EVALUATION OF THE IMPACT OF A HIV/AIDS MODULE ON GRADE 11 BIOLOGY LEARNERS IN SOUTH AFRICA

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The purpose of this study is 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, as well as outcomes-based assessment activities. The answers written by each learner in a pre-, post- and retention-test that included both open and closed questions, will be analysed for significant changes. A narrative written by each learner is analysed to determine how the module had dealt with issues that affected his/her life. A case study was used to monitor the implementation of the intervention and a structured interview was conducted with each teacher to determine difficulties they experienced in implementing the module. Analysis of the questionnaires has not progressed far enough to reach conclusions about changes in learners' attitudes towards HIV-infected people, and their knowledge of HIV and risky behaviour. Narrative analysis is showing that the learners are profoundly glad to have been taught this information, and many of them have provided evidence of how the module impacted on their lives and sexual behaviour.

INTRODUCTION
The purpose of this study is to assess the effect of an education intervention on HIV/AIDS within the context of the subject biology for grade 11 learners, and to identify difficulties teachers have with teaching the material.

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 et al. 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 et al. (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. Anti-retroviral medicines are unavailable to most South Africans because of their high cost and the lack of effective infrastructure for dispensing them. They therefore advocate behaviour change as 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).

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 are infected with HIV. Whiteside and Lyerly (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. They recommend that all teachers 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. They also identify education establishments and staff as potential resources for outreach into broader communities. The Biology HIV/AIDS teaching module provides biology teachers 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 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. Campbell (2003) reports that there is widespread agreement that a key step in addressing the HIV epidemic is to get local people collectively to ‘take ownership’ of the problem and emphasises the need for such approaches as community-led peer education. The module also includes a life skills component that serves to train learners in appropriate behaviour skills, such as the negotiation of condom usage.

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?

THEORETICAL FRAMEWORK
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 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).

They 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” (Harrison et al. 2000, 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’.

Studies done on the effectiveness of HIV/AIDS education initiatives in the USA have identified other characteristics of effective programmes. Kirby et al. (1994) in their study of 23 school-based programmes to reduce sexual risk behaviours and a UNAIDS (1997) study cited by King (1999), found that the effectiveness of such programmes varies considerably. However, both studies identified additional characteristics of effective interventions including:

- having a narrow focus on reducing sexual risk-taking behaviour that could lead to HIV transmission rather than also spending time on other sexuality issues such as gender roles and dating
- providing basic and accurate information about the risks of unprotected intercourse and also methods of how to avoid such intercourse through activities designed to personalise this information
- reinforcing clear and appropriate values to strengthen individual values and group norms against unprotected sex
- providing modelling and practice in communication and negotiation skills
- providing extensive training for teachers who were to implement the programme

HIV was only identified 20 years ago and for a number of years it was commonly thought of as a gay male disease. For these, and other reasons, HIV education programmes for schools are relatively recent and there is not much literature on programmes and even less on their effectiveness, as not many programmes have been evaluated. This is especially true of South Africa, where apart from a few individuals who were
infected with the HIV strains from the USA, the major thrust of the epidemic moving down Africa only hit in the early 1990s.

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.

There is only one programme that has been introduced by the National Department of Education, i.e. the South African National Life Skills programme developed by the Departments of Education, and Health and Welfare. This programme aims to prevent HIV infection by raising awareness, educating learners about the nature of the epidemic and ways to prevent infection, and promoting the use of condoms and reducing high-risk behaviours. The programme involved training approximately 10 000 teachers to teach a Life Skills programme. It was intended that these teachers would return to the secondary schools where they taught and, in a cascade effect, train other teachers who would then also be able to teach these life skills and HIV/AIDS education. Visser and Schoeman (2001) looked at the evaluation of the programme and its outcomes, and concluded that there have been difficulties in implementing the programme that included the lack of teacher training and the lack of time to implement the programme within the school curriculum. This has been verified in the questionnaire administered as part of this study, in which only 26.4% of the respondents answered the question ‘have you been taught about HIV/AIDS before, and if so, in which subject/s?’ with the answer ‘Life Skills’ or ‘Life Orientation’. Personal communications with teachers including those attending the HIV/AIDS courses run as part of the Rainbow Biology Teacher Enrichment Programme also bear out the fact that HIV/AIDS prevention skills are not taught as part of the Life Skills programme in many schools. (Personal communications, 21 September 2003 Mbetse, 2 October 2003 Jyothi Chabilall, 27 October 2003 Joan Dommisse) While James in a presentation at the National AIDS Conference in Durban, 5 August, 2003 reported that in a study of some schools where the full programme was run, learners showed a significant change in outcome variables, I have been unable to access written work to substantiate these claims. Visser and Schoeman (2001) found that although learners’ knowledge of AIDS had increased significantly after they had participated in the programme, there was no significant difference in such high-risk behaviours as sexual activity, lack of condom use and multiple sex partners. They list some of the processes maintaining the high-risk behaviour as being peer group norms, the meaning attached to sex and relationships and the lack of skills to deal with relationships and personal problems.

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 Love Life national youth sexual health initiative, there have been few evaluations of HIV/AIDS education interventions in Africa. This current study will contribute to what we know of the link between increased knowledge and behaviour change.

THE INTERVENTION
Rainbow Biology teacher enrichment workshops began as part of an initiative to promote excellence in the teaching of biology by providing for professional development of teachers. The content of the workshops focuses on some of the cutting edge developments in biology and the development of teaching materials by teachers who attend the workshops. Three weeklong HIV/AIDS workshops have been run to date. All, except two of the teachers involved in this study attended one of the workshops and in addition, four of the teachers also attended a week-long course in HIV/AIDS at the University of Wisconsin, USA. This training is an important criterion for an effective HIV/AIDS intervention.

The first draft of the HIV module was completed in 2002 and tried in two schools. By the end of 2002, the second draft of the module was complete and an English edit was done on it to ensure the language used in the module was not too complex for the module to also be used by English second language learners. Work was also begun on the teacher’s guide.

The study on the effectiveness of the module was begun in January 2003.
METHOD
Prior to the implementation of the module at each of the six schools in the study, learners were given a pre-test questionnaire to determine their knowledge, and to try and determine their attitudes and behaviour re HIV/AIDS. It is acknowledged that while ‘sexual and contraceptive behaviours reported on questionnaires or interviews are not perfect proxies for actual behaviour’ … ‘reports of sexual behaviour do provide useful indicators of actual sexual behaviour.’ (Kirby et al. 1994).

The questionnaire was trialled as a pre-test in the first school studied in January 2003, shortcomings identified, and changes were made to it for the succeeding schools.

The questionnaire contained questions about the age and gender of the respondent as well as questions about prior instruction received in sex education and in HIV/AIDS as these variables might influence the learners responses in the questionnaire. The questionnaire included both open and closed form questions. The closed form questions were multiple choice questions, true and false questions, questions on attitude using Likert-type categories and some questions on perceptions of sexual behaviour of peers. In an attempt to establish if the respondents guessed the answers to the true and false questions, a section on how sure the respondent is that their answer for each item is correct was added. The open form questions included questions which were designed to try to establish the respondents’ attitude to HIV/AIDS, HIV/AIDS education, and the questionnaire.

The same test was given at the end of the module as a post-test and two months later as a retention test. The pre-, post- and retention-tests will be compared using an analysis of variance to determine if there is a significant difference.

The topic covers issues that are sensitive because they are of a sexual nature and also involve a stigmatised disease, so it was a concern that learners might be worried about being honest, and thus the questionnaires were answered anonymously, and the answers were confidential. As the answers in the pre, post and retention tests of each individual will be compared; each learner was given a questionnaire number that they kept for the duration of the study.

Standard procedures for the credibility and reporting of qualitative research are being observed.

On completion of the module, each learner was asked to write a two page narrative on how the module has dealt with issues that affect his / her life. The narratives are being read and reread to identify the main themes that they contain. A double blind analysis will be done by a second reader to determine whether each narrative’s themes were correctly identified.

A case study of the implementation of the module was also carried out in one school, with the researcher attending and videoing all lessons to give an additional perspective on changes in learners’ attitudes and also difficulties experienced by teachers.

Structured interviews were conducted with each of the six teachers and these have been analysed to identify difficulties teachers had with teaching the module.

RESULTS
Initial results from the analysis of the answers of learners from two schools in the true and false section of the pre-, post- and retention-tests, show that learners’ initial knowledge of HIV/AIDS is relatively good i.e. the average percent obtained in this section was 61.45 in one school and 71.35 in the second. While in the first school there was no significant difference in the percentage obtained in the pre, post and retention tests (61.45, 61.7 and 62.4 respectively) there was an improvement in the results in the second school (71.35, 82.15, 79.65 respectively).

One concern following the initial perusal of the questionnaires is the number of learners who got certain significant questions wrong in the retention test – see Table 1.
Table 1. Percentage of learners in two schools who got three important questions wrong in the retention test.

<table>
<thead>
<tr>
<th>Question</th>
<th>Percentage who got question wrong – school 1</th>
<th>Percentage who got question wrong – school 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>There is a cure for AIDS.</td>
<td>45.1</td>
<td>40.9</td>
</tr>
<tr>
<td>If you are faithful to one partner you will not get HIV.</td>
<td>35.4</td>
<td>40.9</td>
</tr>
<tr>
<td>Mosquitoes or other blood sucking insects can transmit HIV.</td>
<td>25.8</td>
<td>45.4</td>
</tr>
</tbody>
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Narrative analysis is showing that the learners are profoundly glad to have been taught this work, and many of them have provided evidence of how the module impacted on their lives and sexual behaviour:

‘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.’

The learners are confident that they know how to protect themselves:

‘Now in my daily lives I can see what is wrong and write about sex. Now I can be able to protect myself during sex intercause. And how to protect myself from the disease.’

They are proud of their knowledge and are sharing what they learned with friends and family:

‘I told them... and how they can prevent it to spreading and kill and how they can be treated and leave life to the fullest and never sleep around with boys or sugar daddy just because they want because HIV is there and it kills.’

A number of learners asked that the programme be taken to other schools as they felt that it was of such benefit:

‘I think you must go through all schools with this module 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.’

The case study showed that the learners were very involved in the work taught. They participated wholeheartedly in the activities, they grew in confidence during the teaching of the module, and became increasingly willing to talk about issues of a sexual nature. Problems that were observed with the teaching of the work were problems unrelated to the nature of the material, but were rather general problems such as a lack of facilities and a high absentee rate.

Analysis of the teacher interviews showed that those teachers who had attended training workshops had no problem with teaching the module, but two teachers who had not attended a workshop both dropped out of the study. They gave different reasons for their withdrawal – one was angry about the extra workload that teaching the module involved while the other said that as she did not know any more than her learners did about HIV/AIDS, she lost face if the learners asked her questions that she could not answer, and it resulted in her learners losing confidence in her ability as a teacher. This finding highlights the importance of adequate training of teachers to teach HIV.

CONCLUSION

While this is a work-in-progress, the preliminary analysis of results shows that the programme has touched the lives of many of the learners to whom it was taught. It is not easy to predict or to change the behaviour of adolescents as there are so many contributing factors that affect their behaviour, but confidence and knowledge are both motivating factors in determining behaviour (Solomon 1989, in Edwards 1999), and hopefully their new knowledge will help to reduce high-risk behaviours.
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REFERENCES


