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Cannabis

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schools

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Report prepared for the NSW Department of Education
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About the National Drug Research Institute

The National Drug Research Institute (NDRI), formerly the National Centre for Research into Prevention of Drug Abuse, was established at Curtin University in March 1996 as one of two Australian Centres of Excellence in Drug Research. The Institute has been designated a World Health Organisation Collaborative Centre for Prevention and Control of Alcohol and Drug Abuse. The Commonwealth Government provides core funding for the Institute as part of the National Drug Strategy, with additional funding being received from a variety of sources for particular research projects. The mission of the Institute is to contribute to the overall aim of the National Drug Strategy, which is to minimise the harm associated with drug use. It fulfils its mission by undertaking and disseminating research designed to establish the prevention potential of a range of legislative, fiscal, regulatory, health promotion and educational interventions. For further information about NDRI, visit their website: <http://www.curtin.edu.au/curtin/centre/ndri/>

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Acknowledgement

This report was developed by the National Drug Research Institute, Curtin University of Technology, Western Australia for the New South Wales Department of Education and Training. The authors acknowledge the considerable time and expertise of John Somerville, NDRI's librarian, who devoted much time to the searches of scientific databases undertaken as part of this review.

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ISBN: 0 7313 7042 2
SCIS: 1025363

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Executive summary

1. Early drug education

In the USA the repeal of Prohibition in 1933 signalled a change in emphasis from alcohol to illicit drug prevention. Drug education was discouraged in this climate as knowledge was considered to encourage experimentation (Anslinger and Tomkins, 1953). In the early 1960s the previously dominant view that no education was good prevention was reversed and drug education expanded substantially (Beck, 1998). Factual information was provided on the harmful effects of drug use in order to establish negative attitudes. However, information only approaches had little impact on changing attitudes or behaviours. This failure spurred the development of affective programs during the 1970s (Gorman, 1996; Beck, 1998). Affective programs sought to reduce drug use by enhancing personal development, but the evidence did not support their efficacy (Hansen, 1993). The social influence model has dominated the most recent phase of drug education. This approach is based on the premise that to resist drug use young people need to be inoculated by prior exposure to counter arguments and have the opportunity to practise resistance skills.

One of the important lessons from the history of drug education is that choosing a program on the basis of its intuitive appeal or popularity rather than its effectiveness can be more than just poor use of resources. Poorly conceptualised programs can actually do harm.

2. Why young people use cannabis and the harms they encounter

Research indicates that young people perceive drug use quite differently from adults. They see it as part of youth culture and consequently view it as normative behaviour. Coffield and Gofton (1994) considered that young people approach soft drugs as consumer goods. These authors developed a balance sheet of the benefits and costs of drug use as perceived by young people, and concluded that the perceived benefits clearly outweighed the costs. At the top of the benefits list was pleasure.

Although the public health burden of cannabis use is currently small, people who use cannabis, particularly long-term heavy users, can experience significant adverse health effects. Swift et al (2000) claimed the following acute harms which do not persist beyond intoxication are probably associated with cannabis use:

- negative psychological effects
- disruption of cognitive function
- psychomotor impairment
- increased risk of psychotic symptoms amongst vulnerable individuals.

In addition, the following chronic harms are probably associated with daily use or near daily use of cannabis over several years are:

- cannabis dependence
- subtle cognitive impairment
- adverse respiratory effects.

Swift et al (2000) noted that although the majority of adolescent cannabis use is experimental, early onset has been associated with poor mental health, drug use and abuse, delinquent behaviour and criminality, and poor educational achievement. There is also evidence that young people may be more prone to develop cannabis dependence for a given dose than adults (Chen et al, 1997).

There are social consequences of cannabis use relating to its illegal status. A relationship has been found between frequent cannabis use by young people and their participation in crime (Baker, 1998). There are juvenile provisions of the law in most Australian jurisdictions such as juvenile cautioning and Children's Courts and Panels, which apply to cannabis possession, use and supply. It is worth noting, however, that once convicted of a minor cannabis offence younger users are much more likely than older counterparts to be re-arrested and re-convicted (Broadhurst and Loh, 1995).

There is also a strong statistical relationship between cannabis use and the use of other drugs although most cannabis users do not progress to use other drugs (Cohen and Sas, 1998; Donnelly and Hall, 1994; Le Dain, 1972; MacCoun, 1998; Single et al, 1974). A large scale longitudinal study of New Zealand children by Fergusson and Horwood (2000) supports the notion that early cannabis use may be a risk factor for later use of other drugs. This research points to the potential benefits of developing and implementing prevention and intervention programs for school-aged adolescents which aim to delay onset of use and provide appropriate interventions for those who may be regular heavy users.

3. School-based drug education programs: what works?

Hansen (1992) reviewed the effects of different program components in 45 drug education studies. Overall, social influence and multiple component programs incorporating social influence strategies were more successful than either information-based or affective education approaches. Hansen's findings are reinforced by a number of other researchers in the area. Eggert et al (1994) and O'Donnell et al (1995) reported that drug education programs based on social learning principles have had beneficial long term effects in terms of student drug use. The effects are stronger: if booster sessions are added (Bell, Ellickson and Harrison, 1993; White and Pitts, 1998); if school activity is complemented by a parenting component (Rohrbach et al, 1994) and if the social messages are reinforced at the community level (Perry and Kelder, 1992; Perry et al, 1996).

Ballard et al (1994), Coggans and Watson (1995), Dielman (1994), Dusenbury and Falco (1995) and Kelder et al (1994) identified the following critical components in drug education:

- broader social skills training and comprehensive health education
- coherent and consistent messages
- research-based and theory-driven
- evaluation
- education before behavioural patterns are established
- developmentally appropriate information
- strategies related to objectives
- an overall goal of harm reduction
- resistance skills training
- normative education
- interactive teaching approaches
- values, attitudes and behaviours of individuals and the community addressed

- the interrelationship between individual, social context and drug identified
- a focus on prevalent and harmful drug use
- credible peer leadership
- additional family, community, media and special population components
- cultural sensitivity
- training and support for teachers
- role of teacher is pivotal
- adequate initial coverage and continued follow-up
- fidelity of implementation.

The Midwestern Prevention Program (Pentz et al, 1989) provides a good example of a well-conceptualised and implemented drug education program. In this project, 22,500 sixth and seventh grade students in Kansas City received a school-based, social influence intervention. The intervention consisted of 10 classroom sessions designed to skill the students in resisting drug use and 10 accompanying homework sessions which included parental involvement. In addition, media intervention, health policy development and community organisation were progressively added to the school-based program, on the basis that this would support and extend prevention skills learned at school. The results indicated that drug use rates were lower in the intervention population at one and two-year follow-up compared to controls.

An Australian model drug education program, the Illawarra Program, provides another example of effective practice (Wragg, 1990). The program, which targeted students in Year 6, began with a parent familiarisation evening. The classroom component of six units of work was introduced to students by Year 7 students who had completed the program the previous year. The curriculum covered decision making strategies, information on drug problems, alternatives to drug misuse, pressures to take drugs and resistance skills. Over this period there was a second parent evening. Following the teaching phase, students worked in groups to develop various drug-related materials and produce a short piece of drama. This culminated in a third parent evening where the materials and dramas were presented. Wragg (1990) followed up students to Year 10 and found that a significantly lower proportion of the program group had used tobacco or cannabis compared to controls but that there was no impact on the proportion that had ever used alcohol.

Tobler et al (1999) reviewed 37 well conducted programs that had cannabis use as a dependent variable and found the factors that distinguished success in terms of general drug use were similar to the factors that had an impact on cannabis use. Interactive programs were significantly better than non-interactive (didactic) programs in both changing attitudes to cannabis and reducing cannabis use. Certain program content such as knowledge, attitudes about drug use, drug refusal skills and intrapersonal skills was necessary for effectiveness.

4. Australian education programs for cannabis and other illicit drugs

The current Australian approach to cannabis education is, in theory, based on harm reduction but in practice, teachers are in a difficult position if they want to openly discuss the issues around student cannabis use. Consequently, cannabis education tends to equate to providing information as to the harms associated with use. Drug education needs to be seen by students as something more than propaganda and for this to happen it needs to acknowledge what students already know by direct or indirect experience, which is that drug use can be enjoyable. One of the reasons Australian alcohol education programs have

been so well received by students and teachers is that they deal openly with both sides of the decision making equation (Farringdon et al, 1999; McLeod, 1997). Cannabis education in Australia needs to do the same thing if it is to be relevant to students' decision making about cannabis use.

5. What to consider when formulating Australian drug education programs

Goals and processes

- Education programs should aim to reduce harm
- School initiated programs for 'at risk' cannabis users should be trialled
- Development of new programs should involve consultation with stakeholders.

Research evidence

- Junior programs should be generic, senior programs should be differentiated
- Programs should be interactive
- Effective programs have certain essential content
- Effective programs tend to be faithfully implemented
- Credible peers need to be involved in leadership roles
- Timing of the intervention is important
- Parents and the wider community should be involved where possible.

6. Conclusion

There is good evidence as to what works best in drug education but this is unlikely to be enough in itself to sustain the coherent development of such programs. The greatest potential barrier to good drug education remains the same; decision makers selecting drug education programs on the basis of what they would like to see happen rather than on the evidence of what can realistically be achieved. Ultimately this is self-defeating because the whole approach is discredited when the program is shown to be ineffective. In undertaking any new cannabis or other illicit drug education programs there needs to be a commitment to developing approaches that draw on the research evidence as to what is most likely to be effective in the Australian context. The process should not end there. The selected program or programs should be evaluated and ineffective approaches changed or replaced. Finally, backing for new approaches should be voiced at senior government levels and marketed to the community. Schools and teachers must feel supported in undertaking interventions which may not satisfy the Utopian desire to 'drug proof' young people but which are needed to keep young people safer in a world where drug use is a fact of life.

1 A brief history of cannabis education and other prevention measures

Early education programs focus on alcohol

In the USA there is a long and well-documented history of drug education, with practice in that country exerting a strong influence on how other countries, including Australia, have tackled drug education. Provision of formal school-based drug education in the USA dates from the 1880s, when the Temperance Movement sought to take preventative action against alcohol, tobacco and narcotic drugs, by teaching youth about their dangers (Beck, 1998). Leaders of this movement considered that alcohol was the leading cause of America's social problems and by the turn of the century they had gained nationwide support for compulsory temperance education in schools (Mezvinisky, 1961).

At this time, the practice of smoking and growing cannabis was completely unregulated and essentially unknown in mainstream American society. However, use of cannabis was commonplace in nineteenth century Mexico (Bonnie and Whitebread, 1999). When substantial Mexican migration to Texas and New Mexico occurred around the turn of the century, the new immigrants continued their customary patterns of use and cultivation. As the century developed, cannabis use was also introduced into American port cities by sailors from the Caribbean and travelled north to the major industrial centres as the Mexican immigrants moved to better paying jobs in the cities.

The 'Demon Drink' is replaced with the 'Monster Marihuana'

Alcohol-focused school drug education programs in America probably reached their peak of influence during the Prohibition years of the 1920s and early 1930s. The repeal of Prohibition in 1933 signalled the failure of a solely abstinence oriented approach to alcohol and prohibitionist approaches to alcohol education were rapidly abandoned. At the same time, the post prohibition drug bureaucrats, led by Harry Anslinger, considered that illicit drugs, particularly cannabis, constituted the greatest problem (Beck 1998). Anslinger asserted in a series of public appearances and radio broadcasts that cannabis use led to killings, sex crimes and insanity. In a 1937 newspaper article he stated dramatically that "If the hideous monster Frankenstein came face to face with the monster Marihuana he would drop dead of fright" (Bonnie and Whitebread, 1999: p 117). The American Federal Bureau of Narcotics deliberately used such sensationalism and scare tactics to arouse public opinion against cannabis and pave the way for strong prohibitionist legislation (Bonnie and Whitebread, 1999). These approaches also characterised drug education campaigns for several decades (Schlosser, 1994; Wallack, 1980). Drug education based on information was discouraged in this climate as knowledge was considered to encourage experimentation (Anslinger and Tomkins, 1953).

The modern period of drug education

In the early 1960s the previously dominant view that no education was good prevention was challenged from a number of quarters and as a consequence drug education expanded considerably during the decade (Beck, 1998). Programs during this period drew on behaviour theory in developing their change strategies. Typically, so called factual

information was provided on the harmful effects of drug use in order to establish negative attitudes and a fear of use. However, information only approaches had little impact and in a review of drug education from this period, Kinder et al (1980) indicated there was "little to support the notion that presenting factual information is an appropriate and effective method of changing attitudes and behaviour" (p 1044).

This acknowledged failure spurred two developments during the 1970s - affective programs and abuse prevention (Gorman, 1996; Beck, 1998). Affective programs sought to reduce drug use by enhancing personal development. Programs typically included training in self esteem, decision making, values clarification, stress management and goal setting. Again, the evidence indicated that these programs did not demonstrably succeed in changing behaviour (Hansen, 1993). This was not surprising according to Dielman (1994) because, like the information programs that preceded them, these affective programs had use or abuse reduction as their stated goal, but were evaluated against completely different dependent variables, such as increase in self esteem. This model makes assumptions that drug use by young people is driven by individual deficiency and that abstinence can be achieved by enhancing self esteem or improving decision making skills. However, Shedler and Block's (1990) research challenges this notion of a linear relationship between drug use and poor psychological adjustment. They found that young people who had engaged in some drug experimentation, primarily with cannabis, exhibited better psychological health than non-users, although frequent users were considered maladjusted.

The other major drug education development at this time was abuse prevention. Such programs targeted alcohol use and were based on the premise that drinking by young people would occur and that pragmatic programs should seek to prevent or minimise the problematic consequences of such use. Such an approach today would be considered harm reduction, although it was not called that at the time. Harm reduction approaches have tended to be adopted more in Europe, Canada and Australasia, where they gained credibility because of their success in combating the spread of HIV among intravenous drug users. In the USA there was a short period during the late 1970s when official support was given to harm reduction as a guiding principle in drug education, but abstinence re-emerged strongly within a few years as a result of the influence of the 'parent power movement'. This grass roots movement convinced governments to support only non-use or 'zero tolerance' education programs (Beck, 1998).

The education programs that were developed in the 1980s generally reflected this abstinence goal, but were more sophisticated in their methodology. The social influence model, developed from Bandura's (1977) social modelling theory and McGuire's (1964) work on social inoculation/resistance training, has dominated this most recent phase of drug education. The approach is based on the belief that young people begin to smoke, drink and use other drugs, because of social pressures to do so from a variety of sources, such as the mass media, their peers and even the image they have of themselves. In order to successfully resist the adoption of undesirable behaviour young people need to be inoculated by prior exposure to counter arguments and the opportunity to practise the desired coping behaviour.

The social influence model was initially used to prevent young people taking up smoking and its success in this area led to the approach being used to reduce the uptake of other drugs, including cannabis (Perry and Kelder, 1992). Ellickson and Bell (1990), in a study in 30 junior high schools in California and Oregon, reported that their 'Project ALERT'

social influence intervention curbed cannabis uptake by one third and reduced current use by 50-60 per cent. Hansen et al (1988) compared the impact of a 12 session, peer led social influence program (Project SMART) on drug use by seventh grade students with change achieved by an affective program. These researchers found the social influence approach that incorporated a substantial peer education component was effective in delaying the uptake of smoking, drinking and cannabis use. Those students who received the affective program increased their use of all three drugs over both the 'social influence' students and the 'no intervention' controls.

The lessons from history

The increase in drug use following education raises an interesting point that needs to be considered when making decisions about drug education. It can be more than just an inefficient use of resources. Poorly conceptualised programs can actually do harm. In Australia, the Life Education program receives several million dollars each year from government, business and service groups and has a high profile in the community. Yet an evaluation of the social impact of the program in Victoria reported that 22 per cent of all Victorian boys' recent drinking could be attributed to participation in Life Education (Hawthorne, 1996). One of the important lessons that needs to be taken from the history of drug education is that intuitive or ideologically driven decision making has led to some bad choices with regard to drug education programs. A focus on data-driven approaches is beginning to emerge, which recognises that program success is determined primarily by the extent to which the intervention changes the behaviour of students, schools, neighbourhoods and families in a manner that influences drug use and harm. Choosing a drug education program on the basis of its intuitive appeal or popularity rather than its effectiveness could mean that it is taking the place of other, more beneficial, drug education interventions. Once established, well promoted but ineffective programs can consume resources over a long period of time and prevent the implementation of alternative programs, which research suggests are more likely to produce the desired change.

The recent increase in cannabis use

Perry and Kelder (1992) claimed the social influence approach was very successful in reducing cannabis use by young people but, in contrast, its impact on alcohol use has not been as great. They suggested that this is because cannabis is not widely accepted and the social pressure to use is much less than in the case of alcohol. However, prevalence data from most western industrialised countries, including Australia, indicates this situation is changing. In 1993, 23.4 per cent of USA tenth grade students had tried cannabis. By 1997, 42.3 per cent of students in this grade had tried cannabis. In younger students the increase in 'ever use' prevalence was more dramatic with 10.2 per cent of eighth grade students having tried cannabis in 1993, compared to 22.6 per cent in 1997 (National Institute on Drug Abuse, 1998). In Europe, surveys of school children indicate a similar pattern of increasing cannabis use during the 1990s (Kuipers and de Zwart, 1999; Balding, 1998). In 1993, 25 per cent of British 15-16 year old students had tried cannabis which increased to 38 per cent in 1997 (Balding, 1998). In the Netherlands, 14 per cent of 14-15 year old students had tried cannabis in 1992 and this increased to 24.5 per cent in 1996. National drug surveys indicate that Australia has essentially mirrored these international trends of increasing cannabis use by young people (Jones, 1993; Australian Institute of Health and Welfare, 1999). The most recent survey of drug

use by Australian students indicated that 21.7 per cent of 13 year old students and 44.7 per cent of 15 year old students had tried cannabis (Letcher and White, 1998). The international and Australian data indicate the taboos against cannabis use are breaking down and young people are increasingly being faced with choices about use. This change in social norms needs to be considered when designing prevention programs for students.

2

Why do young people use cannabis, what are the problems associated with cannabis use and does use of cannabis lead students into using more harmful drugs?

Why do young people use cannabis and other illicit drugs?

Adolescence is a time of development and transition. A normal part of this change process and the formation of an adult identity involves experimentation and risk taking. This can take a number of forms including unsafe sex, driving fast, or using drugs. All these behaviours contain potential hazards for the young person and their community, but they are not necessarily indicative of underlying deviance. Blackman (1996) considered that the dominant view of youth drug use is that it represents problem behaviour and those who use drugs are unlike ordinary people. This is reinforced by studies which show a relationship between drug use and undesirable behaviour, such as drinking and driving, truancy, lower academic achievement, leaving school early and delinquency (Newcomb and Bentler, 1989; Perry and Kelder, 1992). However, research also indicates that experimentation with licit and illicit drugs is common among young people, yet most do not become frequent or problematic users (Letcher and White, 1998; National Institute on Drug Abuse, 1998; Shedler and Block, 1990). Blackman argued that his qualitative research indicates young people see drug use quite differently to adults. They see it as an integral part of youth culture and consequently view it as quite normative. Coffield and Gofton (1994) considered that "young people approach soft drugs in the same rational, matter-of-fact way they deal with other consumer goods" (p 16). These authors developed a balance sheet of the benefits and costs of drug use as perceived by young people with the benefits clearly outweighing the costs. At the top of the benefits list is pleasure and Coffield and Gofton concluded from their research that "most young people take soft drugs because they enjoy them and they create fun and excitement" (p 18).

The public health effects of cannabis

Like any legal or illegal drug, cannabis has the capacity to cause harm. The public health significance of cannabis use is affected by the severity of the health effects experienced by individual users, as well as the prevalence of cannabis use in the population. While most cannabis use is experimental and intermittent, the major health risks are more likely to be experienced among regular, long-term users, rather than young people (Hall, Room and Bondy, 1999). However, as the prevalence of heavy cannabis use increases and the age of initiation declines the public health burden is likely to increase. This, in itself, is an argument for better prevention and use reduction education programs aimed at students and other young people.

The health effects of cannabis on users

Although the public health burden of cannabis use is currently small, people who use cannabis, particularly long-term heavy users, can experience significant adverse health

effects. The most probable health effects have been identified in recent authoritative systematic reviews of the literature (Hall, Solowij and Lemon, 1994; Hall, Room and Bondy, 1999). These are summarised below.

Probable acute harms

The acute toxicity of cannabis is low and there have been no recorded deaths due to cannabis overdose. The available evidence indicates that it would be very difficult to consume a lethal dose of cannabis via conventional routes of administration, such as inhalation and ingestion (Hall et al, 1994). Swift et al (2000) noted that the most probable acute harms associated with cannabis use are generally self-limiting and do not persist beyond intoxication. They are:

- negative psychological effects, including anxiety, dysphoria, panic and paranoia, which are most common in naive users and can lead to panic attacks
- disruption of cognitive function, including memory, learning and processing of time, which could be disruptive to everyday tasks reliant on complex cognitive processing. Clearly, this includes many tasks associated with learning in the school environment
- psychomotor impairment. Acute intoxication caused by cannabis use probably increases the risk of accidents while driving or operating machinery, particularly in demanding situations (Robbe, 1994). However, studies of motor vehicle accidents have found no relationship between crash culpability and presence of cannabinoids (Hunter et al, 1998). Swift et al (2000) claim that while cannabis is, after alcohol, the second most often detected drug in those involved in road traffic accidents, its causal role will continue to be debated
- increased risk of psychotic symptoms amongst vulnerable individuals. There is some evidence to suggest that heavy cannabis use may be associated with acute psychosis. However, if cannabis-induced psychoses exist they would require very high doses of THC, the prolonged use of highly potent forms of cannabis or a pre-existing vulnerability (Hall and Degenhardt, 1999).

Probable chronic harms

The most probable effects of daily or near daily use of cannabis over several years are:

- cannabis dependence, characterised by an inability to control use, continued use despite problems, withdrawal and tolerance to the effects of the drug. It may be very difficult for the cannabis dependent person to change their pattern of use. This can increase the likelihood of experiencing other health and social problems including reduced work or educational performance (Swift et al, 2000)
- subtle cognitive impairment which can affect attention, memory and the organisation and integration of complex information. According to evidence available to date, these impairments do not appear to be grossly debilitating, but their reversibility is unknown (Solowij, 1998)
- adverse respiratory effects, such as chronic bronchitis and pre-cancerous changes arising from smoking cannabis. Waterpipes or 'bongs', which are frequently used by young Australians, may deliver greater concentrations of tar (Gieringer, 1996). There is evidence to suggest that some of the negative respiratory effects of cannabis and tobacco may be additive (Tashkin, 1999).

Young people as a high risk group

Young people are one group who may be at a higher risk of developing the adverse, acute and chronic effects of cannabis. Adolescence is a time of rapid development and life transition and cannabis use during this period is of particular concern (Swift et al, 2000). Summarising the effects of cannabis use by young people, Swift et al (2000) noted that although the majority of adolescent cannabis use is experimental, early onset has been related to poor mental health, delinquent behaviour and criminality, drug abuse and poor educational achievement. Reviews suggest that these associations are due to common or overlapping risk factors and life pathways between young people who may be predisposed to cannabis use and those at increased risk of other outcomes, rather than to causal connections between cannabis use and these other problems (Lynsky and Hall, 2000).

There is evidence that young people may be more prone to develop cannabis dependence for a given dose than adults (Chen, Kandel and Davies, 1997) and that a strong relationship between frequent cannabis use by young people and their participation in crime has been found in research conducted in NSW (Baker, 1998). A recent longitudinal study of a birth cohort of 1,037 New Zealand young people from age 15 to 21 years failed to find any evidence that cannabis use in adolescence was associated with an increased risk of later mental health problems, but both cigarette use and alcohol use in adolescence independently increased the risk of a later mental health disorder (McGee, Williams, Poulton and Moffitt, 2000).

Social effects of cannabis law on users

A range of adverse social consequences stems from the legislative and criminal justice systems, which aim to prohibit the use of cannabis. These harms may be experienced by cannabis-using individuals, their families, friends and the general community. Most work on the social costs of running foul of the law for a minor cannabis offence has focused on adults. Recent Australian research has shown that adults who acquire a criminal record as a result of a minor cannabis offence can experience significant costs in terms of impacts on employment, further involvement with the criminal justice system, relationship problems and restrictions on international travel (LeDain, 1972; Erickson, 1980; Erickson and Murray, 1986; Lenton, Bennett and Heale, 1999). These costs are far greater than those experienced by offenders receiving an infringement notice under a system where civil penalties apply (Lenton, Christie, Humenuik et al, 1999).

In most Australian jurisdictions juvenile provisions of the law, such as juvenile cautioning, Children's Courts and Panels, apply to cannabis possession, use and supply. However, Lenton (1999) found that in Western Australia charges against juveniles accounted for eight per cent of all cannabis charges from 1994 to 1996. Almost two thirds of juveniles charged with cannabis possession or use as their most serious offence had the charge dismissed, one in five were fined and the remainder were given non-custodial sentences such as probation, community service orders, good behaviour bonds and suspended sentences (Lenton, Ferrante and Loh, 1996). It is worth noting that once convicted of a minor cannabis offence younger users are much more likely than their older counterparts to be re-arrested and re-convicted. This is not simply because younger people are more delinquent than others, but young people, especially those from working class, Aboriginal and marginalised groups, spend much of their lives in public view. Once arrested and convicted, a young person is at increased risk of more scrutiny from police and therefore

the likelihood of being re-arrested increases (Broadhurst and Loh, 1995). There is potential for young cannabis users to find themselves in a snowballing involvement with the law, with cascading adverse social consequences.

The 'gateway theory' of cannabis use

The 'gateway theory' attempts to explain the basic empirical observation that most illicit drug users began their drug use with cannabis. The extent to which this constitutes a 'gateway' depends on what is meant by the term, what are the proposed underlying mechanisms and the implications of these. Some of the more deterministic versions of the 'gateway' phenomenon are easily refuted. Alternative explanations involving more complex sociological and psychological factors appear to be more plausible. MacCoun (1998) has offered seven possible interpretations of the evidence that cannabis use tends to precede the use of other 'harder' drugs.

While there is undoubtedly a strong statistical relationship between cannabis use and the use of other drugs, most cannabis users do not progress to use other drugs (Cohen and Sas, 1998; Donnelly and Hall, 1994; LeDain, 1972; MacCoun, 1998; Single et al, 1974). Licit drugs such as alcohol and tobacco relate just as strongly as cannabis to other illicit drug use and trends in cannabis use do not always relate to trends regarding other illicit drugs. Heavy cannabis use may be a marker for other drug use, but it does not follow that it caused the other drug use. More plausibly, either: (1) heavy cannabis users and users of 'hard drugs' shared underlying personal or social vulnerability factors: rebelliousness (Torabi, Bailey and Majd-Jabbari, 1993), risk taking and stimulus seeking (Lynskey and Hall, 1998), poor economic prospects (Schaefer Commission, Marihuana, 1972; LeDain, 1972), for example, and/or (2) frequent involvement in the cannabis market exposed heavy cannabis users to many opportunities to use other drugs (Blackwell and Erickson, 1988; Johnson, 1973). These studies suggest that interventions offered to those at risk should not simply aim at avoiding or stopping cannabis use, but should address a range of possible underlying factors. This latter explanation of progression to harder drugs provides one of the rationales for Dutch policy in regard to cannabis use. The Dutch consider it crucial not to marginalise young people who experiment with cannabis, as this may lead them to use more dangerous drugs. Accordingly, the Dutch are prepared to tolerate the individual risks associated with using cannabis in preference to the social risks attached to criminal action against users. Cannabis markets are similarly tolerated as a way of separating them from other illicit drug markets and thus making it less likely that cannabis users will be exposed to harder drugs (de Kort and Cramer, 1999).

In a recently published 21 year longitudinal follow-up of a birth cohort of 1,265 New Zealand children, Fergusson and Horwood (2000) found the relationship between early cannabis use and later use of other illicit drugs was maintained despite controlling for socio-economic background, childhood family circumstances, adjustment in early adolescence, adolescent lifestyle and deviant peer affiliations. Controlling for peer influences reduced, but did not entirely explain, the apparent linkages found between cannabis use and other illicit drug use. The associations between cannabis use and other drug use may be non-causal and mediated by affiliations with deviant peers and other factors that were not adequately controlled for in the analysis. However, it does seem this large-scale study supports the notion that early cannabis use may be a risk factor for later use of other drugs. This research points to the potential benefits of developing and implementing prevention and intervention programs for school-aged adolescents which aim to delay onset of use and provide appropriate interventions for those who may be regular heavy users.

3 Contemporary school-based cannabis and other illicit drug education programs

What is likely to make a difference?

The early reviews of drug education programs were consistently critical of their methodology and achievements (Goodstadt, 1980; Kinder et al, 1980; Schaps et al, 1981). However, Dielman (1994) considered that these programs and the accompanying research were useful as both a foundation and impetus for the development of better interventions. In more recent reviews and meta-analyses of contemporary drug education programs, a picture is beginning to emerge as to what type of intervention is likely to make a difference.

Tobler (1986) conducted a meta-analysis of 143 drug prevention programs designed for young people and concluded that programs which combined peer influence with specific skills training were the most effective, although programs offering alternatives to drug use, such as sporting or social activities, were particularly useful for 'at risk' students. Bangert-Drowns (1988) conducted a meta-analysis of 33 school-based prevention programs which in the main focused on alcohol and emphasised education strategies. The evaluation examined changes in drug-related knowledge, attitudes towards drugs and drug use behaviour. He found that education increased drug-related knowledge and changed attitudes, but drug use behaviour only changed in students who had volunteered to participate in the education. He also found that the mode of delivery was important. Programs that used lectures as their only intervention had less influence on attitudes than those which used discussion.

Hansen (1992) reviewed the effects of different program interventions on outcome variables from 45 drug education studies. Overall, social influence and multiple component programs, which typically featured social influence strategies, demonstrated more success than either information-based or affective education approaches. Among the rigorous studies, 63 per cent of those relying solely on social influence approaches and 73 per cent of those incorporating social influence within a multiple component program produced significant change, whereas only 30 per cent of similarly well conducted information-based programs and 42 per cent of affective programs achieved a similar result.

Hansen's review serves to illustrate the relative merits of the social influence approach and his findings are supported and extended by a number of other researchers in the area. Eggert et al (1994) and O'Donnell et al (1995), among others, have reported that drug education programs based on social learning principles have had beneficial long-term effects on student drug use. Such programs have also demonstrated broader prevention benefits. Programs have reduced anti-social behaviour and school behaviour problems, increased academic performance and commitment to schooling, and reduced affiliation with deviant peers (O'Donnell et al, 1995; Spoth et al, 1995). The effects appear to be stronger if booster sessions are added at critical points of developmental transition (Bell, Ellickson and Harrison, 1993; White and Pitts, 1998), if school-based activity is complemented by a parenting component (Rohrbach et al, 1994) and if the social messages are reinforced at the broader community level (Perry and Kelder, 1992; Perry et al, 1996).

For the first time in the history of drug education, research has shown that programs could change drug-using behaviour. These successful programs were more often than not based on social influence models and initially most sought to develop specific skills for resisting the pressures to initiate drug use. Botvin (1986) however, included a general set of skills for enhancing individual competence in his Life Skills Training (LST) program, because he considered these would enhance a young person's ability to deal with the indirect pressures to use drugs. The following skills training was included in Botvin's program: development of greater autonomy, self mastery, self esteem and self confidence, coping with social anxiety, better knowledge of drug use prevalence among their age peers and development of attitudes and beliefs consistent with non-use. The LST program has been evaluated in ten separate studies and, according to Dusenbury, Falco and Lake (1997), has reduced alcohol, cannabis and tobacco use into early adulthood.

Gorman (1996), in a very detailed critique of the LST approach, indicated the claims of the programs need to be assessed in light of their methodological limitations. He noted that while some of the evaluation studies reported significant education effects, most results indicated no change due to the intervention. An additional consideration with those studies that reported significant change, was the large number of comparisons. In such cases one or two significant results were likely to occur by chance. Gorman also pointed to the small numbers in some of the social influence studies and in one instance, the collapsing of variables into dichotomised scales, which depending on the cut off points chosen, could have influenced significance. It is also worth noting that the LST programs comprise at least 15 classroom sessions for seventh grade students followed by ten and eight sessions respectively in eighth and ninth grades (Duryea et al, 1984; Perry and Kelder, 1992). This is a substantial intervention and it may be difficult for schools to add such a program to their already crowded curriculum.

The use of peer leaders to educate is another strategy that has received increasing attention in the drug education literature. Carr et al (1994) considered that at the heart of this approach is the view that young people can more usefully explore controversial issues with others of the same age and social background. Klepp et al (1986) reinforced this point with a range of evidence that supports the credibility of peer educators in terms of social information. They argued that the role of peer educators extends beyond the provision of information. Peer educators can serve as "potent role models by demonstrating non-use, by creating a norm that drug use is deviant rather than acceptable and by providing alternatives to drug use" (p 407). Coggans and Watson (1995) also considered that peer led approaches could take advantage of factors such as peer modelling and normative attitudes and values. However, they recommended that peer leaders be selected very carefully. Students considered good role models by adults are not necessarily so regarded by the target group and simply selecting 'good' students to be mouth pieces for education material is not only ineffective but places unreasonable pressure on the student educators themselves (Baklien, 1993). Botvin (1990) considered that ideally, peer leaders should be credible with high-risk young people, have good communication skills, show responsible attitudes, but at the same time, be somewhat unconventional. Botvin (1990) considered that even ideal peer leaders are likely to lack the organisational and management skills possessed by effective professional teachers and accordingly he has recommended that the best of both worlds could be achieved by using teachers and peer leaders in combination.

In a meta-analysis of 120 school-based drug education programs Tobler and Stratton (1997) presented comparisons between programs that were considered to be interactive

and those considered to be didactic. The interactive programs were those which actively engaged students in discussions, role-plays and games. The didactic programs, in comparison, relied heavily on lectures, videos and worksheets. Six factors relating to program effectiveness were analysed as covariates, including type of leader. These researchers found that peer education produced similar results to other interactive programs conducted by teachers and other leaders. The most important factor was the interactive process. In a comparison of those programs that measured knowledge, attitudes and behaviours, only the interactive programs produced significant change in attitude and drug use. The interactive programs were equally successful with tobacco, alcohol and cannabis and extremely successful with illicit drugs other than cannabis, although the authors cautioned that this result came from only six programs.

Hansen and Graham (1991) have identified another element that seems to play a crucial role in effective school-based drug education programs: normative beliefs about drug use and drug-related behaviour. They found that students over estimated the proportion of their age group that drank alcohol. This erroneous belief that more of their peers drank than was actually the case acted to increase the likelihood that they themselves would drink. In their study, Hansen and Graham compared alcohol use among students who had received one of four curricula: information only; information plus resistance skills training; information plus normative beliefs; information plus resistance skills training plus normative beliefs. They found that after one year, alcohol use was significantly reduced among students who received programs that included a normative beliefs component. Hansen and Graham's study only looked at alcohol education programs, but their findings are likely to be applicable to education programs for other drugs where actual prevalence is considerably lower than perceived prevalence. In the case of cannabis education this would have to be assessed during the formative evaluation phase.

The timing of drug education is likely to be critical according to a number of researchers (Dielman, 1994; Duncan et al, 1994). Kelder et al (1994) commented that primary prevention is most effective if instituted before behavioural patterns are established and more resistant to change. In Australia, students are typically taught about drug use in high school, whereas in the USA, young people are exposed to primary prevention programs from as young as ten years of age (Falco, 1992). Falco argued that young people at this age are still eager to learn resistance skills and that they comprise a captive audience, because the great majority still attend school. In many USA cities there is a high student drop out rate, even in early high school years, and these particularly vulnerable young people will not be exposed to prevention programs targeting older students. The general consensus in the literature (Johnston, O'Malley and Bachman, 1989; Dielman, 1994; Duncan et al, 1994) is that the optimal time for initiating youth drug interventions is during the late primary or early high school years, as this is when experimentation begins. However, onset of use can vary in different populations and with different types of drugs. Accordingly, timing of programs should be optimised for a particular population and for particular drugs such as cannabis, by reference to the appropriate prevalence data.

Dusenbury and Falco (1995) sought to identify and summarise the key elements of effective drug education. They reviewed school-based programs conducted between 1989 and 1994 and interviewed 15 leading researchers in the area. They identified 11 critical components of an effective program. Ballard et al (1994) undertook a very similar process of consultation and review in developing their 15 principles for drug education in schools. These principles are substantially evidence-based and Ballard et al (1994) considered they offer a framework for policy makers, school administrators,

teachers, parents and other stakeholders to use when making decisions about the selection, design and implementation of drug education programs. They are remarkably similar to Dusenbury and Falco's key elements and these two sets of critical components have provided the basis for the summary of effective drug education elements contained in Table 1. In addition, three features of successful drug education programs not mentioned in these two reviews, but consistently identified in other research, have been included in this table. These features are: appropriate timing of the intervention to ensure that prevention programs are initiated when prevalence of use by young people is still very low (Kelder et al, 1994); use of peer leaders to focus on the social factors that influence drug use (Coggans and Watson, 1995) and fidelity of implementation to ensure that programs are delivered as intended (Dielman, 1994).

Table 1: Summary of critical elements in effective school-based drug education and prevention

Theme	Component	Source	Comment
Context	Drug education is best taught in the context of broader health skills.	Ballard et al (1994) Dusenbury and Falco (1995)	Ongoing, comprehensive, developmentally appropriate health programs promote general competence and provide a context for understanding drug-related behaviour.
Consistency	Drug education messages across the school environment should be consistent and coherent.	Ballard et al (1994)	Whole school policies and practices should reinforce the objectives of drug education programs.
Basis in evidence	Drug education needs to be based on research as to effective curriculum practice and the needs of students.	Ballard et al (1994) Dusenbury and Falco (1995)	Effective programs are based on an understanding of contemporary theory and research evidence as to what causes drug use and what factors provide protection.
	Drug education programs should be evaluated.	Ballard et al (1994) Dusenbury and Falco (1995)	Evaluation will provide formal evidence of the worth of the program in contributing to short and long term goals as well as improving the design of future programs. The quality of evaluation studies should also be assessed.
Timing of education	Prevention education is best delivered before behavioural patterns are established.	Kelder et al (1994)	Drug education programs should start when prevalence of use by young people is still very low.
	Drug education programs should be immediately relevant, developmentally appropriate and have sequence, progression and continuity.	Ballard et al (1994) Dusenbury and Falco (1995)	Programs must be credible and useful to students, which means they need to be provided regularly at different stages of schooling.
Education goals	Drug education strategies should relate to program objectives.	Ballard et al (1994)	Strategies should be selected because they are expected to achieve the objectives of the program.
	Objectives for drug education should be linked to the overall goal of harm reduction.	Ballard et al (1994)	The concept of harm reduction encompasses a range of strategies, including non-use, which aim to reduce harmful consequences of drug use.
Education strategies	Social resistance skills training	Dusenbury and Falco (1995)	Such an approach helps young people identify pressure to use drugs and gives them the skills to make alternative responses.

Theme	Component	Source	Comment
Education strategies (cont.)	Normative education	Dusenbury and Falco (1995)	This gives young people an accurate indication as to the extent of drug use in their peer group, which is typically lower than expected.
	Interactive teaching techniques	Dusenbury and Falco (1995)	Techniques such as role play, group discussion and joint activities promote active involvement in the learning process.
	Approaches to drug education should address the values, attitudes and behaviours of the community and the individual.	Ballard et al (1994)	Responsible decisions by students about drugs are more likely where peer and community groups demonstrate responsible attitudes and practices.
	Drug education programs should acknowledge the interrelationship between individual, social context and drug in determining drug use.	Ballard et al (1994)	The drug experience is influenced by these three components and effective education programs need to deal with these influences in an integrated manner.
	Drug education programs should focus on drug use that is most likely and most harmful.	Ballard et al (1994)	Generally, school-based drug education should concentrate on lawfully available drugs because their use by young people is more likely. While illicit drug use disproportionately attracts media attention and public concern it should be addressed in particular contexts or subgroups where it is particularly prevalent and harmful.
	Peer led education	Coggans and Watson (1995)	Credible peer leaders can be effective in presenting the social factors that influence drug use.
Collaborative approaches	Mechanisms should be developed to involve students, parents and the wider community in school-based drug education.	Ballard et al (1994) Dusenbury and Falco (1995)	Broadening school-based education by including family, community and media components will reinforce desired behaviours by providing a supportive environment for school-based programs.
Sensitivity to different needs	Drug education should be responsive to developmental, gender, cultural, language, socio-economic and lifestyle differences.	Ballard et al (1994) Dusenbury and Falco (1995)	Drug education programs that are sensitive to the different backgrounds of the young people they target will be more relevant and effective.
Teachers	Teachers should be trained and supported to conduct drug education.	Ballard et al (1994) Dusenbury and Falco (1995)	The classroom teacher, with specific knowledge of students and the learning context, is best placed to provide contextual drug education. Programs are most successful when teachers receive training and support, particularly in undertaking interactive teaching activities.
	Drug education programs and resources should be selected to complement the role of the classroom teacher.	Ballard et al (1994)	The classroom teacher is central to the delivery of effective drug education and should not be compromised by external programs.
Program implementation	Drug education programs should demonstrate adequate coverage, sufficient follow-up and ability to achieve long-term change.	Ballard et al (1994) Dusenbury and Falco (1995)	An adequate intervention, complemented by follow-up is needed to counter effect decay and the ongoing influence to use drugs. Stand alone and one-off interventions are not likely to be effective.
	Fidelity of implementation	Dielman, (1994)	Monitoring should be undertaken to ensure programs are delivered in the intended manner, as failure may occur because of inadequate implementation rather than as a result of any deficiency in the design of the program.

Examples of effective drug education programs from the USA

The Midwestern Prevention Project reported by Pentz et al (1989) provides a good example of a large, well conceptualised and implemented universal drug education program. The study involved the entire adolescent population of 15 communities that comprise Kansas City. In the first two years of the project 22,500 sixth and seventh grade students received a school-based social influence intervention. This major component of the intervention consisted of ten classroom sessions designed to skill the students in resisting drug use and ten accompanying homework sessions. The content of the classroom sessions included psychosocial consequences of drug use, correction of misconceptions about the prevalence of drug use, dealing with media and community influences on drug use, resistance and assertiveness training, problem solving in regard to drug use and publicly committing to non-use. The homework sessions involved interviewing parents and other members of the family about drug use rules at home, ways of avoiding drug use and methods families could use to counter media and community influences to use drugs. In addition, mass media marketing and news coverage, health policy development and community organisation were progressively added to the school-based drug education, on the basis that these environmental components would support and extend prevention skills learned initially in a school program. The results indicated that prevalence rates for all three drugs measured for the study (tobacco, alcohol and cannabis) were significantly lower in the intervention population at one year follow-up compared to controls. The net increase in drug use among intervention students was half that of the delayed intervention controls. In the case of control students, the percentage using cannabis in the last month increased over the first year of follow-up from approximately three to ten per cent. For intervention students, the increase was from approximately four to seven per cent. Preliminary results of the two year follow-up indicated that program effects were maintained. Pentz et al (1989) suggested that resistance skills training, coupled with successive environmental interventions, may act to shift the social norms in the student population towards non-drug use and while these results were statistically significant, the practical relevance of such a small change needs to be considered.

Perry and her colleagues (Perry et al, 1996) reported on another rigorous large-scale drug education program, Project Northland, which combined school-based education with multi-level community support activities. While the program was designed to reduce alcohol use, its impact on other drug use was also measured. The intervention students received was a three year program starting in sixth grade. The students were taught skills to enable them to talk to their parents about alcohol, to deal with peer influences and normative expectations about alcohol, and to understand how community-wide change towards alcohol could be achieved. At the same time the program sought to address how parents communicated with their children, how peers influenced each other and how the community dealt with alcohol use by young people. Perry et al (1996) stated that the intention of the program was not only to give students skills to affect their social environment, but also directly to change that social environment so that it was more supportive of non-use. At the end of three years the researchers found that the intervention students reported less use of alcohol, but cannabis use was only lower in those intervention students who were non-drinkers at baseline.

Stevens et al (1996) conducted a similar multi-component prevention study in New Hampshire, with a specific focus on outcomes in terms of uptake and regular use of cannabis. These researchers selected a well known curriculum-based drug education package, *Here's Looking at You*, as the basis for their intervention. One group of students

just received the drug education curriculum. Another group received the curriculum and a community intervention consisting of a parenting course and a series of community activities initiated by a community task force. The third group served as a control. The study was undertaken over a period of three years and while neither of the prevention interventions affected initiation of cannabis use, students that were exposed to the comprehensive community intervention reduced their cannabis use by 50 per cent. The community program specifically addressed the role of parents and adult role models in influencing drug use choices by children and the researchers considered that they had more than the usual level of success in reaching high-risk parents. As a consequence they considered that the results reflect their success in working with parents and other adult role models to influence the children's drug using behaviour.

An alcohol education study by Shope et al (1994) was one of the first to explore the harm reduction benefits they may derive from education. These researchers found that while there was no difference in the level of alcohol use between intervention and control groups, the harms deriving from alcohol use did not increase as rapidly in an intervention subgroup with a prior history of unsupervised drinking, as they did in comparable controls. While curriculum materials used in the study contained a strong abstinence message and there was criticism of the small numbers in the subgroup that demonstrated change (Gorman, 1996), it does seem to indicate that harm reduction can be achieved by school drug education and that this is not necessarily linked to reduced consumption.

The Australian contribution

An Australian model drug education program, the Illawarra Program, incorporated a range of good practice elements identified by drug education research in the 1970s and 1980s (Wragg, 1990). The program was based on social learning theory (Bandura, 1977), incorporated aspects of social inoculation (McGuire, 1968), involved peer presentation and undertook concurrent parental education. The program was conducted in the last year of primary school (Year 6 in NSW) in an attempt to reach the students before they initiated drug use and was matched to their level of cognitive and social development. The program began with a familiarisation evening, where the program was introduced to parents. The classroom program of six units was introduced to students by Year 7 students, who had completed the program in the previous year. The material included decision making strategies, information on problems associated with drug misuse, alternatives to drug misuse, social pressures to take drugs, issues relating to conformity, assertiveness and peer resistance skills. Over this period there was a second parent evening. Following the teaching phase of the program, the students worked in groups to develop various drug-related materials and produce a short piece of drama. This process took another 12 to 16 hours of school time and culminated in a third parent evening, where the materials and dramas were presented. In the following year the students returned to introduce the program to the next group.

Wragg (1990) conducted a longitudinal evaluation of this program whereby 363 intervention and 256 control students were followed up to Year 10. Six surveys with these students were undertaken. A short questionnaire was administered before and after the program and a more detailed outcome instrument was administered in each subsequent year at secondary school. At each of the four outcome surveys, between 67 per cent and 81 per cent of the original sample was successfully followed up and at the final survey 70 per cent of the sample was accessed (Wragg, 1992). At pre-test there were no significant differences between the two groups. At first post-test there were significant attitudinal

differences, with intervention students reporting more healthy lifestyle attitudes and anti-drug use attitudes than non-intervention students. The four outcome surveys revealed that significantly lower proportions of the program group had used tobacco or cannabis compared to controls, but there was no impact on the proportion that had ever used alcohol. These results are illustrated in Figure 1.

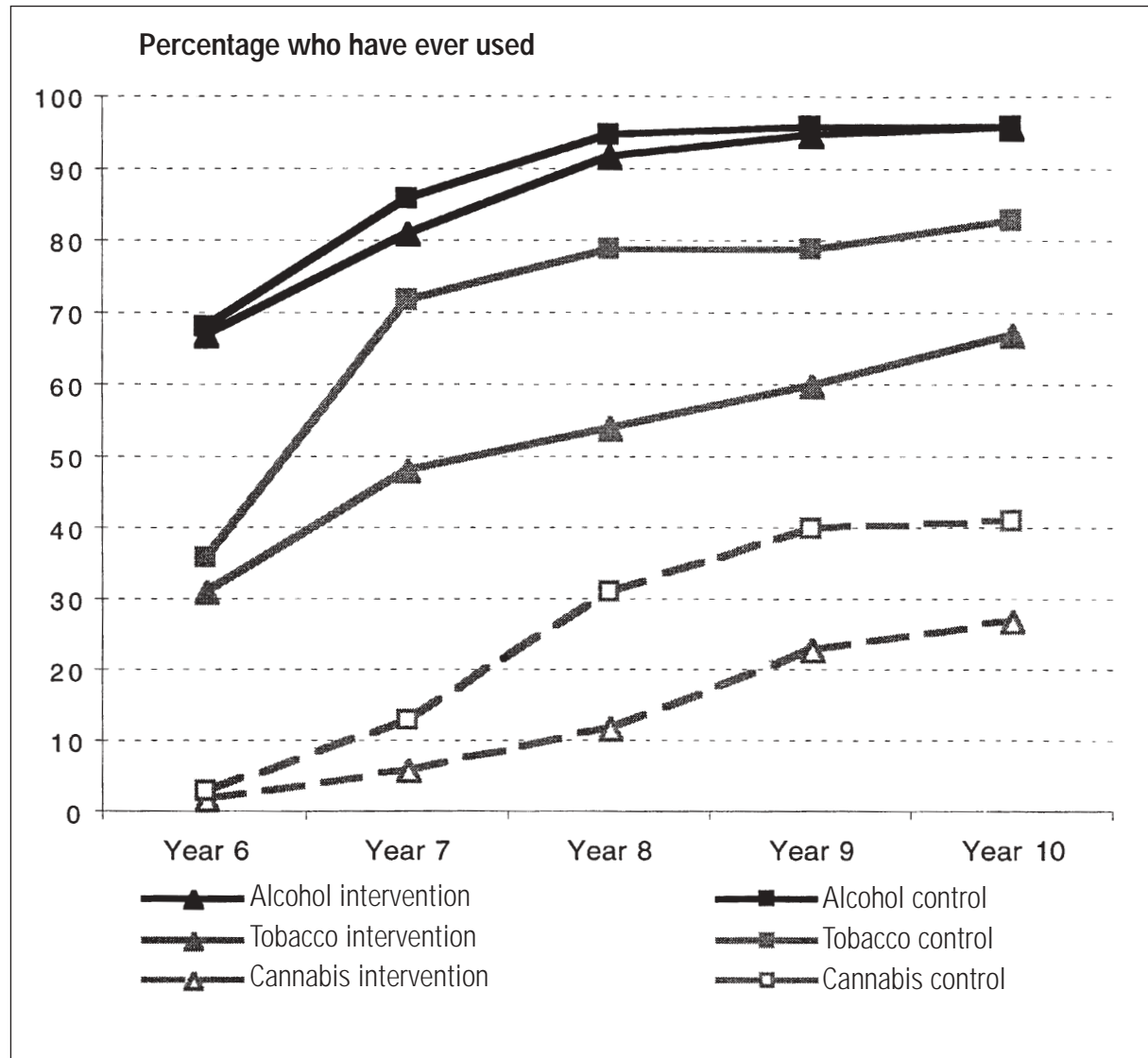


Figure 1: Impact of the Illawarra program on selected drug use over 5 Years
(Data taken from Wragg, 1990)

A more recent study by McBride et al (2000a) explored the prevention benefits of an alcohol education program for junior high school students (Years 8-10) based on classroom learning activities. This drug education study was fundamentally different from most large-scale American research programs, because it sought to enhance students' abilities to identify and deal with high risk drinking situations and had harm reduction as its primary goal. Seven intervention and eight control government high schools in Perth, Western Australia participated in the program with 1,111 students receiving the first part of the intervention during their first year of high school (Year 8). In the first phase,

reported in McBride et al's study, a sequenced program of 17 interactive skills-based activities was conducted over eight to ten lessons. The activities encompassed understanding and applying utility information on alcohol, skills rehearsal, individual and small group decision making and discussion of typical student drinking scenarios, with an emphasis on recognising and identifying ways to reduce harm. The teachers conducting these lessons all participated in a two-day training workshop, which modelled these activities and were provided with a comprehensive manual to guide practice in the classroom. Students were each provided with a workbook as an aid to activity and for recording their answers. From initial surveys, both the intervention and the control groups were broken down into three categories; non-drinkers, drinkers only with adult supervision, and unsupervised drinkers. Preliminary results reported by McBride et al indicated that intervention students' knowledge about alcohol increased, their attitudes were more knowledge-based and reflected increased support for harm reduction, and their consumption did not increase to the same extent as that of control students. Harm was not reduced when the intervention group was looked at as a whole. However, the subgroup of intervention students, who reported at the start of the study they only drank alcohol when supervised by adults, experienced less harms associated with their own drinking following the intervention than their counterparts in the control group. This suggests that in the case of alcohol, practical skills are most usefully imparted before young people progress to unsupervised drinking.

Drug education produces a small but widespread change in behaviour

In a recent meta-analysis of 55 school or college-based drug education program evaluations that met minimum methodological criteria, White and Pitts (1998) considered that 18 were methodologically sound studies and that 10 of these 'sound' studies evidenced some impact on drug using behaviour. Meta-analysis of 11 'sound' studies, with a year follow-up, indicated that the mean effect size was 0.037. This means that over a period of a year the best-researched drug education interventions were able to delay the onset of drug use or stop use in 3.7 per cent of young people, who would otherwise have used drugs. White and Pitts' research indicated that certain drug education approaches did achieve statistically significant changes in drug use, but the effect size of these programs was very small at one year follow-up and declined with time. They suggested the only thing drug education has been able to achieve to date is a short-term delay in onset of use by non-users and a short-term reduction in the amount of use by some current users. The practical implications of such a low level of improvement need to be considered in the light of efficient resource utilisation.

Gorman (1995) illustrated this issue of meaningful change through an examination of two large well-regarded drug education programs: a Learning Skills Training (LST) style program to prevent smoking and the WHO Collaborative Study designed to delay onset and reduce use of alcohol (Botvin et al, 1992; Perry et al, 1989). In the case of the LST study, statistically significant differences between control and intervention students was only found for past month smoking which is essentially an indication of low level, experimental use. In the case of the WHO study, two instances of statistically significant improvements in alcohol use scores emerged at post-test. However, the actual levels of use reported were all very low and fell within the 'rarely drink' range. According to Gorman, while the differences between control and intervention groups in this study were statistically significant, all scores fell in the same category of low level drinking, and for practical purposes, were similar.

While the recent meta-analysis undertaken by White and Pitts (1998) demonstrated that drug education programs still have difficulty changing behaviour, the authors identified promising individual approaches that produced slightly larger effects. The effective interventions were a mix of focused and generic training, although some elements that worked as part of one program were also present in unsuccessful programs. The great majority of programs that had a longer term impact were intensive in their own right and supported by reinforcing messages from the broader community. They also usually included booster sessions at a later stage of the program. White and Pitts however, found that programs rarely identified the separate contribution of each component element, which makes it difficult to tease apart why programs work and optimise the composition of new initiatives.

Cannabis education programs that work best

The findings from the latest generation of drug education programs and from recent program reviews are fairly consistent in identifying the mix of program components or types of programs that are most effective in changing drug use behaviour. Some of these programs, such as the Midwestern Prevention Project (Pentz et al, 1989), the New Hampshire study (Stevens et al, 1996), and the Illawarra Program (Wragg, 1990, 1992) have demonstrated ability to change cannabis use. However, until recently there has been no comprehensive review of program effects solely in terms of cannabis use. Tobler et al (1999) remedied this in a review of 37 well-conducted programs that had cannabis use as a dependent variable. These programs are a subset of the 120 school-based adolescent drug prevention programs reported in the meta-analysis by Tobler and Stratton (1997). The purpose of their more focused review was threefold. Firstly, they sought to determine what types of programs are most effective in delaying or preventing cannabis use. Secondly, they wanted to find out if program success is dependent on the characteristics of the participants. Finally, they wanted to explore the relationship between implementation factors and success.

Tobler et al (1999) found the factors that distinguished success in their meta-analysis of 120 drug education programs were very similar to the factors present in those programs that had an impact on cannabis use behaviour. Tobler and her colleagues particularly emphasised the importance of classroom interaction for successful cannabis education. Interactive delivery methods provide opportunities for exchanging ideas through participatory contact among peers. In younger groups a highly structured format is developmentally appropriate, as younger adolescents bond with their peers, while they participate in activities together. The teacher keeps the group on track, correcting misconceptions and keeping the focus on peer-to-peer interchanges. Ideally, each student practises skills and receives corrective feedback in a supportive atmosphere.

Interactive programs were significantly better than didactic programs in both changing attitudes to cannabis and reducing use. The more traditional programs showed a decrease in effect size for cannabis use indicating students actually used more following exposure to the programs. Program content such as knowledge, attitudes about drug use, drug refusal-based interpersonal skills and intrapersonal skills (shown in Table 2) was also necessary for effectiveness. Placebo programs that were equivalent in all other aspects and were delivered interactively, but had essential content missing, had a negative effect.

The size of the program was also significant in determining effectiveness. Whether interactive or didactic, the smaller programs involving less than 400 students, in total,

were more effective than the larger programs involving 400 to 1,000 students. Tobler et al (1999) offered two possible explanations for this effect. Firstly, fidelity of implementation may be lower in the larger programs because an essential ingredient of the interactive program may have been missing as some teachers may have excluded parts of the program because they felt uncomfortable with certain areas such as role plays. Secondly, large-scale programs seldom include extra classroom leaders (teachers) because of the added costs to the school system. Without additional leaders to involve all students in the activities, the students were not exchanging ideas, getting validation from peers or practising the interpersonal skills that will help them deal with drug use situations. Participation by everyone, preferably in small groups, is essential in interactive programs and this seems to occur better in small well-managed programs.

The programs Tobler and her colleagues reviewed were essentially one-off demonstration interventions involving a small number of schools, so the relevance of these findings is less clear for routine, system wide, drug education programs. However, the implication is that a standard program needs to allow sufficient time for interactive learning by all students and would be best implemented by teachers who are well trained in these techniques. Additionally, some tailoring of a standard program to suit local circumstances is likely to make the program more relevant for a broader range of teachers and students and increase ownership and fidelity of implementation.

The message from the Tobler et al (1999) review is clear. The most effective education programs for cannabis should contain certain essential information, they should be small in scale, or managed in a way that generates ownership among those involved, they should be implemented as intended and they should be interactive. Tobler and her colleagues also make the point that those programs that were successful in reducing cannabis use achieved similar results in changing tobacco smoking and drinking behaviour. This indicates that drug education does not need to be compartmentalised by drug type. A more generic approach that incorporates alcohol and smoking prevention can be used up to eighth grade although these authors acknowledge that their findings cannot be generalised to older students.

Table 2: What works and doesn't work in cannabis and other drug prevention programs: content and delivery features

What works	What doesn't work
Content: Knowledge	
Short-term effects of drug use Long-term health consequences of drug use	Omission of short-term consequences
Content: Attitudes about drug use	
Feedback from school surveys of peer drug use Analysis of media and social influences that promote pro-drug attitudes	Omission of perceptions of peer drug use Omission of media influences on pro-drug attitudes Ethical or moral decision making
Content: Drug refusal-based interpersonal skills	
Perception adjustment of universal peer substance use Drug refusal skills Assertiveness skills Communication skills	Values teaching Omission of interpersonal skills, particularly drug refusal skills
Content: Intrapersonal skills	
Safety skills Coping skills Stress reduction techniques Goal setting Decision making/problem solving	Problematic if solely intrapersonal focus Problematic if solely self-esteem building exercises
Delivery	
Everyone actively involved Participation between peers Student-generated role plays Supportive comments from peers Rehearsal of drug refusal skills Sufficient practice time Peer modelling of appropriate behaviour Developmentally appropriate activities to promote bonding between younger adolescents	Passive participation Lectures Teacher-centred class discussions Unstructured dialogue sessions Effective classroom management techniques without an accompanying drug program

(Taken from Tobler et al, 1999)

4 The dilemma of taking a harm reduction approach to cannabis education

The National Initiatives in Drug Education (NIDE) evaluation (Midford and McBride, 1999) indicated that drug education in Australia has developed considerably during the past few years, both in terms of aggregate level of activity and quality of practice. However, different jurisdictions were at different points in the development of their programs and approaches differed from state to state. In some jurisdictions education activity has been intense in selected schools whereas in others, activity was spread more evenly across most schools. Generally, Australian school drug education programs espoused a harm reduction approach at the time of the NIDE evaluation and this emphasis remains substantially the same today. The various state approaches to drug education also tend to be problem focused, in that they emphasise prevalent drug use and generic prevention skills, rather than adopting separate illicit and licit or drug specific approaches. The primary explanation for this appears to be that drug education is seen as part of health education and therefore requires a similar health protection skills approach which is relevant to the students' lifestyles. However, the increasing prevalence of cannabis use presents a challenge to this harm reduction, health protection skills approach. Cannabis use is illegal and consequently teachers are in a difficult position if they want to discuss the issues around student use in the same way they would with alcohol and tobacco. It is easy for critics to represent any deviation from an abstentionist message as condoning or even encouraging drug use and, understandably, schools do not wish to defend their drug education program in these terms (Midford et al, 1999). This has meant that when cannabis education in Australia has gone beyond abstentionist messages, it has tended to focus on providing information, because such an approach can be easily defended as useful and even-handed.

Queensland produced the first cannabis education resource for schools, *Who's in Charge Here?*, which was ground breaking, because it went beyond scare tactics and selective provision of information (McConnell and O'Rourke, undated). However, its focus was clearly abstinence, which reduced its relevance for students who continued to use. *Candidly Cannabis* (Commonwealth Department of Health and Family Services, 1996), was well received by teachers when it was released, because it was the first national resource of its kind. Its aim was to 'encourage students to reject the use of cannabis, to delay the initiation of use, and to avoid the potential harms posed by the use of cannabis by other people' (p 11). The resource seems best used as a stimulus for student discussion, rather than as the definitive guide to cannabis education in schools. However, its relevance has to be questioned for the 36 per cent of students who have tried cannabis and the 12 per cent of regular cannabis using students who may want help in reducing use, or who could benefit from changing their method and pattern of usage so as to reduce harm (Letcher and White, 1998).

The other well known illicit drug education resource used in Australian schools is *Next Step* (Munro and Bellhouse, undated). This is probably the first comprehensive illicit drug education resource for schools in this country and deals with illicit drug use issues in an interactive and balanced manner. It clearly acknowledges the role of harm reduction in illicit drug education, but because of its primary prevention focus it emphasises generic

safety measures. This is probably appropriate, given the low prevalence of use of most illicit drugs, as specific harm reduction strategies for low prevalence drugs are not likely to be useful at a population level. It devotes a considerable amount of attention to cannabis use, including issues to do with its illegal status. However, this resource fails to acknowledge why young people would want to try cannabis.

In this sense none of the illicit drug/cannabis education resources available to Australian schools and reviewed here are truly well rounded in their treatment of drug use. Drug education needs to be seen by students as something more than propaganda, and for this to happen it needs to acknowledge what students already know by direct or indirect experiences, which is that drug use can be enjoyable. One of the reasons Australian alcohol education programs have been so well received by students and teachers is that they deal openly with both sides of the decision making equation (Farrington et al, 1999; McLeod, 1997). Figure 2 contains an excerpt from a Dutch high school cannabis education resource (Rensink, 2000). The booklet is part of a broader program based on a range of evidence as to what is most likely to produce behavioural change in terms of drug use. However, the particular point illustrated by this excerpt is the willingness of Dutch schools to present and discuss both sides of the decision making equation. Cannabis education in Australia is likely to benefit from adopting a similar approach, as this would probably make it more relevant to students' decision making about this drug.

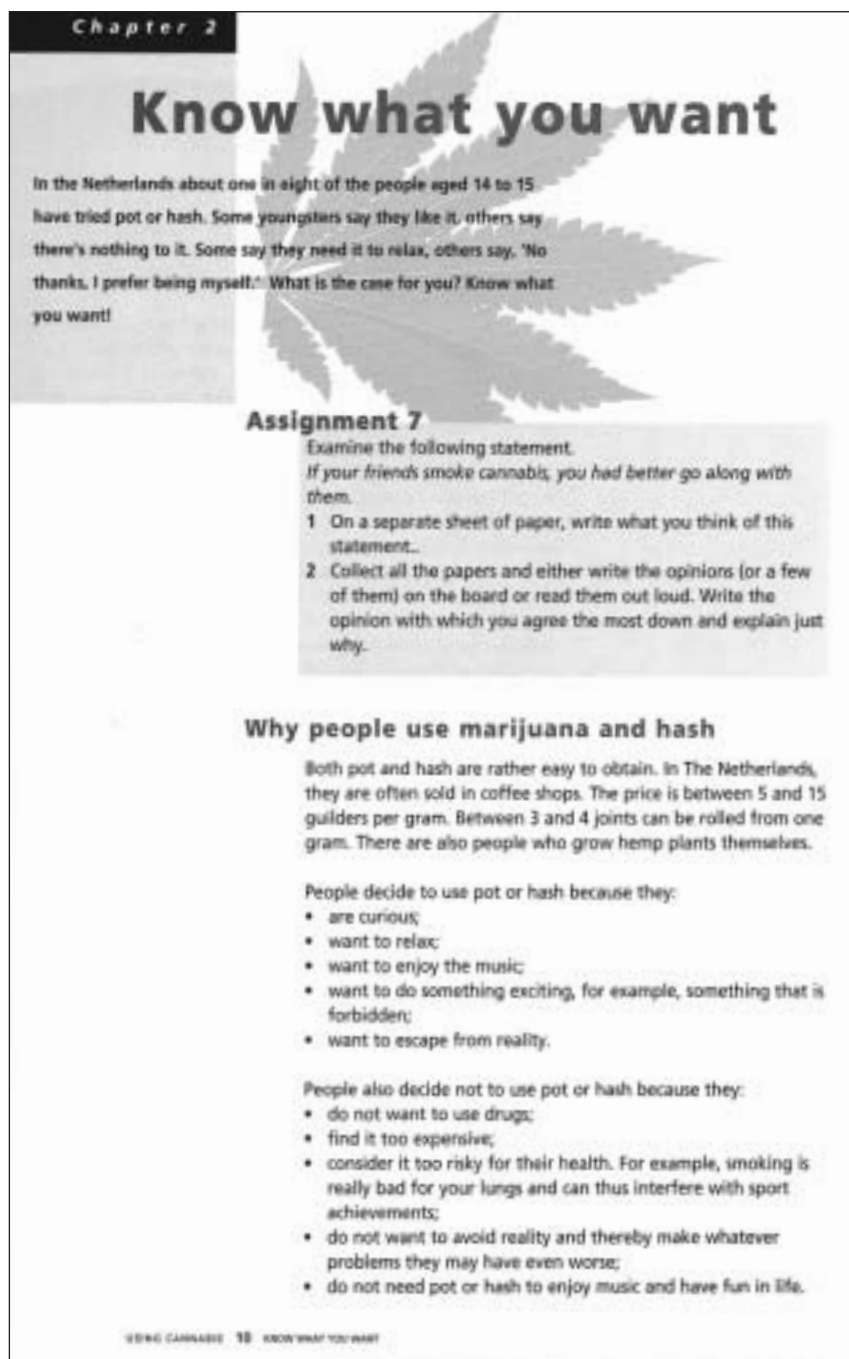


Figure 2: Excerpt from a Dutch high school cannabis education resource, *What to expect from using cannabis*

5

School-based cannabis and other illicit drug prevention programs: what is likely to produce the best results in the Australian context?

There is a wealth of research evidence as to what is most effective in drug education and this provides a sound basis for recommendations on future education approaches in this country. Additionally, there are other more fundamental elements related to goals and processes that need to be considered first when developing comprehensive school responses to cannabis and other illicit drug use.

Making decisions as to the goals and process

Education programs should aim to reduce harm

Australian drug policy is based on the principle of harm reduction (Ministerial Council on Drug Strategy, 1998). This is quite different from USA drug policy that is abstinence based. In the drug education area this is relevant because the great majority of drug education studies have been conducted in the USA and have abstentionist aims (Foxcroft et al, 1997; Office for Substance Use Prevention, Alcohol, Drug Abuse and Mental Health Administration, 1989). Accordingly, the 'successful' programs tend to be judged as such in terms of achieving abstinence or delaying onset, although the extent to which the observed changes are clinically, as opposed to purely statistically relevant, remains open to question. Dielman (1994) made the point that exclusive reliance on measures of drug use can obscure important program effects on patterns of use and he recommended that programs should be assessed in terms of greater variety of outcomes. In Australia, cannabis and other illicit drug prevention programs should be designed to achieve a reduction in net harm. This does not mean that abstinence or reduced use should not be a means of reducing harm, but other strategies which focus on changing patterns of use should also be included. Convincing students not to use cannabis at or before school, not to come to school with a cannabis 'hangover' and not to combine cannabis use and alcohol use are likely to reduce harm, although they may not necessarily reduce use.

School initiated programs for 'at risk' cannabis users should be trialled

A universal prevention education approach may not be sufficient for students who are already experiencing problems because of their cannabis use. These students are most at risk of dropping out of the education system and are unlikely to initiate treatment (Swift et al, 2000). An early intervention program should be trialled to determine whether 'check up' style problem identification, followed by brief intervention involving the family, professional support from the community and involvement in alternative sporting and social activities would assist in reducing problematic cannabis drug use in this group.

Development of new programs should involve extensive consultation with stakeholders

One of the important elements in the success of the NIDE program was the extensive consultation process with the range of stakeholders who were central to its implementation (Midford and McBride, 1999). Any development process for a new

drug education program, particularly if it is likely to be controversial, should involve extensive consultation with and reporting of findings to all relevant stakeholders, including the target students. In this way the needs of all groups are better reflected in the program and the actual consultation process is likely to enhance ownership and increase support.

Making decisions on the basis of research evidence

Junior programs should be generic; senior programs should be differentiated

The research finding that should be considered first when developing cannabis and other illicit drug education programs is that the most effective cannabis education programs for late primary and early high school students were also effective in reducing the use of alcohol and tobacco (Tobler et al, 1999). The findings from senior high school programs, while less definitive, suggest that a more differentiated approach is required with older students. Accordingly, any cannabis program should be an integral part of a well-designed generic drug education program up until Year 8. In Years 9 to 12 a separate program or well-differentiated program components should be offered.

Programs should be interactive

Tobler et al (1999) found that interactive programs were significantly better than didactic programs in both changing attitudes to cannabis and reducing cannabis use. Such programs had planned activities to present content and develop skills, but they also provided opportunities for exchanging ideas between peers (see Table 2 for more detail). The intention of such programs is that the student acquires, practises and refines new prevention skills in a supportive environment, which then equips them to better deal with real world drug-related situations.

The essential content of effective programs

Programs that covered knowledge of the short and long-term effects of drug use, normative information on drug use by young people, attitudes to drug use, interpersonal skills that assisted in drug refusal and practical intrapersonal skills were better than placebo programs (see Table 2 for more detail) (Hansen and Graham, 1991; Tobler et al, 1999). These findings are reinforced by several other researchers, such as Dusenbury and Falco (1995) and indicate that effective cannabis and other illicit drug education programs must be constructed to provide certain information, facilitate exploration of attitudes and develop particular practical skills. They also need to allow sufficient time for thorough coverage of this critical content.

Effective programs tend to be small and well implemented

Tobler et al (1999) found the size of a program was significant in determining its effectiveness. Whether interactive or didactic, the smaller programs involving less than 400 participants were more effective than the larger programs involving 400 to 1000 participants.

Involve peers in leadership roles

Coggans and Watson (1995) considered that peer led approaches offered a number of advantages in terms of modelling and normative attitudes. However, good role models in adult terms may not be similarly well regarded by other students and even the most capable students may require support to fulfil a leadership role. Accordingly, new drug education programs should look to use peer leaders and teachers in combination, where the peer leadership role is well structured and credible.

Timing of the intervention is important

Kelder et al (1994) and Dielman (1994) have commented that primary prevention is most effective if instituted before behavioural patterns are established and more resistant to change. Accordingly, timing of cannabis education or any education programs addressing prevalent drug use should be optimised for a particular population by reference to the appropriate prevalence data. This may mean that implementation of programs should occur earlier with particularly high-risk populations.

Involve parents and the wider community where possible

Effective large-scale drug education projects such as the Midwestern Prevention Project (Pentz et al, 1989), Project Northlands (Perry et al, 1996), the New Hampshire study (Stevens et al, 1996) and the Illawarra Program (Wragg, 1990) all incorporated substantial parent and community reinforcement components. Added to this, Dusenbury and Falco (1995), in their review of key elements in effective drug education programs, considered that family components, community components, media components and components for special populations would enhance the school-based programs. However, the relative contribution of these additional components is not well understood. McBride et al (2000b) also noted that complementary community approaches in research studies are well resourced. Such a level of support is not realistic for routine prevention programs. Accordingly, community components should be incorporated into any drug education program wherever resources permit but further research should also be undertaken to determine whether they add sufficient potency to a curriculum-based approach to justify the additional effort and expenditure.

6 Conclusion

Drug education as a whole has become demonstrably more effective in the last decade and as a consequence there is greater understanding of the various influences involved. This is not to say that drug education is the answer to preventing drug use or problems associated with drug use in young people. Rather, it seems there is greater understanding at a component level of the factors that foster drug use and the program elements that need to be included if a program is to comprehensively and effectively address these factors. Unfortunately, the history of drug education suggests that whether or not drug education works has not been central in the decision making process. Gorman (1998) considered that the decision to conduct drug education tends to be driven by political and moral factors. Society has determined that drug use is inherently bad and dangerous. Young people are particularly susceptible to taking up drug use and need to be appropriately skilled to remain drug free. On this basis governments of all persuasions around the world have increased funding for drug education in recent years.

All these factors mean that drug education is at a crossroads in terms of future development. There is likely to be funding in the future to undertake drug education and there is a growing body of evidence that indicates, not just which programs influence behaviour, but which features consistently appear in the more effective programs (Dusenbury, Falco and Lake, 1997; White and Pitts, 1998). This allows new programs to be developed which can distil the good practice features of past interventions and develop new approaches which are likely to be more potent again. On top of this, new harm reduction approaches are being developed which promise to take education objectives beyond maintaining abstinence or delaying onset, into the realms of equipping young people with the skills they need to keep themselves safe from drug harm (McBride et al, 2000a; Shope et al, 1994). These developments are likely to increase the impact and relevance of drug education for young people and make it a more effective strategy, within the broad range of responses society deploys to deal with drug problems. However, the past history of drug education is littered with several false dawns, where considerable effort was put into particular approaches, only to dissolve when the evidence mounted as to their ineffectiveness. The one critical factor that is different now is that there is good evidence as to what works. The greatest potential barrier to good drug education remains the same, decision makers selecting drug education programs on the basis of what they would like to see happen rather than on the evidence of what can realistically be achieved. Ultimately this is self defeating, because when the programs are evaluated and shown to be ineffective, questions will again be asked as to why drug education is not working and the whole approach is discredited once more. In undertaking any new cannabis or other illicit drug education programs there needs to be a commitment to developing approaches that draw on the research evidence as to what is most likely to be effective in the Australian context. The process however, should not end there. The selected program or programs should be evaluated to measure achievement against stated objectives and ineffective approaches changed or replaced. Finally, backing for innovative, reality-based approaches should be voiced at senior government levels and marketed to the community. Schools and teachers pioneering new drug education programs need to feel supported in undertaking interventions, which may not satisfy the Utopian desire to 'drug proof' young people, but which can be justified in terms of keeping them safer in a world where drug use is a fact of life.

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Appendix A

Finding evidence of effective illicit drug education: literature search methodology

The databases listed below were searched for relevant Australian and international literature, published subsequent to 1984 using the search terms cannabis (marijuana), illicit drug use and illicit drug education.

- ETOH: NIAAA Alcohol and Alcohol Problems Science Database
- MEDLINE: Database of the US National Library of Medicine
- ERIC: Resources in education (RIE) and current index to journals in education (CIJE) on CD_Rom
- SCIENCEDIRECT
- CURRENT CONTENTS: Database produced by the Institute for Scientific Information
- OZLINE
- BMJ: British Medical Journal

Eric proved the most fruitful database, turning up a total of 99 articles on the topic. All other databases identified a further 27 articles.

An internet search, using the 'Look Smart' search engine was also conducted, using the phrases 'cannabis school drug education' and 'illicit drug education in schools'. These searches identified thousands of web sites containing information on the search terms. Only the first 30 web sites in each list were visited, although in 14 cases, links to other relevant sites were utilised to seek additional relevant material. The criteria for including Internet sourced material in the review was essentially the same as that used for print material: it had to be published by a reputable agency, it had to identify the author(s) and it had to reference its sources.

Finally, selected national and international experts in the area were contacted to provide information on innovative cannabis and other illicit drug education programs in Australia and overseas. A range of policy documents, information brochures and curriculum material was accessed in this manner.

Appendix B

Assisting 'at risk' students and responding to drug use in schools

While drug education programs in Australian schools almost universally have a commitment to harm reduction in one way or another, this commitment is less well enunciated in the case of policies and procedures for assisting students at risk from drug use or for responding to drug-related problems at school. Midford et al (1998) stated that school administrators often had concerns about the implications of harm reduction for how a school chooses to deal with drug-related incidents. If a student at school is clearly affected by drugs or uses on site, should the school offer assistance because the student is at risk, or should the student be punished for bad behaviour? In the face of this dilemma, these authors recommended that disciplinary responses should be formulated so as to achieve overall long-term benefit in terms of messages on drug use and the need to balance the school's legal responsibilities with welfare concerns for the students being disciplined. How to respond to actual drug use is a major concern and administrators need guidance and support in dealing with this.

A number of policy documents have been produced by various agencies to guide responses to drug use in schools (New South Wales Department of Education and Training, 2000; Department of Education, Victoria, 1998; School Drug Education Project, 1998). The fact that these guidebooks are becoming available is likely to make the task of dealing with drug-related incidents easier for schools because they provide a well considered procedure that has been approved at the systems level. In the past, school administrators may have felt the need to automatically expel students involved in drug use at school, but the guidebooks not only sanction the use of alternative welfare options, they are backed by supporting evidence, which decision makers can use to justify alternatives to punishment. Another issue, highlighted in a recent seminar on managing illicit drugs in schools, is that if a school wants students with problematic drug use to use the school as a link to appropriate services, then the school has to be sensitive to how it deals with revelations of drug use (Murray, 2000).

Appendix C

Programs for cannabis users and their relevance in the school context

Swift et al (2000) noted that there were no published controlled studies of interventions specifically for young people with cannabis related problems. They also suggested there are likely to be barriers to intervention among young people, such as scepticism about drug-related messages generally. This scepticism may be further heightened by parents and other adults who try to stop young people using cannabis by emphasising the risks in a way that doesn't fit with their experience of cannabis use.

Given the lack of research on treatment of young people with cannabis related problems, the following section briefly summarises the research on the treatment of adults with cannabis dependence. Subsequently the implications of this work for informing how schools can most usefully respond to students with cannabis related problems are considered.

Treatment of adults dependent on cannabis

There have not been many systematically developed treatments for cannabis dependence (Swift et al, 2000). Some of the cannabis interventions have been adaptations of treatment approaches developed for alcohol, based on the premise that cannabis dependence is directly comparable to alcohol dependence (Hannifin, 1988; Miller and Gold, 1989). The majority of the cannabis treatment packages, which have been subject to evaluation, are cognitive-behavioural in orientation. A twelve-step treatment approach for cannabis dependence has been proposed (Miller, Gold, and Pottash, 1989), although its efficacy has not been reported. A small number of self help manuals have been developed, some with an abstinence focus (Grenyer, Solowij and Peters, undated), some which handle both abstinence and non-abstinence goals (Hancock, Williams, Shand, and Quigley, in preparation) and some which focus on harm reduction, with less emphasis on strategies for changing cannabis consumption (Bleeker and Malcolm, 1998). Such materials may include suggestions on managing withdrawal, removing cues to smoking, self-monitoring, development of alternative responses and relapse prevention. As yet, none have been systematically evaluated, although some have been developed with extensive piloting and feedback from experts and users (Hancock, Quigley and Shand, 1999).

Additional treatment components for cannabis dependence treatment have been suggested by a number of researchers. Tunving, Lundquist and Eriksson (1988) suggested a concrete educational approach to treatment during initial stages (using diagrams, examples and repetition), due to the client's possible difficulties in abstract reasoning, while the 'cannabis fog' clears. In order to address cannabis withdrawal, Zweben and O'Connell (1992) included education about withdrawal, including nature and duration of symptoms, reassurance that cravings were not a sign of failure, training in coping strategies and reminding clients of temporary limitations in maintaining attention or concentration, which may impair performance. Other recommended treatment components have included encouraging regular exercise, use of non-chemical means of modifying mood states, distraction from smoking cues and insomnia management strategies (Zweben and O'Connell, 1992). A trial of rapid smoking of THC free cannabis as an aversion therapy,

along with self management counselling has been reported (Smith, Schmeling, and Knowles, 1988), but this study was conducted on a small sample, with no experimental control. The use of social support groups (Murphy, 1997) and narrative therapy groups have been described, but have not been subject to evaluation beyond client satisfaction surveys.

Cognitive-behavioural interventions with adult cannabis users have been evaluated in America and Australia. In America, effectiveness of a relapse prevention cognitive behavioural (RP) and a social support group discussion (SS) model were compared by Roffman, Stephens, Simpson and Whitaker (1988) in a randomised, controlled trial. Both groups were conducted over ten two-hour sessions with booster sessions provided prior to three and six month follow-up. Groups of 12-15 participants met each week for eight weeks and biweekly for the last four weeks. The RP group focused on the importance of understanding circumstances that may lead to relapse and developing effective coping skills. Skills training included self monitoring, identifying antecedents to use, cognitive re-training, relaxation, and using social support. In the SS group the emphasis was placed on discussion of social support and use of group members for support during behaviour change. Thirty per cent of respondents across the whole sample (N=110) reported abstinence at one month post treatment although 75 per cent of participants had identified abstinence as their treatment goal. Abstinence rates did not differ significantly between RP and SS groups, but participants reduced cannabis use to less than 50 per cent of their pre-treatment levels.

In another randomised-controlled trial Stephens, Roffman, and Simpson (1994) evaluated the efficacy of relapse prevention treatment for cannabis dependent adults. Again ten two-hour relapse prevention groups (RP) were compared with ten two-hour social support groups (SS). Subjects were 161 men and 51 women recruited through media announcements promoting a program for adults who wanted help quitting cannabis use. This study employed a very similar methodology to the previous study. However, controlled or moderate use was not promoted as a viable treatment goal and all subjects were expected to cease cannabis use by the fourth session. Follow-up data was collected at one, three, six, nine and twelve months post treatment. There were no significant between-group differences on measures of abstinence, cannabis use or cannabis related problems. Overall, 65 per cent of participants reported abstinence by the quit date and there were no significant differences between treatment conditions for end of treatment abstinence.

Stephens, Roffman and colleagues have more recently conducted a controlled clinical trial comparing a 14 session combined cognitive behavioural and social support relapse prevention group (RPSG), a two session individual assessment and intervention and a wait list control group (N=291) (Stephens, Roffman, Cleaveland, Curtin, and Wertz, 1994). The two intervention types showed superior reductions in cannabis use compared to the control group, which were maintained at 16-month follow-up. No significant differences were observed between the two intervention types on measures of abstinence, days of use, or cannabis related problems at four or sixteen month follow-up.

In Australia, Rees, Copeland and Swift (1998) have conducted a randomised, controlled trial of 229 severely dependent cannabis users, which evaluated an individualised cognitive-behavioural treatment (CBT) approach. Participants were assessed and randomised to either a six session, intervention package, incorporating a motivational interview and a standard relapse prevention intervention, a one session version of the more intensive intervention with a self-help booklet, or an assessment and wait-list

control group. Preliminary findings suggest that continuous abstinence rates at eight months were low, but were consistent with those found in similar studies of brief interventions for other drugs. There was however, a significant impact on frequency and amount of cannabis used and in the associated harms, including relationships, family and work related issues, and on levels of depression and feelings of dependence (Copeland, 2000).

While there is a lack of research on the treatment of young people with cannabis related problems, research with adults suggests that cannabis dependent users respond reasonably well to a variety of treatment types. Brief CBT interventions have shown comparable outcomes to longer interventions, although it is likely that more serious cases may require more intensive therapy. Given the comparable outcomes across treatment types, brief interventions may be considered preferable to longer interventions in terms of pragmatism and cost effectiveness.

Harm reduction strategies for adult cannabis users

While the best way to avoid the harms from cannabis use is not to use at all, Swift, Copeland and Lenton (2000) have offered a number of suggestions for reducing harm for those continuing to use cannabis.

- **Accurate information** - Knowledge doesn't necessarily change behaviour, but accurate, empirically-based, non-sensational information about the probable acute and long-term risks of cannabis use is necessary if users are going to make informed decisions about reducing cannabis related harm.
- **Anxiety, paranoia and panic** - For those who are prone to anxiety, paranoia and panic, perhaps the best strategy is to abstain from use or put limits on their intake. Avoiding mixing drugs and using in a safe, familiar environment with friends might also help. The anxious user can be reassured that the distress will pass, but those with a psychotic illness should be warned that use can precipitate a schizophrenic episode.
- **Psychomotor impairment** - The extent to which cannabis use is implicated in serious accidents is debated, but there is general agreement that use can impair psychomotor performance, especially when unexpected events occur in an emergency situation. For this reason users should avoid smoking before driving or operating machinery. Combining cannabis with alcohol use seems to increase the psychomotor impairment.
- **Respiratory harm** - Eating cannabis (e.g. in cakes or cookies) may eliminate the respiratory effects associated with smoking the drug but it is more difficult to titrate the dose. Furthermore the effect is longer lasting and produces a type of intoxication that many users find unpleasant. This is because orally consumed cannabis is broken down by the liver, which produces a noxious cannabis metabolite (Morgan, 2000). For those who prefer to smoke, using 'joints' rather than 'bongs' and not mixing their cannabis with tobacco may reduce harms. The risk of spreading respiratory infections can be reduced by not sharing 'bongs' or 'joints'.
- **Cognitive Impairment** - Impairments of attention and memory are difficult to detect, but users should be encouraged to reduce their use if it is impairing daily performance. This is particularly relevant for young people who are learning new skills in the class room or the work setting. Users should also be aware of a cannabis 'hangover' effect which can affect performance the morning after a heavy session.

- **Legal sanctions** – Many users are unaware of the consequences of running foul of the law for a cannabis offence and wrongly believe that they are trivial. Many of the consequences, such as employment problems or restriction on overseas travel, may only be felt many years after the initial cannabis offence. The best way to avoid legal harms is not to use the drug. For those who choose to use cannabis, avoiding coming to the attention of the law by not smoking in public, or carrying used smoking equipment on their person or in their vehicle may help.

Implications for treatment with school-aged young people

The extent to which the findings of treatment outcome research with dependent adult cannabis users can be applied to adolescent users needs to be considered. Cognitive-behavioural interventions in individual and group formats have been shown to work well with adult clients, who are motivated to seek treatment. Such approaches often incorporate use of a self-help manual. While it is hard to imagine how such an approach would be appropriate in a classroom setting, it may be appropriate in contexts where a school guidance officer or school counsellor is working with individual students or where students are referred for treatment because of problematic behaviour at school related to cannabis use. It may also be possible for elements found in a CBT treatment program or self-help manual to be modified for use as part of a cannabis education intervention in the school environment. Swift et al (2000) have suggested that as young people are not a group that initiates treatment, novel programs are required. For those students who have been identified as having problems at school because of their cannabis use, a "check-up" (self-administered screening followed by brief intervention) style approach that involves families in a non-confrontational and realistic discussion of the harms associated with heavy cannabis use would be worthy of investigation.

