the module together, link certain parts of the module together so that I don't have to repeat them in the other module, like for example part 8 was combined with part 3 because I discovered somewhere in part 3 they discuss about the misconceptions so then I brought that there and then I dealt with it once and some of the things I actually didn't have to read through the module with the learners - I had to explain and then give them homework to go through with it.

when you teach it in your classroom its very easy to teach two topics at the same time as you cannot cut it short when they overlap with one another.

Teacher # 3 had a problem with getting the concepts of DNA across to her learners, but reported that she managed to rectify that (lines 173, 174, 176). Teacher # 6 suggested that a model of DNA could be included with the module (line 395 - 396) as this would make it easier for the learners to understand DNA:

And again the model of DNA and RNA, the strands, maybe we can find a model, it would be much better for them to understand.

Possible solutions to these problems are:

- Teacher workshops and up-to-date literature are essential to provide the in-depth knowledge that teachers need in order to teach the subject matter adequately. When HIV becomes a part of the formal curriculum in biology, teachers will have to learn more about the science of HIV. It is hoped that the Departments of Education will provide the necessary workshops and literature for the teachers.
- The HIV teacher's file will provide background information to help teachers.
- The HIV teacher's file could include the template for model of a DNA molecule that was provided with the Rainbow Genetics module.

The experiences that we had at school # 4 highlighted the importance of teacher knowledge, and thus the importance of both the teacher workshops and the teacher resource file. During the course of this study, a second researcher started a parallel study, at school # 4, on the teaching of the module. The school was chosen for different reasons than had the other 6 schools in the study - it was simply one where the principal was prepared to allow the extra work to be taught. Neither of the teachers of grade 11 biology at school # 4 had attended a Rainbow HIV/ AIDS workshop or any other workshop or training on HIV. The second researcher spent a few hours with the two teachers helping them prepare for the teaching of the module, and then the teaching started.

The situation was not ideal as the second researcher could attend one lesson per week only, and so it was arranged that the module would be taught on that day only and for the rest of the week, the formal curriculum would be taught. The researcher continued to help with advice on the teaching of the module, but after the first two weeks the two teachers said that she was better prepared than they to teach the work and they requested that she do the teaching. As this was not the purpose of the study, she refused and asked me to help workshop the teachers on the content of the module. On meeting with the two teachers, I found an attitude of anger and resentment - they did not want to teach the module at all. When I asked them why, the one simply said that he did not want the extra work that teaching the module entailed. The other said that she did not know enough about HIV / AIDS. I explained that all the work necessary was in the module, but she said that this would mean that she would only know as much as her learners did, and that if a learner asked a question which she could not answer, she would lose face and the learners would lose confidence in her as a teacher. Although I pointed out that there was a Rainbow Teacher's workshop running soon after that, that they could attend and this would prepare them for teaching the work, neither was interested in giving up holiday time to attend the workshop, and the study at this school folded shortly after this.

This matter raises interesting questions: the teachers in the other 6 schools were passionate about

teaching the module, and went out of their way to organise their school year and their teaching to enable this study to take place. They had all attended a Rainbow HIV / AIDS workshop. Do teachers have to feel confident in their knowledge and ability to teach the work before they will teach it? If all biology teachers attend workshops on HIV / AIDS, would they be willing to teach about it? Or are the teachers who give up holiday time, and pay out of their own pockets to attend a workshop the only ones who are interested or care enough to teach the work?

5.3.6. The ability of the teacher to cope with dealing with the emotional aspects of HIV / AIDS when teaching the module

All five teachers felt they had coped well emotionally with teaching about HIV / AIDS. Teacher # 2 commented that there had been no HIV infected learners in the school and no learners had mentioned that members of their family were infected. However, during the analysis of the narratives, two learners from this school disclosed that they were HIV positive.

At the moment in our school, we don't have cases of learners who I can say are living with the virus or died from the virus and even in the class where I was teaching there was not even a single one who actually maybe came to me and said I am affected because I have a member of my family who is living with the virus. So we don't have any problem.

So in my case, especially that I am very used to these kids, I normally go to the classes and talk to them about life skills under general or health talks. I didn't find any problem when teaching them because they are used to me as a friend, we are at the same level, so I didn't have a problem.

Teachers # 3 and # 6 reported that the students were interested in the topic because of the reality of HIV.

HIV is real - they are aware of it.

The researcher must, however, report that the analysis of narratives written by these learners does reveal that a number of the learners report feeling pain caused by the HIV pandemic. In addition, the researcher observed that the teachers involved in this study have an exceptionally good relationship with their learners. The lessons taught by teachers # 5, # 6 and # 7 that were observed during the study showed that the teachers and the learners were able to talk openly and honestly with each other and they all respected the opinions of others. The narratives also showed that the learners trust what they are taught by their teachers.

5.3.7. The autonomy to determine what is taught in the classroom

Teacher # 2 reported that under the current system of education, she does not have the autonomy to determine what she teaches in the classroom, that she has to adhere to the syllabus and that this is controlled in various ways (lines 62, 63, 66 - 69).

At the moment we have to stick to the syllabus and teach what is supposed to be taught according to it - the syllabus

We have cluster meetings and we have to do portfolios and at the end of the year we have to write common exams, so it is very important that we actually teach the same thing and make sure that we complete that within the required period. So that the learners will sit for the common paper at the end of the year.

The researcher also experienced the disapproval expressed by the subject facilitator for this school when the teacher arranged to teach the module for the purpose of this study.

Teacher # 3 said that the subject facilitator was flexible about what she teaches her class, but that she is sometimes limited by the conservative attitude of her learners who are not open to talking about sexual activities (lines 187 - 190).

You know sometimes students are too conservative. They are still following their culture and they are too conservative They follow what their parents do tell them. Like sometimes when you tell them something and they say 'No, no, that is not right', they are still having that hidden idea about sexual activities.

Teachers # 5 and # 6 both said they had the autonomy to determine what was taught in their classes, while teacher 7 said she had to stick to the curriculum of the district that was given by the Department of Education.

The determination by the Department of Education of what can be taught could therefore continue to be a problem for the teaching of HIV / AIDS as the 2006 FET National Curriculum Statement shows a biology curriculum that is, again, very full (NCS -FET Life Sciences p 1 - 48). As commented earlier in this chapter, while there is a place in the curriculum to teach HIV in grade 11 biology, there is very little time for it to be taught, and therefore it cannot be taught in enough detail to make the study meaningful. The problem of lack of time to teach something will be exacerbated by the Minister of Education's decision that the FET learners have to do 7 subjects instead of 6, which means that less time will be allocated to each subject.

5.3.8. Comments about the module made by the teachers

5.3.8.1. Teacher # 2

Teacher # 2 is a very experienced and organised teacher, and she commented that:

- it was possible to leave parts out of the module as they could be taught elsewhere or even in other subjects, for example, she used the comprehension of the stages of the disease - activity 2.3 - in her life skills lessons in grade 10 and 12 and also gave it to the English teachers to use.

I gave even the language teachers that comprehension test where it explains the different stages of the HIV / AIDS and I also used those copies during my life skill periods in grade 10 and the grade 12 classes I gave them the comprehension test and I said lets discuss that and they follow that it was quite interesting that. Teachers can also use that to teach kids about HIV / AIDS even in a language class in the form of a comprehension.

The drawing of graphs could be used for portfolio work or used in other grades when the learners have to draw graphs.

- it was possible to join certain sections that contained a certain amount of repetition

other sections like part 8 and part 3 because there is actually repetition of some of the concepts, they can be linked together certain sections so that the module is taught within a period of 5 weeks

- a number of sections could be left out of the learner's module and included in the teacher's module to give background to the teacher, or for the teacher to include while teaching as the need arises.

I think it is the immune system and then we have, I think from also that part the social and economic impact of HIV and you also had that section on scientific investigation - that can also be in the teacher's guide and then the teacher will have to plan and then discuss that with the learners instead of that information being in the learner workbook.

These sections were:

- ◆ The **immune system**. The immune system is taught in grade 10 biology, but as part of the circulatory system and it is not covered in great detail. The immune system was included in detail in the module as:
 - ▶ it was felt at the time of writing the module that not all grade 11 biology teachers teach

grade 10 biology and therefore they might not all be familiar with the details of the immune system

- ▶ the amount of detail in which the system was covered in grade10 was not adequate for the learners to understand CD4 cells and their role in the immune system
- ▶ learners do not always remember the following year what they have learned in one year, especially when the work learned is not used as a building block that is used repeatedly until the following year. For example, a theorem in mathematics taught in one year is used to solve geometry problems again and again that year, thus being reinforced

◆ **scientific investigations.**

- the students found the language used easy to follow.
- the module generated a high degree of interest in the learners.

they were very motivated and they participated positively because it was the language was actually on their level, so they found it very interesting.

When asked if she would choose to teach this work if the new FET system allowed a choice of modules, the answer was

Yes. Yes, definitely.

5.3.8.2. Teacher # 3

Teacher # 3 also commented on the simple English used in the module.

It is clear and simple, English, simple language, since you know that most of our students are second language speakers.

She mentioned that one problem she experienced was the conservatism of the learners was sometimes a barrier to teaching about issues around HIV / AIDS.

I. it can be difficult, but since you are dealing with unclear.

R. And when you said difficult, in what way is it difficult? Who determines what you teach?

I. You know sometimes students are too conservative. They are still following their culture and they are

too conservative They follow what their parents do tell them. Like sometimes when you tell them something and they say 'No, no, that is not right', they are still having that hidden idea about sexual activities.

5.3.8.3. Teacher # 5

Teacher # 5 also made a number of comments on the module i.e.

- The learners would benefit from learning about HIV / AIDS from a lower grade. He specifically mentioned that learners go a bit wild and become sexually active in grade 10, and at this age they question everything and experiment, but they settle down in grade 11. Teacher # 5 felt that learners should learn about HIV / AIDS before getting to the experimenting stage so that they could make informed choices.

So, that's why... so maybe you can start in grade 10 and if you can... you know, kids who have started to be in that stage, is it puberty stage?

So they are naughty to know, they are eager to know. So you have to pump up with the knowledge so that they can be able to know to make a choice. You know some of them they make a choice, a wrong choice, in grade 10. Some become... they don't talk too much, is it no they won't talk too much because they say I am too naughty. Immediately they go to grade 11, they change completely, they become different people not like in the same like while they were in grade 10. So maybe you can start it in grade 10, I should think it can help a lot.

With reference to the issue raised by this teacher about the HIV modules' being taught at a lower grade, i.e. before grade 11, the module is designed to be taught in grade 11 is because it requires an understanding of DNA, RNA, transcription and translation, which are taught in grade 11. This problem will be exacerbated in the future, with the new NCS for FET stipulating that DNA should be taught in grade 12, but HIV is scheduled to be taught in grade 11. Popham and Hall (undated) discuss the importance of considering the pre-instruction status of students, and point out that many education programmes have failed as they have not considered that students might already possess the knowledge in the programme (which therefore becomes redundant) or worse, presumed that students had prior knowledge necessary for the programme, which, in fact, they did not have.

- Learning the work in the module is important to these learners as they do not talk about matters of a sexual nature with their families.

at home parents are working maybe in town, they come back and they just talk a bit and its some of the things at home, but they don't even talk about this. You know, we black, we usually

eat separately. I came home late at 10 o'clock, I take my plate, I eat. My father who also eats... You understand what I am saying?

- The importance of teaching the learners from rural areas all about HIV / AIDS before they go to the urban areas for work or tertiary education, and encounter a different life, so that they can make informed choices.

so that when they grow up, nê, they grow up with this education. So now its doing grade 11, grade 12, then they go to tertiary level. And you can see that some of our kids who are coming from secondary school, when they go to the tertiary, they change completely. Like these ones who are living in the rural places, when they go to urban areas like Johannesburg, they see cars moving, weekend people are going to the movies, they even change. And I... education like this one, like HIV they don't even get time to be educated, so here in the school its a place where they can really get the education before they can go outside to the world.

This expressed need for targeting the youth for HIV education is borne out by the findings of the 2003 National Survey of HIV and Sexual Behaviour among 15 -24 year olds, in which Pettifor et al (2004) report that 2% of boys and 4% of girls aged 16 are already infected with HIV (p 72).

5.3.8.4. Teacher # 6

Teacher # 6 commented on:

- Resources needed to teach the module that should be provided with the module:
 - ◆ the spices listed as being healthy to eat in the part on living with HIV / AIDS. She said that some of her learners did not know what these spices are and they should be part of the material included with the module.

Some didn't know what spices are, some didn't even know what cinnamon, cloves, coriander, all these types of spices and herbs, so if they are brought in the classroom, I think it would be much better.
 - ◆ a model of DNA to make it easier for the learners to understand its structure.
- The module needs to emphasise that the HIV / AIDS counsellor is there to work with the client to solve problems.

5.3.8.5. Teacher # 7

Teacher # 7 commented on:

- The difficulty learners face when they have to communicate in English.
 - I. *The problem of language which we are having in our school whereby we find that the second language which is English is giving them a problem in each and every subject. Although we are trying our best to communicate with them, but its really, its is a problem.*
 - R. Why would the problem of language prevent the students doing those activities?
 - I. *Role playing wants active students who will talk freely without any shyness, but because they couldn't express themselves they felt embarrassed.*

This was a problem that I observed when I sat in on her lessons. There were times when the learners clearly did not understand what she had said, even though her English is good, and she had to repeat the explanation in the learners' home language. On occasion, the learners also had to give their answers or questions in their home language. This must make it difficult to teach a topic which is already a sensitive one, when the learners are unable to communicate freely.

- The need for more of this material to be included in the Life Skills curriculum. She expressed frustration and sadness about the Life Skills curriculum being inadequate, i.e. not helping the learners in everyday life by including issues like how HIV is contracted, living with an HIV positive person and the fact that there are antiretroviral medicines that can be taken.

I am teaching life skills in grade 9, but the information that I am giving them or discussing with them as far as HIV is concerned, its very limited.

So even if the Department of Health when they come to our schools, they don't address the issue of medication that one can get drugs, no, that one is not addressed it is just the HIV how to prevent it, how to go for testing - the medication part is not taken into account.

we are not looking at some of the things that can really help the learners in every day life.

- The module being interesting.

No, what I wanted to add that I found the module very interesting and especially that it covered life skills portion whereby learners could learn a lot out of it.

5.3.9. Problems I observed with teaching about HIV / AIDS (and other sections of the syllabus)

During my visits to the schools in the study, and observations of the lessons in schools # 2, # 3, # 5, # 6 and # 7, I realised how many difficulties there are in some of the schools in South Africa. These all make it difficult to teach effectively, be it teaching of HIV / AIDS or any other section of the curriculum - i.e. they would hinder the 'capacity of the schools to support innovation' (Rogan et al. (2002). These problems also mean that learners are not able to benefit fully from their schooling.

Problems that I observed were: (classification based on Rogan, et al. (2002) p.III-346)

- **Physical resources**
- **A lack of furniture**

Many desks and chairs in the classrooms were broken, and so sometimes this meant that learners had to sit two per chair, or sit on a chair that was broken, or share a desk with another learner. This certainly cannot be conducive to effective learning.

- **A lack of electricity**

Classrooms had only the light that came through the windows and in some schools the rooms were very dark. As the chalk boards were old and their condition poor, it was not easy for the learners to read anything written on the board.

We have given the teachers who attend the workshops some coloured overhead transparencies and a video on HIV / AIDS, but these can obviously not be used in the lessons.

- **The lack of technological resources in some of the schools**

Three of the schools did not have a photocopy machine or duplicating machine of any type. This meant that none of the teachers at this school could copy extra notes or articles for the learners when the need arose.

None of the schools had a computer available for the teachers to use to prepare nicely presented work for learners. Posters, for example to show the structure of the HI virus, were drawn roughly in felt-tipped pens on the back of old posters, which were torn, and then stuck on the black board with press-stick.

- **The teachers have no storage place within the school**

As the teachers are not allocated a classroom they do not have a place where they can store their resources effectively. Two of the teachers in the study each had a half of a steel storage cupboard in the staffroom in which to store their teaching aids, but the other teachers had no storage place. This means that the teachers have to transport things to and from home for example posters, and these become damaged very quickly. As three of the teachers had to walk some distance each day to catch a taxi or get a lift to school, there is not much incentive to take teaching aids to and from school.

- **Learners' background**
- **English is a second language for most of the learners and the teachers in the schools studied**

On occasion this lead to a lack of understanding, for example:

- ▶ when a student gave the correct answer, but was told 'no' by the teacher, who obviously had misunderstood the answer
- ▶ when a teacher asked a question such as 'Give five ways of the virus replicating' when what was meant was 'Give the five steps of virus replication'
- ▶ in the two schools where I observed the docudrama being performed, the aim of the docudrama was obviously misunderstood, and so it was presented as a soapie about the life of people with HIV/ AIDS rather than a documentary on the immune system's fight over a virus. In 2004, when my grade 11 learners (English first language learners) did the docudrama activity, I was careful not to give them any more instructions that were in the module, as I wanted to see how they interpreted the written instructions in the module, and both of my classes designed a docudrama that did what was intended - i.e. described how the immune system attacks any invaders. This raises the question of whether the incorrect interpretation of the instructions was the result of misunderstanding the English or not.

Biology is a complex subject, with difficult terminology, and even English first language learners can struggle with the complex language used. Being taught this subject in a second or third language can only exacerbate this problem.

- **There is a high rate of absenteeism among learners in some of the schools**

The schools all appeared to have a high absentee rate amongst the learners involved in the study. In the six weeks that I attended lessons at school # 6 there was always at least one learner absent from the class. This makes it very difficult to teach a section effectively.

- **The poverty of the homes from which the learners came**

Many of the learners in some of the schools came from very poor homes, some from informal settlements. This meant that many were not well informed on current issues so important to HIV education, such as vaccine trials and the Nevirapine used to prevent mother-to-child transmission, as they probably did not have access to TV or newspapers.

Judging from the condition of their hair, many of the learners were suffering from malnutrition, which must make effective learning difficult.

- **School ecology and management**
- **The teachers move while the learners stay in the classroom**

All the high schools that I have attended / taught in / observed in South Africa prior to this study have the system that each teacher is allocated a classroom and the learners move from one room to another to be taught different subjects. This means that a teacher is able to prepare a room for a class, for example write on the chalk board before the lesson, put up appropriate newspaper articles and posters on the walls and or set up apparatus for activities. It was during this study that I first encountered the system where the learners stay in a room and the teachers move from class to class. This means that classroom cannot be made a biology venue; no posters can stay up, there is no place to put newspaper articles, so posters provided at courses do not fulfill their purpose, and when the teacher moves from one grade 11 classroom to another to teach the same lesson, all the resources must be taken with. This is not conducive to setting up a room to have an atmosphere that stimulates interest and learning.

- **The lack of consistency of what the teachers teach**

Of the five teachers involved in this study, all five have attended an HIV / AIDS workshop for teachers and three of them have also attended a course at the University of Wisconsin in the USA. However, three of the five teachers are no longer teaching grade 11 biology as they have been moved to teach other subjects such as English and Mathematics. This means that these teachers who have been trained to teach HIV / AIDS effectively in the grade 11 biology curriculum are no longer able to do so.

5.4. CONCLUDING REMARKS

The results and statistical analyses of the data from the tests and questionnaires show that prior to the implementation of the module, the learners did have a good general and functional knowledge of certain aspects of HIV and AIDS. They also showed a significant increase in knowledge and an improvement in attitudes, having been taught the module. The information obtained from the narratives certainly verified that the learners felt that they knew much more about HIV / AIDS, and that although they were concerned, even fearful, about the effect of this disease on South Africa, their communities, and their families, they felt that their knowledge equipped them to know better what were high risk behaviours, and how to deal

with situations that could lead to high risk behaviours. “Being mature and in control means that feelings are to be disciplined in favour of intellect. But that is not possible, because feelings are always attached to what we are thinking and doing. They are an inherent part of all thought and action. Every choice we make among thoughts and actions pays tribute to these relative feelings” (Solomon, 1976 and 1989 cited in Edwards, 1999, p 17). How a person behaves is a complex issue, and is difficult to predict. Changing sexual behaviour is not an easy matter, even if people know the implications of their behaviour choices; but knowledge does influence behaviour to a certain extent, and so do motivation and empowerment. Bronfenbrenner’s social ecological model shows the influence of all parts of an individual’s life in influencing behaviour. What was pleasing is that many learners wrote about having shared the information with friends and family. By teaching HIV and AIDS in school, and by the learners sharing it with others in their environment, meaning that more people in their homes and communities will share some of their knowledge, and hopefully some of their motivation, we can make it easier for the learners to make the choice against high HIV risk behaviour - a difficult thing for an adolescent in today to do.

In answer to research question 1: What changes in knowledge, behaviour and attitude resulted from the learners’ exposure to the Biology HIV / AIDS module?

There were significant changes in knowledge and attitude following the programme. Many learners wrote about changes that they had made, or intended to make, in their behaviour (secondary abstinence, intended condom use), but it is impossible to tell from tests or questionnaires whether the learners do show HIV-safe behaviour now, and, if they do, whether that is sustained with time and also in a variety of circumstances.

In answer to research question 2: Did the module deal with the issues affecting the lives of the grade 11 learners to whom it was taught?

The writings of the narratives and the classroom observations showed that the module does deal with some of the issues in the lives of the learners such as how to use a condom properly, how to negotiate condom usage, how to live a healthy life with HIV / AIDS and how to look after somebody with AIDS. It also helped the learners to know what to do to protect someone who has been raped from HIV infection. Knowledge can also go a long way to reducing the stigma attached to the disease, and learners did write about this in their narratives.

However, in hindsight, and with two years of reading about the lives of teenagers and how they think, in addition to having gone into communities that my life doesn’t normally take me to, I realised that, although the module does deal with many of the issues in the lives of the learners, it cannot deal with the issues of poverty and unemployment. Poverty does not cause AIDS, but it certainly does enable the spread of HIV and speeds up the progression to AIDS. There are many issues that are too big to deal with in one small module that forms one small part of the grade 11 biology curriculum:

- Gender issues - the ‘ingrained cultural habits that leave sections of society (especially women) more

vulnerable to infection and less able to cope with the effects of the disease' (Health-e news, 2002, p 1).

- The issue of the stigma that HIV / AIDS carries that is rife.
- The issue of the welfare grant that young girls get for their babies that encourages people in extreme poverty to have unprotected sex in order to fall pregnant.
- The issues of sex for material possessions
- The issue of peer pressure and social norms that play an important role in the lives of a teenager.

In answer to research question 3: What difficulties did the educators experience in the teaching of the module?

The problems verbalised by the teachers are:

- the lack of availability of apparatus for
 - transmission activity
 - condom investigations
 - simulation of an antiretroviral regimen
- the poor English ability of the English second language learners. This is not a problem peculiar to this subject or this section of biology, but must hamper these students in all subjects.
- the long time that the section took to complete. This is a problem as the formal curriculum for biology is very long, and this was an extra section added to the formal curriculum. The teachers are under pressure to complete the formal curriculum as common examinations are written within the district, and also the subject facilitators in some districts are not happy with the teachers' not adhering to the formal curriculum. However, it is a directive of the Education Department that teaching of HIV / AIDS should be integrated into all subjects.

In addition, I identified a number of other problems the teachers experienced during the course of the classroom observations, namely:

- the lack of physical resources such as
 - storage space for posters and similar resources
 - electricity to use overhead projectors
 - overhead projectors
 - a biology classroom / laboratory, to enable the displaying of posters etc
 - a high absentee rate of learners
 - having to teach this complex subject in English to some English second language learners

Chapter 6: Summary of findings, conclusions and recommendations

6.1. DISCUSSION OF THE FINDINGS IN THE CONTEXT OF BRONFENBRENNER'S SOCIAL

ECOLOGICAL MODEL OF HEALTH BEHAVIOUR

Human sexual behaviour is very complex and difficult to predict. The pre-test results in this study and the findings of the survey of 15 - 24 year olds conducted in South Africa by Pettifor et al. (2004) showed that knowledge of the most common way in which HIV is transmitted and how this transmission can be prevented with the correct use of condoms, is relatively good. The paradox of the HIV / AIDS pandemic is why people who are well aware of this basic information still put themselves at risk for contracting the disease.

Bronfenbrenner's social ecological model of health behaviour postulates that there are many factors within an individual's ecosystem that influence sexual behaviour. They range from the biological disposition and intrapersonal factors of the individual, to factors within his / her immediate environment, such as the family, to factors that are a little further removed from the microsystem, such as the school and friends in the mesosystem, and even to seemingly remote factors like the welfare system of the state. Yet all these factors interact with, and affect the individual in a two-way relationship, as they too are affected by the individual and also by each other (Bronfenbrenner & Mahoney, 1975, King, 1999). The other models of sexual behaviour change such as the transtheoretical model of change (as discussed in chapter 2) are far more simplistic than the social ecological model of health behaviour. They state that there is a series of changes through which a person must progress in order to change their sexual behaviour. Bronfenbrenner's model shows that the situation is far more complicated than this. Each person's ecosystem is a unique and highly complicated web of factors that all interact to determine how that person will behave in a situation. Knowledge and perception of the dangers of unprotected sexual intercourse are not enough to make one behave in a HIV-safe manner - if that was the case, this epidemic would have been under control years ago. The South African situation is further complicated by such things as the many diverse cultural groups, gender issues and poverty. I started this study with the simplistic belief that knowledge was the solution to controlling the pandemic - the health belief model and the transtheoretical model of changing sexual behaviour made perfect sense to me. The further the study progressed, the more I realised how naive I had been. The narratives, the time I spent in different communities and my school observations during this study made me realise just how complex the whole situation really is. Bronfenbrenner's model highlights how seemingly unconnected aspects of a person's environment, such as social welfare policies, can impact on his / her behaviour. No one person can ever know or understand **all** the factors that interact in another's ecosystem and this is complicated further by intricate and unpredictable way in which adolescents think and behave. The role of the teacher and education in this epidemic is to try provide all his / her learners with the in-depth knowledge and skills to cope with the many different situations that arise within each individual's daily life, so that in each case the learner is best equipped to behave in an HIV-safe manner.

6.1.1. Some aspects of Bronfenbrenner's social ecological model of health behaviour that emerged as most influential in the context of this study

6.1.1.1. In the macrosystem

- **Traditions**

Religion plays an important role in the lives of many learners. Some of these learners wrote about the basic biblical tenants of 'do not commit adultery', fidelity, no sexual intercourse outside of marriage and how these are the solution to slowing the spread of HIV.

- **State laws**

The legacy of the apartheid laws that lead to migratory labour and separated families has certainly contributed to the spread of HIV in South Africa.

- **Welfare**

The lack of effective welfare for those affected by poverty has contributed to the spread of HIV. Teachers spoke of, and learners wrote about adolescents in their communities who have sex for material possessions and money. I was also told of learners who have had unprotected sexual intercourse in order to fall pregnant to qualify for the grant the welfare department gives to parents of young children.

Clinics are few and far between, and so learners do not always have easy access to condoms. At some clinics adolescents are treated aggressively or turned away by nurses for wanting condoms. While it is felt by some that easy access to condoms promotes promiscuity, literature shows that research has found that this is not the case, and it might be more realistic to provide free condoms at schools.

- **Cultural customs**

In many South African communities females play a subservient role and are unable to negotiate either sex or condom use. The prevalence of HIV is far greater in women in South Africa than in men.

6.1.1.2 In the exosystem

- **Community factors**

Poverty is a contributing factor to the spread of HIV in the impoverished communities in this study.

- **Extended family**

Relatives are called upon to nurse those affected by AIDS, and some have contracted HIV through

lack of education about the correct way to handle infected body fluids.

6.1.1.3. In the mesosystem

- **School**

Learners spend almost as much time at school as they do at home. It is also compulsory for South Africans to attend school. School, teachers and peers therefore play an enormous role in determining the attitudes of their learners towards HIV / AIDS and safe sex, as well as empowering their learners with the appropriate skills needed for HIV-safe behaviour. It was very obvious from this study that the learners acquired knowledge about HIV / AIDS and also learned desirable attitudes. In addition they perceived that they had acquired the necessary skills to remain safe from the disease.

- **Friends**

Many of the learners wrote about the enormous influence of peer pressure on the behaviour of adolescents. It is clear that unless a culture of HIV-safe behaviour is developed within a community all the knowledge and self-efficacy in the world will not keep the learners safe.

6.1.1.4. In the microsystem

- **Parents**

In some cultures in South Africa it is traditional for parents and their children not to talk about sex. This can result in misconceptions amongst the youth about issues concerning sex. Many learners wrote about how the module raised an opportunity for them to talk to their parents openly about HIV / AIDS and sex, and also to share their knowledge with their parents and siblings. They were proud of how much they knew, and enjoyed helping to educate their families.

- **The learners**

The greatest impact of this module was on the learners themselves. The narratives were full of information that revealed how motivated and confident they were after having been taught the module. Many wrote about the power their knowledge and skills had given them to keep themselves safe from HIV.

6.2. RECOMMENDATIONS FOR POLICY

1. The inclusion of HIV / AIDS into the biology curriculum should be formalised with:
 - adequate time allocated to teach it properly
 - an appropriate place in the curriculum i.e. considering essential pre-knowledge needed to understand it, for example DNA, RNA, transcription and translation
2. HIV / AIDS should be taught by motivated and caring teachers, to whom the learners will relate. HIV / AIDS is a sensitive subject area, and it needs teachers who are non-judgmental, and who will treat the subject matter appropriately. It also requires a reasonable amount of preparation (depending on whether one follows the module exactly or not) and so the teachers should be

prepared to put in some work.

3. The teachers need to be trained in this subject matter to ensure that they are able to teach accurate information, and also that they are able to dispel myths such as 'mosquitoes can spread HIV' with accurate scientific information.

6.3. SUGGESTIONS FOR FUTURE RESEARCH

1. The cultural appropriateness of the module for all South African learners should be investigated.
2. The social norms surrounding condoms and their use should be investigated in detail. Once all the perceptions of all groups of South Africans are known, the hesitance of adolescents to use condoms can be addressed.
3. It would be interesting to do a study of the long term effect of the module on learners, e.g. follow the life of some members of the group for five years, or collect statistics from the clinics in the area where the module is taught, to determine if the prevalence of STIs and / or HIV / AIDS does decrease. If the prevalence does decrease in comparison to the prevalence in a control clinic, then it could provide a more accurate indication of the effectiveness of the module.

6.4. CONCLUDING REMARKS

It is acknowledged in the literature that knowledge is essential for HIV-safe behaviour, but that knowledge alone is not enough; self-efficacy and motivation are very important factors. Adolescents in South Africa are at grave risk for contracting HIV. School is one place that all adolescents attend, and knowledge and skills taught in schools can permeate throughout the community and the different layers of each adolescent's ecosystem. Biology is the ideal subject in which to teach the science of HIV so that it is understood. In addition, as the biology curriculum involves teaching sex and reproduction, biology teachers often have a unique relationship with their learners, and teaching about HIV is a natural extension to teaching about reproduction. The tests, questionnaires and narratives showed that many of the learners who were taught the HIV module are knowledgeable and motivated to behave in an HIV-safe way. In addition, the learners did not keep their knowledge and skills to themselves, they have shared them with other people in their ecosystems. It is hoped that having learned this work and the skills for HIV-safe behaviour will make a difference in the lives of the learners, their family members and the people in their communities.

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Gender: <input type="checkbox"/> male <input type="checkbox"/> female	V5
Have you received HIV / AIDS education at school before this? <input type="checkbox"/> yes <input type="checkbox"/> no	V6
If you answered yes to the question above, in what subject/s have you learnt about HIV / AIDS? subject _____ subject _____	V7
	V8
Have you received sex education at school before this? <input type="checkbox"/> yes <input type="checkbox"/> no	V9
If you answered yes to the question above, in what subject/s have you learnt about sex education and in what grade/s did you learn about sex education? subject _____ grade _____ subject _____ grade _____	V10
	V11
	V12
	V13
	V14
Multiple choice questions	

The first part of the questionnaire contains **20 multiple choice** questions, each of which has four alternative answers. **Circle the letter** of the answer that you think is correct. Remember that each question has **only one** correct answer.

We will do the first example together:

	What does the abbreviation <i>HIV</i> stand for?	Do not use this column
A	Human Immune Virus	
B	Human Immunodeficiency Virus	✓
C	Human Isolation Virus	
D	Human Immunisation Virus	

Now please complete the next 20 multiple choice questions in a similar way.

01	What does the abbreviation <i>AIDS</i> stand for?	V15
A	Acquired Immune Disease Syndrome	
B	Auto Immunodeficiency Syndrome	
C	Anti Immune Deficiency Syndrome	
D	Acquired Immunodeficiency Syndrome	✓
02	What is a 'syndrome'?	V16

A	A group of signs and symptoms that together characterise a disease	✓
B	One disease	
C	A disease caused by poverty	
D	A single symptom of a disease	

03	Which of the following groups of body fluids in an HIV positive person contains HIV?	V17
A	Tears and urine only	
B	Only blood and blood products	
C	Vaginal secretions, blood, semen and breast milk	✓
D	Semen, blood and breast milk only	

04	Approximately how many people worldwide are currently infected with HIV?	V18
A	2.5 million	
B	10 million	
C	20 million	
D	42 million	✓

05	The use of Nevirapine to reduce the transmission of HIV from a mother to her unborn child	V19
A	is not effective at all	
B	is not available in any South African hospitals	
C	is very toxic to the child	
D	reduces transmission rate significantly	✓

06	'Safe sex' is sex which involves	V20
A	using a condom the right way, every time	✓
B	remaining faithful to only one partner	
C	never penetrating the vagina	
D	using contraceptives	

07	The 'window period' is	V21
A	the time during which an HIV positive person still looks healthy	
B	the time following initial infection when an HIV person is still healthy enough to work	
C	the time following infection with HIV when a person has so few antibodies against HIV that they are undetectable in an antibody test	✓
D	the time following initial infection when an HIV positive person cannot infect another person	

08	Which of the following behaviours harm the immune system?	V22
A	Working	
B	Eating garlic	

C	Doing exercise	
D	Smoking	✓

09	HIV tests most commonly done in South Africa test for the presence of which of the following in the blood?	V23
A	The Human Immunodeficiency Virus	
B	Antibodies to HIV	✓
C	Infected CD4 cells	
D	Infected blood cells	

10	HIV was first recognised as the virus that causes AIDS in ...	V24
A	1980	
B	1983	✓
C	1987	
D	1990	

11	Statistics of AIDS deaths in South Africa are inaccurate because the death certificate is often filled in as death due to	V25
A	'HIV'	
B	'Lowered immunity'	
C	'Tuberculosis' or 'pneumonia'	✓
D	'AIDS'	

12	One of the main types of cell of the immune system that is infected by HIV is	V26
A	CD4 cells	✓
B	B cells	
C	Killer T cells	
D	Clone cells	

13	A person who is sexually assaulted by an HIV positive rapist can significantly reduce the chance of becoming HIV positive by	V27
A	reporting the matter to the police as soon as possible	
B	bathing or showering as soon as possible after the rape	
C	taking antiretrovirals within 48 hours	✓
D	there is no way to prevent becoming HIV positive after such a rape	

14	A person who is HIV positive is said to have AIDS when	V28
A	He / she has lost 20 kg	
B	As soon as he / she has tested positive for HIV	

C	When he / she has a CD4 cell count of 200 or less	✓
D	He / she is looking ill	

15	Is there a difference between HIV and AIDS?	V29
A	Yes	✓
B	No	
C	Not much difference	
D	You can use the word HIV and the word AIDS for the same thing	

16	What is the best protection against getting HIV by sexual intercourse?	V30
A	Contraceptive pills	
B	Condoms	✓
C	Spermicidal jelly	
D	Withdrawal of the penis before ejaculation occurs	

17	Which drug is currently the most effective at reducing the transmission of HIV from a mother to her unborn child?	V31
A	Nevirapine	✓
B	AZT	
C	Antibiotics	
D	Norvir	

18	Does HIV only affect homosexuals?	V32
A	Yes	
B	No	✓
C	Only gay men	
D	Only gay women	

19	Does having a sexually transmitted infection increase the chances of becoming infected with HIV?	V33
A	No	
B	Yes	✓
C	Only if the male partner has a sexually transmitted infection	
D	Only if the female partner has a sexually transmitted infection	

20	Is it possible to become infected with HIV by deep kissing?	V34
A	Deep or open-mouthed kissing is a very low risk activity in terms of HIV transmission	✓
B	Deep or open-mouthed kissing is a risk in terms of HIV transmission	
C	Deep or open-mouthed kissing is a high risk activity in terms of HIV transmission	

D	Deep or open-mouthed kissing is not a risk in terms of HIV transmission	
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Thank you for completing the multiple choice questions.

	Did you understand all of the multiple choice questions or were there some that you did not understand?	V35
1	I understood all of the questions	
2	There were one or two that I did not understand	
3	There were at least five that I did not understand	
4	I didn't understand at least half of them	

Now please go on and answer the **true** or **false** questions on the next page.

True or false?

There are 20 true or false questions. Read each of the following statements carefully and then decide whether the statement is true or false. **Circle the answer that you think is correct.** Then place a tick (✓) in the appropriate column under the heading 'How sure are you that your answer is correct'.

There are two examples that will be completed with you.

Remember that this is not a test or exam. Please answer each question as honestly as you can.

	Statement	True or false?		How sure are you that your answer is correct?			Do not write in this column
				I am sure	I think so	I am guessing	
E1	HIV causes AIDS	True	False				
E2	There are vaccinations available that can prevent infection with HIV	True	False				

Now please complete the 20 true or false questions in a similar way

21	AIDS can be caused by poverty.	True	False				V36
22	It is possible to get infected with HIV through oral sex.	True	False				V37
23	South Africa has one of the highest HIV infection rates in the world.	True	False				V38
24	HIV causes AIDS by reducing the number of CD4 cells in the body.	True	False				V39

25	You can tell whether a person has HIV by looking at them - they do not look well.	True	False				V40
26	There are hospitals in South Africa that provide antiretrovirals for rape victims.	True	False				V41
27	HIV is a mainly a disease of homosexuals.	True	False				V42
28	A person in the first few weeks following infection with HIV is not infectious to anybody else.	True	False				V43
29	Having unprotected sex with another HIV positive person is fine as both partners already have HIV, so they cannot infect each other.	True	False				V44
30	Condoms, if properly used with every act of sexual intercourse, are effective at preventing infection with HIV.	True	False				V45
31	There is a cure for AIDS.	True	False				V46
32	Married people do not become infected with HIV.	True	False				V47
	Statement	True or false?		How sure are you that your answer is correct?			Do not write in this
				I am sure	I think so	I am guessing	
33	Most of the people worldwide now living with HIV don't know that they are carrying the virus.	True	False				V48
34	There is a risk of HIV transmission when having a tattoo or body piercing.	True	False				V49
35	If you are fit and healthy you won't become infected with HIV.	True	False				V50
36	If a person becomes infected with HIV it means that they have AIDS.	True	False				V51
37	If you stick with one partner you won't become infected with HIV.	True	False				V52
38	Mosquitoes or other blood sucking insects can transmit HIV.	True	False				V53
39	If you have sex with people you know, you won't become infected with HIV.	True	False				V54
40	If you have sex only with people who look healthy, you won't become infected with HIV.	True	False				V55

	Did you understand all of the true or false questions or were there some that you did not understand?	V56
1	I understood all of the questions	
2	There were one or two that I did not understand	
3	There were at least five that I did not understand	
4	I didn't understand at least half of them	

Do you agree?

Read each of the statements below and decide how you feel about each one. Place a tick (✓) in the appropriate column under the heading strongly agree, agree, don't know, disagree or strongly disagree.

		Strongly agree	Agree	Don't know	Disagree	Strongly disagree	Do not write in this column
41	I have no problem with using the same plate and cutlery as someone who is HIV positive.						V57
42	I know all the ways in which a person could become HIV positive.						V58
43	I am confident that I know how to negotiate using a condom if I were to have sexual intercourse.						V59
44	If somebody in my household had AIDS, I would know how to look after them and nurse them.						V60
45	I feel that I have the right to negotiate using a condom if I were to have sexual intercourse.						V61
46	It is possible for a mosquito to transmit HIV.						V62
47	I feel comfortable touching someone who is HIV positive.						V63
48	If I were unmarried and sexually active, I would use a condom every time I had sexual intercourse, even if I knew the person well.						V64
49	Having a monogamous sexual relationship with someone protects a person from getting HIV.						V65
50	I feel confident that I would know the best advice to give a friend who is sexually abused by someone that we suspect might be HIV positive.						V66

<p>54. Who / what influences your thinking on HIV and AIDS? Tick those answers that are appropriate. You may tick more than one answer.</p> <p>Peers _____</p> <p>TV _____</p> <p>Newspapers _____</p> <p>Magazines _____</p> <p>Teachers _____</p> <p>Minister of Health _____</p> <p>Parents _____</p> <p>The President of South Africa _____</p> <p>Nelson Mandela _____</p>	<p>V72</p>
<p>55. If you were appointed to help curb the spread of HIV / AIDS in your school and community, which of the following messages do you think would be the most effective? (Circle the letter of your choice).</p> <p>A. Persuade all classmates to abstain from sexual activity as advocated by tradition and religion.</p> <p>B. Persuade all classmates to always use condoms when having sexual intercourse.</p> <p>C. Persuade all classmates to be tested for HIV so that their HIV status can be checked before having sexual intercourse.</p>	<p>V73</p>
<p>56. Give a reason for your choice of answer for question 55.</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p>V74</p>
<p>57. Do you think there are there better (more effective) strategies than those listed as possible answers to question 55 above?</p> <p>_____</p> <p>Explain your answer.</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p>V75</p> <hr/> <p>V76</p>

Now that you have finished the questionnaire, please check for answers that you may have left out, and complete them if you can.

Thank you for your help.

Appendix B: Stimulus for the narrative

You might be interested to know who is funding all the separate parts of this HIV / AIDS section of the Rainbow Project. The money comes from The Netherlands, and it covers the modules, the research expenses, the classroom materials and the teachers' course. These funders are of course, very interested in assessing the impact of this project, and ask each learner to share personal feelings and ideas about it.

Please write approximately 2 pages so that we can understand how your new knowledge has influenced your life. How do you now feel and act in your daily life? If you have changed, how do you do and see things differently. How have you shared information both inside and outside your family?

Please do not write your name on the paper, but do write your questionnaire number if you remember it.

Appendix C: Interview schedule for use with educators to determine problems experienced by they experienced when implementing the module.

School number		V1
Date of interview		V2
Amount of teaching time allocated to biology per week (minutes)		V3

1.a.	The module was originally designed to be taught in 5 to 6 school weeks. What was your experience of the length of the module? Was it: too long? too short? just right?	V4
1.b.	If your answer to question 1.a. was that the module is too long or too short, how long do you feel it would take to teach the module adequately? _____	V5
1.c.	If you found the module too long, which sections did you leave out? _____ _____ _____ _____	V6
2.a.	Would you normally have a problem with getting materials together for teaching the module? yes? no?	V7
2.b.	If the answer you gave to question 2.a. was that you would have a problem getting the materials for teaching the module, list those materials that you would have a difficulty with obtaining. _____ _____ _____ _____	V8
3.a.	Did you feel that your knowledge of HIV / AIDS was good enough to teach the module effectively? yes? no?	V9
3.b.	If your answer to question 3.a. was no, then in which areas did you feel that your knowledge was inadequate? _____ _____ _____ _____ _____	V10
4.a.	HIV / AIDS is a very sensitive issue which affects all of our learners in South Africa. Did you feel that you were able to adequately deal with the emotional aspects that the study of this subject raises? yes? no?	V11

4.b.	Elaborate on the answer you gave for question 4.a. _____ _____ _____ _____	V12
5.a.	Do you have the autonomy to change the curriculum in your classroom? yes? no?	V13
5.b.	If you answered no to question 5.a. who determines what you teach in your classroom? _____ _____	V14
6.a.	Did you do all the activities in the module? yes? no?	V15
6.b.	If you answered no to question 6.a. list those activities that you left out. _____ _____ _____ _____ _____	V16
6.c.	If you left out activities, did you leave them out because: of lack of time? of lack of materials? you didn't see the point of the activity? other reason / s (list) _____ _____ _____	V17
7.	Add any comments that you would like to make about the module. _____ _____ _____ _____ _____ _____ _____ _____ _____ _____	V18

Appendix D: Transcripts of teacher interviews**Interview - Teacher, school 2. 26.05.2003**

Teaching time with grade 11 biology class per week - 4 hours

R is the researcher and these comments and questions are not in italics.

I is the interviewee and the responses and comment are in italics.

Words in brackets indicate the meaning of some of the sounds, such as 'mm', made by the interviewee, while [unclear] means that a word or two on the tape are unintelligible.

- 1 R. The module was originally designed to be taught in 5 to 6 school weeks. What was your experience of
2 the module? Was it too long, too short or just right to be taught in 5 to 6 weeks?
- 3 *I. I think it was too long. Because certain parts of the module I had to leave out, especially some of activities*
4 *I had to leave out. If you do all the activities, you probably won't complete it within five weeks.*
- 5 R. Okay. How long do you feel it would take to teach the module adequately?
- 6 *I. I think eight weeks.*
- 7 R. Eight weeks. Which sections did you leave out? Did you leave out whole parts or did you just bits of some
8 parts.
- 9 *I. Um... I left out activities, but every section, I managed to teach every section or every concept in the*
10 *module, but the activities, I had to select and I left out some activities.*
- 11 R. Specifically which activities did you leave out? Could you list some of them for me please?
- 12 *I. We had one activity where learners had to build the structure of a virus and then there was one activity*
13 *where they were actually supposed to compile a questionnaire, which I thought will take a lot of their time.*
14 *And there was one activity where they were supposed to draw I think graphs which I think is part of what*
15 *you are supposed to do and I thought I can leave that out because I will definitely do it with them in our*
16 *lessons when we do portfolio work and the activity on testing the strength of condoms - that one also I*
17 *left out but I wanted to do that. The problem was I didn't have part of that, the tube. Lisette brought them*
18 *late, but I wanted to do that. So quite but if in one part if they had four or five activities I selected two or*
19 *at least one, depending on which one actually was not going to take too much of our time.*
- 20 R. Good, thank you.
- 21 R. Would you normally have a problem with getting the materials together for teaching the module?
- 22 *I. Um...*
- 23 R. For example in the condom activities you didn't have all the materials that you needed.
- 24 *I. Um, maybe I should have perhaps at the beginning planned enough and made sure that I had all the*
25 *activities. So I didn't do that. Maybe that is why I ended up when I was supposed to do that I discovered*
26 *that I didn't have that.*
- 27 R. Right. If you said you would have a problem getting some of the equipment, for example the little pipes,
28 or the lead, um.. are those the only pieces of equipment that you would have a problem? Do you have
29 everything else?
- 30 *I. Yes. I had everything else like the retort stand we have here at school, so but we don't have lead here*
31 *at school.*
- 32 R. Right. The little pieces of pipe, if you do want to do that at a later stage, I just got it at a hardware shop.
33 It is not expensive at all. I just used a saw to cut it into little pieces. You must just be careful that the
34 edges are then not very jagged then they will tear the condoms.
- 35 *I. Yes, I was thinking of that.*
- 36 R. Did you feel that your knowledge of HIV / AIDS was good enough to teach the module effectively?
- 37 *I. I think so, because I actually had to combine certain parts of the module together, link certain parts of the*
38 *module together so that I don't have to repeat them in the other module, like for example part 8 was*
39 *combined with part 3 because I discovered somewhere in part 3 they discuss about the misconceptions*
40 *so then I brought that there and then I dealt with it once and some of the things I actually didn't have to*
41 *read through the module with the learners - I had to explain and then give them homework to go through*
42 *with it.*
- 43 R. Good, that's excellent. So in no areas did you find that your knowledge was inadequate?
- 44 *I. Not at all. Because even like part two if it's the immune system it is part of other I know as a biology*
45 *teacher.*

- 46 R. Good.
- 47 R. Right. HIV / AIDS is a very sensitive issue that affects all of our learners in South Africa. Did you feel that
48 you were able to adequately deal with the emotional aspects that the study of this subject raises?
- 49 I. *I think so.*
- 50 R. Is there anything that you would like to elaborate on for the answer you gave there?
- 51 I. *Um, because at the moment in our school, we don't have cases of learners who I can say are living with
52 the virus or died from the virus and even in the class where I was teaching there was not even a single
53 one who actually maybe came to me and said I am affected because I have a member of my family who
54 is living with the virus. So we don't have any problem.*
- 55 R. Do you have the autonomy to change the curriculum in your classroom? So although there is a set
56 curriculum for grade 11 you have put in something that is not in the curriculum. Are you able to do that
57 quite freely?
- 58 I. *Um...Maybe in the next curriculum, where if OBE is introduced in grade 10 and 11 we will be able to
59 include whatever we want, but at the moment we have to stick to the syllabus and teach what is supposed
60 to be taught according to it - the syllabus.*
- 61 R. So if you said no, that you have to stick to the syllabus, who determines what you teach in your
62 classroom? Is there somebody who checks up on you, and if so, who is that?
- 63 I. *Um.... we have cluster meetings and we have to do portfolios and at the end of the year we have to write
64 common exams, so it is very important that we actually teach the same thing and make sure that we
65 complete that within the required period. So that the learners will sit for the common paper at the end of
66 the year.*
- 67 R. Okay.
- 68 R. So you answered in response to one of the questions about the sections that you had left out, you said
69 that you didn't leave out sections but you didn't do all the activities.
- 70 I. Yes.
- 71 R. Okay. So I can just use that answer for those questions for the activities that you left out.
- 72 R. Have you remembered any other activities that you left out. You listed building a virus, compiling a
73 questionnaire, drawing the graphs. Was that for drawing graphs or interpreting the graph?
- 74 I. *Um.. there was somewhere where the learners were actually were supposed to draw either bar graphs
75 also line graphs. Those.*
- 76 R. Were there any other activities that you left out?
- 77 I. *Yes I think so. Which one, there was one, I can't remember now. Okay, there was one activity where the
78 learners actually had to decide whether this type of reaction, is it risky or non risky.*
- 79 R. Right, the risk continuum.
- 80 I. *Yes. That one we didn't do, because I think we had one activity where it was sort of, it was repetition
81 although they didn't use cards, but they had to say whether it was risky or not, like hugging or kissing, so
82 I did that activity and then I felt that it was a repetition of that one.*
- 83 R. And for the other ones it was because of lack of time that you left them out?
- 84 I. yes
- 85 R. except for the condom experiment for the conduit piping.
- 86 I. *Mm (affirmative). But the drama they did, they did a docudrama, they also had a class debate.*
- 87 R. Are there any other comments that you would like to make about the module and teaching the module?
- 88 I. *What I can say is that there are certain sections which can be removed from the module from the learner
89 workbook and they can form part of the teacher's guide and other sections like part 8 and part 3 because
90 there is actually repetition of some of the concepts, they can be linked together certain sections so that
91 the module is taught within a period of 5 weeks. And I think also that section on the immune system. The
92 immune system is part of the grade 10 syllabus I think in our syllabus, so if the learners don't get
93 background about the immune system and then if you have to teach that whole section in detail it will take*

- 94 *too much of your time but if the teacher in the teachers guide emphasises what is important about the*
 95 *immune system, especially talking about the helper cells, the CD4 cells, how they help and not explaining*
 96 *in detail the function of the lymphatic system.*
- 97 R. Those sections that you say, you suggested certain sections can be removed and put into the teacher's
 98 guide was it specifically the immune system you were thinking of there or were there others as well?
- 99 I. *I think it is the immune system and then we have, I think from also that part the social and economic*
 100 *impact of HIV and you also had that section on scientific investigation - that can also be in the teacher's*
 101 *guide and then the teacher will have to plan and then discuss that with the learners instead of that*
 102 *information being in the learner workbook.*
- 103 R. Any other comments?
- 104 I. *Um..I think the module itself it was very good and the learners actually understood it and they cooperated*
 105 *and they were very motivated and they participated positively because it was the language was actually*
 106 *on their level, so they found it very interesting.*
- 107 R. The learners were able to read those sections that you didn't manage to do.
- 108 I. *Mm. (affirmative).*
- 109 R. Okay.
- 110 I. *And there was also I think to add on, there was one activity which was a comprehension test. I made a*
 111 *copy of that and I gave even the language teachers that comprehension test where it explains the different*
 112 *stages of the HIV / AIDS and I also used those copies during my life skill periods in grade 10 and the*
 113 *grade 12 classes I gave them the comprehension test and I said lets discuss that and they follow that it*
 114 *was quite interesting that. Teachers can also use that to teach kids about HIV / AIDS even in a language*
 115 *class in the form of a comprehension.*
- 116 R. Yes, and possibly also the graphs, to use them in maths.
- 117 I. *Yes, yes the graphs, even in biology, because they have to draw graphs, so I have that which we can use*
 118 *also in other grades for graphs.*
- 119 R. Would you be able to use any of these activities to put into the portfolios?
- 120 I. *Yes of course. There is one activity which I marked. Can you see here I marked myself I got nought out*
 121 *of 26. The learners came and said 'Mam, you got nought, this is your module you marked yourself'. So*
 122 *I said they must submit this and then I marked it.*
- 123 R. Okay.
- 124 I. *So what I am going to do, I am going to make them to remove this and then put it in their portfolios.*
- 125 R. Okay. That's great.
- 126 I. *And I also gave them a test. When I was busy teaching them I gave them a class test on some of the*
 127 *concepts in this module and they used that as a portfolio mark.*
- 128 R. Good. That's good.
- 129 R. Thank you, I really appreciate you doing this. Do you feel that your learners benefited from doing this?
- 130 I. *A lot, it benefit a lot. There was I think that there are some girls who asked Lisette you know 'we want*
 131 *to be involved, we want to be part of a support group, for people living with HIV / AIDS. Where can we go?'*
 132 *So they are keen.*
- 133 R. Great, that's excellent. So it actually does mean something in their lives?
- 134 I. Yes.
- 135 R. That's wonderful. Thank you. So if you were able to chose, if we get OBE if the FET phase, if you are
 136 able to choose a module, some modules to teach as voluntary, would you choose to teach this?
- 137 I. Yes. Yes, definitely.
- 138 R. Thank you.
- 139 I. *It is a good teaching aid. Even the life skill, it can be used during the life skill. Not necessarily for biology.*
- 140 R. Yes, John Rogan wanted me to separate it into two parts, the biology part and the life skills part but I

141 thought that that was, um.... I felt that it would deprive the learners, in that if they only learn the science
 142 part they still have the life skills part that they can take home with them, so if they do become affected by
 143 HIV, with a member of their family, possibly then they could look at how to bath people and what food to
 144 feed them and that kind of thing.

145 R. Thank you very much.

Interview - Teacher, school 3. 19.08.2003

Teaching time with grade 11 biology class per week - 3 hours

R is the researcher and these comments and questions are not in italics.

I is the interviewee and the responses and comment are in italics.

Words in brackets indicate the meaning of some of the sounds, such as 'mm', made by the interviewee, while [unclear] means that a word or two on the tape are unintelligible.

153 R. The module was originally designed to be taught in 5 to 6 school weeks. What was your experience of
 154 the module? Was it too long, too short or just right to be taught in 5 to 6 weeks?

155 I. *just right.*

156 R. Ideally how long do you think it should take to teach that module?

157 I. *About 5 to 8 weeks, depending on the appeal to the students.*

158 R. Did you leave out any sections when you taught it?

159 I. *Not really.*

160 R. Would you normally have a problem getting materials for teaching the module, the practical materials?

161 I. *No, since you supplied it.*

162 R. Okay, but if I didn't supply it, would you have a problem getting them?

163 I. *Yes.*

164 R. Right, which ones would you have a problem getting?

165 I. *The retort stands and the materials needed for that experiment, the condom experiment.*

166 R. And for the transmission activity where they put the stuff in the cups?

167 I. *No, that one I wouldn't have a problem.*

168 R. Do you feel that your knowledge of HIV / AIDS was good enough to teach the module effectively? Yes
 169 or no?

170 I. *Yes.*

171 R. Were there any areas that you felt that your knowledge was inadequate?

172 I. *Um, not really, but I had a little bit of difficulty with the introduction of DNA, putting it across. But I rectified
 173 it.*

174 R. Was that a problem with your knowledge or a problem with teaching the students?

175 I. *It was a problem to put it across.*

176 R. So your knowledge was fine?

177 I. *Yes.*

178 R. HIV / AIDS is a very sensitive issue which affects all of our learners in South Africa. Did you feel that you
 179 were able to adequately deal with the emotional aspects that the study of this subject raises?

- 180 I. *Yes, there wasn't any emotion so far. They looked upset, but HIV is real - they are aware of it.*
- 181 R. Do you have the autonomy to change the curriculum in your classroom? Do you have the power to be able
182 to change your curriculum?
- 183 I. *Yes, although it can be difficult, but since you are dealing with [unclear].*
- 184 R. And when you said difficult, in what way is it difficult? Who determines what you teach?
- 185 I. *You know sometimes students are too conservative. They are still following their culture and they are
186 too conservative They follow what their parents do tell them. Like sometimes when you tell them
187 something and they say 'No, no, that is not right', they are still having that hidden idea about sexual
188 activities.*
- 189 R. Do you have a subject facilitator who determines what you can teach?
- 190 I. *Yes, I have got one, but she doesn't determine what I can teach.*
- 191 R. Is she quite free in allowing you to decide what you are going to teach - is she flexible?
- 192 I. *She is flexible, yes.*
- 193 R. Some of the subject facilitators aren't.
- 194 I. *No, this one is very fine.*
- 195 R. Did you do all of the activities in the module? Or did you leave some of them out?
- 196 I. *No, I did everything.*
- 197 R. Would you like to make any comments about the module?
- 198 I. *Yes the module is quite adequate and it had all the information that the students required and it was well
199 structured for students to understand. Like with the all those examples like the dialogues about HIV, so
200 it made it simpler for the students to understand.*
- 201 R. Anything else?
- 202 I. *It is clear and simple, English, simple language, since you know that most of our students are second
203 language speakers.*
- 204 R. Did they find the language simple?
- 205 I. *Mm. (affirmative)*
- 206 R. Because we had an English second language editor go through it and simplify quite a lot of the language.
- 207 R. Right, is that it? Thank you very much.

<p>Interview - Teacher, school 5. 26.08.2003</p>

<p>Teaching time with grade 11 biology class per week - 5 hours</p>

R is the researcher and these comments and questions are not in italics.

I is the interviewee and the responses and comment are in italics.

Words in brackets indicate the meaning of some of the sounds, such as 'mm', made by the interviewee, while [unclear] means that a word or two on the tape are unintelligible.

- 211 R. The module was originally designed to be taught in 5 to 6 school weeks. What was your experience of
212 the module? Was it too long, too short or just right to be taught in 5 to 6 weeks?
- 213 I. *Ja, it was a little bit long because it needs much more time to do it.*
- 214 R. How long do you think it will take to teach it properly? How many weeks?

-
- 215 I. *Um approximately 8 weeks. 8 weeks.*
- 216 R. Did you leave sections out or did you just teach it all?
- 217 I. *Ja.....I left some sections.*
- 218 R. Which sections? Do you remember?
- 219 I. *I don't still remember. In actual fact I adjusted the time so that I would be able to finish on this particular*
220 *week, as it has been stated.*
- 221 R. So you left out which parts?
- 222 I. *Parts 6, 7 and 8.*
- 223 R. Before parts 6, 7 and 8, did you do everything? All the activities?
- 224 I. *Ja, all the activities.*
- 225 R. When I was here, I brought quite a lot of the materials with me for some of the activities. Would you have
226 a problem getting those materials normally, if I hadn't brought them here?
- 227 I. *Er, in the first place some material, I usually call them teaching aids so that they can be able to*
228 *understand, some of them they need it needs in actual fact preparation before you can begin the class,*
229 *so if I get them right now then I need to sit down and create a teaching environment for them. Maybe I*
230 *can prepare for three or four hours so even the kids can be able to enjoy the lesson.*
- 231 R. What about the transmission activity with the cups and the chemicals, or the condom experiments with
232 the retort stands and the lead? Would you be able to, in your environment, have access to those
233 materials or not?
- 234 I. *Ja, but for testing the condom, that one, it is not easy to get the material. But that one it was one of the*
235 *most interesting activities.*
- 236 R. Um. So the materials that you would have a problem getting hold of are...
- 237 I. *That is the condom testing. Ja.*
- 238 R. Did you feel that your knowledge of HIV / AIDS was good enough to teach the module effectively?
- 239 I. *Ja, er, I attended some workshops subsequently that have helped me a lot.*
- 240 R. Since then?
- 241 I. *Ja. Since then.*
- 242 R. Which workshops?
- 243 I. *We attended in workshop in 2000 and even in Wisconsin, we attended a workshop there.*
- 244 R. Oh, I thought you were saying you had attended some since then. Okay.
- 245 R. Um, so in no area did you feel that your knowledge was inadequate?
- 246 I. *Ummm, can you repeat the question maybe?*
- 247 R. The last question that I asked you was did you feel that your knowledge was good enough to teach the
248 module effectively, and you said yes. Was there no area where you had any problem?
- 249 I. *No.*
- 250 R. HIV / AIDS is a very sensitive issue which affects all of our learners in South Africa. Did you feel that you
251 were able to adequately deal with the emotional aspects that the study of this subject raises?
- 252 I. *Ja, because even the government they are introducing this from the lower grades. Like LO, Life*
253 *Orientation. So some of them, they are learning from eh.. from some grades, you know. Somebody,*
254 *maybe he or she get a younger sister or a brother at home, they can take one book of his own brother and*

- 255 *you can see they are more or less one and the same thing coz they educate the learners about the HIV*
 256 */ AIDS.*
- 257 R. When you taught your classes did you ever feel that there was anything, that emotionally maybe you know
 258 that one of your learners has got a parent who is dying from HIV / AIDS or who has died from AIDS, and
 259 it is quite... some of the things are quite emotional when you talk about that. Did you ever feel that that
 260 was a problem?
- 261 I. *Um... I never encountered such a thing.*
- 262 R. Do you have the autonomy to change the curriculum in your classroom? Do you have the power to
 263 change what you teach in your classroom?
- 264 I. *Err... (questioning)*
- 265 R. Because this is not part of the curriculum, you just did it extra, different.
- 266 I. *Er, ja. So the curriculum has been done by a person like myself, then I can bring along any idea that can*
 267 *be helpful. An additional one. So that ideas, when they come together, they build a nation, like a kid*
 268 *...what is in this kid, so that they become ... maybe a theologian, or... to be somebody else in the future.*
 269
- 270 R. So for parts, 1, 2, 3, 4 and 5, you did all the work and all the activities?
- 271 I. *Right.*
- 272 R. So the activities that you left out in those sections, did you leave them out because there was a lack of
 273 time?
- 274 I. *A lack of time. Correct.*
- 275 R. Not that there was a problem with materials or you didn't see a point to it.
- 276 R. Do you want to add any other comments about the module or about the work?
- 277 I. *Jaaa... I can say er.. kids who are advantageous are like grade 11 students, which means that they start*
 278 *to change their behaviour in living in grade 11. In actual fact they should have started this in the lower*
 279 *grades so that when they grow up, nê, they grow up with this education. So now its doing grade 11, grade*
 280 *12, then they go to tertiary level. And you can see that some of our kids who are coming from secondary*
 281 *school, when they go to the tertiary, they change completely. Like these ones who are living in the rural*
 282 *places, when they go to urban areas like Johannesburg, they see cars moving, weekend people are going*
 283 *to the movies, they even change. And I... education like this one, like HIV they don't even get time to be*
 284 *educated, so here in the school it's a place where they can really get the education before they can go*
 285 *outside to the world.*
- 286 I. *So my comment is that I can it is my suggestion that they should have started this from the lower*
 287 *grades, like for instance our parents, I mean these kids, at home, together with the parents they can't even*
 288 *talk about this, and that one, because I even asked some of them they are afraid, they are afraid to*
 289 *even talk about this. They are the ones who know that this disease is.... its amongst us, but at home*
 290 *parents are working maybe in town, they come back and they just talk a bit and its some of the things at*
 291 *home, but they don't even talk about this. You know, we black, we usually eat separately. I came home*
 292 *late at 10 o'clock, I take my plate, I eat. My father who also eats.... You understand what I am saying?*
 293 *Unlike people who are modernised, who stay in town, they gather on time of eating, its where they can*
 294 *share maybe this kind of topics. How can a child protect or protect yourself. So I am saying it needs.....*
 295 *you know kids must have to grow with something, like if the kids respect, kids who doesn't have respect,*
 296 *it means even at home maybe you find the kid doesn't have a mother or one of the parents. But the kid*
 297 *who got respect which means the kid respect the mother and the father. So if a kid grow with something,*
 298 *we indoctrinate, you indoctrinate them with something in the mind and it is going to be very very good,*
 299 *which is going to be helpful to the kid. Like a kid, if you tell any kid that you don't have to go there, there*
 300 *is a snake, but naughty kids will go there, but will come back and said no, he want to be sure that this is*
 301 *a dangerous place to go there. Okay, that was my comment.*
- 302 R. I just want to ask you something else, you said we should start earlier. One of the things.... there were

- 303 there a whole lot of ideas in my mind when I thought about this and starting the project, and even what
 304 level we must write the module for, and I wanted.... the students are doing some life skills about HIV and
 305 AIDS, but in grades that are younger and I wanted this to be about the biology of HIV and AIDS, so that
 306 the students if they are told a myth, they would be able to say 'no, but it doesn't work like that, look I know
 307 from school this, this and this'
- 308 *I. Exactly.*
- 309 R. ... and then they can say 'no that's nonsense'. Or....um.. I wanted the students to understand, deeply, the
 310 biology of HIV and I think to understand the biology of HIV, you have got to understand about DNA and
 311 RNA and viruses and whatever, and that only comes in grade 11. But sometimes I think it is a bit late.
 312
- 313 *I. Mmm. (affirmative)*
- 314 R. Um..Because I think that a lot of students are already sexually active by grade 11.
- 315 *I. Mmm. (affirmative)*
- 316 R. And I think once a lot of them have made their choices about life and the way that they are going to
 317 behave in life and sexual activity, maybe grade 11 is too late, but I think that you have got to understand
 318 about DNA and RNA.
- 319 *I. Ja. You know, we usually say there is a standard, like grade 10, so when our kids are starting to change.*
 320 *From grade 9 when a kid is gone to grade 10 he started to develop some.... sexual active in actual fact,*
 321 *because they are wild. Even now you can go to a class, they are the most wild students in the school.*
- 322 R. Grade 10?
- 323 *I. Ja.*
- 324 R. I have just been to speak to grade 10.
- 325 *I. So, that's why... so maybe you can start in grade 10 and if you can... you know, kids who have started to*
 326 *be in that stage, is it puberty stage?*
- 327 R. Yes.
- 328 *I. So they are naughty to know, they are eager to know. So you have to pump up with the knowledge so*
 329 *that they can be able to know to make a choice. You know some of them they make a choice, a wrong*
 330 *choice, in grade 10. Some become... they don't talk too much, is it no they won't talk too much because*
 331 *they say I am too naughty. Immediately they go to grade 11, they change completely, they become*
 332 *different people not like in the same like while they were in grade 10. So maybe you can start it in grade*
 333 *10, I should think it can help a lot.*
- 334 R. Maybe they need a life skills for grade 9 and a biology module for grade 10....11, 11, when they
 335 understand about it, but the life skills thing is more about respecting and negotiation and sexual activity
 336 and responsibility and things like that. So that would be a bit different to the biology bit.
- 337 R. Thank you much.

Interview - Teacher, school 6. 28.08.2003
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Teaching time with grade 11 biology class per week - 5 hours
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R is the researcher and these comments and questions are not in italics.

I is the interviewee and the responses and comment are in italics.

Words in brackets indicate the meaning of some of the sounds, such as 'mm', made by the interviewee, while [unclear] means that a word or two on the tape are unintelligible.

- 341 R. The module was originally designed to be taught in 5 to 6 school weeks. What was your experience of
 342 the module? Was it too long, too short or just right to be taught in 5 to 6 weeks?

-
- 343 I. *It has taken longer.*
- 344 R. Please just estimate how many weeks you would need to teach it adequately?
- 345 I. *2 months.*
- 346 R. Did you leave any sections out when you taught it?
- 347 I. *There were some that we just discussed under general and the learners know them.*
- 348 R. Can you tell me which ones they were?
- 349 I. *The use of condoms. And the drugs. And the counselling parts. And the testing we were just discussing*
350 *under general because they know that have to go and they have to be tested.*
- 351 R. Um....for some of the activities, I brought the materials to the school. Would you normally have a problem
352 with getting materials for those activities, like for the condom activities and the transmission activity.
353 Would you be able to get those materials or would you have a problem getting them?
- 354 I. *We would have a problem because we do not have a laboratory and then we also we do not have the*
355 *chemicals that we are supposed to use.*
- 356 R. All right, so the chemicals were a problem, and which apparatus?
- 357 I. *Um, cylinders together with the retort stands, I would not have enough retort stands, together with the lead*
358 *and also the buckets, I won't have the buckets.*
- 359 R. Did you feel that your knowledge of HIV / AIDS was good enough to teach the module effectively? Yes
360 or no?
- 361 I. *Yes.*
- 362 R. Are there any areas that you felt that your knowledge was inadequate?
- 363 I. *No, I don't think so.*
- 364 R. HIV / AIDS is a very sensitive issue which affects all of our learners in South Africa. Did you feel that you
365 were able to adequately deal with the emotional aspects that the study of this subject raises?
- 366 I. *Mmmmm.....I think so.*
- 367 R. Is there anything that you would like to say about that answer?
- 368 I. *Especially on the emotional aspect part of it. Learners won't accept it at first but when you explain it,*
369 *explain it to them, they become interested also they want to know more about it so that they should be*
370 *aware and take precautions.*
- 371 R. Do you have the autonomy, the power, to change the curriculum in your classroom?
- 372 I. *Change it to?*
- 373 R. To include something different like HIV?
- 374 I. *I do especially when I teach other part in biology, I do.*
- 375 R. Did you do all of the activities in the module? Or did you leave some of them out?
- 376 I. *Not all.*
- 377 R. Can you look and see which ones you left out?
- 378 I. *The children orphans. The social and economic impact of HIV, I just done the myths only, we did not*
379 *discuss in detail about the children, the orphan children and all that. I have only done the myths.*
- 380 R. Are there any other activities you left out?
- 381 I. *(Head shake - negative).*

- 382 R. No?
- 383 I. *Mm.*
- 384 R. That section that you left out, did you leave it out because you ran out of time?
- 385 I. *That was because of the running out of time especially because of the examinations that they are*
386 *supposed to write. That's why I said I just done the myths.*
- 387 R. Are there any other comments that you would like to make about the module?
- 388 I. *I think the time factor is the first one. And some of the resources that are supposed to be given especially*
389 *dealing with food, what type of food should the person living with HIV / AIDS eat should also be given to*
390 *learners so that they must know. Some didn't know what spices are, some didn't even know what*
391 *cinnamon, cloves, coriander, all these types of spices and herbs, so if they are brought in the classroom,*
392 *I think it would be much better.*
- 393 I. *And again the model of DNA and RNA, the strands, maybe we can find a model, it would be much better*
394 *for them to understand.*
- 395 I. *And again, coming to the counselling, I think that it should have included where the counsellor together*
396 *with a client are there to solve problems.*
- 397 R. Is that all?
- 398 I. *Mm. (affirmative)*
- 399 R. Thank you very much and thank you very much for all the work that you have done. And I thank Nana
400 for letting her take the grade 11s for my study, thank you. And Mathabo, thank you for looking after the
401 students while they wrote the test.

Interview - Teacher, school 7. 28. 08. 2003

Teaching time with grade 11 biology class per week - 4 hours and 5 minutes

R is the researcher and these comments and questions are not in italics.

I is the interviewee and the responses and comment are in italics.

Words in brackets indicate the meaning of some of the sounds, such as 'mm', made by the interviewee, while [unclear] means that a word or two on the tape are unintelligible..

- 404 R. The module was originally designed to be taught in 5 to 6 school weeks. What was your experience of
405 the module? Was it too long, too short or just right to be taught in 5 to 6 weeks?
- 406 I. *According to my own view when I look at this module I find that the module... when I look at the module*
407 *I find that it is big but when you teach it in your classroom its very easy to teach two topics at the same*
408 *time as you cannot cut it short when they overlap with one another. So the time that was given for*
409 *teaching that module I find that it more-or-less accurate. You can even do it at a faster pace than 6 weeks.*
- 410 R. Um....I brought you the materials for doing the condom activities and the transmission activity and the
411 antiretroviral activity. Would you normally have a problem with getting those materials for doing those
412 activities or would you have those materials available?
- 413 I. *No, I will always have some problem to get those materials for those activities.*
- 414 R. Which of the materials would you have a problem getting?
- 415 I. *The retort stands and the tubes. I could get the condoms. I think condoms I will easily get.*
- 416 R. And the lead?
- 417 I. *yes, the lead.*
- 418 R. What about the chemicals for the transmission activity?
- 419 I. *No, the chemicals would be a problem. Chemicals I can't get.*
- 420 R. Did you feel that your knowledge of HIV / AIDS was good enough to teach the module effectively?

- 421 I. *Excuse me?*
- 422 R. Did you feel that your knowledge of HIV and AIDS was good enough to teach the module effectively?
- 423 I. *No my own knowledge was not going to be effective, but through knowledge of what was in the module,*
424 *it helped me a lot because what I know I can say I know it better but when you look at it you find that you*
425 *can teach something for a short period but after reading about it in the module I found that most of the*
426 *activities could really help the children when they come to day-to-day situations. So the module it helped*
427 *me a lot.*
- 428 R. Did you....Your knowledge of HIV from the course that you did at Wisconsin and Pretoria University did
429 you have the content, did you know it well enough? Before you started teaching this?
- 430 I. *Yes, before I started teaching this, because I went to.... I attended a teacher's a training programme with*
431 *the PPASA whereby they were training teachers on how to teach modules or on HIV / AIDS so I did have*
432 *some knowledge before because I attended many training courses for teachers before.*
- 433 R. Um....so there were no areas of this, no sections of this that you felt that your knowledge was inadequate?
- 434 I. *No, how the virus gets into one's body that one I wasn't aware and the difference between this virus HIV,*
435 *this HI virus it is very much different from other viruses that we are used to. So that one, I didn't know it*
436 *before.*
- 437 R. HIV / AIDS is a very sensitive issue that affects all of our learners in South Africa. Did you feel that you
438 were able to adequately deal with the emotional aspects that the study of this subject raises with you and
439 your students?
- 440 I. *So in my case, especially that I am very used to these kids, I normally go to the classes and talk to them*
441 *about life skills under general or health talks. I didn't find any problem when teaching them because they*
442 *are used to me as a friend, we are at the same level, so I didn't have a problem.*
- 443 R. Do you have the autonomy to change the curriculum in your classroom? The right to change the
444 curriculum that you teach? The power.
- 445 I. *No I don't have the power, I have to follow the curriculum according to the district.*
- 446 R. Who gives you that curriculum that you must teach?
- 447 I. *The Department.*
- 448 R. Did you do all the activities in the module?
- 449 I. *No I didn't.*
- 450 R. If you didn't do all the activities, which activities did you leave out?
- 451 I. *Its only the ones in part four, those which were involving debate, the role play the ones like that.*
- 452 R. So 4.3. and 4.4.?
- 453 I. *Yes.*
- 454 R. If you left out activities, did you leave them out....
- 455 I. *Before we go on Jenny, and that other one, that one of drinking pills they were, when I was giving*
456 *instructions they were not carrying instructions as I word unclear you see they were making fun out of it*
457 *too much, not concentrating on what they were supposed to do like when they see sweets they were just*
458 *playing and when I say 'when I do this you must drink your first pill' they were just doing it at their own*
459 *pace, laughing, wasting all the time so maybe the instructions were not carried through although they*
460 *understood what I wanted to teach them.*
- 461 R. Right. If you left out these activities - 4.3. and 4.4., did you leave them out because of lack of time, lack
462 of materials, or you didn't see the point of the activity, or were there other reasons. And if there are other
463 reasons, will you tell me what the other reasons are?
- 464 I. *That is the problem of language.*
- 465 R. Please will you elaborate on that.
- 466 I. *The problem of language which we are having in our school whereby we find that the second language*
467 *which is English is giving them a problem in each and every subject. Although we are trying our best to*

- 468 *communicate with them, but its really, its is a problem.*
- 469 R. Why would the problem of language prevent the students doing those activities?
- 470 I. *Role playing wants active students who will talk freely without any shyness, but because they couldn't*
471 *express themselves they felt embarrassed.*
- 472 R. Are there any other comments that you would like to make about the module and teaching the module?
- 473 I. *No, what I wanted to add that I found the module very interesting and especially that it covered life skills*
474 *portion whereby learners could learn a lot out of it but my question was if whether it was allowed in the*
475 *curriculum as such that it comes like this as we are teaching it, not cutting out sections like when we are*
476 *teaching it in life skills we are only having how one.... we don't concentrate on the origin..... how one can*
477 *contract it, living with HIV positive people, what can one do so that one can know his status, we are not*
478 *looking at some of the things that can really help the learners in every day life. So my question was could*
479 *that be possible that we make suggestions in the life skills curriculum? So it includes the boarder way of*
480 *HIV?*
- 481 R. Do you not feel that students need more biology knowledge to understand this than they would have in
482 the life skills curriculum, say in grade 9 because then they don't know about DNA and RNA and
483 transcription and translation and so they wouldn't really understand how the medicines work and why they
484 work, or what a vaccination is and why a vaccination works?
- 485 I. *Yes, the background knowledge on biology, as the foundation, it is really important in this case. But that*
486 *was a question when I asked that is it possible that when it is involved in the curriculum they involve it in*
487 *a broader way. But the foundation of biology is very important in this case as you say that they won't*
488 *understand DNA, RNA, how this virus looked like and how it is translated and whatever. But the*
489 *foundation of biology is very necessary in this case.*
- 490 R. Just another question that is not part of this questionnaire I want to know from you, for my interest. There
491 is a part of the curriculum in life skills about HIV - do you think that, plus this would give a good education
492 on HIV?
- 493 I. *But it won't be enough, it won't be enough. I am teaching life skills in grade 9, but the information that I*
494 *am giving them or discussing with them as far as HIV is concerned, its very limited. Because I only teach*
495 *them to avoid, helping avoid contracting this virus all those possible things that can bring the virus into*
496 *their body eh, how to avoid, eh, go for testing and counselling, and then the myths, the cultural issues*
497 *about it but we don't get deeper into the medication, especially that you are undermining our environment*
498 *where we are staying that when a child or when a person is having the virus, he won't be able to afford.*
499 *As you see the environment they don't have access to medical aids, most of them, to the extent that they*
500 *won't be able to afford drugs. So even if the Department of Health when they come to our schools, they*
501 *don't address the issue of medication that one can get drugs, no, that one is not addressed it is just the*
502 *HIV how to prevent it, how to go for testing - the medication part is not taken into account.*
- 503 R. Thank you very much.