



SCOTTISH EXECUTIVE

Literature Review into the Effectiveness of School Drug Education

Education



LITERATURE REVIEW INTO THE EFFECTIVENESS OF SCHOOL DRUG EDUCATION

Conducted for Scottish Executive Education Department

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INTRODUCTION

This document presents findings from a literature review conducted as part of a larger research study to examine the nature and effectiveness of current drug education practice in Scottish schools. The research is being conducted to help identify what more needs to be done to promote effective school drug education in Scotland.

Previous research has indicated that the majority of Scottish schools now deliver drug education, and that there is an apparent degree of homogeneity in the stated aims, approaches and curricula adopted. The annual SEED survey of drug education in schools, published in September 2003¹, shows that the vast majority of schools are meeting targets on the provision of drug education. However, there is a need for more detailed information on precisely how drug education is delivered: to what extent do teachers adopt teaching delivery styles which the evidence suggests are associated with greater impact, such as interactive methods? Do teachers understand and operationalise the key theoretical concepts associated with effective drug education? Even where schools are using similar curriculum packages, to what extent is there variation in delivery style and completeness which might affect the ultimate impact of the package on young people?

There is also a need for more information on how drug education is organised in schools; for example, whether it is delivered by PSHE specialists or by general form tutors, the extent to which it is delivered continuously throughout the school, and the priority given it in the school timetable. Finally, there is a pressing need to examine the views of young people themselves. Is the drug education they receive of value to them? How do they engage with it in the context of other influences in their lives, such as peers, family and the media? What knowledge and skills do they gain from it, and, crucially, does this learning help them beyond the period of compulsory education into young adulthood?

Four research exercises are being conducted to provide this information:

- A. A **Literature Review** examining the effectiveness of drug education in schools and the elements of drug education associated with greater impact.
- B. A **Survey** of a representative sample Scottish schools examining current drug education delivery arrangements.
- C. **Classroom Observation** of 100 drug education lessons in a representative sample of Scottish schools. The Classroom Observation will provide a detailed and rigorous assessment of drug education delivery in practice.
- D. **Qualitative Research** with two samples of young people: current school students in both upper primary and secondary schools, and young adults (aged 16 and over) who have completed compulsory education.

This report presents findings from A, the Literature Review. The Survey is currently (June-July 2004) being conducted. The Classroom Observation will take place in Autumn 2004, and the Qualitative Research in Spring 2005.

¹ <http://www.scotland.gov.uk/stats/bulletins/00284-00.asp>

1 METHODOLOGY

1.1 Aims

The literature review aims are to:

- Identify and review published research evidence regarding the effectiveness of drug education in schools.
- Identify recommendations regarding the theoretical bases, approaches, content, methods, format and curricula associated with effective drug education in schools.
- Summarise indicators which can be used to evaluate the effectiveness of current drug education in schools.

1.2 Methods

The search and review methods were thorough and comprehensive but not systematic (see Section 1.3 below for a definition of systematic review). Time and resource constraints did not permit the use of systematic review procedures.

A series of preliminary searches were carried out to give an insight into the types of literature available and to help refine the searching strategy. Following these preliminary searches, a systematic search method was adopted for all the electronic databases (see Table 1.1 below). As detailed in the proposal, each database has a different focus relevant to the review so it was important to use a wide range.

Table 1.1 Electronic Databases Searched

Electronic Database	Types of literature
Pub Med/Index Medicus	Medical sciences
ISI Social Science Citation Index	Social sciences
Ingenta Online and Ariel	Medicine, environmental science, psychology, social sciences
PsychINFO	Psychology and social sciences
Sociological Abstracts	Social sciences
ERIC	Education research

The original evaluation plan also proposed searching CINAHL, a database of nursing and allied health literature. However, we were not able to gain access rights to the database through local universities' libraries or through the National Library of Scotland. From information available about the CINAHL database, it covers twenty-one 'substance use disorders' journals, all but three of which are indexed in three of the databases listed above (Ingenta, PubMed, Sociological Abstracts). It also includes five 'school health' journals; four of which are indexed in several of the databases above. The small number of journals listed on CINAHL that are not covered by other databases do not appear to be peer-reviewed and are along the lines of weekly/quarterly newsletters. A brief search of the article titles and abstracts on the websites of these journals did not provide anything relevant to this review. Therefore it was felt justified not to search CINAHL.

Three tailored Boolean searches were carried out using the following search terms:

1. drug* AND school AND (education OR prevention)
2. “substance use” AND school AND (education OR prevention)
3. (alcohol OR tobacco) AND school AND (education OR prevention),

Where possible, limits to English Language and Human Subjects. were used in the databases to narrow the relevancy of the citations lists returned. The Cochrane Database of Systematic Reviews was also searched for other relevant literature reviews.

The returned citation list (in title and abstract form, or just title if abstracts not available) was printed for each search. This yielded over 800 citations containing the key terms. There was a huge amount of overlap in the results. As there is an obvious similarity between the three search strings (as well as overlap between the databases themselves) the same citation may appear in each of the three searches per database. A set of exclusion and inclusion criteria were then developed to help filter the citations. Citations were **excluded**:

- if the programme was not based in a primary or secondary school (or equivalent ages outside the UK);
- if the article only described the development, content or theoretical basis of the programme as opposed to reporting original research conducted to evaluate the programme;
- if no indication of sample size was provided, or the study had a weak methodology;
- if the article reported data from the intervention evaluation to explore something other than the impact of the intervention (eg. to explore the relationship between drug use or attitudinal variables but not to examine the impact of the programme);
- if the article was an opinion piece reporting no empirical research or containing no substantial review of the literature;
- if the article was published before 1980. This criterion was applied because it was judged that the bulk of relevant work has been conducted since 1980; pre-1980 studies are in any case covered thoroughly in early systematic reviews.

Dissertation abstracts were also excluded as time and resource constraints did not allow for their retrieval.

Included in the citation collection were:

- evaluations of drug education and prevention programmes based in schools or with a school-based component;
- systematic reviews and meta-analyses;
- non-systematic reviews of literature;
- discussion pieces and guides to good practice based on substantial reviews of the literature or empirical research (eg. studies of experts’ views on effectiveness in drug education);

The inclusion/exclusion criteria detailed above were applied in order to sift out non-relevant citations. The remaining studies were then obtained in full text and read to assess their relevance to the review.

In addition to the electronic database searches, the bibliographies of retrieved studies were scanned for further relevant articles. Articles judged to be of relevance to the review were also retrieved from in-house files.

Retrieval of ‘grey’ literature

Grey literature, including evaluations and empirical studies, reviews and guidance documents, has been retrieved from the websites of organisations judged to be relevant to the review and from in-house files. Relevant organisations have included the Effective Interventions Unit, Learning and Teaching Scotland, Drugs Prevention Advisory Service (now part of Drugs.gov.uk), TACADE, HM Inspectorate of Education, and NIDA and SAMHSA in the USA.

In total, 302 studies, reports and other documents were included in the review.

1.3 Overview of the literature

1. Systematic Reviews and Meta-analyses

Seventeen systematic reviews and meta-analyses of school-based drug prevention were judged relevant to the review. Systematic review is a methodology for reviewing literature which is comprehensive, transparent and replicable in its search, selection and reviewing processes. Meta-analysis is a statistical analysis technique for pooling and drawing conclusions about effects in several studies. Rather than rely on reported significance, it uses a standard measure of study outcomes, effect size, which can be compared across studies and which enables the results of all studies to be taken into account. Effect size is defined as the difference between the means of the experimental groups pre- and post-intervention and the means of the control groups pre- and post-intervention, divided by their standard deviations (Bangert-Drowns 1988). Various statistical adjustments are performed to account for differences in study size, number of outcome effects measured and so on.

Systematic review and meta-analysis are related but not synonymous: it is possible to conduct a systematic review without using meta-analysis, if, for example, the studies being reviewed involve too disparate a range of interventions and outcomes to combine their data, in which case a ‘narrative synthesis’ performed.

Systematic ‘Cochrane reviews’, conducted through the international Cochrane collaboration, are considered the gold standard of SRs in the UK. Three Cochrane reviews, and one NHS Health Technology Assessment Review (which uses similar methodology) were found which examine school-based prevention (Table 1.2):

Table 1.2 Cochrane & NHS HTA Reviews

Authors	Scope
Thomas 2004	Review of all randomised controlled trials of school-based smoking prevention programmes.
Foxcroft et al 2004	Review of evaluations of “psychosocial and educational” alcohol prevention interventions aimed at young people.
Sowden et al 2004	Review of effectiveness of community interventions at preventing smoking among young people
Lister-Sharp et al 1999	Review of all forms of health promotion in schools including substance use prevention

In addition, one Cochrane review focusing specifically on the effectiveness of school-based programmes on generic drug use (alcohol, smoking and illicit drugs) was found at protocol stage (ie. in progress) (Faggiano et al 2004).

Fourteen other systematic reviews and meta-analyses were judged relevant to the review, four of which were conducted by Nancy Tobler and colleagues (see Table 1.3 below).

Table 1.3 Non-Cochrane Systematic Reviews and Meta-analyses Included in the Review

Authors	Scope
Bangert-Drowns 1988	School-based alcohol and drug prevention
Bruvold 1993	School-based tobacco prevention
Cuijpers 2002b	School-based drug prevention comparing peer and adult delivery
Elliott et al 2002	Secondary drug prevention (ie. reduction of drug use in young people already using drugs) in a range of settings including schools
Ennett et al 1994	Project DARE outcome evaluations
Gottfredson & Wilson 2003	School-based alcohol and drug prevention
Rooney & Murray 1996	School-based tobacco prevention
Rundall & Bruvold 1988	School-based alcohol and tobacco prevention
Tobler & Stratton 1997	School-based alcohol, tobacco and drug prevention
Tobler 1986	School-based alcohol and drug prevention
Tobler et al 1999	School-based cannabis prevention
Tobler et al 2000	School-based alcohol, tobacco and drug prevention
White & Pitts 1998	School-based alcohol, tobacco and drug prevention
Wilson et al 2001	School-based prevention of 'problem behaviours' including drug use

In addition, a small number of reviews were found which either claimed to be systematic or which contained systematic elements, but whose full systematicity was difficult to judge from the methodological information provided (Gottfredson 1997, Hansen 1992, Cuijpers 2002a, McBride 2003, Werch & Owen 2002). Because these reviews were of high quality and relevance, they were also examined in the review.

Cochrane reviews, other systematic reviews and meta-analyses provide the most rigorous evidence to date on the effectiveness of drug prevention. They gather evidence from many hundreds of studies - one Tobler review alone analyses 207 different studies - and apply high standards of scrutiny and comparison to ensure that the conclusions they draw from the evidence are robust. Therefore, this review focuses primarily on these studies in assessing the effectiveness of drug education.

2. Literature Reviews

Non-systematic literature reviews, or narrative reviews, do not use systematic procedures to search for and select studies, and may provide partial or even no information on how literature was retrieved and selected for inclusion in the review. They do not necessarily search less widely than systematic reviews - indeed, a non-systematic literature review could consult a wider range of sources than a systematic review - but because their search, selection and appraisal criteria are neither systematic nor replicable, their conclusions are generally considered more subjective and less valid than those of systematic reviews.

The searches uncovered several such literature reviews. They are used selectively in the review to illustrate key findings and recommendations.

3. Intervention Studies

The biggest category of evidence on school-based drug education comprises studies of specific interventions. These vary hugely in terms of methodological design, quality, robustness and scale. Designs range from multi-site randomised controlled trials to simple post-tests. Some of the North American prevention programmes such as Life Skills Training and the Midwestern Prevention Project (Project STAR) have been extensively tested in numerous studies, and subjects have been followed up over several years. Few UK interventions have been tested as rigorously as the larger North American programmes.

The search retrieved several hundred intervention studies. As our search was not as rigorous or extensive as that typically deployed in a Cochrane or other systematic review, this is unlikely to be a comprehensive list of all intervention studies. Rather than review all the retrieved intervention studies - which was not possible in the timescale for the review - we focused on the systematic reviews and meta-analyses to assess effectiveness, and used findings from the intervention studies selectively to illustrate key findings and recommendations.

4. Studies of Drug Education Practice

A small number of retrieved studies examined drug education in practice, both in Scotland and in other countries. The focus of these studies is not on evaluating a specific drug education programme or curriculum but on observing or assessing what is actually taught under the banner of drug education. Typical methods include observation of classroom practice, school surveys and interviews with teachers. Findings from these studies are used in the review to assess the extent to which current drug education practice reflects or does not reflect what is assumed to be effective.

5. Guidance

Finally, the search retrieved a number of guidance documents produced by government bodies, individual drug education experts or organisations concerned with quality in drug education. These vary in scope, status and the extent to which they draw explicitly on the evidence base. Because there are a large number of such documents, we prioritised those concerned with drug education in Scotland and the UK, although others were also considered. Findings and recommendations from these were used selectively to identify key recommendations and indicators and also to examine the extent to which ‘official’ guidance reflects what the evidence base suggests is effective.

1.4 Scope of the review

As indicated in the previous section, the review will not attempt to cover all these types of literature in similar depth. In assessing the effectiveness of drug education in schools (Section 2), it will concentrate on evidence from systematic reviews and meta-analyses, as these represent the most robust evidence available on effectiveness. In identifying the features of effective drug education (Section 3), it will draw widely and selectively from studies in various categories, including systematic reviews and meta-analyses, intervention studies, and guidance and discussion documents. In considering the extent to which practice matches the evidence base (Section 4), it will draw particularly on studies of drug education practice.

2 HOW EFFECTIVE IS SCHOOL-BASED DRUG EDUCATION?

This section examines findings from systematic reviews and meta-analyses regarding the effectiveness of school-based drug education. As described previously, Cochrane reviews, other systematic reviews and meta-analyses gather evidence from many hundreds of studies and apply high standards of scrutiny and comparison to ensure that the conclusions they draw from the evidence are robust. They therefore provide the best available evidence on the effectiveness of drug education.

Section 2.1 summarises findings from systematic reviews and meta-analyses, while section 2.2 summarises findings from high quality reviews which were claimed to be or potentially systematic, but whose systematicity was difficult to judge. Section 2.3 summarises findings and conclusions from all the reviews.

2.1 Findings from systematic reviews and meta-analyses

The findings of the systematic reviews and meta-analyses are summarised below, in two subsections:

- Drug programmes (including drug-specific and generic substance use programmes)
- Alcohol and tobacco programmes

2.1.1 Drug and generic programmes

Lister-Sharp et al 1999 (NHS Health Technology Assessment review)

Lister-Sharp and colleagues reviewed 32 systematic reviews of the effectiveness of health promotion interventions in schools. Only interventions targeting the whole school population (as opposed to high risk groups) were included; interventions delivered in multiple settings were included only if it was possible to separate out the effects of the school-based component. Nine of the reviews examined substance use interventions: two covered all substance use interventions, three alcohol interventions only, two drugs only, and one tobacco only. In total, the included reviews examined 146 primary evaluation studies reporting on 125 different interventions.

Sixty-three programmes covered in the reviews examined short-term effect on alcohol behaviour. Of these, 25 reported short-term beneficial impacts, 30 reported no impact, and seven a negative effect; one was unclear. Of the two programmes which followed up behaviour after five years, one (Life Skills Training delivered with high implementation fidelity) was effective (Botvin et al 1995).

Alcohol programmes including peer-led interventions appeared more effective than programmes overall. Alcohol programmes including resistance skills, stress management and/or norm setting were more effective in general than programmes not using these approaches (although not all resistance skills programmes were effective). Involving parents appeared to increase the impact of programmes.

Fifty-two programmes covered in the review examined smoking outcomes. Twenty-one had a positive short-term effect on smoking behaviour, and four were partially effective (eg. for one gender only). Thirteen had no effect, two programmes had potentially harmful effects, and in 12 programmes the results were unclear. Three studies examined longer-term impacts. Programmes were effective for between six months and two years after delivery (Murray et al 1989, Flay et al 1989), but not at six year follow-up. Programmes involving peers in delivery appeared to be more effective than those without peer delivery. The majority of effective programmes involved resistance skills. Involving parents did not seem to increase effectiveness.

Thirty programmes covered in the reviews examined short-term impact on cannabis behaviour. Four were effective and five were partially effective. Six had no effect, one had a harmful effect, and in 14 studies the results were unclear. Four studies examined longer-term impact on cannabis use. Two were effective (Pentz et al 1989, 1990; Horan & Williams 1982), one partially effective (Botvin et al 1990, 1995), and one not effective (Ellickson & Bell 1990, Ellickson et al 1993a, 1993b), in the long-term. Programmes involving peers tended to be as effective as programmes overall. The majority of effective programmes involved resistance skills and normative education. All four of the programmes involving parents had some effect.

In conclusion, Lister-Sharp et al note that systematic reviews, like primary studies, vary in quality, and that there is considerable disagreement between them both in what studies they include and in how they assess effectiveness. Differing assessments of programme effectiveness in the reviews contributed to the large number of studies deemed by Lister-Sharp as having ‘unclear’ effects.

Overall, Lister-Sharp et al note that between one-third and two-thirds of studies found a positive short-term impact on behaviour. Tobacco and cannabis use were more likely to be influenced positively than alcohol use. Effectiveness in the longer-term tended to be consistent with short-term effectiveness rates. They state “These reviews demonstrate that it is possible to impact at least on the initiation of substance use and misuse, but that programmes cannot be relied upon to be successful” (p50).

Resistance skills and norm setting programmes were more likely to be effective, but not in every case; the same was true for peer involvement. Parental involvement appeared to increase effectiveness slightly, although it was difficult to draw conclusions from the small number of studies. As interventions involving parents tend to be sophisticated multi-component interventions, there may be other confounding influences.

Tobler 1986

In the first of several meta-analyses of drug prevention (see below), Tobler reviewed 98 studies reporting on 143 school-based drug prevention programmes. Studies were published between 1972 and 1984 and included equal opportunities of randomised and non-randomised quasi-experimental designs.

Effect sizes were calculated for knowledge, attitudes and use. Not all studies measured all effects (only 91 measured behaviour).

Tobler classified programmes into five ‘modalities’ reflecting their “type or strategy”: Knowledge Only (equated by Tobler with “didactic ‘scare tactics’” p539); Affective Only, which made no reference to drugs but focused on “intrapersonal and social growth” (p539); Peer Programmes which are concerned with peer influence, and are sub-divided into two further categories, Refusal Skills and Social/Life Skills; Knowledge plus Affective; and Alternatives, which included both what would now be termed diversionary activities, and intensive tutoring and other interventions for at risk young people.

Meta-analysis using effective sizes found that, overall, programmes had the strongest effect on knowledge, followed by behaviour, and then attitudes. When behavioural effects were analysed by type of drug, the programmes overall had strongest effects on tobacco, followed by ‘all drugs’, alcohol and soft drugs, in order.

Regression analysis found that ‘peer programmes’ had the strongest overall effects of the five categories, followed by Alternatives, Knowledge plus Affective, Knowledge Only and Affective Only programmes. When behaviour effects were specifically examined in the regression analysis, Peer Programmes were “dramatically more effective” than other programmes.

In conclusion, Tobler argues that the results undermine the assumption that knowledge-attitude-behaviour change occurs in sequence: programmes were better at changing behaviour than attitudes. She argues that solid evidence exists for discontinuing the use of Knowledge Only and Affective Only programmes.

Tobler and Stratton 1997

A second meta-analysis by Tobler reviewed 90 studies reporting on 120 school-based programmes published between 1978 and 1990. It differed from the 1986 review in using a different programme classification scheme and in that all included studies measured effects on drug use behaviour.

Programmes were coded both for content and by delivery style. Programmes in which young people interacted with one another were classified as Interactive, while those delivered in a more didactic style with little group involvement were classified as Non-interactive. These were then combined into six sub-categories:

- Non-interactive Knowledge Only.
- Non-interactive Affective Only.
- Non-interactive Knowledge-plus-Affective. Knowledge-plus-Affective included sub-categories of programmes, Values clarification and DARE or DARE-type.
- Interactive Social Influences.
- Interactive Comprehensive Life Skills.
- Interactive Others.

‘Interactive Others’ refers to programmes delivered interactively but not including a refusal skills component. The first two interactive categories seem to relate to what were defined as Peer Programmes in the 1986 review. Use in the past month was most frequently used as the main behavioural outcome. Studies were rated for methodological quality, and additional more rigorous analyses conducted on a subset of 56 high-quality programmes.

Meta-analysis of effect sizes for both the total set of programmes and the high-quality subset found that the Interactive programmes had stronger overall effect sizes than the Non-interactive programmes. Analysis of the high-quality subset found that the Interactive Comprehensive Life Skills and Interactive Others had slightly higher effect sizes than Interactive Social Influences programmes; all three interactive types of programme had higher effect sizes than the three Non-interactive types (Knowledge Only, Affective Only, Knowledge and Affective). When effects were analysed by types of drug, the Interactive programmes appeared to have similar magnitude of effect (success) with tobacco, alcohol and cannabis, while the Non-interactive programmes appeared to be equally unsuccessful with the substances. A comparison of programmes by the delivery agent (teacher, peer, health professional or other) found that each were similarly effective in the Interactive programmes. There were no significant differences in effectiveness between longer more intense programmes and shorter less intense programmes, although the former tended to be slightly more effective.

In conclusion, Tobler argued that the additional classification of programmes by degree of interactivity avoids the equivocal picture found in some earlier reviews. She stated that “although not all drug prevention programmes work, the Interactive programmes consistently were more effective than the Non-interactive programmes” (p108). Interactive programmes were effective in changing knowledge, attitudes and skill, while Non-interactive programmes tended only to change knowledge.

Tobler identified two programmes whose continued use, according to the review findings, was not justified - Here’s Looking at You (Hopkins et al 1988) and Project DARE (see Ennett et al 1994 for a summary of DARE studies) - and two efficacious programmes which should be more widely adopted, Project STAR (Pentz et al 1989) and the Minnesota Heart Health Programme (Perry et al 1989).

Tobler et al 2000

A third review by Tobler and colleagues updated and expanded the 1997 meta-analysis. It reviewed 144 studies reporting on 207 programmes published between 1978 and 1998. Drug use in the last month was the main behavioural outcome examined, and effects on knowledge and attitudes were not assessed. As in the 1997 analysis programmes were classified according to both content and delivery style, combining to produce eight programme types:

Non-interactive:

- Knowledge Only
- Affective Only
- Decisions/Values/Attitudes
- Knowledge-plus-Affective
- DARE-type

Interactive:

- Social influences
- Comprehensive Life Skills
- System-wide change

The last category comprised both multi-component school-plus community/media/family programmes and programmes designed to produce “change in the entire school system” (p287). Over a third of all programmes were classified as Interactive: Social Influences and around a quarter as Interactive: Comprehensive Life Skills. Nine other potential predictors of programmes effectiveness were also examined: sample size, delivery agent, type of control group, programme attrition, population characteristics, type of drug targeted, school grade, programme intensity, and baseline substance use. Nearly three-quarters of the Interactive programmes targeted a single drug, compared to around half of the Non-interactive programmes. As in the previous review, analyses were conducted both for the full set of studies and for a subset of 93 methodologically higher quality studies.

Analysis of weighted effect sizes indicated that the Interactive programmes had stronger effects than the Non-interactive programmes. Within the Interactive group, ‘System-wide change’ programmes were the most effective, followed by Comprehensive Life Skills and Social Influences programmes. Within the Non-interactive groups, Knowledge programmes were slightly more effective (although still less effective than any of the Interactive types), while Affective and Decisions/Values/Attitudes programmes were less so, often having little effect.

When analysis was conducted by programme characteristics, smaller Interactive programmes were more effective than larger Interactive programmes (although there was little difference by size for Non-interactive programmes).

Health professionals appeared to be more effective as delivery agents in larger Interactive programmes, followed by teachers, peers and others; however, there were no differences in effectiveness in smaller Interactive programmes. Higher intensity (longer) Interactive programmes appeared to be more effective than lower intensity Interactive programmes. Regression analyses suggested that programmes with larger sample sizes were less effective than smaller sample programmes, although Interactive programmes were generally more effective than Non-interactive programmes over a range of programme sizes, while Non-interactive programmes tended to be similar (in)effective whatever their size.

Tobler et al suggested that Interactive programmes may suffer in delivery quality when delivered on a large scale, while Non-interactive programmes, because they are likely to be more didactic and standardised, were possibly unaffected by scale.

Overall, programmes had weaker effects on alcohol than on tobacco. Analyses examined whether programmes which targeted a single substance were more or less effective than those targeting generic substance use. Interactive programmes targeting tobacco only appeared to be more effective at reducing smoking than Interactive generic substance use programmes. Interactive programmes targeting alcohol only appeared equally effective at reducing alcohol compared with generic substance use programmes].

In conclusion, the review emphasises the superiority of Interactive over Non-interactive programmes and notes that Interactive programmes appear equally effective with tobacco, alcohol and cannabis, and more effective in schools with minority or special needs populations. The review is particularly enthusiastic about ‘Interactive System-wide’ programmes as the future of prevention, and draw attention to Project Northland (Perry et al 1996) as a particularly promising Interactive System-wide change programme.

In conclusion, the review recommends that increasing programme intensity (length) should increase effectiveness, but only with programme types found to be more effective (ie. Interactive programmes). It suggests that smoking may be better prevented through tobacco-specific rather than generic programmes, whereas both alcohol-specific and generic programmes are equally effective in reducing alcohol use.

Tobler et al 1999

This meta-analysis by Tobler and colleagues reviewed 30 studies reporting on 37 school-based programmes which measured cannabis use, and compared them with the 120 programmes reviewed in Tobler & Stratton 1997, specifically focusing on cannabis use outcomes. Programmes were classified into interactive (comprising Social Influences, Comprehensive Life Skills and Other programmes types) and Non-interactive (Affective Only and Knowledge-plus-Affective) categories. As in the previous reviews, delivery and other programme characteristics were analysed. Cannabis use in the past month was the main behavioural effect measured.

Meta-analysis using weighted effect sizes found that the 22 Interactive programmes had much larger effect sizes than the 15 Non-interactive programmes, which were generally ineffective. Analysis of a small subset of studies which compared the full programme with a placebo version using similarly Interactive methods but without the content found that placebo programmes were ineffective, suggesting that both interactivity and content are important to effectiveness.

The Interactive programmes were generally equally as effective with tobacco, alcohol and cannabis, whereas the Non-interactive programmes were generally equally ineffective for the three substances. Programmes involving smaller numbers of participants (<400) were more effective than larger programmes.

Bangert-Drowns 1988

Bangert-Drowns reviewed 33 studies of college- and school-based alcohol and drugs prevention programmes. Programmes which addressed tobacco alongside alcohol and drugs were included but programmes which exclusively targeted tobacco were excluded. Years covered ranged from 1968 to 1986. The effects examined in the review were behaviour, attitudes and knowledge, with most emphasis given to longer-term behavioural effects. Programmes were coded by approach (three categories: information only, affective only and mixed) and various delivery variables such as length of time and delivery agent.

Meta-analysis using effect sizes found that overall the programmes were more successful in changing knowledge and least successful in changing behaviour; the average effect size for behaviour was not significantly different from zero, suggesting little or no impact. However, when programmes were analysed by year of study publication, more recent programmes had a higher behavioural effect size than earlier programmes, potentially suggesting an improvement over time.

In conclusion, the review suggests that school-based alcohol and drug education is effective in increasing knowledge and, to a lesser extent, changing attitudes towards drugs, but of limited effectiveness in changing behaviour.

White and Pitts 1998

White and Pitts reviewed 71 studies reporting on 62 drug education interventions targeting young people aged 8-25. Eighty-nine percent of the interventions were school or college-based. Nearly half of the interventions targeted cannabis, a quarter cannabis and cocaine, and around a quarter did not specify which drugs were targeted. Self reported cannabis use was the main behavioural outcome measured.

Effect sizes were computed, and heterogeneity tests conducted to assess variability. A subset of 20 methodologically stronger studies was examined separately alongside the total set.

Of the 55 school-based interventions which measured impact on drug behaviour, 27% had a significant positive impact. Among the methodologically stronger studies, 56% had an impact on drug behaviour. Ten out of eleven interventions which had been followed up one year had a small but positive effect, and all but two of these ten had positive effects beyond one year. Meta-analysis showed that effects were generally small in size and declined over time. At one year follow-up, the weighted mean effect size was 0.037, and at two-year follow-up or later, the weighted mean effect size was 0.018. To put these figures into context, White and Pitts note that an effect size of 0.037 mean that exposure to school drug education accounts for less than one per cent – 0.14% - of variance in drug use, or, that 3.7% of young people who would otherwise use drugs delay their onset of use as a result of school drug education, or are persuaded never to use drugs. They also note that while such effect sizes seem small, in trials of pharmaceutical drugs they would be considered large enough to provide compelling evidence that a treatment ‘worked’. They conclude their discussion by suggesting “*it is for policymakers to decide whether it is worth seeking to achieve changes among populations of this size*” (p.484).

Effective programmes included knowledge, resistance skills, peer support and life skills. Methodologically sound effective programmes recommended by the review were Life Skills Training (Botvin et al 1990, 1995), Project STAR (Pentz et al 1989, Johnson et al 1990), Here’s Looking at You 2000 with a community component (Stevens et al 1996), and assertiveness training (Horan & Williams 1982). Project ALERT (Ellickson & Bell 1990), two refusal skills programmes (Schinke et al 1998 and Shope et al 1996), and normative education (Hansen & Graham 1991) were effective in the shorter-term.

Cuijpers 2002b

Cuijpers conducted a meta-analysis of 12 studies as part of a larger review (see Cuijpers 2002a in Section 2.2 below). All the studies reported on a school-based drug prevention intervention in which peer-delivery was compared to adult-delivery (of the same intervention). The outcome examined was substance use (tobacco, alcohol or cannabis). A further meta-analysis was conducted on studies focusing on tobacco use.

Peer-delivered interventions were more effective at immediate post-test, but not at one-year or two-year follow-up, both in terms of all substance use and tobacco use specifically. However, the number of studies was small, and the high degree of heterogeneity limited the comparisons which could be made.

Elliott et al 2002

Elliott et al reviewed evidence on the effectiveness of treatment and care interventions targeting drug using young people up to 16 years old. Seven reviews and 11 primary studies were included, reporting on interventions in a range of settings including schools. Only school-based programmes aimed at reducing drug use and harm among young people already using drugs were included; universally-targeted school-based drug education was excluded. However, the criteria appear to have been somewhat confusingly applied, as at least one universally-targeted school-based programme has been included in the review (Stead et al 2001, 'NE Choices'). Results are presented in a narrative synthesis.

The review found "weak evidence" that school-based programmes were effective in reducing drug use among drug-using young people, but also conclude that "purely education programmes" and "multi-faceted school-based programmes" are ineffective. The extreme heterogeneity of the interventions examined - including outpatient treatment, intensive counselling, 12-step programmes and family therapy - and the rather confusing inclusion criteria limit the usefulness of this review to the present review.

Ennett et al 1994

Ennett and colleagues reviewed ten studies reporting on eight separate evaluations of one programme, Project DARE. Effect sizes were computed for six outcomes reflecting DARE's aims: knowledge, attitudes, social skills, self-esteem, attitudes towards the police, and drug use. Across the eight evaluations, DARE had the greatest effect on knowledge, followed by social skills, attitudes towards the police, attitudes towards drugs, self-esteem and drug use, on which it had the smallest effect. When usage outcomes for different drugs were examined, DARE had a significant effect only on tobacco use. A comparison with Tobler & Stratton's (1997) meta-analysis indicated that DARE's effects on drug use and social skills were more than a third smaller than the comparable effects for Tobler's category of 'interactive' programmes, and were smaller in all comparisons than those of the interactive programmes. DARE had larger effects on knowledge, attitudes and social skills than Tobler's non-interactive programmes.

Gottfredson and Wilson 2003

Gottfredson and Wilson reviewed 130 documents reporting on 94 school-based prevention programmes for alcohol and other drug use (excluding tobacco). The time frame is not given. Programmes coded according to whether they were delivered to a universal school population or selectively to a high risk group; the age of young people in the programme; programme delivery agents; and programme duration.

Effect sizes were calculated based on the contrast between intervention and comparison groups. Where studies investigated multiple intervention-comparison group contrasts, these were also included in the meta-analysis, producing 136 contrasts.

Meta-analysis using effect sizes indicated that programmes targeting high risk young people appeared to be more effective than programmes targeting universal school populations, although the analysis was based on a small number of studies and the authors caution that it is “weak” evidence. Programmes targeting middle/junior high school pupils appeared to be slightly more effective than those targeting younger or older age groups. The authors suggest that the variations in follow-up period may have confounded this result, as programmes targeting younger pupils tend to be followed up for longer (allowing more time for effects to wear off). Regression analysis to explore this possible confounding suggested that length of follow-up period did appear to influence effect size; in other words, programmes delivered to middle/junior high school students did appear to be slightly more effective than programmes delivered to younger children.

Analysis by programme duration showed no relationship between length and effect. No relationship was found between who delivered the programme (teachers, peers, police, health professionals, others) and effect, although analysis of a subset of programmes which involved peers in delivery found that programmes delivered only by peers had higher effects than programmes delivered by peers and teachers (the authors caution that this may be confounded by features other than who ran the programme).

In conclusion, the authors note that the possibility that selective high risk programmes are more effective than universal programmes needs further investigation, not least because of the potential cost and ethical implications of targeting only high risk young people. They suggest that the case for targeting prevention before middle/junior school is still unproven, but cannot be ruled out. They also note that longer programmes (over 4 months) are not necessarily better than shorter programmes, and that peer-only delivery is more effective than either teacher-only or teacher-plus-peer delivery: in other words, the benefits of peer involvement in delivery may disappear if peers share delivery with teachers.

Wilson et al 2001

Wilson and colleagues reviewed school-based interventions targeting criminal and violent behaviour, school-disaffection, rebelliousness and substance use. Two hundred and nineteen studies/reports reporting on 165 programmes were reviewed.

Nearly three-quarters of the programmes targeted a universal student population, while the rest targeted high-risk populations. Programmes were categorised as environmentally-focussed (addressing classroom management, class reorganisation or school discipline) or individually-focused; the latter group included social competence, cognitive behavioural, mentoring, counselling, recreational and ‘other instructional’ interventions.

Effect sizes were computed, for those studies which provided sufficient information, in four categories: criminal behaviour, alcohol and other drug use, dropout and non-attendance and other problem behaviours.

Overall, the effect of programmes on substance use behaviour was positive but very small, with a high degree of variability across studies. Studies of better methodological quality tended to have larger effects, as did studies restricted to high-risk young people. This may be because it is more difficult to change a low occurring behaviour in a general population.

Environmentally focused interventions and cognitive behavioural interventions were generally effective in influencing alcohol/drug use, while instructional programmes which did not use cognitive behavioural instruction, plus mentoring, tutoring and recreational programmes, were generally ineffective. Counselling generally had negative effects.

In conclusion, Wilson and colleagues state that school-based prevention is effective for reducing alcohol and drug use, but that overall effects are small. More rigorous studies produced larger effects, as did programmes targeted at high risk groups.

2.1.2 Alcohol and tobacco programmes

Foxcroft et al 2004: Alcohol Misuse Prevention in young people (Cochrane Review)

Foxcroft et al identify 56 studies meeting methodological quality criteria which examined interventions to prevent alcohol misuse in young people. Unlike Thomas' review, eligible studies were not restricted to RCTs (although the majority, 41, were RCTs), and interventions delivered in family and community as well as school settings were included. Young people were defined as up to 25 years.

Included studies were not rated for methodological quality, and the authors caution that there were "concerns" about most studies, whether RCT or otherwise, particularly the discrepancy between unit of allocation (eg. class, community) and unit of analysis (eg. individual), and the high level of attrition in several studies. Because of the heterogeneity of studies, the authors argue that qualitative analysis of overall effect "would have little meaning" and instead present results in a narrative systematic review structured by the period of follow-up (up to one year, one to three years, over three years). The outcomes of interest vary according to the individual study, but include alcohol behaviour.

Of the studies examining short-term outcomes (up to one year), 15 reported some positive effects, 24 reported some non-significant outcomes, and four reported effects in the 'wrong' direction (the interventions appeared to increase drinking behaviour). There was considerable overlap between all three groups: ie. several studies reported both positive and non-significant outcomes (depending on the outcome variable of interest), and several reported both non-significant and negative outcomes.

Of the studies examining medium-term outcomes (one to three years), twelve were at least partially effective, nineteen found no evidence of effectiveness, and two had negative effects (they appeared to increase drinking in the medium term).

Of the studies examining long-term outcomes (over three years), three studies found long-term effects, four studies found no long-term effects or that earlier effects had worn off, and one showed mixed results.

Overall, the review finds some evidence that alcohol misuse prevention interventions can work, but many studies had very mixed results. The majority of the 56 interventions examined (42) were entirely school-based; a further four were school plus community or school plus family, with the others being delivered in non-school settings. The review did not set out to compare school-based interventions with interventions in other settings, and school-based interventions were represented reasonably proportionally in both the 'effective' and 'ineffective' intervention groups. In other words, the review is not able to say whether school-based alcohol prevention is more or less effective than prevention in other settings, only that there is evidence from some studies that it works and from others that it does not.

Foxcroft et al do not draw any conclusions about the relative merits of different approaches overall. However, they draw attention in their conclusions to a number of programmes for which they feel "it is probably reasonable to say that the evidence base does not support their continued use in the primary prevention of alcohol misuse for young people" (p8). The list is somewhat confusing, as it includes several studies Foxcroft et al rate elsewhere in the review as effective or partially effective in the short- and medium-term.

They also highlight the Strengthening Families family-based programme (Spath 2001) as a particularly promising programme, and a culturally-focused school and community intervention for Native American young people (Schinke et al 2000). They are less enthusiastic about Life Skills Training (Botvin 1995), arguing that its longer-term effects were weak, although in the desired direction.

Thomas 2004: School-based smoking prevention (Cochrane Review)

Thomas reviews 76 randomised controlled trials of school-based smoking prevention programmes. The studies are grouped into three categories according to methodological quality:

- Better quality studies had minimal selection, performance, attrition and detection bias, and performed power calculations and appropriate statistical analysis.
- Medium quality studies had one or more design problems which could threaten validity of their conclusions.
- Poor quality studies had "serious problems in design or conduct that precluded drawing any conclusions".

Studies are also grouped into five categories according to the type of programme:

- Information-only.
- Social competence.
- Social influence.
- Combined social influence and social competence.
- Multi-model (multi-component programmes combining school-based and other components such as media or policy).

Because of the heterogeneity of studies, Thomas argues that quantitative synthesis (ie. meta-analysis) of data is not appropriate, and instead reports results in a narrative systematic review structured by the type of programme. The outcome of interest is smoking prevalence.

In the information-only category, one out of four medium quality studies found an effect on smoking behaviour, while three studies did not. In the social competence group, the sole better quality study found an effect (there were no medium quality studies). In the social influences group, eight out of fifteen better quality studies found an effect, and seven did not; in the same group, thirteen medium quality studies found an effect and seven did not or were unclear. In the combined social influence and social competence group, the sole better quality study and all eleven medium quality studies found an effect. Finally, in the multi-model programme group, one out of three better quality studies found that a multi-component programme was more effective than a school-only component, and two did not.

Overall, Thomas' review provides reasonably strong evidence that school-based programmes can be effective in reducing smoking prevalence. Effects on smoking behaviour are found in some studies but not in others. Thomas' review also points to some types of prevention programme being more effective than others. Although there was some evidence that information-only could be effective, in the majority of programmes it was not, suggesting that the evidence is weak. Of the relatively large number of social influences programmes examined, more were effective than were not. In the other categories examined, results were more mixed.

Thomas draws conservative conclusions from the findings. Although conceding that "there is some evidence that school programmes incorporating social influences models can affect smoking behaviour in the short term", Thomas also argues that "these studies must be weighed against the findings of the Hutchinson Prevention Project which failed to find a sustained effect of a social influences intervention programme on smoking behaviour" (p27). The Hutchinson programme (Peterson et al 2000) was "the largest and most rigorous test of a social influences model" to date (p29).

Sowden et al 2004: Community interventions to prevent youth smoking (Cochrane Review)

Sowden et al reviewed 17 community interventions for preventing smoking in young people which met methodological quality criteria. Community interventions were defined as "coordinated, widespread programmes in a particular geographic area ... which support non-smoking behaviour" (p2-3). Fifteen of the programmes included a school-based component; however, there was wide diversity in the type of school component, as well as in the mix and focus of the other intervention elements (eg. media, policy). Outcome measures of interest were self-reported smoking and objectively measured (eg. through saliva testing) smoking behaviour. Both randomised and non-randomised controlled trials were included. Young people up to age 25 were included. The extreme heterogeneity of the interventions and study methods made a meta-analysis inappropriate.

Twelve studies compared the effectiveness of a community intervention with no intervention or health promotion activities as normal. Two reported significant and sustained reductions in smoking behaviour (Perry et al 1994, Vartiainen et al 1998) - in the latter case, significantly decreased youth tobacco use was still found at 15-year follow-up. A third study found that where the school-based component of the community intervention was delivered in an intensive 12-week block there was a reduction in youth smoking behaviour, but no reduction was found where the programme was delivered over a 3-year period (Piper et al 2000). Nine studies found no effects on smoking; some of these included sizeable school components, while two were non-school-based.

Four studies compared the effectiveness of a community intervention including a school-based component with the school-based component alone. One found that the community intervention performed better than the school-only intervention (Biglan 2000); three found no evidence that the community intervention performed better.

One study compared a community with school component programme with a community programme without school programme. Both interventions were associated with a reduction in smoking behaviour, but there was no difference between them (Kaufman 1994). Finally one study compared a media and school programme (Project STAR) with a media only intervention. The multi-component programme had a significant impact on smoking at one year follow-up compared with the media only programme (Pentz et al 1989).

In conclusion, the authors suggest there is “some limited support for the effectiveness of community interventions” in preventing smoking by young people.

Rooney and Murray 1996

Rooney and Murray reviewed 90 studies reporting on 131 school-based tobacco prevention programmes targeting 6th-12th grade children. Only ‘social’ or ‘peer-type’ programmes were included, and all studies were published between 1974 and 1991.

Just over three-fifths of the programme targeted tobacco only, with the rest targeting other tobacco plus another substance, or being generic in nature. Programmes were classified into three categories:

- Social influences.
- Generic social skills.
- Resistance skills.

Effect sizes were computed using the same formula as in the Tobler reviews, but the analysis was limited to one effect size per ‘treatment’. Statistical adjustments were made for the ‘unit of analysis problem’ - analysing at the level of the individual student rather than the school or class.

The mean effect size for all programmes was small but significantly different from zero, suggesting moderate effectiveness. Regression analyses indicated that programmes delivered over a longer period of time and with longer follow-up periods, random assignment, 10 or fewer sessions, untrained peers as programme leaders and a wider focus than tobacco only tended to be more effective at short-term follow-up. At longer-term follow-up (> one year), programmes targeting a younger age group (6th grade), programmes concentrated in a short period of time or with booster sessions, and programmes delivered by trained teachers and untrained peers tended to be more effective, with estimated optimal effect sizes ranging from 0.50 to 0.80. These translate into an approximate 19-29% reduction in smoking, which could be considered an encouraging achievement.

All three types of intervention were equally effective, apart from when programmes were not focused only on tobacco, in which case social influences programmes were more effective.

Rundall and Bruvold 1988

Rundall and Bruvold (1988) conducted a meta-analysis of school-based alcohol and smoking prevention. Forty-seven smoking and 29 alcohol programmes whose studies were published between 1970 and 1984 were reviewed. All the studies included a control or comparison group. Meta-analysis was conducted using study effect size. Effect size is described by the authors as a standardised measure of a programme outcome, comprising the average difference between treatment and control group on the outcome variable divided by the standard deviation of the control group. It represents the standardised mean differences between outcomes of individuals in the experimental group and individuals in the control group. In meta-analyses, programme-specific effect sizes are aggregated, with adjustments for varying sample sizes, across many programmes to produce an average effect size. Only programmes in which control groups had been randomly allocated were included in the calculation of pooled effect sizes (19 in total). These were then compared with effect sizes calculated from the total sample, and found to be “extremely consistent” (p322); therefore, the total sample of studies was asked in the meta-analysis.

The subject of smoking prevention programmes achieved a greater proportion of intended short-term behavioural outcomes than did the alcohol prevention programmes and had a larger overall effect size. When the two types of programmes were compared in terms of longer-term behaviour effects (more than three months), smoking programmes achieved a much greater proportion of effects than did alcohol programmes, and had a much greater overall effect size.

A further analysis compared programmes by type of theoretical model. The authors categorised programmes into two categories: “rational”, which they define as “imparting factual information to individuals, usually in didactic format” (p319), and “innovative” which they define as programmes based on social reinforcement, social norms or developmental theories. They argue that a more detailed categorisation was not possible because virtually no programmes were based solely on one of the three ‘innovative’ theories. Innovative smoking prevention programmes had a higher pooled behavioural effect size than did traditional programmes for immediate behavioural outcomes, although for longer-term behavioural outcomes innovative and traditional programmes had similar effect sizes. A different pattern was found with alcohol prevention programmes: innovative and traditional programmes had similar behavioural effect sizes for immediate behavioural outcomes, but innovative programmes had a higher behavioural effect size than did traditional programmes for longer-term behavioural outcomes.

In conclusion, the authors note that, in general, while alcohol and smoking programmes appear similarly effective in terms of immediate outcomes, smoking programmes appear more effective at achieving longer-term behavioural change. Innovative programmes “more reliably” produced desired behavioural outcomes than did traditional programmes.

Bruvold 1993

A more rigorous, and updated, analysis building on Rundall and Bruvold (1988) was conducted by Bruvold in 1993. Eighty-four studies reporting on 94 smoking prevention programmes in schools were reviewed, covering 1971-1988. Studies were rated for methodological quality, and meta-analyses conducted on both the total set and on the “better

quality” subset. Programmes were classified into four categories according to their major orientation (most contained elements of several types): rational (information giving), developmental (affective education), social norms, and social reinforcement. Nearly all the studies included in the meta-analysis examined immediate post-intervention effects on behaviour, and many also examined behaviour at two subsequent follow-ups.

Programmes classified by the authors as having predominantly ‘social reinforcement’ and ‘social norms’ orientations were found to have consistently positive and significant behavioural effect sizes. Programmes classified as developmental (affective) had more mixed but generally positive and significant behavioural effect sizes, and those classified as rational were generally not significant and were both positive and negative. Subsequent analysis of the better quality studies found that ‘social reinforcement’ programmes and the greatest impact on behaviour, social norms and developmental programmes had a similar impact, and rational programmes very little, if any, impact on behaviour.

Further analysis was conducted to examine whether programme orientation alone explained the variance between effect sizes, or whether other variables might explain the differences. Other variables examined included grade level, number of sessions, and when the study was conducted (to examine whether variations in study findings reflect universal time trends in smoking). Only grade level appeared to be associated with effect, with programmes delivered to higher grade levels tending to have larger effect sizes.

In conclusion, Bruvold draws attention to three exemplary programmes representing the three programme types found to be more effective: McAlister et al (1980), classified by Bruvold as social reinforcement; Coe et al (1982), classified as social norms; and Botvin et al (1984), classified by Bruvold as developmental.

2.2 Other high quality reviews

As noted above, this section examines a number of potentially systematic reviews whose systematicity is hard to judge from the methodological information available.

Gottfredson (1997)

This large-scale review by Gottfredson was conducted as part of a larger report to the United States Congress on youth delinquency and crime prevention (Sherman 1997). Time constraints ruled out a fully systematic search and review, and high-quality reviews were used rather than original studies to summarise some key findings. Effect sizes were calculated for an incomplete set of studies. In total, 149 studies were reviewed. Programmes were categorised as focusing on either environmental change or individual change, with sub-categories in each group as follows:

Environmental change:

- Building school capacity.
- Setting school behavioural norms and rules.
- Class management.
- Regrouping pupils/classes.

Individual change:

- Instruction (Gottfredson includes factual information, social influences, DARE, and programmes to “improve their moral character etc” in this category).
- Behaviour modification and thinking strategies.
- Peer programmes.
- Counselling and mentoring (excluding peer counselling).
- Recreational and leisure alternatives.

Nearly half of the programmes (77 of 149) measured effects on alcohol, tobacco and other drug use. Results are presented narratively, with selective use of effect sizes.

Gottfredson seeks to identify strategies which work, which do not work, and which are promising. Strategies which work - defined as those “for which at least two different studies have found positive effects on measures of problem behaviour and for which the preponderance of evidence is positive” (p210) - in reducing drug use are programmes which clarify and communicate behavioural norms, which focus on social competency skills, and which teach behaviour modification and thinking skills to high risk young people. Promising strategies (shown to be effective in one rigorous study and in need of replication to confirm effect) for drug prevention are three classified by Gottfredson as concerned with environmental change in the school rather than individual change: programmes to build school capacity to initiate and sustain innovation, programmes which teach pupils in smaller units, more interactively or more flexibility; and programmes which improve classroom management.

Cuijpers 2002a

Cuijpers reviewed drug prevention literature to identify mediating variables and programme characteristics associated with effectiveness. Although the study claims to be a systematic review, it is difficult to assess the systematicity of the search and selection process from the limited information provided. Findings are presented in a narrative format.

In addition to examining three meta-analyses (Tobler 2000, Rooney & Murray 1996, White and Pitts 1998), Cuijpers examines seven studies which found mediating variables potentially related to the effects. Mediators which were found to be significant are listed, together with those found not to be significant, in table form for the 7 studies. A normative approach - correcting prevalence estimates and clarifying normative expectations - was a significant mediator of effect in three of the studies but not in one. Refusal/resistance skills was a mediator of effect in one study but not in four. Other mediators found to be associated with effect, in one study each, were information about consequences of smoking, commitment or interventions not to use drugs, and increased parent-child communication. Self-esteem was not found to be a mediator of effect in two studies.

Cuijpers also examines 21 studies which directly compared programme characteristics: studies comparing programmes with and without booster sessions (4 studies); studies comparing programmes led by peers versus adults (12 studies); and studies comparing school programmes with or without community intervention components (5 studies). It was unclear whether booster sessions increased or decreased the effectiveness of programmes. Peer-led programmes were found to be slightly more effective than adult-led programmes in the short-term, but not after one year, when no significant differences were found (see Cuijpers 2002b

in previous section]. Adding community intervention components to school programmes appeared to increase the effectiveness of school programmes.

McBride 2003

As part of a larger review, which included examination of previous reviews, McBride reviewed 5 studies reporting on 4 programmes published between 1997-2001. As the aim was to identify programme characteristics associated with effectiveness, only programmes which reported an effect on behaviour change were included. Four of the studies examined alcohol prevention and one smoking.

McBride identifies a number of recommendations arising from the 5 primary studies, although no indication is given of the strength of the evidence for each of the recommendations. She recommends that programmes should be delivered prior to, during and after initial experimentation; that they should be meaningful and interesting to target groups and based on their needs; that booster sessions should be included (although she notes that recent effective programmes tend to have comprised fewer sessions overall than earlier effective programmes); that programmes should be interactive; and that programmes should focus on a single drug rather than generic drug use. She suggests that normative education is a more important element of the social influences approach than resistance skills, but proposes that resistance skills might be effective within a harm minimisation rather than prevention context. Finally, she suggests that interaction with peers, rather than delivery by peers, may be more important, although this recommendation seems to be based on only two reviews and one study.

Hansen 1992

Hansen reviews the content and outcomes of 45 studies of school-based drug use prevention programmes published between 1980 and 1990. The first part of the review codes programmes on the basis of their content into four broad categories:

- Information/Values Clarification
- Affective
- Social Influences
- Comprehensive.

In the second part of the review, Hansen codes and summarises behavioural outcomes from all studies, and presents the data in tabular form. Nothing that the approach is simplistic “from a meta-analytic perspective”, he suggests it is valuable for providing an initial assessment of consistency. Social Influence programmes were found to have the highest proportion of positive outcomes (51%, with 38% neutral/no effect, and 11% negative). Comprehensive programmes were also effective, with 50% positive and 50% neutral outcomes.

Hansen also estimates the statistical power of all included studies to determine the absolute reduction in prevalence which the study would need in order to achieve 80% power, ie. to have an 80% chance of detecting a difference. Similar calculations were conducted for a relative reduction of 50%. Around half of the studies were found to have insufficient

statistical power to detect relative reductions in substance use - that is, given their number of subjects and limited time between baseline and follow-up, the impact the study would have needed to show in order to be of statistical significance was probably too large and unobtainable (eg. follow-up prevalence in the intervention group would have had to have actually been lower than baseline prevalence, rather than simply lower in relation to follow-up prevalence in the control group). In other words, many studies are not statistically powerful enough to detect changes. Information/Values Clarification programme studies were particularly likely to lack power, raising the possibility that their presumed lack of effectiveness may be erroneous.

Information/Values Clarification programmes had positive outcomes in just under a third of programmes, but negative results in a quarter, and neutral in 44% of programmes. Affective programmes were largely neutral in effect. When results were adjusted to allow for selection bias and statistical power, Comprehensive programmes were found to have the highest number of positive outcomes, followed by Social Influence programmes, then Affective and Information/Values Clarification programmes.

Werch & Owen 2002

Werch and Owen reviewed substance use prevention programmes targeted at school and college students to examine programme factors associated with negative effects. Only programmes which had shown an increase in substance use, or an undesirable change in substance behaviour, were included in the review, resulting in 17 studies.

Slightly more of the negative effect programmes targeted drugs compared to alcohol; none targeted tobacco. The number of negative effect programmes appeared to have increased over time, with nearly half being published in 1996-2001, compared to two published in the period 1980-85.

The greatest number of negative effects was associated with social influences programmes, followed by “knowledge/attitudes/values” programmes. The main negative effect found was an increase in alcohol consumption. Generic programmes (those addressing all substances) appeared to result in more negative effects on alcohol use than programmes focusing only on alcohol; the authors suggest that multiple substance prevention programmes may be more ‘harmful’ than single drug programmes because they risk making some drugs appear less harmful than others (and therefore safe to try), but there was insufficient evidence to test this possibility.

2.3 Is drug education more effective for some drugs than others?

An important question for drug education is whether it is more effective at preventing use of some drugs than others; is it easier to influence smoking than drinking, for example? There are broadly two ways to explore this question. The first is to compare the ‘success rate’ for alcohol programmes with those for tobacco programmes and those for illicit drug programmes. Three reviews report success rates for different types of programmes. White & Pitts (1998) found that between 27% and 56% of programmes (depending on the methodological quality of the programmes) reporting illicit drug use outcomes had a positive

effect on illicit drug use. Foxcroft et al (2004) found that 35% of programmes reporting alcohol outcomes had a positive effect on short-term use; 36% had a positive effect on medium-term use; and 38% on long-term use. They included non-school based interventions, although the majority of interventions reviewed were defined in school or had a school component. Just under a third of programmes reporting short-term outcomes had a positive effect, over half had mixed or non-significant effects, and nearly a tenth had negative (harmful) effects. Of the 33 programmes reporting medium-term outcomes, just over a third had positive effects, over half had no effect, and two out of 33 had negative effects. Of the eight programmes reporting long-term outcomes, three had positive effects, four had no effect, and one had mixed effects. Thomas found that 62% of programmes reporting tobacco outcomes had positive effects on use (17% had no effect, and 21% had mixed or unclear results).

A second way of approaching the question is to look at reviews which compared, *within the same set* of programmes, outcomes for different drugs. Four reviews did this:

Lister-Sharp: Lister-Sharp et al examined the effectiveness of school-based health promotion interventions for alcohol, tobacco and drug outcomes separately. Sixty-three interventions reported alcohol outcomes, 52 reported smoking outcomes, and 32 reported cannabis outcomes. Each group included programmes targeting only one substance *and* programmes targeting all drugs. Table 2.1 below summarises short-term outcomes in terms of whether they were positive, negative (ie. harmful), unclear or no effect.

Table 2.1: Lister-Sharp: Summary of Short-Term Programme Outcomes for Different Substances

Substance	No. of programmes reporting outcomes	Positive outcomes*	No effect	Negative outcomes	Unclear
Alcohol	63	25	30	7	1
Tobacco	52	25	13	2	12
Cannabis	30	9	6	1	14

* including partially effective outcomes, eg. effects for one gender only

Nearly two-fifths of programmes reporting short-term alcohol outcomes had a positive effect on alcohol, compared with nearly half for tobacco and just under a third for cannabis. However, nearly half of the programmes reporting short-term alcohol outcomes had no effect, and over a tenth had a negative outcome (ie. they increased alcohol use). Of the programmes reporting short-term tobacco outcomes, a quarter had no effect and less than 4% were negative. A fifth of the cannabis programmes had no effect and only one out of 30 was negative. Just under a quarter of programmes reporting tobacco outcomes and nearly a half of programmes reporting cannabis outcomes reported unclear outcomes. Alcohol programmes, therefore, while their success rate compared reasonably well with the success rate of both tobacco and cannabis programmes, were also more likely to be *ineffective* and harmful. Overall, Lister-Sharp et al conclude that drug education programmes (including both programmes targeting a single substance and generic programmes targeting several substances) appear to be slightly more effective at influencing tobacco use than alcohol or cannabis. Drug education programmes are more likely to have no effects or negative (harmful) effects on alcohol use than on tobacco or drug use.

Rundall & Bruvold (1988): Rundall & Bruvold compared the proportion of positive outcomes and pooled effect sizes from 47 programmes reporting tobacco outcomes and 29 reporting alcohol outcomes. Eleven of the programmes targeted both alcohol and tobacco, 7 targeted

alcohol only and 23 targeted tobacco only. Results for behavioural outcomes are summarised below in Table 2.2.

Table 2.2: Rundall & Bruvold: Summary of Positive Outcomes for Smoking and Alcohol Programmes

	Smoking Programmes		Alcohol Programmes	
	<3 months	>3 months	<3 months	>3 months
No. of desired positive effects /total reported outcomes	28/35	29/34	18/27	9/18
Pooled effect size	0.15	0.34	0.11	0.12

The short-term (under 3 months) effect sizes for smoking and alcohol programmes were comparable (0.15 and 0.11). However, longer-term effect sizes were markedly higher for smoking than for alcohol programmes (0.34 versus 0.12), suggesting that smoking programmes were consistently more effective at achieving long-term behaviour change. The low ratios of desired effects to total outcomes found with long-term outcomes of alcohol programmes suggests that alcohol programmes were more likely to have no effect or a harmful effect. Overall, programmes (including both programmes focusing on one substance only and programmes focusing on both) were slightly more effective in the short-term at influencing tobacco than alcohol use, and markedly more effective in the longer term at influencing tobacco than alcohol use.

Tobler 1986: Tobler 1986 examined substance use outcomes for 143 school-based programmes including programmes targeting single substances and generic programmes. Higher effect sizes were found for tobacco, followed by, in order, ‘all drugs’, alcohol and soft drugs, indicating that, overall, programmes were more effective at influencing smoking (where this was a goal of the programme) than other drug use. ‘Peer Programmes’, defined as including both Refusal Skills and Social/Life Skills programmes, were similarly effective at influencing tobacco, alcohol, soft drugs, and ‘all drugs’, although slightly more effective at reducing soft drug and all drug use than tobacco and alcohol use. Other programme types were reasonably effective at influencing tobacco use, but relatively ineffective at influencing alcohol and soft and all drug use. The overall conclusion from the review is that drug education programmes (including both single substance and generic programmes) appear to be more effective at influencing tobacco than other drug use.

Tobler & Stratton (1997): Tobler & Stratton reviewed 120 school-based programmes, of which 36% targeted tobacco, 23% targeted alcohol, and 41% were generic in focus. Overall, the programmes had larger effects on illicit drug use excluding cannabis than on tobacco, alcohol and cannabis use. Interactive programmes were more effective than non-interactive programmes for all drug use outcomes when the analysis concentrated on 56 high quality programmes. The interactive programmes overall had slightly higher effects on alcohol, followed by illicit drugs, tobacco and cannabis. Non-interactive programmes had slightly higher effects on tobacco than on other drugs, but overall were less effective than interactive programmes. In conclusion the review suggests that drug education programmes (including both single-substance and generic programmes) appear to be slightly more effective at influencing use of illicit drugs other than cannabis than at influencing tobacco, alcohol or cannabis.

To conclude, three out of four reviews which compared outcomes for different drugs suggest that drug education programmes are more effective at influencing tobacco use than use of other drugs, and two reviews (Lister-Sharp et al 1999 and Rundall and Bruvold 1988) suggest

that drug education programmes are more likely to have no effects or harmful effects on alcohol use than on use of other substances.

There is no consensus on why drug education seems less successful at influencing alcohol and more successful at influencing tobacco. It may be that the message tends to be less ambiguous, and also more credible, for tobacco than for other drugs. It is possible that more is known about smoking behaviour acquisition and change, through decades of research, with the result that prevention programmes are more effective at targeting the appropriate mediators.

Another possible explanation lies in how success is defined for each drug. For tobacco and illicit drugs, the desired outcome (on which programme effects are calculated) is usually a reduction in prevalence. However, it is not clear in many of the reviews whether the desired effect in the alcohol programmes reviewed was total abstinence or safer use (e.g. reduced frequency of drinking or a change in context). It may be that the apparent poorer performance of alcohol programmes reflects their adoption of unrealistic abstinence goals, or the failure of reviewers to measure harm reduction as well as prevalence outcomes (McBride et al 2004). A more sophisticated meta-analysis which separately analysed both harm reduction and prevention outcomes would be needed to address this question. Foxcroft et al's (2004) review of alcohol programmes specifically examined both use and misuse outcomes (e.g. quantity and frequency of drinking), but did not compare whether programmes were more effective at reducing use (prevention) or misuse (harm reduction). McBride's (2003) small-scale review of 5 more recent studies (conducted between 1997 and 2001) finds that programmes focusing on harm reduction outcomes for alcohol can yield substantial desired effects, suggesting that a paradigm change in how successful outcomes for alcohol programmes are designed and measure might change the picture. Project SHAHRP, a harm reduction school programme, has so far shown promising effects on alcohol behaviour (McBride et al 2000).

Foxcroft et al (2004) note that the majority of studies are conducted in the USA, where abstinence tends to be the desired outcome, as opposed to sensible drinking, which is a more acceptable goal in other countries. The diversity of outcomes measured in alcohol programmes combined with the relative paucity of studies from outwith the USA make it difficult to reach definitive conclusions.

2.4 Summary and conclusions

- Systematic reviews and meta-analyses provide the most robust evidence available regarding the effectiveness of school-based drug education. They synthesise the results of several (often large numbers of) studies to enable their aggregate impact to be assessed and their individual effects compared.
- Seventeen systematic reviews and meta-analyses, plus five other potentially systematic reviews, have been examined in this review. Four of the systematic reviews examined effects on smoking only and one on alcohol only; the remainder examined effects on two or more substances or substance use in general.
- Reviewers used a variety of methods for assessing effectiveness, ranging from complex meta-analyses to simple narrative descriptions of each programme's outcomes. Reviewers

seldom included exactly the same studies as other reviewers, and focused on different outcome effects. They also differed in the standards of evidence they required: it is notable that Cochrane reviews tended both to include fewer studies than other reviews (because their methodological quality criteria are particularly stringent) and to be more cautious in their conclusions. These differences in focus, sample and stringency mean that there is sometimes limited consensus on the key questions of drug education effectiveness.

- Despite these differences, it is possible to draw conclusions from the reviews. There IS evidence that school-based drug education is effective. All the reviews examined here, regardless of method or whether they examined tobacco, alcohol or generic drug education, found at least some drug education programmes which had a significant impact on behaviour. Effect sizes tended to be modest, translating into approximate reductions in substance use behaviour ranging between 3 and 29%, to take examples from two reviews. While these reductions may appear small, it is worth noting that similar sized effects in clinical trials might be judged compelling enough evidence of effectiveness to terminate a trial. It is for drugs education policymakers to decide whether they are compelling enough in a drug education context.
- Effects were not found for all programmes, but the fact that not all programmes are effective does not negate the principle: the evidence shows that it is possible to prevent youth smoking, even if it does not happen in every programme. None of the reviews concluded that school-based drug education was ineffective or not worthwhile.
- In nearly all reviews, programmes which had a negative or harmful effect – ie. which increased substance use – were in a very small minority, suggesting that on balance drug education is either positive or neutral in its impact. However, negative effects have been found in a small number of studies, typically increases in alcohol consumption. There is insufficient high quality evidence to identify the reasons for negative effects.
- There is evidence that drug education programmes can influence all types of substance use. However, the evidence suggests that they are slightly more effective at influencing use of tobacco than at influencing use of alcohol and illicit drugs. Drug education programmes are more likely to have *no* effects, or *harmful* effects, on alcohol use than on use of other substances. The reasons for this differential effectiveness are not clear and have not been fully explored, but may reflect the adoption of less realistic ‘abstinence’ goals in alcohol education programmes.
- Many of the reviews compared effects across different programme types to identify whether particular programme characteristics, such as approach or teaching method, were associated with increased effectiveness. These findings are examined in more detail in the next section, Section 3.

3 WHAT ARE THE FEATURES OF EFFECTIVE SCHOOL-BASED DRUG EDUCATION?

3.1 Introduction

The preceding section has examined evidence from high quality systematic reviews and meta-analyses, and has concluded that school-based drug education is effective. This second section examines why and how it is effective and how its effectiveness can be increased: what approaches, methods, content areas, delivery styles and so forth are associated with more successful programmes?

Several of the systematic reviews and meta-analyses examined in the previous section attempt to disentangle which elements of school-based prevention are associated with effectiveness. However, drawing conclusions from these comparisons is not easy. There is no universal agreed categorisation scheme for describing programmes or analysing their components and features. Some typologies focus on theoretical basis, some on content, some on delivery method; many combine all three dimensions. Turning to the original studies is not always helpful, as programme evaluators may adopt yet another set of labels to describe their programmes, or may believe their programme is of one type when others perceive it differently.

Even where reviewers use similar category labels they do not always agree on how a specific programme should be categorised. For example, of the 12 smoking prevention programmes which are reviewed both in Tobler et al 2000 and Thomas 2004, six are categorised similarly and six differently by the two reviews. Some reviewers use very broad programme categories (for example, Rundall & Bruvold's (1988) 'Innovative' vs. 'Rational' programmes), while others use such a complex programme categorisation scheme that it is difficult to reach manageable generalisations from the results (eg. Tobler et al 2000) .

These categorisation discrepancies make it difficult to compare the findings of different reviews. Botvin's Life Skills Training (LST) programme (Botvin et al 1990, 1995) provides a good example. The programme is agreed by many reviews to be effective, but, depending on whether the reviewer categorises LST as a social influences, life skills or other type of programme, the conclusions drawn from this finding regarding the most effective approach to drug education will differ.

This section therefore attempts to disentangle the comparisons of programme features made by each review in order to identify consistent findings across the reviews. In doing this it also draws on other literature, particularly the original intervention studies, to expand and explain the programme features examined in each review: for example, in order to make sense of comparisons of programme approach it is necessary to examine how concepts such as 'social influences' and 'normative education' are actually conceptualised and operationalised in programmes.

3.2 What programme approaches are most effective?

The most fundamental question in identifying best practice in drug education concerns its overall approach. A key ingredient of approach is the theory on which a drug education

programme is based: what model of behaviour acquisition or behaviour change underpins the programme? What assumptions about the psychosocial mechanisms involved in drug use does the programme make? What predictors of drug use or protective factors against drug use are targeted by the programme?

Comparing the effectiveness of different drug education programme theories is extremely difficult. Firstly, several studies of drug education programmes do not explicitly state the theoretical basis of their programme, leaving it to be inferred by later reviewers (who do not always themselves agree). There is often little or no account of what mediators a programme is hoping to target and change, and many programmes appear to be based on a mix of theories. Secondly, even where reviewers claim to compare the effectiveness of different theories, their comparisons are often inconsistent. Rather than compare Theory A with Theory B, reviews often compare categories which are a hybrid mixture of theory, content, focus, teaching style, process or goals. For example, some refer to some sort of conceptual model which explains how drug behaviour is mediated (eg. Social Norms) while others refer to process or teaching and learning style (eg. Interactive, Peer). Some focus on content (eg. Information); others refer to the setting or context of the programme (eg. Environmental, System-wide). Several resort to ‘Other’ category labels to signify programmes which they cannot fit into a particular typology.

Given the diversity in categorisation, it would be extremely challenging to separate out each review’s findings for theory, content, process and the other elements which make up ‘approach’. Table 3.1, therefore, summarises each review’s findings regarding the effectiveness of different approaches using the categorisation scheme used by the review itself (however unwieldy or inconsistent).

Table 3.1: Conclusions from Systematic Reviews and Meta-analyses Regarding Effective Programme Approaches

Authors	Approaches compared	Conclusions
Bangert-Drowns 1988	Information only Affective only Mixed	None reported.
Bruvold 1993	Rational (Information) Developmental (Affective) Social Norms Social Reinforcement	SOCIAL REINFORCEMENT programmes are generally the most effective. SOCIAL NORMS and DEVELOPMENTAL programmes were also effective, but less reliably; RATIONAL programmes were generally ineffective.
Ennett et al 1994	Project DARE Tobler’s 1992 set of programmes	Project DARE has weaker effects than Tobler’s set of ‘interactive’ programmes, but stronger effects than Tobler’s set of ‘non-interactive’ programmes.
Foxcroft et al 2004	No statistical comparison of programme types, but the theoretical base of each reviewed programme is listed if known.	No generalisations are made about effective theoretical base. Programmes which involve families, are culturally-focused and are community-wide are highlighted as valuable.
Gottfredson 1997	Environmental change: Building school capacity. Setting school behavioural norms and rules. Class management. Regrouping pupils/classes. Individual change: Instruction (includes factual information, social influences,	Effective programmes (those found to be effective in at least 2 studies) include INDIVIDUAL programmes which involve Behavioural Modification and thinking strategies. Promising programmes (found to be effective in one study) are ENVIRONMENTAL programmes which build school capacity, teach in smaller units, and improve class management.

	DARE, and programmes to “improve moral character etc”). Behaviour modification and thinking strategies. Peer programmes. Counselling & mentoring (excluding peer counselling). Recreational alternatives.	
Hansen 1992	Information/values clarification Affective Social influences Comprehensive	COMPREHENSIVE programmes are more frequently effective, followed by SOCIAL INFLUENCES programmes, with AFFECTIVE and INFORMATION/VALUES CLARIFICATION programmes being often neutral in effect, although programmes from all four groups have been found to be effective.
Lister-Sharp et al 1999	No statistical comparison of categories, but programme content features are discussed in narrative synthesis.	Programmes including resistance skills, stress management and/or norm setting are generally more effective on alcohol behaviour than programmes not using these approaches. The majority of programmes effective with drug and smoking behaviour involve resistance skills and/or normative education.
Rooney & Murray 1996	Social influences Generic social skills Resistance skills	All three types of intervention are equally effective, apart from when programmes are not solely smoking-focused, in which case SOCIAL INFLUENCES programmes were more effective.
Rundall & Bruvold 1988	Rational Innovative	INNOVATIVE programmes are generally more effective although not for all outcomes.
Thomas 2004	Information-only Social Competence Social Influence Combined Social Influence & Social Competence Multi-modal (Multi-component)	SOCIAL INFLUENCES programmes appear to be more effective than other programme types, but evidence is mixed. INFORMATION programmes are generally ineffective.
Tobler 1986	Knowledge only Affective only Peer Programmes Knowledge + Affective Alternatives	PEER Programmes (comprising refusal skills and social/life skills approaches) are most effective, followed by AFFECTIVE, KNOWLEDGE + AFFECTIVE, KNOWLEDGE ONLY and AFFECTIVE ONLY.
Tobler & Stratton 1997	Non-interactive Knowledge Only. Non-interactive Affective Only. Non-interactive Knowledge-plus-Affective. <i>Included 2 sub-categories: Values clarification and DARE-type.</i> Interactive Social Influences. Interactive Comprehensive Life Skills. Interactive Others.	INTERACTIVE programmes as a whole have stronger effects than NON-INTERACTIVE programmes. Interactive OTHERS programmes are slightly more effective than COMPREHENSIVE LIFE SKILLS programmes, which are slightly more effective than SOCIAL INFLUENCES programmes.
Tobler et al 1999	Interactive Social Influences Interactive Comprehensive Life Skills Interactive Others Non-interactive Affective only Non-interactive Knowledge + Affective	INTERACTIVE programmes of all types are more effective than NON-INTERACTIVE programmes.
Tobler et al 2000	Non-interactive: Knowledge Only Affective Only Decisions/Values/Attitudes Knowledge-plus-Affective	INTERACTIVE programmes have stronger effects than NON-INTERACTIVE programmes. Of the interactive programmes, SYSTEM-WIDE CHANGE are the more effective, followed by COMPREHENSIVE LIFE SKILLS and

	DARE-type Interactive: Social influences Comprehensive Life Skills System-wide change	SOCIAL INFLUENCES. Smaller Interactive programmes are generally more effective than larger Interactive programmes. Among the NON-INTERACTIVE programmes, KNOWLEDGE programmes were slightly more effective, and AFFECTIVE-ONLY and DECISIONS/VALUES/ATTITUDES programmes largely ineffective.
White & Pitts 1998	No statistical comparisons were made, but features of programmes found to be effective are discussed.	Effective programmes include knowledge, resistance skills, normative education, peer support and life skills.
Wilson et al 2001	Environmentally-focused (eg. classroom management, school rules) Individually-focused (eg. social competence, cognitive behavioural, mentoring, recreational)	Some types of ENVIRONMENTALLY-FOCUSED programmes are effective; some types of INDIVIDUALLY-FOCUSED programmes are ineffective.

Several broad conclusions can be drawn from the table:

- a) *Interactive drug education programmes are nearly always more effective than Non-interactive programmes (strong evidence)*
- b) *Drug education programmes adopting information and affective approaches are generally ineffective or less effective than other approaches (reasonably strong evidence, but there is wide variability in how the approaches are defined by different reviewers)*
- c) *Drug education programmes adopting life skills, social influences, resistance skills or normative approaches are more effective than programmes not adopting these approaches (very strong evidence, but reviews differ in how they define the approaches)*
- d) *Drug education programmes which are multi-component in nature and/or which target young people's environment (eg. school, community) are possibly more effective than those which are single-component in nature and which primarily target the individual (moderate evidence).*

Each of these conclusions is now discussed in turn.

3.2.1 Interactive drug education programmes are nearly always more effective than Non-interactive programmes

The comparison of programmes in terms of interactivity was introduced by Tobler & Stratton (1997) and developed in the two later Tobler reviews (Tobler et al 1999, Tobler et al 2000). Tobler originated the concept in recognition that *how* a programme is delivered tends to be ignored in reviews which focus largely on *what* is delivered. Interactive programmes were defined as those with a higher degree of active participation by all students, through discussion, brainstorming or skills practice. The most Interactive programmes were those which “included everyone and were both *participatory* and *between peers*” [emphasis in original] (Tobler & Stratton 1997 p. 109). Non-interactive programmes were those comprising didactic presentations by teachers and teacher-led discussion. Experiential

activities could be included, but the interaction tended to be teacher-to-pupil rather than between peers.

Three reviews by Tobler and colleagues (1997, 1999, 2000) found that Interactive programmes had stronger effects overall, and were effective on knowledge, attitudes and behaviour, while Non-interactive programmes tended to have weaker effects, often restricted to knowledge change.

Rundall and Bruvold (1988) did not specifically examine interactivity, but did examine two programme types, 'Rational' (information delivered in a didactic format) and 'Innovative' (based on social reinforcement, social norms or developmental theories). Innovative programmes "more reliably" produced desired effects than Rational programmes.

Interactivity is assumed to be a key feature of effective drug education for several reasons. Firstly, it is assumed that people learn better when they are actively involved in their learning. Secondly, in Tobler's view, interactivity is integrally linked to certain theoretical approaches to drug education, specifically those which are concerned with understanding, resisting and challenging peer influences (see 3.2.3 below). Interaction with peers is essential for building 'interpersonal competence' – the ability to negotiate drug offer situations skilfully and without losing face in the peer group. Through peer interaction, students also learn about the actual levels of drug use, and views of drug use, in their peer group – an integral element of normative education. Support is lent to this conclusion by a meta-analysis of evaluations of the DARE programme (Ennett et al 1994). DARE shares some elements of the resistance skills approach but also other elements which have resulted in it tending not to be classified as a social influences programme (Coggans et al 2003, Tobler & Stratton 1997, Tobler et al 2000). It has been consistently found to be less effective than other programmes with a similar theoretical basis, largely, it has been hypothesised, because of its typically didactic delivery by uniformed police officers (Ennett et al 1994).

Given the close interdependence of delivery process and programme theory, it would seem sensible to conclude that interactive delivery is important, providing it is of the 'right' programme. The inseparability of delivery process and approach was demonstrated in Tobler et al's 1999 review, which examined 'placebo' interactive programmes – drug education programmes delivered using recommended interactive methods but without essential theoretical content - and found that they were as ineffective as Non-interactive programmes.

3.2.2 Information and affective approaches are generally ineffective or less effective than other approaches

Eight reviews support the view that **information/knowledge** approaches are ineffective or less effective than other approaches, in terms of drug use behaviour. Bruvold (1993) found that 'rational' (information-giving programmes) had very little if any impact on behaviour. Rundall & Bruvold (1988) found that 'rational' (information given in a didactic format) programmes were less effective than 'innovative' programmes based on social reinforcement, social norms or developmental theories. Hansen found that 'information/values clarification' programmes were largely neutral in effect, and less effective than 'comprehensive' and 'social influences' programmes. Thomas found that information programmes are generally ineffective. The four Tobler reviews found that 'Non-interactive knowledge-only' programmes were generally less effective than all types of 'Interactive' programmes, and

generally less effective than other types of Non-interactive programmes, although effectiveness increased when knowledge was combined with another programme approach (eg. Knowledge-plus-Affective programmes).

In contrast, two reviews, White & Pitts (1998) and Lister-Sharp et al (1999), conclude that ‘information’ or ‘knowledge’ is one of the features of effective programmes.

The underlying assumption of information/knowledge approaches is that people misuse drugs because they lack information about their effects. A knowledge → behaviour paradigm is assumed or implied: better knowledge leads to behaviour change. The apparent failure of information/knowledge approaches has led to a questioning of this paradigm (eg. Rundall & Bruvold 1988).

However, it is important to note that reviewers claiming to investigate information/knowledge approaches mean widely differing things by ‘information’ and ‘knowledge’. For example, Tobler & Stratton (1997) and Tobler et al (2000) adopt a much wider definition which includes “knowledge of media and social influences”, and “knowledge of actual drug use by peers (normative education)” - these latter two elements are defined by other reviewers as part of a “social influences” approach (see below). Hansen combines information and values clarification into one programme category, making it difficult to separate out the relative importance of information. Tobler 1986 defines knowledge programmes as ones comprising “legal, biological and psychological effects of drug abuse; presentation by teacher to students; limited group discussion; scare tactics.” This unwieldy definition conflates content with teaching and learning style and message.

These inconsistent and blurred definitions have possibly limited the usefulness of review findings on the effectiveness of knowledge/information approaches. This is particularly likely with Tobler’s first review, in which information provision, didactic teaching and fear arousal are combined in a single category. It is therefore difficult to identify precisely what features render these approaches ineffective or less effective, as reviews claim – particularly when there is strong evidence that some types of information provision form a key part of approaches which have been found to be effective, such as social influences and normative education (see 3.2.3 below). The key consideration is perhaps that factual information provision *alone*, without a sound theoretical basis and more behaviourally-focused elements, particularly the opportunity to practise skills for dealing with drug situations, is insufficient to change behaviour. This is supported by Tobler’s (1986) finding that programmes combining ‘knowledge and affective’ approaches are more effective than ‘knowledge-only’ approaches, and by the conclusions of Lister-Sharp et al (1999) and White & Pitts (1998), which identify information provision as *one of* the features of effective programmes.

In the past decade, knowledge/information approaches have been defined as including harm reduction: “providing clear information on safe and unsafe drug use as well as raising awareness about risks to their future choice of career posed by existing legislation on drugs” (eg. HEBS 1995 p.6). However, reviews have tended to judge the effectiveness of knowledge/information approaches in terms of prevention rather than harm reduction effects: the effectiveness of information/knowledge approaches in a harm reduction context is largely untested. It might be that this refocusing would result in a reappraisal of the usefulness and effectiveness of information/knowledge approaches, and indeed of other approaches generally.

Six reviews examined **Affective** programmes. Two found that they are generally ineffective (Hansen 1992, Tobler et al 2000), and four that they can be effective but are less effective than other approaches (Bruvold 1993, Tobler 1986, Tobler & Stratton 1997, Tobler et al 1999).

Affective is an umbrella term incorporating programme approaches which focus on building self-esteem, developing decision-making skills, clarifying values, and sometimes other elements such as self-awareness and goal setting. Self-esteem programmes are predicated partly on the assumption that self-esteem is a key mediating variable in substance use: higher self-esteem will be a protective factor against use. Tobler et al (1999) defines such approaches as being focused on 'intrapersonal' rather than 'interpersonal' skills, as their aim is to build individual self-esteem rather than ability to understand and deal with peer influences; consequently they are also largely 'non-interactive' in delivery style, because students largely learn through individual worksheets and self-reflection rather than through interaction with their peers.

Values clarification programmes focus on the relationship between the individual's values and the consequences of their behaviour, and on demonstrating "that personal values are incompatible with substance use" (Hansen 1992 p.409). They are assumed to work by inculcating the idea that individual values can influence life choices, and by developing beliefs that drug use is inconsistent with an individual's objectives in life. Decision-making programmes focus on teaching a process for rational decision-making, on the assumption that enhanced skills in this area will help individuals in a variety of problematic life situations, including substance use; however, the link with substance use is sometimes not made explicit (Hansen 1992). In many affective programmes, there is little or no direct coverage of drugs per se.

As with information/knowledge, reviewers mean different things by 'affective', again making it difficult to identify precisely why this approach is or appears to be less effective than others. For Bruvold (1993), Developmental (Affective) approaches are those which seek to increase self-esteem and self-reliance, decrease alienation, and foster decision-making and/or interpersonal skills; they usually have "minimal or no focus on drugs per se". All four Tobler reviews share most elements of this definition but also add "feelings, attitudes, values clarification". The theoretical assumption of affective approaches in Tobler's view is that they address the psychological factors which put people at risk of drug use, particularly low self-esteem, poor self-awareness and weak decision-making skills. In 1997, Tobler & Stratton distinguished two categories of knowledge-plus-affective programmes: Values programmes, which emphasise insight and self-awareness, and DARE-type, which included normative expectations but not insight and self-awareness. In 2000, Tobler differentiates Affective from Decisions/Values/Attitudes approaches, defining Affective-only programmes as concerned with self-esteem, feelings, self-awareness, attitudes, beliefs and values, and Decisions/Values/Attitudes programmes as combining knowledge, affective, attitudes, values and decisions elements; the distinction is not terribly clear, particularly as decision-making skills are also defined as a key element of a third approach called by Tobler Generic Skills. Affective elements also appear in Tobler et al's (2000) Knowledge-plus-Affective, Social Influences, DARE-type, and Comprehensive Life Skills categories. Indeed, the classification schemes in the later Tobler reviews are so complex and overlapping as to be of limited help.

For Hansen, Affective approaches involve decision making; stress management, self esteem, and values clarification, although they are somewhat confusingly defined as distinct from

“information/values clarification approaches”. A key aspect of affective approaches for Hansen is that they involve no resistance skills training.

Given the fuzziness and inconsistency of ‘affective’ categories across reviews, it is difficult to identify precisely why these types of programme are (assumed to be) ineffective compared with other approaches. As with information/knowledge approaches, part of the answer may lie in an incorrect paradigm about the routes to drug use. It has been argued that these programmes suffer from ‘theory failure’ in that the assumed link between targeted mediators and drug use is weak or non-existent. Hansen (1996) suggests that approaches which build self-esteem and generic social skills may have other worthwhile effects but are targeting the wrong mediating variables for substance use, hence their apparent ineffectiveness when judged on this criterion (Hansen 1996). Other investigators have also pointed up the weak association between self-esteem and drug use (Shedler & Block 1990, Schroeder et al 1993). However, White & Pitts (1998) found that the most effective programmes in their review included elements addressing self-esteem and “improved attitudes to abstinence”, *as well as* knowledge, beliefs about prevalence, resistance skills, peer support and modelling, and alternative strategies for peer approval.

A review of all existing evaluations of Botvin and colleagues’ Life Skills Training programme, conducted for the Scottish Executive, found little evidence that the programme achieved its effects by influencing ‘intra-personal’ factors such as self-esteem and social competence (Coggans et al 2003). Evidence on the role of these mediating variables in substance use was “unclear” and “conflicting”, and Coggans and colleagues suggests that there is little empirical support for the theory that social competence and self-esteem protect against drug use. It is important to note that Life Skills Training (LST) is not usually categorised as an Affective programme because of its inclusion of other, social influences elements (see 3.2.3 below). What is important about Coggans et al’s review is that it demonstrates that the affective elements of LST - probably the best evaluated drug education programme to date - have been largely proven to be ineffective, lending support to the view that the theory basis of Affective programmes is flawed.

Another defining feature of Affective approaches is that the focus on substance use (if substance use is addressed at all) is limited. Skills to deal specifically with drug-use situations (such as resistance skills) tend not to be addressed. An assumption is made that generic decision-making and coping skills will be transferred to drug use situations. It is not clear whether it is the absence of drug-specific content and skills, or the presence of elements which are theoretically flawed (eg. elements boosting self-esteem) which accounts for the poorer performance of affective programmes. The most likely answer is probably that both contribute.

3.2.3 Life skills, social influences, resistance skills or normative approaches are more effective than other approaches

There is strong evidence from eight reviews that programmes based on one or more of these approaches are effective.

Bruvold (1993) found that Social Reinforcement programmes designed to develop skills to recognise and resist pressures to use drugs were generally the most effective of four programme types; Social Norms and Developmental programmes could also be effective, but less reliably, while Rational (information) approaches were generally ineffective. Rather

confusingly, Bruvold's 'social norms' category does not refer to normative education (see below) but is rather a variant on the affective and life skills approaches with a focus on increasing self-esteem. Hansen (1992) found that when four programme categories were compared (information/values clarification, affective, social influences and comprehensive), the latter two categories were generally the most effective, with comprehensive programmes being the most effective when statistical power was taken into account. 'Comprehensive' programmes were defined as including social influences elements such as resistance skills and norm setting but also information and decision-making skills. Examples of comprehensive programmes given by Hansen included LST, DARE, SMART and STAR which are sometimes included in other reviews as examples of life skills, resistance skills or social influences programmes.

Rooney & Murray (1996) compared three types of related programme: social influences, generic social skills, and resistance skills. All three types were found to be equally effective, but the social influences programmes were more effective when the programme was focused on more than simply tobacco. Thomas found that social influences programmes were generally more effective than other types of programmes, but that the evidence was mixed.

Tobler (1986) found that a category of programmes called 'peer programmes' (a label used to describe refusal skills and social/ life skills approaches) were the most effective of the five approaches examined. Later, using different classification schemes, Tobler & Stratton (1997) and Tobler et al (2000) found that interactive social influences programmes were more effective than all types of non-interactive programmes, but that 'interactive comprehensive life skills' programmes (which included social influences elements) and 'interactive other' or 'interactive system-wide' programmes (see section 3.2.4 below) were more effective than social influences programmes. Werch & Owen (2002), in an examination of programme features associated with *ineffectiveness*, found that social influences programmes were not always guaranteed to be effective.

Why do these sorts of programmes appear to be more consistently effective than other approaches? Life skills, social influences, resistance skills and normative approaches share an emphasis on behaviour change and a similar theory base, drawing both on 'problem behaviour theory' (eg. Jessor & Jessor 1977) and on social learning and social cognitive theory (Bandura 1977, 1986). Broadly, taken together these theories posit that behaviours such as drug misuse arise from deficits in life skills such as decision-making, problem solving, emotional and personality problems, or insufficient protection against social pressures to use drugs (Coggans et al 2003). While sharing this common theoretical base the approaches differ in the emphasis given to different processes and mediating variables, with life skills approaches tending to give greater emphasis to the problem behaviour dimension and social influences approaches to the social cognitive dimension.

Life skills approaches (sometimes called 'social competence') focus primarily on generic skills but also includes elements of the social influences approach. There is some overlap with 'affective' approaches in the emphasis on generic skills such as decision-making and problem-solving. As with the affective approach, there is an assumption that enhanced social and personal skills are mediators of drug use. The comprehensive Life Skills approach as developed particularly by Botvin and colleagues (1990, 1995, 1997, 2000, 2001) combines the teaching of generic social and personal skills with the narrower problem-specific focus on drug use and drug offer situations associated with the social influences approach (Botvin 1996). Botvin suggests that broad-based 'competence enhancement' approaches to drugs

prevention may not have an effect on drug use unless some specific drugs resistance skills training is provided.

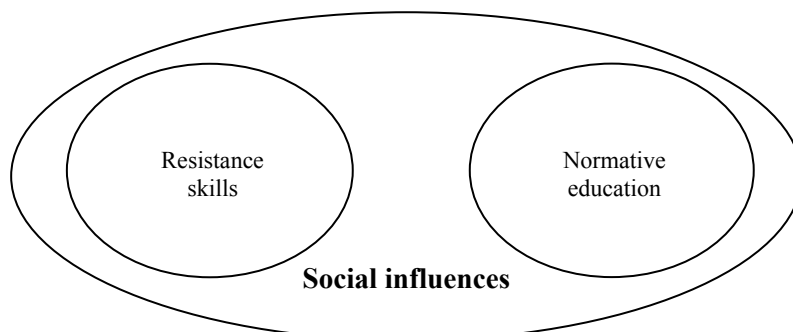
This is confirmed by a review of all existing evaluations of Botvin and colleagues' Life Skills Training (LST) programme, conducted for the Scottish Executive (Coggans et al 2003). Six key mediating factors are hypothesised in LST to prevent drug use: assertiveness, self-image, social efficacy (social skills), social anxiety, influenceability and locus of control. These six mediators are targeted through three main programme elements: resistance skills, general social skills (addressing self-esteem and assertiveness), and self-management skills (including the relationship between perceptions and behaviour, and the skills to deal with peer and media influences). Coggans' analysis found that, while there was evidence that LST was effective, it did not necessarily work in the way hypothesised. Few of the targeted mediating variables turned out to be related to programme effects: life skills, self-esteem, local of control and social efficacy consistently showed little or no change. There was more mixed evidence for assertiveness, social anxiety and influenceability. Where LST did consistently show effects was on knowledge, attitudes and normative expectations of substance use. The interactive nature of LST was also found to be related to programme effectiveness, as was high implementation quality. In other words, while the life skills approach can be effective, it appears not to be effective for the reasons assumed but rather for its normative elements, ability to change knowledge and attitudes, and its delivery style and quality.

The **social influences** approach draw more directly on social cognitive theory (Bandura 1986) which assumes that drug use behaviour is 'reciprocally determined' by an interplay between personal factors (such as knowledge, skills, self-efficacy, outcome expectations and personal goals) and environmental factors (such as peer, media, social, and institutional influence) (Maibach & Parrott 1995). The social influence model as subsequently refined by (Hansen 1990) and others posits that social influence can be both direct and active, and indirect and passive. Adolescents are influenced not simply by direct pressure from peers (in the form of offers, ridicule or threats) but also indirectly by general group norms and wider social norms which 'position' drug use and assign value to it. Graham et al (1991) consider social influence to comprise both 'active' social pressure (offers and teasing by peers, for example) and two types of 'passive' social pressure, one concerned with modelling of behaviour and one with misperception of peer use. Perceiving that more people take drugs than is the case is a proven predictor of drug use (Conrad et al 1992). Sussman (1989) conceptualises two types of social influence on adolescent substance use, which he suggests operate empirically separately:

- Normative social influence, the pressure applied by the peer group or experienced by the recipient to make a young person act in ways to achieve group acceptance, eg. offers of cigarettes or drugs.
- Informational social influence, the more covert pressure applied to make young people adopt social values favourable to substance use. These values may be acquired from peers, from advertising, parents, films etc. These sources of information may suggest that use of substances is widespread, or will convey on the user a desired social image.

This leads to two further categories of approach, **resistance skills** and **normative education**, or normative approaches (see Figure 1 overleaf).

Figure 1: Two dimensions of the social influences approach.



Resistance skills programmes focus on the behaviour and skills needed to cope with direct peer pressure, particularly the skills to refuse drug offers. Interactivity is central to the approach, because young people must identify and practise, through discussion, drama and role play, different skills and strategies.

Normative education has been variously defined (see Stead and Angus 2002). One particularly comprehensive definition is that it corrects “*erroneous perceptions of the prevalence and acceptability of drug and alcohol use and establish[es] conservative group norms...Norm setting programs also utilise natural peer opinion leaders to establish or define standards of group behaviour...[they] are postulated to operate through lowering expectations about prevalence and acceptability of use and the reduced availability of substances in peer-oriented social settings*” (Hansen 1992 p411). Norm setting encompasses both factual elements - correcting erroneous perceptions of prevalence - and standard-setting or expectation-building - establishing conservative group norms. Peers are commonly used to ‘model’ appropriate behaviour and to provide appealing, credible non-using role models. Typical normative education methods include providing information about the prevalence of substance use from national or local surveys, or having young people conduct their own surveys among peers (Botvin 2000).

The theoretical validity of the social influences approach, including its ‘sub-approaches’ resistance skills and normative education, has been empirically demonstrated by studies showing that resistance skills and, particularly, perceptions of friends’ level of drug use and tolerance of drug use are mediators of programme effects (eg. MacKinnon et al 1991, Donaldson et al 1994)

A few studies and reviews have attempted to establish whether different dimensions of the social influence approach are differentially effective. Botvin (2000) notes that in one of the earliest investigations into the social influences approach for smoking prevention [Evans et al 1978], ‘psychological inoculation’ did not lead to any greater impact on smoking onset than that produced by ‘normative education’ (ie. feedback on the actual level of smoking by same-age peers). Donaldson et al (1994) compared two social influence strategies within the Adolescent Alcohol Prevention Trial (AAPT) (Graham et al 1991, Hansen & Graham 1991). Different cohorts of students in the trial received either a Resistance Skills Training programme or a Normative Education programme. The intention was to identify which of

these was the ‘active ingredient’ in a social influences programme. Both versions of the programme impacted on their intended mediators: the Resistance Skills Training programme improved resistance skills, and the Normative Education programme influenced prevalence estimates and beliefs about the acceptability of drugs. However, only the normative beliefs turned out to be predictors of subsequent drug use; resistance skills alone were not a predictor of use. Donaldson and colleagues suggests that, without the active ingredient of normative education, resistance skills programmes may not impact on drug use itself.

McBride’s review also suggests that normative education is a more important element of the social influences approach than resistance skills, but proposes that resistance skills might be effective within a harm reduction rather than prevention context (for example, skills to resist pressure to drink more heavily, or to mix substances). Analysis of the mediating variables in the Midwestern Prevention Project (Project STAR) found that perception of friends’ tolerance of drug use was the most substantial mediator of programme effects on drug use, compared with beliefs about the consequences of using drugs, intentions to use drugs and communication skills (MacKinnon et al 1991). And, as noted above, normative education was one of the key variables found to consistently explain LST’s effectiveness (Coggans et al 2003).

Some commentators have argued that resistance approaches endorse naive and prescriptive ‘say no’ strategies which are ideologically inconsistent with an emphasis on decision-making and informed choice and place too much emphasis on the role of direct peer pressure in causing experimentation with drugs (eg. Coggans & Watson 1995). It has been argued that resistance approaches are unpopular outside the USA because of a cultural dislike of overt behavioural techniques (Dorn & Murji 1992 p23) and because they are perceived as adopting narrow abstinence goals (Midford et al 2002). It is also worth noting that the vast majority of the studies have been conducted in north America, which potentially limits the transferability of their conclusions to a UK context, although this is true of most areas of health promotion research. Nevertheless, the evidence points to the theoretical validity and superior effectiveness of the social influences approach overall. Lister-Sharp et al conclude that, although resistance and social skills training approaches could not be guaranteed to be effective, successful programmes for alcohol, cannabis and tobacco were likely to involve resistance skills training and normative education: “In almost all the programmes where it was reported, those which showed an effect on behaviour were those based on social psychological theory such as social learning theory” (p.52). The only approaches which potentially perform better tend to be those which add other components (see next section below) to a social influences curriculum. Furthermore, the mechanisms by which social influences programmes are assumed to work have been investigated, and the strength of hypothesised mediators has been tested. This analysis has shown that normative education in particular is a reliable mediator of drug education programme effects. This evidence forms the basis of the normative-based Blueprint programme, currently being trialled in 29 English schools (Home Office 2004). This will provide a thorough test of the transferability of the normative/social influences approach to the UK.

3.2.4 Multi-component and environmentally-focussed programmes are more effective than single-component and individually-focussed programmes

Some reviews have compared the effectiveness of multi-component with single component drug education programmes. Single component programmes typically comprise solely a

school curriculum, while multi-component programmes comprise a school-curriculum plus other components, such as a media campaign or parent programme, and sometimes policy level activity (eg. Flynn et al 1992, 1994; Pentz et al 1989, Biglan 2000). Some reviews have compared environmentally- with individually-focused programmes. Environmentally-focused programmes attempt to change the environment in which young people interact and make decisions about drugs (for example, the classroom or the community), while individually-focused programmes seek primarily to change the individual. It is not easy to separate the two sets of findings (for example, some reviewers combine multi-component and environmental into a single category), therefore they are considered together in this section. There is some overlap between multi-component and environmentally-focused programmes - for example a multi-component drug education approach might include a component seeking to improve school policy on drug incidents – but they are not synonymous, and the thinking behind the approaches differs.

Multi-component prevention programmes are considered more effective than single component programmes because the different components reinforce or amplify one another and combine to produce a greater and longer lasting effect (Pentz et al 1997, Fortmann et al 1995). The use of multiple approaches and delivery channels may reach a greater proportion of the population at risk of a given health behaviour than if the intervention is delivered through a single channel (Manger et al 1992), and at potentially lower costs per person reached (King 1998). Intervention messages are consistently communicated from multiple sources (Pentz et al 1997), thereby potentially increasing credibility and persuasiveness. The theoretical rationale for multi-component programmes is that health behaviour has multiple determinants (eg. Peterson et al 1992), and more specifically is shaped by three sets of factors: individual factors, immediate peer and social group influences, and societal or environmental factors (eg. Pentz 1996, Pelletier et al 1997, King 1998).

The theoretical justification for environmentally-focused programmes targeting the school environment is that “students interact in the context of classrooms, each of which has its own normative climate encouraging or discouraging certain behaviours. And classrooms exist in school environments which establish larger contexts for all activities in the school” (Gottfredson 1997 p.163). Typical environmental approaches include setting and enforcing school behavioural norms and rules, improved classroom management and regrouping pupils/classes to create a more focused and constructive learning environment. The approach appears to be more widely used in tackling general school problem behaviours such as disaffection, truanting and rule-breaking rather than substance use per se, but its impact on substance use has been measured in two reviews (Gottfredson 1997, Wilson et al 2001).

Conclusions from the reviews which examined multi-componency or environmental approaches are summarised in Table 3.2 below.

Table 3.2: Conclusions from systematic reviews and meta-analyses regarding multi-componency and environmental approaches

Authors	Approaches compared	Conclusions
Bruvold 1993	Various programme variables including number of additional components	Stronger effects were “sometimes” found in programmes with one or no additional components, and “sometimes” in programmes with two or more additional components.
Gottfredson 1997	Environmental change: Building school capacity. Setting school behavioural norms and rules.	Effective programmes (those found to be effective in at least 2 studies) include INDIVIDUAL programmes which involve Behavioural Modification and thinking strategies.

	<p>Class management. Regrouping pupils/classes.</p> <p>Individual change: Instruction (includes factual information, social influences, DARE, and programmes to “improve moral character etc”). Behaviour modification and thinking strategies. Peer programmes. Counselling & mentoring (excluding peer counselling). Recreational alternatives.</p>	<p>Promising programmes (found to be effective in one study) are ENVIRONMENTAL programmes which build school capacity, teach in smaller units, and improve class management.</p>
Lister-Sharp et al 1999	<p>No statistical comparison of categories, but programme content features are discussed in narrative synthesis.</p> <p>HEALTH PROMOTING SCHOOL approaches, as well as health promotion interventions <i>in</i> schools, were reviewed.</p>	<p>School programmes with a parent component were possibly more effective than school programmes without, but numbers too small to compare.</p> <p>Evidence from one intervention that a health promoting schools approach was effective in reducing tobacco use, but numbers were too small and programmes too variable to draw firm conclusions.</p>
Sowden et al 2004	<p>Review compared: community interventions including a school-based component with the school-based component alone; community intervention with a school component with the community component alone; and a media plus school intervention with the school intervention alone.</p>	<p>Modest evidence overall for the effectiveness of community interventions in reducing smoking.</p> <p>Community and multi-component programmes sometimes performed better than single component programmes, and sometimes there was no difference.</p>
Thomas 2004	<p>Compared “multi-modal” and “single-component” interventions.</p>	<p>Mixed. One school-plus-media intervention performed better than a school-only intervention; in another study, there was no differences between the two types of intervention.</p>
Tobler 2000	<p>One category of programme, SYSTEM-WIDE CHANGE, was defined as including “knowledge, refusal skills and parent, community or media components”.</p>	<p>System-wide change programmes had consistently higher effect sizes than Knowledge, Affective, Decisions/Values/Attitudes, Knowledge-plus-Affective and DARE-type approaches. Were slightly more effective than Social Influences and Comprehensive Life Skills approaches.</p>
Tobler & Stratton 1997	<p>One category of programme, OTHER, was defined as including peer counselling, parent involvement, community involvement, homework, rewards and reinforcement.</p>	<p>‘Other’ programmes appeared to have higher effect sizes than all other approaches apart from Comprehensive Life Skills (which were equally effective). But confusing definition of programme type.</p>
White & Pitts 1998	<p>No statistical comparisons were made, but features of programmes found to be effective are discussed.</p>	<p>The impact of some school-based programmes may have been enhanced by being part of community intervention.</p>
Wilson et al 2001	<p>Environmentally-focused (eg. classroom management, school rules) Individually-focused (eg. social competence, cognitive behavioural, mentoring, recreational)</p>	<p>Some types of ENVIRONMENTALLY-FOCUSED programmes are effective; some types of INDIVIDUALLY-FOCUSED programmes are ineffective.</p>

Three reviews found mixed evidence: multi-component programmes were sometimes more effective than single component programmes, and sometimes were not (Bruvold 1993, Thomas 2004, Sowden et al 2004). Sowden also found that community interventions - defined as “coordinated, widespread programmes in a particular geographical area... which support non-smoking behaviour” (p.2-3 of 33) - were, in generally, moderately effective.

Two Tobler reviews (1997, 2000) examined programmes with parent, community and other additional components. In Tobler & Stratton (1997), ‘other’ programmes were defined as including peer counselling, parent involvement, community involvement, homework, “rewards, token economy and reinforcement”. This mixed category of programmes overall had higher effect sizes than programmes in knowledge, affective, knowledge-and-affective and social influences categories, and similar sized effects to comprehensive life skills programmes. However, Tobler & Stratton do not seem to include in their “Other” category large multi-component programmes such as Project STAR (Pentz et al 1989) or the Minnesota Heart Health Program (Perry et al 1989), so “Other” does not seem to equate with multi-componency in the sense that it is usually defined. Tobler & Stratton (1997) note that Project STAR and the Minnesota Heart Health Program “achieved a weighted effect size nearly double those of similar types of school-based programmes that were implemented on a large scale without community involvement” (p.118).

In 2000, Tobler introduces another category of ‘system-wide change programs’, which covers both “school-based programme plus community/media/family, or change in the entire school system” (p.287). System-wide programmes of the first sort included a curriculum based on social learning theory and addressing peer influences, and added to this a range of community and family components. System-wide programmes of the latter sort involved small group teaching styles and building relationships between school and pupils and school and parents. ‘System-wide’ programmes consistently had higher effect sizes than programmes in knowledge, affective, decisions/values/attitudes, knowledge-plus-affective, and DARE-type categories, and were also slightly more effective than social influences and comprehensive life skills programmes without additional system-wide components.

White and Pitts (1998) suggest that the impact of some school-based programmes may have been enhanced by their being delivered as part of a community intervention, but do not examine this statistically. Another review, not listed in the table, suggests in its conclusions that school programme effects may be improved “if they are part of a multi-component health programme”, although multi- versus single-componency does not seem to have been one of the intervention variables examined in the review’s analysis (Rooney & Murray 1996). It is possible that the authors mean the inclusion of booster sessions or the use of programmes with a wider focus than tobacco only (e.g. general health programmes), both of which characteristics are associated with improved effectiveness.

Two reviews compare environmentally-focused with individually-focused interventions. Wilson and colleagues (2001) reviewed school-based interventions targeting criminal and violent behaviour, school-disaffection, rebelliousness and substance use. Programmes were categorised as environmentally-focussed (addressing classroom management, class reorganisation or school discipline) or individually-focused; the latter group included social competence, cognitive behavioural, mentoring, counselling, recreational and ‘other instructional’ interventions. Environmentally focused interventions as a whole tended to be slightly more effective than individually-focused interventions as a whole. However, one type of individually-focused intervention, “cognitive behavioural, behavioural modelling,

behaviour modification” was more effective than some of the environmentally focused interventions, with the exception of “reorganisation of grades and classes”. No further information is given on this strategy or why it appears to be effective at reducing drug use. In conclusion, Wilson et al note that no single type of intervention has a large effect, and that in reality most schools provide a mix of different interventions. They suggest that a more useful question for research is “which combination or sequences of strategies work best?” (p.269) rather than trying to refine one single ‘best’ approach.

Gottfredson (1997) compared individual-change and environmental strategies for youth delinquency and crime prevention. Nearly half of the programmes (77 of 149) also measured effects on alcohol, tobacco and other drug use. Strategies which ‘worked’ - defined as those for which at least two different studies have found positive effects on drug use - were individual programmes which clarified and communicated behavioural norms, which focused on social competency skills, and which taught behaviour modification and thinking skills to high risk young people. In addition, however, several environmental programmes were defined as ‘promising’ (shown to be effective in one rigorous study and in need of replication to confirm effect) for drug prevention. These included Program Development Evaluation (Gottfredson 1986), a structured organisational development method designed to improve school management (e.g. increased clarity of rules and rule enforcement, strategies to increase student feeling of belonging); normative education (Hansen & Graham 1991); the Child Development Project a classroom management intervention also involving family homeworking and ‘community building’ activities (Battistich et al 1996); and STATUS – Student Training Through Urban Strategies (Gottfredson 1990), which regrouped ‘high risk’ students within the school and involved a law-related curriculum. ‘Ineffective strategies’ are defined by Gottfredson as counselling, recreational alternatives, information, fear arousal, moral appeals and affective education.

Gottfredson (1996) notes that 94% of the 149 studies reviewed were multi-component in the sense that they used more than one major type of programme activity, and that 40% used four or more types of activity. Many of the school-based programmes included both an instruction curriculum and ‘environment’ components designed to alter classroom management or change the “normative climate” of the school.

Finally, Lister-Sharp et al (1999) examined interventions using a “health promoting schools approach”, defined in the review as activity in three domains: school ethos and environment, curriculum, and links with family and community. There was significant evidence from one study (the Wessex Healthy Schools Award study) that a health promoting schools approach could have a positive effect on smoking by older adolescent boys. The variability of intervention and evaluation methods in this emerging field made it difficult to draw firm conclusions about effectiveness. Lister-Sharp and colleagues also examined parental involvement in programmes. They found that parental involvement appeared to increase effectiveness slightly, but as the interventions involving parents tended also to be complex multi-component interventions, there may have been other confounding influences.

Conclusions

As this section has shown, there is no single agreed conceptual framework for describing, analysing and comparing different theoretical bases for drug education. Most programmes draw on a mix of (often poorly articulated) theories, and most reviews, as has been shown, do not compare different theories but hybrid approaches combining theory, content and teaching

style. This makes it difficult to unpack the key elements of an effective approach. Nevertheless, some conclusions can be drawn regarding approach:

- a) Interactive drug education programmes involving a high degree of student-to-student interaction and active learning are nearly always more effective than Non-interactive programmes. There is strong evidence for this conclusion.
- b) Drug education programmes adopting knowledge/information and affective approaches are generally ineffective or less effective than other approaches at influencing drug use behaviour. There is reasonably strong evidence for this conclusion, but it is important to note that reviewers vary widely in what they mean by both knowledge/information and affective approaches. Indeed, information provision and some aspects of the affective approach are found in effective programmes. The key factor is perhaps that programmes relying *only* on these approaches - without a proven theoretical basis, a high degree of interactivity and coverage of drug-specific influences and skills - are unlikely to change behaviour.
- c) Drug education programmes adopting life skills, social influences, resistance skills or normative approaches are more effective than programmes not adopting these approaches. There is strong evidence for this conclusion. Programmes adopting these approaches derive from social cognitive theory and to a lesser extent problem behaviour theory, and target individual, peer and social influences on drug use. The theoretical mechanisms by which these approaches are assumed to work have been tested. These analyses have indicated that normative education in particular is an important mediator of drug education effects, and should be included in drug education programmes.
- d) Drug education programmes which are multi-component in nature and/or which target young people's environment – their school, family or community - are possibly more effective than those which are single-component in nature and which primarily target the individual. There is moderate evidence for this conclusion. However, there have been too few studies to assess which mix of components is the most effective: for example, is a school curriculum plus a parent programme better than a school curriculum plus media campaign? Environmental interventions which target the school teaching environment rather than the individual child have the advantage of also being effective at preventing other behaviours such as delinquency and school disaffection. The evidence base for whole school, or health promoting school, approaches is still evolving, and they are difficult to evaluate, although one study to date has shown effects on smoking.

The above generalisations are helpful in identifying the *types* of approaches which should be implemented in drug education, but not in identifying specific effective programmes. Table 3.3 over identifies programmes which have been found to be effective in two or more reviews, together with an indicator of their approach; where a programme is categorised differently by different reviewers, key terms used by all reviewers are listed. This is not intended to be an exhaustive or definitive list, as several reviews do not identify effective programmes by name, and some only provide illustrative examples of effective programmes.

Table 3.3: Selected programmes identified as effective in two or more reviews

Authors and programme name	Key features
Biglan 2000 <i>Project SIXTEEN</i>	Social influences, community
Biglan et al 1987	Social influences, social reinforcement
Botvin et al 1990, Botvin et al 1995, Botvin et al 1997, Botvin et al 2000, Botvin et al 2001 <i>Life Skills Training</i>	Comprehensive life skills, social influences
Caplan 1992 <i>Positive Youth Development Program</i>	Social and life skills
Clarke 1986	Social influences, knowledge
Elder 1993, Eckhardt 1997 <i>Project SHOUT</i>	Social influences
Ellickson et al 1993a, 1993b, Ellickson & Bell 1990 <i>Project ALERT</i>	Normative education, resistance skills
Gilchrist 1987	Social influences, social competence
Gliksman 1983	Knowledge
Hansen & Graham 1991 <i>AAPT</i>	Normative education
Hansen 1988 <i>Project SMART A</i>	Normative education
Horan & Williams 1982	Assertiveness
Pentz et al 1989, Johnson et al 1990, Mackinnon et al 1991, Pentz & Valente 1993 <i>Project STAR (Midwestern Prevention Project)</i>	Social influences, resistance skills, multi-component
Schinke et al 1988, Schinke et al 1986, Schinke et al 2000	Refusal skills, tailored for Native American population
Shope et al 1996	Refusal skills
Sussman et al 1995, Sussman et al 1998, Sussman et al 1997 <i>Project TND (Towards No Drug Abuse)</i>	Comprehensive, multi-component, social influences, life skills
Vartiainen et al 1990, 1998 <i>North Karelia Project</i>	Community, multi-component

3.3 Who should deliver drug education?

Seven of the systematic reviews and meta-analyses compared different drug education delivery personnel in terms of effectiveness. Their conclusions, and the basis for these conclusions, are summarised in Table 3.4.

Table 3.4: Conclusions from Systematic Reviews and Meta-analyses Regarding Programme Delivery Personnel

Authors	Delivery styles and methods compared	Conclusions
Bangert-Drowns 1988	Peer delivery vs. adult-delivery	Peer delivery was associated with higher effect sizes but the difference was not statistically significant.
Cuijpers 2002b	Peer-delivery vs. adult delivery.	Peer-delivered programmes are more effective in the short term than the same programmes delivered by adults, but at one and two year follow up there is no difference.
Gottfredson & Wilson 2003	Delivery agent: teachers, peers, police, health professionals, others.	No relationship between delivery agent and effectiveness. Analysis of a subset of programmes suggests programmes delivered only by peers are more effective than those delivered by peers plus teachers.
Lister-Sharp	No statistical comparison of	Alcohol and smoking programmes including peer-led

et al 1999	different delivery styles and methods, but delivery features are discussed in narrative synthesis.	components appear more effective than non-peer programmes. For drugs programmes, peer involvement appears to be no more or less effective than no peer involvement.
Rooney & Murray 1996	Various programme variables including programme leader.	Delivery by untrained same-age peer leaders is one of the factors associated with increased programme effectiveness, but so is delivery by a trained teacher.
Tobler & Stratton 1997	Non-interactive vs Interactive (see table 3.1 above for full breakdown). Delivery agent: teacher, peer, health professional, other adult.	Teachers and peers are equally effective at delivering Interactive programmes, but slightly less (although not significantly so) effective than 'mental health clinicians'. For non-interactive programmes there are no differences in effectiveness between different delivery personnel.
Tobler et al 2000	Non-interactive vs. Interactive (see Table 3.1 above for full breakdown). Delivery agent: teacher, peer, health professional, other adult.	Health professionals appear to be more effective delivery agents than peers, and peers appear to be more effective than teachers, in larger programmes, but there is no difference between agents in smaller programmes.

In addition, a recent UK literature review has examined the role of external contributors in school drug, alcohol and tobacco education (White et al 2004). Although not purporting to be a fully systematic review, the review was carried out in a systematic manner and is comprehensive in scope. Its findings are also discussed below.

An unclear picture emerges from the reviews regarding the most effective delivery agents for drug education. Two of the reviews suggest that peer delivery improves the effectiveness of programmes (Bangert-Drowns 1988, Cuijpers 2002b) and one suggests that 'peer-led' components improve the effectiveness of alcohol and tobacco programmes but not drugs programmes (Lister-Sharp et al 1999). One review finds no major difference between delivery agents (Gottfredson & Wilson 2003), one finds that both trained teachers and untrained peers are associated with greater effectiveness (Rooney & Murray 1996), and two find that health professionals are more effective for some programmes (Tobler & Stratton 1997, Tobler et al 2000).

Gottfredson & Wilson (2003) found no differences in effect sizes for programmes according to delivery by teachers, peers or police. They note that in practice many programmes were delivered by more than one sort of personnel. More detailed analysis suggested that programmes delivered by peers-only had the highest effects, but that this superiority disappeared if peers taught the programme alongside teachers.

Tobler suggests that the concept of interactivity might help reconcile these different findings. Noting that interactive programmes are consistently more effective than non-interactive programmes (see 3.2.1 above), she suggests that it is the opportunity to interact with one's peers, in groupwork and discussion, which is a key element in programme effectiveness. This may explain why peer-led programmes are sometimes found to be more effective – because they by default offer this opportunity – but a programme led by non-peers might, according to Tobler's theory, be nonetheless effective if it provides sufficient peer interactivity. She suggests (1997) that interactive programmes depend on participation by everyone, preferably in small groups, and that "without extra leaders to form small groups, the adolescents can only interact a few times and the essential part of the interactive programme is missing – that is, active involvement, exchange and validation of ideas with their peers" (p.118). This suggests that the main value of peers may be that they allow more

groupwork to take place by adding extra bodies to the classroom. McBride (2003) echoes this, suggesting that interaction with peers, rather than delivery by peers, may be more important. However, Gottfredson & Wilson (2003) found that peer-alone programmes were superior to those in which peers and teachers taught together – the involvement of teachers cancelled out the peer benefit. This suggests that the opportunity to interact with peers may not in and of itself explain the apparent superiority of peer delivery.

Overall, it is difficult to draw firm conclusions from the reviews on this question, because results are likely to be strongly confounded by programme type. A programme designed for delivery by peers, or peer involvement, is likely to be predicated on a particular theoretical approach to drug education (such as social influences), and any comparison with a programme delivered by a different agent may reflect more fundamental programme differences. Quality of implementation and support for implementation are also important confounding factors. Tobler's findings that mental health clinicians were more effective at delivering interactive drug education than teachers may have reflected differences in training and experience with a particular programme – the mental health clinicians may well have been trained in a particular intervention for the purpose of a study – rather than the general skill or suitability of one type of personnel rather than another for delivering drug education. Coggans et al's (2003) review of the effectiveness of Life Skills Training found that implementation quality was an important contributor to programme effect; both teachers and peers could produce desired effects with the programme if trained and if they delivered it to a high standard.

Surprisingly little attention has been directed towards investigating **teacher** effectiveness in drug education: for example, reviews have compared teachers with peers and with external contributors, but have not examined basic questions such as whether drug education is more effectively delivered 'inhouse' (ie. by school staff) or by external contributors, nor whether some sorts of teachers (eg. health education specialists) are more effective than others.

Another facet of drug education delivery largely neglected by reviews is **credibility**. The perceived credibility, in the eyes of students, of the person delivering drug education is likely to be strongly related to programme impact; young people are more likely to engage with a programme and be responsive to learning from it if they perceive the deliverer as a reliable and trusted source (Stead et al 2001, MacKintosh et al 2001, O'Connor et al 1998, Anguelov et al 1999). Again, this may explain why peers are sometimes found to be more effective than teachers and sometimes not. It also suggests that selection of the 'right' drug educator should take into account not only age, background and relationship to students, but also the perceived credibility and trustworthiness of that educator (which may be unrelated to any of the previous factors).

White et al's (2004) review of the role of 'external contributors' in school drug education finds that the evidence on this issue is often of poor quality, particularly British evidence. From better quality studies they conclude that peers can be effective drug education deliverers; they also note that *being* a peer educator can have beneficial effects, and may be a cost effective intervention for high risk young people. They found evidence that peers, nurses, health educators, guest experts and older mentors, when delivering "intense, structured educational packages", could have small but long term impacts on behaviour. They do not find evidence that the police delivering DARE and similar programmes are effective, although they suggest the police can be used in a supplementary role, providing their expertise is 'mapped onto' the aims and content of drug education planned by the

school. Several gaps in the evidence base are identified by the review, including: little evidence on how the contributions of external visitors are integrated into the broader school curriculum; limited information on the delivery style used by external visitors; and no research examining whether particular messages are better delivered by particular external visitors.

Evidence on the impact of training on drug education delivery is somewhat inconsistent in the reviews. However, evaluations of individual programmes (McBride et al 2002, Phelps et al 1994) and other studies (eg. Allott & Paxton 2000) find that training teachers and other implementers in how to deliver drug education programmes enhances knowledge, confidence and skills. Training which ‘models’ the curriculum can reduce variability between individual teachers in how they interpret written instructions (McBride et al 2002).

Conclusions

There is reasonably strong evidence that peers should be involved in the delivery of drug education, but insufficient evidence to state whether they should be the sole deliverers, as some reviews claim. As Lister-Sharp et al (1999) express it, “programmes in which peers were involved were more likely to be successful than those in which they were not, but peer involvement did not guarantee success” (p.50). There is also evidence that trained teachers and health professionals can be effective. The effectiveness of a particular delivery agent is likely to be strongly bound up with programme type, amount of training, programme implementation quality and the perceived credibility of the deliverer in the eyes of students participating in the programme.

3.4 Is there a relationship between duration or intensity of drug education and effectiveness?

Eight of the systematic reviews and meta-analyses examined whether the duration and intensity of drug education programmes influence effectiveness. Their conclusions are summarised in Table 3.5.

Table 3.5: Conclusions from Systematic Reviews and Meta-analyses Regarding the Relationship between Programme Duration and Intensity and Effectiveness.

Authors	Comparisons	Conclusions
Bruvold 1993	Various programme variables including intensity (number of hours)	Larger effect sizes were associated sometimes with less intensity (9 or fewer sessions) and sometimes with higher intensity (10 or more sessions).
Cuijpers 2002a	Various programme variables including addition of booster sessions.	Unclear whether boosters increase or decrease the effectiveness of programmes.
Gottfredson & Wilson 2003	Programme duration.	No relationship between duration and effectiveness.
Rooney & Murray 1996	Various programme variables including programme duration.	Larger short-term effects were associated with fewer sessions (10 or fewer) but a longer delivery period (more than 2 months). Larger long-term effects were associated with delivery over a short period (less than two months) or booster sessions.
Tobler 1986	Various programme variables including intensity (number of hours).	No relationship overall between programme intensity and effect, but different ‘modalities’ of programmes (e.g. knowledge, peer programmes) displayed differential effects at

		different levels of programme intensity. For some categories, effectiveness increased with greater intensity.
Tobler & Stratton 1997	Various programme variables including intensity (number of hours).	Programme intensity was generally not related to effectiveness. The mean intensity of programmes reviewed was 10 hours.
Tobler et al 2000	Various programme variables including intensity (length).	Higher intensity (longer) Interactive programmes appear to be more effective than lower intensity (shorter) Interactive programmes.
White & Pitts 1998	No statistical comparisons were made, but features of programmes found to be effective are discussed.	A majority of effective programmes were intense (comprising 10 or more sessions and usually also booster sessions). However, a number of intense programmes were also ineffective. Programme intensity appeared to increase but not guarantee effectiveness.

In addition, a ninth review (Thomas 2004) did not compare number of sessions and boosters, but noted that the Hutchinson Smoking Prevention Project, which was ineffective, included more sessions than any previous study, suggesting that number of sessions may not be an important mediating variable.

An unclear picture emerges from the reviews. Three reviews found no relationship between overall programme duration and effectiveness. One found that more intense (longer) programmes were more effective. Three found that longer programmes were sometimes more effective and that shorter programmes were sometimes more effective. In one the results were unclear.

‘Booster’ sessions – lessons delivered months or years after a programme in order to repeat and refresh its messages – have been assumed to be an important ingredient of effective programmes. Although the reviews here provide some support for this view, the evidence is not consistent. A similar conclusion was reached by Coggans et al’s (2003) review of Life Skills Training, which found little empirical support for the assumption that boosters enhanced the impact of the programme.

Conclusions

There is no clear relationship between effectiveness and overall programme duration, intensity or number of sessions. It is likely that programme design and implementation quality are as or more important than length of programme or number of lessons: a very intensive but theoretically unsound or badly taught programme is unlikely to be effective. Nevertheless, reviews agree that programmes should be of ‘sufficient’ length and intensity to achieve change; no reviews recommend ad hoc single sessions, for example. On average, evaluated drug education programmes have comprised around ten sessions, often with follow-up sessions the following year.

3.5 Should drug education programmes target single drugs or all drugs?

Drug education programmes can focus on one single drug or on several drugs. Another important question, therefore, is whether a single or generic focus should be adopted, ie. is it easier to influence smoking through a tobacco-only programme or through a generic programme targeting all drugs? Several of the reviews examine both single-focus and generic-focus programmes but do not examine whether they are differentially effective (e.g. Lister-Sharp et al 1999, White & Pitts 1998, Thomas 2004, Rundall & Bruvold 1988,

Bruvold 1993). Foxcroft et al's (2004) review of alcohol prevention interventions reports that "whether interventions focused on alcohol alone, or alcohol as one of a number of drugs, appeared to have no effect on outcome in the studies reviewed" (p.11 of 69), although no data are presented to illustrate this.

Three reviews specifically examined whether single-focus or generic-focus programmes were more effective (Tobler & Stratton 1997, Tobler et al 2000, Rooney & Murray 1996), while one (Werch & Owen 2002) examined factors associated with *ineffectiveness*. The results are summarised in Table 3.6 below.

Table 3.6: Conclusions from Systematic Reviews and Meta-analyses Regarding Single and Generic Drug Focus

Authors	Comparisons	Conclusions
Rooney & Murray 1996	Compared tobacco use outcomes from: - tobacco-only programmes - tobacco, alcohol and drugs programmes - generic health programmes	Tobacco-only focus programmes tended to be less effective than the other two types of programme, both in the short and long term.
Tobler & Stratton 1997	Compared general effectiveness of: - tobacco-only programmes - alcohol-only programmes - generic programmes	Effect sizes were similar for single focus and generic programmes across the whole set of programmes. Among the interactive programmes, tobacco-only programmes were slightly more effective than alcohol-only and generic programmes. Among the non-interactive programmes, generic programmes were slightly more effective than single focus programmes.
Tobler et al 2000	Compared general effectiveness of: - tobacco-only programmes - alcohol-only programmes - generic (all drugs) programmes - other programmes (not defined) Compared tobacco outcomes for: - tobacco-only programmes - generic programmes Compared alcohol outcomes for: - alcohol-only programmes - generic programmes	Overall, tobacco-only programmes were slightly more effective than alcohol-only, generic and other programmes. When the desired outcome was a reduction in smoking specifically, tobacco-only programmes were generally more effective than generic programmes. When the desired outcome was a reduction in alcohol use specifically, neither type of programme was consistently superior.
Werch & Owen 2002	Identified features associated with programme ineffectiveness.	Generic programmes appeared to result in more negative effects on alcohol use than programmes focusing only on alcohol

Rooney & Murray (1996) examined tobacco outcomes from 131 programmes, 63% of which had a tobacco-only focus; 30% focussed on tobacco, alcohol and drugs, and 8% were generic health programmes. Regression analyses indicated that smaller short-term effects were found with tobacco-only programmes than with wider focus programmes, which tended to be more effective. When longer-term effects were examined, wider focus programmes again tended to be more effective than single focus programmes. All three types of programmes examined in the review (social influences, resistance skills, social skills) were equally effective where the intervention had a tobacco-only focus, but social influences programmes were more effective than the other two types when the intervention had a wider focus.

Tobler & Stratton (1997) examined whether programmes focusing on a single drug - tobacco only or alcohol only - were more effective than programmes with a generic substance focus. (The effect size for the generic programmes was calculated by averaging across tobacco, alcohol, cannabis and other drugs.) Across all 120 programmes, effect sizes were largely similar for both single-focus and generic programmes. Interactive tobacco-only and generic programmes were more effective than non-interactive tobacco-only and generic programmes; both interactive and non-interactive alcohol-only programmes were similarly effective. In the high quality set of 56 programmes, interactive tobacco-only programmes were slightly more effective than interactive alcohol-only and generic programmes. Non-interactive generic programmes were slightly more effective than non-interactive tobacco-only and alcohol-only programmes, both of which had negative effects.

Tobler et al (2000) reviewed 207 programmes, of which 36% targeted tobacco only, 25% targeted alcohol, 34% targeted all drugs, and 5% had an 'other' focus (not defined). Tobler reports that, overall, programmes targeting tobacco only had slightly greater effects than programmes targeting alcohol only and generic and 'other' programmes. A similar pattern was found in a subset of 93 high quality programmes. In the total set, interactive tobacco-only programmes were more effective than non-interactive tobacco-only programmes; interactive generic programmes were more effective than non-interactive generic programmes. However, interactive and non-interactive alcohol-only programmes were similarly effective. In the high quality set of 73 high quality programmes, however, interactive and non-interactive tobacco-only programmes were similarly effective, while interactive alcohol-only programmes were more effective than non-interactive alcohol-only programmes. As in the total set, interactive generic programmes were more effective than non-interactive generic programmes.

Additional analysis specifically examined tobacco outcomes, comparing tobacco-only programmes with generic programmes to assess whether tobacco use is more effectively prevented within a generic programme or a tobacco-only programme. Interactive programmes with a tobacco-only focus were more effective than interactive generic programmes at reducing tobacco use. Among the non-interactive programmes, tobacco-only and generic programmes had similar levels of effect on tobacco use.

Similar analyses for alcohol outcomes found that, among the interactive programmes, alcohol-only and all-drugs programmes had similar levels of effect on alcohol use. Among the non-interactive programmes, alcohol-only programmes were more effective than generic programmes when the full set of studies was analysed. When the high quality subset was analysed, however, non-interactive generic programmes were slightly more effective than non-interactive alcohol-only programmes.

Werch & Owen (2002) examined programme factors associated with *negative* effects (ie. *increases* in substance use). Generic programmes (those addressing all substances) appeared to result in more negative effects on alcohol use than programmes focusing only on alcohol.

Conclusions

It is difficult to draw any firm conclusions from these reviews. There is evidence from two reviews suggesting that tobacco-only programmes may be more effective than wider focus programmes, and from one review suggesting the opposite; one review suggests that generic programmes are more likely to have harmful effects on alcohol use than alcohol-only programmes. McBride suggests that programmes should focus on a single drug rather than

generic drug use, but this recommendation is drawn from a limited pool of studies. Werch & Owen suggest that generic programmes may be less effective than single drug programmes because they risk making some drugs appear less harmful than others (and therefore safe to try). Certainly the messages will be more complex in generic programmes, particularly if the programme simultaneously promotes a harm reduction/moderation message for alcohol and a prevention message for tobacco and illicit drugs.

3.6 Is drug education more effective at specific ages?

Seven reviews have examined the grade level/s or age group at which drug education programmes are targeted in order to assess whether they are more effective at specific ages. Their conclusions are summarised in Table 3.7.

Table 3.7: Conclusions from Systematic Reviews and Meta-analyses Regarding Effectiveness at Different Age/Grade Levels

Authors	Comparisons	Conclusions
Bruvold 1993	Various programme variables were examined including grade level targeted by the programme (below grade 9 vs. grade 9 and higher).	Larger effect sizes were always associated with targeting a higher grade level (grade nine or higher)
Bangert-Drowns 1988	Various programme variables were examined including age of participants.	No relationship with effectiveness was reported. Not clear if this is because no relationship was found, or because of gaps in reporting.
Gottfredson & Wilson 2003	Various programme variables were examined including age.	Programmes delivered to middle/junior high school students were slightly more effective than programmes delivered to younger or older age groups.
Rooney & Murray 1996	Various programme variables including age	Programmes targeting grade 6 and below tended to be more effective.
Tobler 1986	Various programme variables including grade level.	Programme effectiveness did not differ by grade level (grade 6-9 vs. grade 9-12)
Tobler et al 2000	Various programme variable including school level.	Programmes targeted at elementary and junior high schools had similar effect sizes.
Wilson et al 2001	Various programme variables including school level.	School level (early elementary, late elementary, middle/junior high) was not a significant predictor of effect size.

Four reviews found little clear relationship between age/grade and effectiveness. Tobler (1986) found that programme effectiveness did not differ by grade level when programmes targeting grade 6-9 were compared with those targeting grade 9-12, and Tobler et al (2000) found that programmes targeted at elementary and junior high schools had similar effect sizes. Wilson et al's (2001) regression analysis found that school level – early elementary, late elementary, middle/junior high – was not a significant predictor of effect size. Bangert-Drowns (1988) examined grade level as an intervention variable but did not report any relationships with effectiveness. It is not clear whether this was because none was found or because not all results were reported in the review.

Three reviews found different results. Gottfredson & Wilson (2003) found that programmes targeting middle/junior high school pupils appeared to be slightly more effective than those targeting younger or older age groups. The authors suggest that the variations in follow-up period may have confounded this result, as programmes targeting younger pupils tend to be followed up for longer (allowing more time for effects to wear off). Regression analysis to

explore this possible confounding suggested that length of follow-up period did appear to influence effect size; in other words, programmes delivered to middle/junior high school students did appear to be slightly more effective than programmes delivered to younger children. Rooney & Murray (1996) found that programmes targeting a younger age group (grade 6 and below) tended to be more effective. Finally, Bruvold (1993) found that larger effect sizes were always associated with targeting a higher grade level (nine or higher).

Conclusions

Overall it does not seem that drug education is more effective at particular ages or grade levels. However, it is important to note that desired effects are likely to vary at different ages, as is the ability of a study to detect an impact (it is difficult, for example, to assess behaviour change in a cohort of young people who are too young to have started experimenting in sizeable numbers). Nevertheless, the evidence from these reviews suggests that there is no good reason to restrict drug education to particular ages, and that drug education should be expected to achieve age-appropriate effects at all ages.

Other commentators endorse the teaching of drug education at primary ages (eg. Lloyd et al 2000). Lloyd et al (2000) suggest that, in early years drug education, skills to identify feelings and communicate these to others should play an important part as well as knowledge about drugs.

3.7 Other features of effective drug education

Reviews have also examined other features of drug education, including programme size, programme targeting strategy, evaluation and cultural relevance.

Although this was not examined systematically in reviews, at least two reviews suggest that drug education programmes which are implemented to a higher and more consistent quality produce better effects (White & Pitts 1998, Coggans et al 2003). There has been a tendency in reviews and studies to focus on outcomes rather than processes of delivery, although it is becoming more common for evaluations now to examine implementation as well as impact.

Tobler et al (1999, 2000) examined the relationship between programme size (the number of students participating in a drug education programme) and effectiveness. Smaller Interactive programmes tended to be more effective than larger Interactive programmes, while Non-interactive programmes tended to be similarly (in)effective, whatever their size. Tobler et al suggest that Interactive programmes may suffer in delivery quality when delivered on a large scale, while Non-interactive programmes, because they are likely to be more didactic and standardised in delivery, are possibly unaffected by scale.

Bangert-Drowns (1988) found that more recent programmes tended to be more effective than earlier programmes, suggesting an improvement over time in quality.

McBride (2003) suggested that programmes should be meaningful and interesting to target groups, and based on their drug education needs as assessed through surveys and techniques such as 'Draw and Write'. The hypothesis that drug education programmes are more effective if designed to be culturally appropriate has not been systematically examined in reviews, but there is evidence from two series of studies that programmes specifically tailored to urban ethnic minority and Native American populations respectively are more effective

with these groups than general population-targeted programmes (Botvin 1995b, Schinke et al 1988, Shinke et al 2000).

Gottfredson & Wilson (2003) and Wilson et al (2001) examined whether selectively-targeted programmes (those targeting high risk young people) were more effective than universal programmes (those targeting the whole population in a school or year group). Both found modest evidence that selective programmes targeting high risk young people tended to be more effective with these groups than universal programmes. The authors suggest that this may be because it is harder to change a low-occurring behaviour in a general population, therefore effects are more easily detectable in a high risk group.

Wilson et al (2001) found that better evaluated programmes tended to produce better results, but this may reflect the heightened attention to implementation quality found in a trial, as well as the potentially greater ability of a methodologically high quality study to detect change.

3.8 Discussion and conclusions

- **What programme approaches are most effective?**

There is no single agreed conceptual framework for describing, analysing and comparing different theoretical bases for drug education. Most programmes draw on a mix of (often poorly articulated) theories, and most reviews, as has been shown, do not compare different theories but hybrid approaches combining theory, content and teaching style. This makes it difficult to unpack the key elements of an effective approach. Nevertheless, some conclusions can be drawn regarding approach:

- Interactive drug education programmes involving a high degree of student-to-student interaction and active learning are nearly always more effective than Non-interactive programmes. There is strong evidence for this conclusion.
- Drug education programmes adopting knowledge/information and affective approaches are generally ineffective or less effective than other approaches at influencing drug use behaviour. There is reasonably strong evidence for this conclusion, but it is important to note that reviewers vary widely in what they mean by both knowledge/information and affective approaches. Indeed, information provision and some aspects of the affective approach are found in effective programmes. The key factor is perhaps that programmes relying *only* on these approaches - without a proven theoretical basis, a high degree of interactivity and coverage of drug-specific influences and skills - are unlikely to change behaviour.
- Drug education programmes adopting life skills, social influences, resistance skills or normative approaches are more effective than programmes not adopting these approaches. There is strong evidence for this conclusion. Programmes adopting these approaches derive from social cognitive theory and to a lesser extent problem behaviour theory, and target individual, peer and social influences on drug use. The theoretical mechanisms by which these approaches are assumed to work have been tested. These analyses have indicated that normative education in particular is an important mediator of drug education effects, and should be included in drug education programmes.

- Drug education programmes which are multi-component in nature and/or which target young people's environment – their school, family or community - are possibly more effective than those which are single-component in nature and which primarily target the individual. There is moderate evidence for this conclusion. However, there have been too few studies to assess which mix of components is the most effective: for example, school plus media or school plus parent? Environmental interventions have the advantage of also being effective at preventing other behaviours such as delinquency and school disaffection. The evidence base for whole school, or health promoting school, approaches is still evolving, and they are difficult to evaluate, although one study to date has shown effects on smoking.
- **Who should deliver drug education?**
There is reasonably strong evidence that peers should be involved in the delivery of drug education, but insufficient evidence to state whether they should be the sole deliverers, as some reviews claim. There is also evidence that trained teachers and health professionals can be effective. The effectiveness of a particular delivery agent is likely to be strongly bound up with programme type, amount of training, programme implementation quality and the perceived credibility of the deliverer in the eyes of students participating in the programme.
- **Is there a relationship between duration or intensity of drug education and effectiveness?**
There is no clear relationship between effectiveness and overall programme duration, intensity or number of sessions. It is likely that programme design and implementation quality are as or more important than length of programme or number of lessons: a very intensive but theoretically unsound or badly taught programme is unlikely to be effective. Nevertheless, reviews agree that programmes should be of 'sufficient' length and intensity to achieve change; no reviews recommend ad hoc single sessions, for example. On average, evaluated drug education programmes have comprised around ten sessions, often with follow-up sessions the following year.
- **Should drug education target single drugs or adopt a generic approach?**
The evidence on this is unclear. Two reviews suggest that tobacco-only programmes may be more effective than wider focus programmes, and one review suggests the opposite; one review suggests that generic programmes are more likely to have harmful effects on alcohol use than alcohol-only programmes. Generic programmes may be less effective than single drug programmes because they risk making some drugs appear less harmful than others (and therefore safe to try). Certainly the messages will be more complex in generic programmes, particularly if the programme simultaneously promotes a harm reduction/moderation message for alcohol and a prevention message for tobacco and illicit drugs.
- **Is drug education more effective at specific ages?**
Overall it does not seem that drug education is more effective at particular ages or grade levels. However, it is important to note that desired effects are likely to vary at different ages, as is the ability of a study to detect an impact (it is difficult, for example, to assess behaviour change in a cohort of young people who are too young to have started experimenting in sizeable numbers). Nevertheless, the evidence from these reviews suggests that there is no good reason to restrict drug education to particular ages, and that drug education should be expected to achieve age-appropriate effects at all ages.

- **Other features**

Reviews have also suggested that drug education programmes are likely to be more effective if implemented to a high quality, although more attention is needed to the process of delivery in drug education studies and reviews. Drug education may also be more effective with high risk groups if it is specifically targeted at those groups (rather than at whole school or year group populations).

Drug education is likely to be more effective if relevant and meaningful to target groups, and tailored to their needs. Culturally appropriate interventions are likely to be more effective with specific ethnic and cultural groups.

4 DO DRUG EDUCATION GUIDANCE AND PRACTICE REFLECT THE EVIDENCE BASE?

This final section of the review examines the extent to which drug education guidance and actual classroom practice reflect the evidence base examined in the previous sections.

The first section, 4.1, examines current recommendations regarding drug education in schools, focusing particularly on Scottish guidance documents. Key recommendations are summarised, and the extent to which they reflect the evidence base, either implicitly or explicitly, is discussed. Section 4.2 examines studies of actual drug education practice and assesses the extent to which practice reflects both the evidence base and official guidance.

4.1 Drug education guidance

The main policy context for drug education in Scotland is provided by:

- The Education (National Priorities) (Scotland) Order 2000
- Improving Health in Scotland: The challenge. Scottish Executive 2003
- Tackling Drugs in Scotland 1999

Of these, Tackling Drugs in Scotland is the most explicit about drug education. For each of four priority aims (young people, communities, treatment and availability) TDS lists 'objectives' and 'action priorities'. Drug education is listed as contributing to the young people aim: *"To help young people resist drug misuse in order to achieve their full potential in society."* Three of the six objectives under this aim refer to drug education:

- (i) Establish a consistent, coordinated, evidence-based approach to drug education, prevention and harm reduction which takes account of individual and community needs.
- (ii) Implement education strategies and initiatives and provide public knowledge which increase knowledge and promote avoidance of drug misuse.
- (iii) Ensure that every school pupil in Scotland has effective drug education including accurate and up-to-date information on the consequences of drug misuse.

The other three objectives refer to reducing incidents of misusing, promoting alternative lifestyles and provision for vulnerable groups including school excludees.

Ten action priorities include: *"Every school to provide appropriate drug education for all pupils in line with national and education authority advice"*; *"every school ... to have an effective welfare policy on the management of incidents of drug misuse"*; and *"effective training of teachers."* The paper also promises the introduction of revised curriculum advice to *"[reflect] good topical evidence of the most effective approaches."*

The most recent SEED Annual Survey of Drug Education (Scottish Executive National Statistics 2003) states that drug education must include coverage of: "safe use of medicine, alcohol, tobacco, solvents and controlled drugs. All drug education has to take account of the

age, stage and maturity of the children involved and it is accepted that education on controlled drugs may not be appropriate until later in primary school”. The report also states that “For drug education to be in line with national advice, it must be provided to every pupil and provide pupils with continuity and progression in their learning”. ‘Continuity and progression’ means that each pupil receives drug education “at several stages during their time at a particular school”. The survey also lists four documents as constituting national guidance on drug education (SE National Statistics 2003). They are:

- 5-14 national guidelines on health education (Learning and Teaching Scotland, 2002a).
- How Good is our School? - Performance Indicator 1.2 - Quality of course or programme. HM Inspectorate of Education, 1996 (HMI 2001)
- A Route to Health Promotion (Aberdeen City Council, Health Education Board for Scotland, HMI Audit Unit 1999).
- HELP UP-DATE on drug and nutrition education, LT Scotland Curriculum File No 9. (Learning and Teaching Scotland 1998)

More recently, these have been joined by HMIE guidance to schools on evaluating their progress towards national priorities in the areas of drug education and relationship education, *How Good is Our School? Two Health Issues: Education about Drugs/Education about Responsible Relationships and Sexuality* (2003). General health promotion advice is also provided by *Being Well – Doing Well: a framework for health promoting schools in Scotland* (2004) produced by the Scottish Health Promoting Schools Unit.

Being Well – Doing Well: a framework for health promoting schools in Scotland (Scottish Health Promoting Schools Unit 2004) does not make specific recommendations about drug education, but outlines a framework intended to create consensus on the characteristics of an effective health promoting school. Key elements of this framework include: a commitment to health promoting practices throughout the school, not just in the health education curriculum; involvement of parents and the community; an ethos oriented towards decision-making skills and a sense of responsibility; “lively and participative” learning and teaching styles; and the use of health education programmes which are in line with national advice.

There is no statutory curriculum in Scotland, unlike England, but the Scottish Executive offers guidance in the form of the 5-14 programme. Health education is included under Religious and Moral Education, which is allotted 15% of the curriculum in primary school (ages 5 to 12); the first two years of secondary school, S1 and S2, are also required to receive a general education based on the 5-14 programme.

The *5-14 National Guidelines Health Education*, together with the *5-14 National Guidelines Health Education: Guide for Teachers and Managers* (2002) is designed to “provide a basis for schools to use in reviewing their existing programmes for health education” (p.1). The guidelines have one “attainment outcome” – ‘taking responsibility for health’ - and six levels of targets from A to F which outline “how the necessary combination of knowledge, skills and attitudes can be achieved in ways that are manageable and effective” (p.1). They are structured around three health domains: physical, emotional and social health.

The overall aim of health education in schools is defined as enabling young people “to explore and clarify their beliefs, attitudes and values, develop personal and interpersonal skills, and increase their knowledge and understanding of a range of health issues” (p.3).

The guidance contains both general and specific recommendations about drug education. General recommendations include the statement that health education should be taught in a “supportive and encouraging climate” using “interactive learning and teaching approaches” (p.3). However, it is not explained that research has proved interactive approaches to be more effective in drugs education. The recommendations also emphasise the concepts of continuity and progression in drug education, with topics being revisited throughout schooling as students mature. It is recommended that drug education is taught within the context of a strategic whole school approach to health promotion. Various planning considerations are listed, including the involvement of all staff, pupils and parents in health education provision; the ability to make a planned response to incidents, and efficient management and coordination of health education and drug education.

More specific guidance concerns topics to be covered at different levels of maturity. Drug education is specifically referred to in several of the attainment targets. Specific attainment targets are outlined for each of six levels, A to F, at each of three strands – physical, emotional and social health. Drugs are specifically mentioned in five of the six physical health attainment targets (eg. ‘show safe use of medicine’ Level A; ‘choosing not to use harmful substances’ Level D; ‘risk assessment on issues such as substance misuse’ Level E). Other attainment targets in emotional and social health are also relevant to drug education, although the link is not explicitly made (eg. ‘show safe ways of dealing with risky situations’ Level C; ‘recognise peer and media influences on health’ Level D; ‘demonstrate ways of seeking help’ Level E).

The HMIe report *How Good is Our School? Two Health Issues: Education about Drugs/Education about Responsible Relationships and Sexuality* (2003) contains guidance for schools on evaluating their progress towards National Priorities. It states that effective drug education “has an important role to play in supporting all of the Scottish Executive’s National Priorities for Education”, most notably, through contributing to the creation of a health promoting school (National Priority 2), supporting pupils in the development of respect for self and others (4), and helping to equip them with the skills and attitudes to prosper in a changing society (5).

Ten quality indicators are highlighted to help schools evaluate their provision of drug education. They are:

- Teachers’ planning of programmes and day-to-day activities
- Teaching process: range and appropriateness of teaching approaches and teacher-pupil interaction
- Pupils’ learning: extent to which learning environment stimulates and motivates; pace of learning; personal responsibility for learning; interaction with others
- Meeting pupils’ needs: choice of task, activity, resources; provision for different abilities
- Pastoral care: ensuring care and welfare of pupils
- Personal and social development: use of planned approaches
- Links with local authority or other managing body
- Partnership with parents, School Board and community
- Organisation and use of resources
- Staff review procedures and development

The document then poses a series of questions to help schools evaluate their progress towards each indicator in drug education and relationships education. Many of the questions are general in nature. Several are concerned with broad-based principles and ethos (for example, Is learning “relevant and meaningful” to pupils? Is the learning atmosphere “supportive and non-judgemental”? Are parents encouraged to be involved?). Others are concerned with processes and procedures for, for example, selecting drug education resources, working with external agencies, and identifying training needs. Only a few are concerned with the specific objectives or content of drug education. The guidance asks, for example, how well does the school take account of the “range of influences (e.g. home, social, peer and media)”? do pupils develop skills to make “responsible decisions”? Both of these questions potentially reflect assumptions that drug education should address social influences and should promote decision-making skills. However, these assumptions are not explicitly stated, nor is any reference made to the evidence base from which they might derive.

Although it is recommended that schools have clear procedures for selecting drug education resources, there is no specific guidance on which resources should be used at specific ages, nor on essential aspects of resources which should be considered (such as, for example, evidence that the resource has been evaluated and is effective; that the resource uses interactive methods; that the resource is based on relevant theory). The guidance does make the general point that schools should “consider adopting a wide spectrum of teaching approaches” such as open-ended discussion, stimulating critical thinking, encouraging expression of ideas and opinions and respecting the views of others. However, as in the 5-14 Health Education guidelines, it is not explicitly stated that interactive methods have been consistently found to be more effective in drug education and should therefore be used.

The largely broad focus, non-specific nature of the drug education questions in part reflects the document’s purpose, to trigger reflection and self-appraisal at school level and to encourage schools to develop their thinking and planning around drug education. However, it is notable that the concept of evidence-based drug education – the idea that drug education should be based on what has been shown to work, rather than left to individual discretion – is largely absent, both in the HMIe guidance and in other guidance for Scotland. None of the guidance documents propose **specific objectives** for drug education as opposed to general health education aims such as ‘the promotion of healthy lifestyles’ and ‘the development of the knowledge, skills and values to help young people make responsible health choices’. The 5-14 guidance adds that ‘prevention of drug misuse’ is one of the broad aims of drug education in Scottish schools, but does not articulate how (or whether) the approaches being recommended might be assumed to lead to less drug misuse.

Finally, the *School Drug Safety Team Final Report* (2000) contained a number of recommendations regarding the content and management of school drug education and the role of the Executive in supporting it. Several of these are concerned with strengthening the curricular position of health education and drug education, both beyond age 14 and generally. There are also several recommendations concerning how drug education is covered in teacher education, training and ongoing professional development. At a national level it is recommended that the Executive should assist schools with self-evaluation in drug education and should “[establish] key targets for drug education at the various ages and stages in schools in line with recently revised national advice on the curriculum”, and that HM Inspectors should examine quality of drug education. The document also outlines some principles of drug education. These state that drug education “will be most effective” when the school has a positive ethos, has or is working towards a health-promoting environment,

and has effective partnerships with local community organisations; if it is planned for the whole school, reflects “accepted good practice in health education and PSD” and “national and local authority guidelines”, and takes account of young people’s experiences, knowledge and views. They also state that teachers “will always be” the main deliverers of drug education, but that external contributors may be used subject to their meeting various criteria, including being ‘refereed’ by experts and drug-free. Under ‘Content and Delivery’, they suggest that schools “consider the use of peer education and other innovative approaches”; they also suggest that drug education provide opportunities to consider and discuss “concepts and opinions”, explore “perceptions and attitudes”, consider and develop personal attitudes and values, assess risk, and practise skills “such as problem-solving, decision-making and assertiveness”.

To what extent, then, does guidance on drug education in Scotland reflect the evidence base examined in the preceding two sections? Table 4.1 below summarises key conclusions regarding effectiveness drawn from Section 3, and compares them with official guidance statements.

Table 4.1: Extent of agreement between evidence and guidance

Evidence-based findings	Guidance recommendations	Extent of agreement
Interactive programmes are more effective than non-interactive programmes	Interactive methods are recommended, but the weight of evidence behind this recommendation is not stated, ie. that interactive methods are consistently more effective and non-interactive methods consistently less effective.	Agreement, but basis in evidence could be made more explicit.
Information and Affective approaches are less effective	Implicitly covered in statements emphasising the importance of skills as well as knowledge, values and attitudes, but it is not stated that information-only and affective-only approaches have proven to be ineffective and should be avoided.	Partial agreement. Again, basis in evidence could be made more explicit.
Life skills, social influences, resistance skills and normative education approaches are effective	Not explicitly addressed in Scottish guidance, which simply states that drug education should recognise peer, media and social influences on health. Normative education and resistance skills are not mentioned. DfES guidance (see text below table) explicitly recommends resistance skills and normative education.	Limited agreement.
Multi-component and environmental/system-wide approaches are promising.	Recognised in the emphasis placed on school policy on substance misuse, on a consistent school approach to drugs, and on involving parents. Strongly recognised in the endorsement of the whole school approach to health. However, other elements of community and multi-component interventions, such as media, are not mentioned, nor are environmental strategies such as classroom management (although they are potentially implied in the health promoting schools approach).	Agreement
No clear consensus on who should deliver drug education, but evidence that peer involvement is desirable	Assumes that the main deliverers of drug education will be teachers, with input from external contributors. Peer involvement is not explicitly recommended.	Partial agreement.
No clear consensus on duration and intensity of drug education.	No explicit recommendations regarding the amount of curriculum time or number of sessions which should be spent on drug education.	Agreement in that no firm recommendation emerges from the evidence base.
No clear consensus on whether drug education is more	No specific recommendation but a generic approach is implied. DfES guidance recommends	Agreement in that no firm recommendation

effective if substances are addresses singly or in a generic programme.	that all substances are addressed in an integrated programme.	emerges from the evidence base.
Evidence that drug education can be effective at both primary and secondary ages.	Guidance recommends drug education continuity and progression throughout primary and secondary school.	Agreement.
Drug education is likely to be more effective where programmes are relevant to students and culturally appropriate.	Drug education should be based on assessment of pupil needs and responsive to different abilities.	Agreement.

It is clear from the table that there are many areas of agreement between the evidence and official guidance, although the guidance largely fails to emphasise the weight of evidence behind particular recommendations. For example, it is suggested that teachers use interactive methods but is not clearly stated that the effectiveness and superiority of interactive over more conventional teaching methods have been proved in drug education. On questions of duration, delivery personnel, focus and age/grade level, there is no strong consensus in the evidence base, therefore the official guidance might be considered appropriate in that it does not make explicit recommendations.

Much of the Scottish guidance concerns the process and organisation of drug education in schools. For example, it is recommended that each school has one named coordinator in each school for health education, and several of the recommendations both for health education in general and for drug education in particular concern schools' working relationship with outside bodies. These aspects of drug education tend not to have been examined in reviews, which have been largely concerned with outcomes rather than processes. However, the weight of evidence suggesting that better implemented drug education programmes are more effective supports the emphasis placed in the guidance on organisational processes and support for drug education.

The question of whether drug education should teach about substances **separately or in generic programmes**, is not explicitly addressed in Scottish guidance. As section 3 has shown, the evidence itself is unclear on this point, therefore a definitive recommendation may not be advisable (however, the DfES guidance for England (DfES 2004) recommends that *"specific drugs are not considered in isolation but integrated within an overall programme"*). However, acknowledgment of the potentially different aims and message for different substances might be expected: for example, to what extent should schools communicate harm reduction as opposed to prevention messages for certain substances, particularly alcohol? The DfES guidance touches on this in making explicit the different policy goals, at Government level, surrounding different substances to be covered in school drug education. A harm reduction approach is recommended for alcohol (*"educating people about the effects of alcohol and how to reduce alcohol-related harm"*). Alcohol education should begin in primary school and be revisited as pupils mature. For tobacco, the aims are more explicitly focused on prevalence reduction (*"help pupils not to take up smoking and supporting those who want to stop"*). The guidance does not explicitly commend either prevention or reduction for cannabis, instead stating that schools should *"reinforce ... that cannabis is harmful to health and ... that possession remains a criminal offence"*. For VSAs, the guidance recommends *"the same approach ... as for other drugs"*: education about risks and effects and sources of help. Specific aims are not listed for Class A drugs, although the DfES guidance notes that primary school pupils should be taught safety in relation to drugs

paraphernalia, and that at older ages the link with crime and the effects on the community should be emphasised.

Where this is least consistency between the evidence base and guidance is in relation to drug education **theory and content**. Other than in noting that peer, media and social influences on health should be recognised, the guidance makes no explicit reference to approaches based on social influences, resistance skills or normative education, and to their proven superiority over other drug education approaches. There is little recognition that different theoretical approaches to drug education exist and have been tested over many decades, resulting in a degree of consensus over which approaches work and which should be avoided.

This contrasts somewhat with the DfES guidance for England, which recommends the inclusion of resistance skills (under skills) and of normative education (under both knowledge - "*prevalence and acceptability of drug use among peers*" - and under attitudes - "*explore media and social influences*"), the two key approaches identified as effective in drug education research (see previous section). However, it does not attach particular emphasis or importance to these, giving equal emphasis to, for example, communication and coping skills, self-esteem, and attitude exploration. The DfES guidance alludes to the evidence base, stating that "*Research shows that certain models of drug education can achieve modest reductions in the consumption of cannabis, alcohol and tobacco*". These "*models*" are not subsequently defined, although the guidance goes on to recommend that, from international evidence, effective drug education programmes:

- address knowledge, skills and attitudes.
- provide developmentally appropriate and culturally sensitive information.
- Challenge misconceptions about peer drug norms. Here the guidance specifically refers to 'normative education', and notes that many young people overestimate peer prevalence.
- use interactive teaching techniques.
- involve parents/carers.

Neither English nor Scottish guidance **endorses specific drug education programmes**, although a range of programmes available for schools to use is listed in some of the guidance documents as well as on teacher websites. This is in stark contrast to the USA, where many of the major governmental, health and drug prevention campaigning bodies have developed their own endorsement and grading schemes to help school administrators and others identify the most effective programmes. The Substance Abuse and Mental Health Administration, part of the US Dept of Health and Human Services, has identified a number of 'Model Programs'. A guide to each programme (<http://modelprograms.samhsa.gov/>) has been developed, outlining its content, target population, required resources, implementation, and evidence of its effectiveness. Similar endorsement schemes are overseen by the US Dept of Education, the Centers for Disease Control, the White House Office of National Drug Control Policy, the National Middle School Association and many other national, state and academic bodies (see Petrosino 2003 for a useful summary). In part, this reflects different culture and practices between UK and USA – structured intensive packages are far more widely used in the USA, and are often aggressively marketed to schools (with the result that the most widely used programmes may not always be the ones for which there is the strongest evidence, but rather which are supported by the strongest promotional activity [Dusenbury & Falco 1997]). The official guides provide a more objective system for assessing the various claims, and help school administrators make more informed choices of materials. The proliferation of

such guides in the USA may also reflect a stronger and longer-established evidence culture in prevention. Such an evidence-based culture is growing in the UK, with Cochrane and NHS HTA reviews of health promotion in schools having been recently conducted, but there appears to be a reluctance to endorse (or indeed reject) specific school programmes on the grounds of proven effectiveness.

4.2 Drug education practice

This section examines what is known about current drug education provision in Scotland, and the extent to which it reflects both official recommendations and the evidence base.

Extent of provision

The fourth annual survey on drug education in schools in Scotland (Scottish Executive National Statistics 2003) found that, in 2002/3, 99% of schools provided drug education (99% of primary and all secondary schools). All schools covered alcohol and tobacco, and 99% covered solvents, controlled drugs and safe use of medicine. The proportions were slightly lower in special schools, 99% and 97% respectively.

Overall, 94% of schools' drug education was classified as "in line with current national advice", defined as meeting all the following criteria:

- Drug education is provided to every pupil and provides pupils with continuity and progression in their learning.
- It must also include education for all of the following areas: safe use of medicine, alcohol, tobacco, solvents and controlled drugs.
- All drug education has to take account of the age, stage and maturity of the children involved
- It is accepted that education on controlled drugs may not be appropriate until later in primary school (ie. P4 onwards).

Among local authority schools, compliance with national criteria was 95%, compared with 78% among other schools. Primary schools had slightly higher compliance with national criteria than secondary schools (95% and 93% respectively); special schools' compliance was 89%.

There was variation between local authorities, with 80% or fewer of Highland, Midlothian and Stirling schools providing drug education in line with national advice compared with 90-100% of schools in other local authorities.

Over half, 56%, of the schools which provided drug education had revised their programme less than 2 years before the survey. Two fifths had last revised it between 2 and 5 years ago, and 4% more than that.

Nature of provision

A study of drug education in Scottish schools between 1996 and 1999 examined, among other issues, its content and style as reported by schools (Lowden & Powney 2000). The

study states (although no data are presented) that *“the personal life skills approach dominates with the main aims being to provide pupils with key social skills and abilities to use information about drugs and promote decision-making skills concerning health”* (p.9). It goes on to state that *“there is no great variance or range of discrete approaches in drug education in Scottish schools which can easily be compared. Primary and secondary schools are using remarkably similar resources within a life-skills framework, interpreted by schools as providing accurate information and facilitating informed decision-making”* (p.9). Information provision and the promotion of decision-making skills are perceived by “almost all the schools” as the aims of drug education in school. It is not clear whether it is the study’s authors, or the schools, who define this approach as life skills. The survey does not appear to examine schools’ awareness or understanding of other approaches to drug education, or the extent to which they are aware of key elements associated with effectiveness such as interactivity.

In a summary of the same study (SEED 2000), Lowden and Powney describe the dominant drug education approach in Scotland as “an evolution of the life-skills approach” whose *“underlying philosophy...stresses self-esteem and empowerment as central to health promotion”* (p.5). They also suggest that most schools’ drug education was “resource driven rather than based on clear theories or approaches” (p.6). Again, the basis for this conclusion is unclear, as it is not evident that teachers were asked about their awareness and understanding of different approaches. A question on perceived training needs found that over half requested regular inservice updates on effective drug education and methods, suggesting a need for greater awareness in this area.

Who delivers drug education in schools

The 1996-1999 Lowden and Powney (2000) survey examined who provides drug education in schools. External personnel play a substantial role in delivering drug education: 38% of secondary schools (45% of primary schools) use local authority personnel to provide parts of drug education, 37% use local drug agencies (22% of primary schools), and 30% use nurses or doctors (21% of primary schools). By far the most common external provider is the police: 71% of secondary schools and 68% of primary schools use the police to deliver part of drug education in the classroom.

Programmes used in schools

The 1996-1999 Lowden and Powney survey reported the range of programmes and resources used in schools. In both primary and secondary schools, the most common choice of resource was a mix of resources customised from Drugwise, TACADE and materials developed in-house (25% of primary schools and 35% of secondary schools). TACADE materials (unspecified) and Drugwise (‘First’, ‘too’ and ‘Drugfree’) were used in both schools, to a lesser degree (between 6 and 16%); in primary schools the Police Box was also used, in 8% of schools. A range of other resources were reported including local health promotion materials, videos, It’s my Life, Skills for Adolescence and Leah Betts-related materials.

The main criterion for selecting resources, according to schools, was perceived suitability for pupils’ needs and abilities, followed by availability, ‘concern over local drug situation’ and recommendation by local authority.

Aims and approach

A qualitative study by Fitzgerald (2003) examined in more depth the actual nature of drug education in Scottish schools and teachers' perceptions of its aims and approach. Qualitative interviews were conducted with 13 respondents in 9 Grampian schools, following which an indepth case study was conducted in one school, comprising lesson observation, focus group interviews with pupils and interviews with school staff.

The study found that very few of the schools had developed their own written drug policy on drug education, reporting that they planned their drug education on the basis of existing guidelines and therefore an inhouse written policy was unnecessary. However, national guidelines were rarely mentioned, and *"in the absence of clear direction in relation to goals and key messages, confusion was widespread among teaching staff particularly in relation to difficult issues such as harm reduction"* (Fitzgerald 2003, p.4). The drug education curriculum tended to evolve unsystematically – for example, in response to a new resource becoming available, or to practical issues such as staffing. There was little involvement of pupils, parents or the community in drug education planning, and uncertainty among schools as to the value of involving these groups.

The core message of drug education was most commonly described by schools as promoting informed choice by supplying pupils with drug information "so that they could make their own choices" (p.5). Staff appeared to be aware that a 'just say no' approach would not work, but, in Fitzgerald's view, frequently provided information and messages designed specifically to support the decision not to use drugs, and sometimes used materials adopting a "scare tactics" approach. From lesson observation it was apparent that many lessons involved a low level of interactivity, relying on teacher-led discussion, worksheets, and videos, although small groupwork and class discussion were also evident.

In conclusion, Fitzgerald reports that the quality of drug education observed in the study "was considerably below best practice as defined by the research literature and current national guidelines" (p.6).

Does practice reflect official guidance and the evidence base?

From the limited number of Scottish studies to date, it is possible to assess only to a limited extent whether practice reflects official guidance and evidence. To the extent that the guidance recommends that all schools provide drug education and that this should be continuous throughout pupils' learning career, practice is in line with guidance: both primary and secondary schools do so. There is a high level of coverage of all the substances recommended in official guidance, medicines, alcohol, tobacco, solvents and controlled drugs.

Assessing the match between guidance and approach is difficult. Schools are described by Lowden and Powney (2000) as perceiving the aims of drug education to be information provision and the promotion of decision-making skills and self-esteem, although it is not clear on what this is based.

As Section 3 has demonstrated, there is limited evidence that self-esteem approaches are theoretically valid or effective. There is slightly stronger evidence for the usefulness of decision-making skills in drug education; however, it is notable that these seems to be limited awareness of the social influences approach, and particularly normative education, at school level.

Other UK studies suggest similar limited awareness of drug education theory, and indeed an uncertainty about its aims. Allott and Paxton (2000), in a small scale English survey, found that although teachers agreed that young people should be encouraged to make their own informed decisions about drugs, 42% of them were uncertain whether encouraging choice might encourage experimentation. This ambivalence may indicate a scepticism about drug education generally, or it might indicate that insufficient attention has been paid to articulating to teachers precisely how the concept of informed choice – a principle of drug education in most UK guidance – relates to drug use prevention goals. (Of course, there is a fundamental inherent tension in any drugs education which emphasises informed choice and personal responsibility for decision making but which is predicated on the notion that the choice not to take drugs is more desirable than the choice to take drugs (Hastings et al 2002). This tension is rarely acknowledged, let alone discussed and disentangled, in official guidance documents). Other studies suggest that even where a school has developed or brought in a specific drugs education programme, staff may differ in their ability to articulate the philosophy underpinning the programme (Bishop et al 2001).

It is important to contextualise findings which suggest a mismatch between drug education and drug education practice. The evidence base examined in Sections 2 and 3 derives almost exclusively from studies of individual, often highly structured programmes delivered in a relatively tightly controlled manner. In other words, the effects which have been found have been produced in a climate which bears little resemblance to how drug education is usually taught. Outwith the rigorous demands and heightened attention conferred by an intervention trial, schools' 'normal' drug education practice is likely to be substantially different in content, consistency and delivery quality compared with that reported in trials (Dusenbury et al 2003). Indeed, even in rigorous intervention studies, implementation of the evaluated programmes often falls below the ideal (Stead & Angus 2002); the discrepancy in 'real life' is likely to be even greater.

This discrepancy is not limited to Scotland or the UK, as several north American studies have shown. Gottfredson & Gottfredson (2002), in a study of normal school drug education practice, found that by no means all schools used programmes found in research to be effective. Even where schools did use an effective programme, they implemented them in an inconsistent and incomplete way. Similarly, Hansen & McNeal's (1999) observational study of drug education in practice found that even where evidence-based content such as social skills training and normative education was taught in observed lessons, it formed a very small part of the total drug education time. Ennett et al (2003) found, also in a study of normal drug education practice, that while most teachers used content found in research to be effective, less than a fifth used delivery *methods* found to be effective. They conclude that the transfer of research evidence to actual practice has been limited. This appears to be particularly the case with the highly interactive methods required for drug education to be effective (Bosworth & Sailes 1993).

In other words, the evidence base reflects an ideal, 'high fidelity', drug education delivered in the artificial context of controlled intervention studies. Nevertheless, the fact that the reality of drug education often falls short of the standards which evidence suggests it *can* attain does not mean that attempting to close the gap between evidence and practice is not worthwhile.

Some of the reasons for this gap have been explored in studies which have examined the process of drug education delivery in schools. Lack of confidence and skills in drugs issues have been identified as a major factor influencing teachers' delivery of drug education in

schools (eg. Allott & Paxton 2000, Bishop et al 2001, Miller & MacGilchrist 1996). Perceived lack of confidence and skills is particularly likely to create anxiety about using highly interactive methods such as role play (eg. Phelps et al 1994). Discomfort or unfamiliarity with recommended strategies may lead teachers to abandon them in favour of more usual non-interactive methods (Bosworth & Sailes 1993).

Delivery of drug prevention programmes is also influenced by teachers' perceptions of the purpose and nature of drug education (Fitzgerald et al 2002). A recommended programme is more likely to be appropriately implemented where it 'fits' the current beliefs and style of a teacher (Buston et al 2002). The more effective drug education programmes, with their derivation from behaviour theory and emphasis on experiential, peer-led and skills-based teaching, may represent a departure for some teachers from their usual teaching mode or their expectations of 'health education' (Perry et al 1990, Piper et al 1993, Dewit et al 1996). In schools, the use of theoretical models and evidence-based programmes may take second place to commonsense, everyday knowledge grounded in experience (MacDonald & Green 2001). Programmes which are perceived as compatible with, and helping to advance, the school's ethos and goals are more likely to be supported and implemented (Perry et al 1997).

These factors highlight the importance of communicating to schools not only that there is a strong evidence base in drug education – ie. that some approaches and programmes are more effective than others – but also *why* this is the case: ie. the ways in which they work. Teachers may be more receptive to adopting evidence-based practice if the rationale for concepts such as interactivity and social influences is better understood, and their value is demonstrated. Findings suggesting that teachers continue to lack confidence in interactive methods underlines the importance of training, not only in the delivery of specific drug education programmes but also more generally in the use of these methods across the curriculum.

5 INDICATORS AND RECOMMENDATIONS FOR EFFECTIVE DRUG EDUCATION

This final section of the review identifies a series of indicators and recommendations for effective drug education. The indicators derive directly from the systematic review evidence examined in Sections 2 and 3. The recommendations emerge from Section 4's examination of current guidance and practice in drug education.

Evidence-based indicators

1. Drug education should be highly interactive. Interactive delivery is a proven feature of effective drug education programmes. Non-interactively delivered programmes are consistently less effective.
2. Drug education should include but should not rely solely on information provision.
3. Drug education should not rely solely on 'affective' approaches designed to boost self-esteem and generic social competence. Whatever their other potentially positive effects, these approaches have proven consistently to be less effective at reducing substance use.
4. Drug education should include life skills elements, but not without the social influences elements listed below.
5. Drug education should be based on a social influences approach, specifically including resistance skills and normative education elements. Programmes based on these approaches have proven consistently to be more effective. Normative education – examining and challenging perceptions of the prevalence and acceptability of drug use – in particular is a significant mediator of programme effectiveness.
6. Drug education programmes which are part of multi-component and 'environmental' programmes are likely to be more effective than those delivered in isolation. Environmental approaches such as improved classroom management and alternative groupings of pupils are promising approaches, as are whole school/health promotion school approaches.
7. Peer education approaches should be considered, as peer involvement in drug education programmes is associated with increased effectiveness. Peers, teachers and other professionals can all be effective deliverers of drug education programmes providing they deliver to a high standard and are perceived as credible and trustworthy by students.
8. Drug education programmes should be of a sufficient length to achieve impact; longer programmes may be better than shorter programmes, but it is not entirely clear.
9. Both generic programmes (addressing all drugs) and single-drug programmes can be effective. If generic programmes are implemented, care needs to be taken to ensure that messages about the effects and risks of different drugs do not cause confusion or give the impression that because some drugs are particularly risky, others are safe.

10. Drug education should be delivered in both primary and secondary schools. There is no evidence to suggest that it is more effective at older or younger ages, although clearly the objectives and content should be age-specific.
11. Drug education should be relevant and socially and culturally specific to the targeted population.
12. Drug education programmes should be delivered to as high a quality as possible, recognising that the optimum delivery conditions which usually apply during an experimental trial are unlikely to apply during 'real world' delivery. It is difficult to specify what delivery quality standard should be attained – it is likely to vary for different programmes and in different contexts. Nonetheless, better results are generally obtained when programmes are delivered to a higher quality.

Recommendations

1. Official guidance should emphasise the importance of using evidence-based approaches in drug education. Misconceptions about the value of certain approaches should be corrected. Schools should be discouraged from using approaches which evidence has found to be ineffective and strongly encouraged to use approaches which have been found to be effective. The reasons for the greater efficacy of these approaches – for example, their theoretical basis and 'active ingredients' - should be clearly communicated.
2. Consideration should be given to developing a list of recommended effective programmes. Programmes and materials included on the list should have been thoroughly evaluated or, *at the very least*, have been designed following evidence-based recommendations regarding approach, content and delivery style. Claims made by programme designers that their programmes are effective and evidence-based should not be taken on trust but verified independently.
3. National and local guidance needs to focus strongly on improving quality and consistency in drug education practice. Training and other support is needed to boost teachers' confidence and skills in using the types of interactive methods required for drug education programmes to be effective.
4. More research is needed to investigate the possibility that drug education is less effective at influencing alcohol use than use of tobacco and other drugs. More realistic harm reduction rather than prevention goals should be adopted for alcohol programmes.

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