DOCUMENT RESUME

ED 287 864 TM 870 572

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TITLE Evaluating Tobacco Education Programs for Youth: Distinctions between In-School and Out-of-School Designs.
PUB DATE Oct 86
NOTE 26p.; Paper presented at the Annual Meeting of the American Evaluation Association (Kansas City, MO, October 29-November 1, 1986).
PUB TYPE Speeches/Conference Papers (150) -- Reports - Evaluative/Feasibility (142)

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS Adolescents; Case Studies; Community Programs; Elementary Secondary Education; *Evaluation Methods; Health Education; *Nonschool Educational Programs; Preadolescents; Prevention; Program Effectiveness; *Program Evaluation; School Activities; *Tobacco; *Youth Clubs
IDENTIFIERS *4 H Programs; *Smokeless Tobacco

ABSTRACT

The evolution of health education programs aimed at reducing the use of tobacco is discussed, and out-of-school educational programs are compared with in-school programs. Further, methodological differences in program evaluations were considered. Out-of-school programs are defined as involving several dimensions not found in schools: (1) goals and objectives; (2) nature of activities--experiential, educational, recreational, or unstructured; (3) structure or schedule of meetings--camps, daily, weekly, or monthly; (4) leaders--volunteer parents or coaches; and (5) range of ages, and other characteristics of youth clientele. Discussion of the out-of-school groups is limited to such groups as 4-H, Boy Scouts, Girl Scouts, Campfire, Boys' Clubs, and YMCA programs. Three elements in the design of in- and out-of-school projects are compared: unit of analysis (group versus individual); generalizability of the study; and potential for treatment contamination. The on-going case study, Project 4-Health, is described, as are the project's three phases: assessing the use of smokeless tobacco in 4-H youth in California; developing and field testing programs about tobacco and smokeless tobacco; and follow-up. (MGD)

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EVALUATING TOBACCO EDUCATION PROGRAMS FOR YOUTH: DISTINCTIONS BETWEEN IN-SCHOOL AND OUT-OF-SCHOOL DESIGNS

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Paper presented at the annual conference of the

American Evaluation Association

Kansas City, October 1986

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EVALUATING TOBACCO EDUCATION PROGRAMS FOR YOUTH: DISTINCTIONS BETWEEN IN-SCHOOL AND OUT-OF-SCHOOL DESIGNS

School-based health education programs aimed at reducing tobacco use have undergone considerable advances in the past decade, in terms of both program content (D'Onofrio et al., 1982; Flay, 1985; Janicki & Braverman, 1985) and the methodology of evaluation (Biglan & Ary, 1985; Flay & Best, 1982). Within that time, researchers have become increasingly sophisticated about the advantages and disadvantages of the school as the site for program delivery (Cook, 1985; Kreuter & Reagan, 1980).

The school will undoubtedly continue to be a major, if not predominant, setting for delivery of innovative programs aimed at reducing tobacco use, but the importance of the community is increasingly recognized by researchers and program developers. It is becoming more common for health education program developers to incorporate program components outside the school setting (e.g., Burke et al., in press; Johnson & Solis, 1983; Perry & Jessor, 1985). In addition, growing attention is focusing on the possibilities inherent in delivering programs through organizations that are outside of schools entirely. These programs present a pattern of strengths and problems that do not parallel those found in schools.

This paper presents an analysis of programmatic issues relevant to the in-school/out-of-school (IS/OS) dimension. It begins by clarifying the characteristics of OS programs and organizations. Following this, two main families of issues are considered. First are the potential differences in program design that are made possible by the two delivery contexts. The program evaluator needs to address

these variables specifically, to build an understanding of the relative efficacy of education delivered within these contexts. The second group of issues involve the methodological differences created by the program evaluations themselves; as will be seen, there are differing possibilities available for the evaluation designs in each of the settings. Following this discussion, we will describe our experiences with a research and program development project aimed at understanding and reducing the use of smokeless tobacco, currently being implemented with the 4-H youth program in California.

Out-of-School Program Settings

The delivery of a tobacco education program in an out-of-school setting will generally involve an organization that provides structured activities during young people's time out of school. Such organizations vary widely in their mission, clientele, and structure. Educational programs might be only incidental to other activities. Several dimensions can be identified that can serve to differentiate such programs.

The goals and objectives of the program are perhaps the most basic descriptive factor. Several programs exist which have as their primary aim the provision of educational and social/developmental experiences. Many other programs focus on sports activities for young people, with baseball, football and soccer being among the most widely known. Other goals include religious education, pursuit of a particular hobby or interest, etc. The overall goal will have strong influence on the nature of activities, which might be experiential,

educational, recreational, unstructured, or a combination of these.

The structure of meetings or scheduled operation is another important dimension. Health education programs could conceivably be delivered in summer sleepaway camps, day camps, daily afterschool (or "latchkey") programs, or programs with regular meetings through the school year.

The nature of the leadership or staffing is another feature distinguishing program types. Almost all programs rely to some degree on parents and other community-based adults, but the programs' dependence on underlying professional organizational elements will vary. Whether or not volunteer staffers require special skills (e.g., as athletic coaches, musicians, etc.) will also vary across organizations.

The age and other characteristics of the youth clientele is another important feature. The ages served might be any combination between elementary school and late adolescence. In addition, specific subgroups may be served, such as gifted children, children from families of a particular religious affiliation, or children experiencing difficulties at home.

Clearly, the range of possibilities is very large, and no analysis that treats out-of-school programs unidimensionally will suffice. We will limit the present discussion to youth organizations having educational and social/developmental goals. Examples of this type of organization are 4-H, Boy Scouts, Girl Scouts, Campfire, Boys' Clubs, and YMCA programs. They are characterized by: (a) regular meetings, ranging from once a week to once a month, and often operating in concert with the school year; (b) strong reliance on parents and other community adults for program operation and local

leadership; and (c) the availability of educational projects for members to choose, according to their interests, and leading to supervised achievement-related activities.

Furthermore, we will limit our consideration to organizations that reflect some central administrative coordination beyond the local delivery site, such as a regional or national office. This focus is important for several reasons. First, the coordination of program delivery to a multiplicity of sites for program field-testing will be more feasible with some centralized mechanism for communication and other administrative support. Second, such organizations provide the most promise for widespread dissemination of a program once it has been field-tested.

These guidelines to our discussion are provided primarily to focus and clarify the analysis. Other kinds of youth organizations also provide promise for program delivery, and should be explored in further work.

We now turn to a consideration of differences between the in-school and out-of-school formats in the areas of program design and evaluation. A summary of these issues is provided in Tables 1 and 2.

Program Design Differences

Age groupings of youth

Most youth organizations incorporate a broader mix of ages than is found within school grades. Placing youth of different ages together into a learning environment can add a richness to the experience that is based on well-known advantages of cross-age

learning experiences (e.g., Slavin, 1980). The younger members can participate in the curriculum alongside older role models, which provides the potential for increased motivation, and, through modeling mechanisms, the acquisition of social skills. The older youth, for their part, can have the opportunity to lead discussions and tutor the younger children in areas related to acquisition of knowledge and understanding. Allen (1976) and Devin-Sheehan et al. (1976) have shown that peer and cross-age tutoring provides significant instructional benefits for the tutor. To make optimal use of this situation, interventions should be designed to provide ample opportunity for youth to interact with each other. Some instructional time should be allocated for small-group discussion and other discovery-oriented activities, performed in grouping arrangements reflecting a diversity of ages.

Use of volunteers to teach sessions

There is some debate about the use of peers vs. adults to teach program sessions (Janicki & Braverman, 1986). Since the IS/OS programmatic differences are most substantial for the case of adult-led instruction, the present discussion will focus on that condition.

Many OS programs make significant use of volunteers for program leadership, and probably could not exist without the active support of volunteers based locally in the community. For health programs delivered in this setting, it may be possible, and in some cases essential, to tap some of that support for instructional delivery of the educational treatment. By contrast, schools often have low participation by parents; the teaching of the intervention sessions is typically done either by the program developers or by teachers.

The possibility of using volunteers in local programs presents both promise and pitfalls for program designers. One of the most significant advantages is that, almost by definition, this strategy involves the community and increases the probability that the program will remain after the research ends. Another large advantage is the opportunity to get parents intimately involved in the delivery of information; this could reduce the possibility of conflicting environments at the program delivery site and in the home. Furthermore, if volunteers can be used successfully, the cost-effectiveness of the program is greatly enhanced.

The most significant pitfall of using volunteers may be the quality of instruction. Many program leaders are not trained in pedagogy, and their instructional expertise would probably be lower than that of teachers. (Interestingly, our experience with 4-H is that many of the local club leaders are professional teachers, but we have not conducted a systematic survey of leaders' occupations to gauge to extent of this overlap). This places substantial importance on the quality of training conducted prior to program implementation. In addition, evaluartors need to pay special attention to monitoring the fidelity of treatment implementation.

Restrictions in time and schedule

The limited time that OS programs typically have for meetings is a large consideration in the planning of programs. Meetings might be once a week, or once a month, and a health education program must conform to that timeline. Furthermore, the time that is available during meetings must accommodate the organization's regular activities as well as any added special programs.

Schools, by contrast, can generally accommodate various schedule formats, and the available time allows for much more flexibility. A program can be delivered for an hour a day over a period of one or two weeks, or once a week, etc. On the other hand, a school district might place a low priority on a special health education program, and in these cases the reservation of necessary time might not be easier than in the OS setting. Thus, on this point a distinction must be drawn between the ability of a district to accommodate program needs, and its willingness to do so.

The time restrictions that often arise with OS programs force a reconsideration of the use of time. Whereas a health program intended for school delivery can, with some confidence, place most priority on instructional considerations when determining the scheduling structure of sessions, the OS program must more frequently be structured to accommodate the organization's schedule. In many cases that will mean relatively infrequent meetings and, possibly, limited time at those meetings (e.g., 1/2 hour - 1 hour). The implications of this contingency have not been explored. The delivery of sessions at infrequent intervals for several weeks or months may be less successful at effecting change in attitudes and behaviors than frequent meetings for a shorter period of time (e.g., daily for a week). Clarification on this point will be provided by further research. This point may potentially be the most important shortcoming of the OS format.

Parent involvement

A program conducted at the local neighborhood level usually

relies heavily on parental leadership. Furthermore, even those parents who are not involved in the instruction of youth or in program administration are often involved in several supportive ways, such as providing transportation to meetings and field trips, giving input on program objectives, or observing meetings. Thus, the potential for parent involvement is very strong.

In addition, in OS organizations parents will perform a more significant "gatekeeper" function with relation to the introduction of the program at all. It is unlikely that a local site will allow program implementation before it has taken careful steps to inform parents of the possibility. When it does so, parents may well reject the program; on the other hand, if they accept it their level of awareness and support during its implementation may be substantial.

In schools, on the other hand, most parents tend not to be involved, and are typically not available for an interactive role while the instruction is going on. Kreuter and Reagan (1980) point out that the lack of community commitment is one of the biggest problems facing efforts to change health-related behaviors through school-based strategies.

An important consequence of parental awareness is that it may then be easier to gain their assistance in creating a home environment consistent with the objectives of the program, e.g., engaging in home discussions, or limiting their own smoking at home.

Potential for dissemination

A persistent problem with school-based health education programs is that the potential for program dissemination, once a program has been field-tested in a district, is low. Experience shows that the

district may or may not repeat the program in subsequent years. More significantly, however, other districts are usually slow to adopt these programs. The reasons for this problem include limited channels for communication between school districts, difficulties in acquiring necessary teacher training, and the difficulties inherent in revising programs to suit local needs. For instance, a new district may be interested in a smoking prevention program, but desire revisions based on a different intended age group or differences in available instructional time. For these reasons, regional and federal supports, such as the Joint Dissemination Review Panel, have been developed.

In the OS setting, additional channels for program dissemination become available. One such channel is through the other local units within a state or region. Using the 4-H program as an example, it is common for staff to exchange ideas and program plans across counties. Another important potential audience is program units within other states. Again, the centralized administrative function of an organization can be a facilitating factor in this process. Finally, some potential may exist for program adoption in other forms, within the community in which it was field-tested.

EVALUATION DESIGN DIFFERENCES

Unit of analysis

Many researchers have argued in recent years that the analysis unit most statistically consistent with group instruction designs is the treatment unit itself, e.g.. classrooms for school-based projects. The use of the actual intact groups receiving treatment is more

appropriate than the use of individuals within those groups for two well-known reasons (e.g., Glass & Stanley, 1970). First, true experimental procedure requires that one use in statistical analysis only those units which have been randomly assigned (i.e., instructional groupings and not students within those groupings, unless students have been randomly assigned to groups); this provides maximum integrity and interpretability for the tests of Type I errors. Second, local history within a group can affect post-treatment scores such that the scores of students within a group are not truly independent observations.

However, school-based approaches often include only a handful of classrooms. This has influenced experimental options such that a true experimental design has been the exception rather than the rule. The tests of most smoking programs thus are classified as quasi-experiments rather than true experiments. Statistical sophistication has advanced to a point where these analyses can provide truly valuable information (Cook & Campbell, 1979), but these designs remain inherently weaker than true experiments in their power to refute competing hypotheses.

Some OS program collaborations could potentially allow for a stronger design in this area. If, for instance, program collaboration has been obtained at a regional or state administative level, there could be a sufficient number of units to allow for the local group to be the unit for both treatment assignment and analysis. In such cases it could be the group mean that is used as the unit score in treatment vs. control comparisons. (This would not preclude quasi-experimental analyses being also done at the individual student level, to examine the effects of person-level variables.)

Generalizability of the studies

If the internal validity of a study is sufficiently strong to allow conclusions about the program's effectiveness, an essential consideration becomes the generalizability of the study to other populations. Every out-of-school program attracts its members on a voluntary basis, and this creates limitations for generalizability. Since these young members were not sampled from a larger population, statistical inferences to the full population based on sampling considerations will not be possible. Thus, generalizability of results will need to be determined by careful examination of characteristics of the sample that did take part in the program.

On the other hand, the superiority of schools on this point should not be overrated (see, e.g., Cook, 1985). Classrooms within a school are often selected for program participation on the basis of self-selection by the teacher. The students in these classrooms do not represent a random sample of the immediate community's youth, especially if tracking or other selective grouping procedures are used. Furthermore, even when schools represent the unit of treatment assignment and analysis, determining the relationship of the sample receiving the program to the district's population is problematic.

An additional point relevant to the IS/OS comparison on the issue of generalizability is that in many cases program field tests in an OS setting will allow for wide geographical divergences. In our own study, for example, we anticipate implementing the program in sites across California, incorporating communities that differ substantially on SES, urbanicity, and prevailing cultural norms. By contrast, IS field tests, while drawing a wider sample from within the immediate

community, are limited in generalizability by the specific characteristics of that community. In recognition of this problem, some programmatic research projects are implementing programs across a range of communities or districts, but this solution is expensive and requires substantial resources. These projects remain the exception rather than the rule.

Furthermore, a program does not necessarily need to be aimed at the full youth population to be useful. A multiplicity of programs tailored for specific settings and audiences may produce population effects which compare favorably to those of a single program delivered to the widest possible audience. Thus, a program that is found to be effective in a particular setting can well be used elsewhere, as long as that setting's defining characteristics are retained as part of the dissemination process.

Potential for treatment contamination

When educational treatment and control programs are delivered to separate classrooms within the same school, there is a strong possibility of treatment contamination. Students in the different treatments may share materials, and may discuss differences between the conditions as well. Teachers in the school might also engage in discussion with each other. An acute awareness of the experiemntal considerations may develop, with attendant possibilities for Hawthorne effects to emerge. If schools are used as the unit of assignment and treatment delivery, this concern is minimized, but most program evaluations thus far have delivered multiple treatments within schools.

The situation is less acute in an OS setting. If treatment is

delivered to the club or other local unit, there is little opportunity for information to be shared across units. While this threat to treatment validity should not be entirely disregarded, since club leaders may meet on occasion, contamination is a far less serious concern than it is within schools.

A CASE STUDY: PROJECT 4-HEALTH

Project 4-Health is a multi-year research project, conducted jointly by the University of California (UC) School of Public Health and the California 4-H program, aimed at reducing the use of smokeless tobacco by youth. The California 4-H program is administered by UC Cooperative Extension. The project is funded by the National Cancer Institute.

The research project, begun in 1986, has three planned phases. Phase I will involve assessing the extent of use of smokeless tobacco in California and, in particular, the 4-H population, as well as building a psychological model of onset and use. Phase II will include the development and field-testing of two separate programs: one devoted to smokeless tobacco and one devoted to all forms of tobacco, including smokeless and cigarettes. These programs will be tested against a control program. Phase III will involve long-term followup of program participants and the study of community dissemination efforts following the program.

Program description. The 4-H program works with youth from 9 to 19 years of age to develop life skills and leadership skills, encourage participation in community affairs, and impart knowledge

from its curriculum subject matter. The 4-H community club is an locally organized group that meets approximately once a month during the academic year. 4-H club members take on subject matter projects. Members in the same project meet in a project club roughly once a week to pursue their project work. The monthly community club meetings generally cover club business, activity planning, and an evening program.

Approximately 40,000 youth participate in 4-H clubs in California, in all but one of the state's 58 counties. Average community club size is about 35 members. Educational experiences are delivered primarily by volunteer adults, who work closely with UC academic staff administering the program. Each county has either 1 or 2 academic staff members known as "Advisors," who establish county program goals, oversee curriculum use, recruit and train volunteer leaders, develop resources, and perform related tasks. In addition, state staff known as "Specialists," based on the UC campuses, provide academic and research support.

Health education programs. Both a smokeless tobacco program and an "integrated" tobacco program are planned for development and field-testing. If the program covering both cigarettes and smokeless products can be effective in reducing tobacco use, it would provide advantages over a smokeless-only program in cost, time efficiency, and, perhaps, the presentation of a balanced perspective on tobacco products. However, the dilution of information that would be necessary to cover the broader subject matter may lessen its potential effectiveness.

The programs will be delivered within the setting of the monthly

community club meeting. Each session will last approximately 30-40 minutes. Development of the programs will be conducted in winter and spring 1987. The programs will be evaluated beginning in October 1987. For the field test, 180 clubs will be recruited (from about 1240 across California), and 60 clubs will be assigned to each of the three treatments (two tobacco programs and one control program). The programs will be taught by 4-H volunteer leaders, previously trained by project staff.

Relevant to the previous discussion, we anticipate that the use of 4-H as a program delivery mode will provide the following advantages:

o Potential for high participant commitment to the project. From participating in the study, community clubs will receive a useful community health project, which could be fit into the ongoing 4-H activities when the formal study ends.

o Increased effectiveness due to multi-aged groupings of youth and the opportunity for family involvement. The broad age-range of 4-H members provides a significant opportunity for the program to incorporate the instructional advantages of cross-age experiences discussed previously.

o High cost-effectiveness, due to volunteer leadership of the educational sessions.

o Organizational decentralization, allowing program implementation across the state. The organizational structure of 4-H, with centralized administrative functions in the UC system and program development activities in local communities, provides an ideal opportunity to use sample sites that are highly diverse with respect

to geography, dominant industries, population concentration, ethnic composition, and other variables that may be relevant to the prevalence of smokeless tobacco use.

o High potential for post-project adoption. The involvement of local 4-H leaders and professional 4-H staff in the development, delivery, and testing of the smokeless tobacco interventions may well create a sense of identification with and ownership of the project. Moreover, since clubs are frequently asked to share their achievements and activities, followup activities are likely to be generated.

o Potential for dissemination to other states. 4-H exists in each of the 50 states, administered by the Cooperative Extension unit of each state's landgrant university. Although the state programs are independent of each other administratively, the communication networks among these programs are strong. Thus, if the present intervention packages are successful in accomplishing their aims, there is a strong potential for immediate, effective adoption by the 4-H program of other states.

o Opportunity for a true experimental design in the programs' evaluation. In comparison many tobacco education studies conducted in schools, the present study has the significant advantage of having a very large number of independent units assigned to each experimental condition. Club means will be used as the statistical unit of analysis. Thus, the study will involve a true experimental design.

Conclusion

While schools will remain a vital and essential delivery mode, the use of out-of-school organizations presents an area of strong

promise. The implications of delivering health education within these two contexts have been, as yet, only minimally examined. We have described and analyzed a number of important issues related to the in-school/out-of-school dimension. We expect that Project 4-Health will prove to be just one of a growing number of explorations in this area.

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TABLE 1

Summary of significant program design differences
between in-school and out-of-school settings

Issue	In-school programs	Out-of-school programs	Analysis
Age groupings of youth	Instruction usually delivered to students within a year of each other in age.	Instruction most likely delivered to the local unit, which would incorporate age ranges dictated by organization policy and enrollment. Probably would involve age range of several years.	Multi-age grouping can be a powerful instructional and motivational device, favoring the OS setting. However, this would require more attention to program design and measurement of variables.
Adult Leadership of sessions	Usually done either by research staff or teachers.	Would probably be done either by research staff or local volunteers.	Use of volunteers would present advantages in the areas of cost of implementation, family involvement, and community awareness. However, controlling the quality and consistency of instruction may present a major challenge.
Scheduling	Can accommodate many variations in scheduling, if the school is willing.	Scheduling restricted to regular meetings or, less likely, special meetings. Successive-day instruction probably not an option.	The greater flexibility that schools have is a distinct advantage. The effectiveness of delivering instruction at widely spaced intervals needs to be demonstrated.
Parent Involvement	Problematic at best, and in many cases non-existent.	Strong potential for parent involvement.	Large advantage to OS programs. Parental involvement can be a powerful contribution to program success.
Potential for dissemination after field-testing	Potential for dissemination is probably low, and might depend on external assistance (eg. federal funding).	Some potential for dissemination to other organizations in the community, to other sites within the organization and to local schools.	Advantage appears to be with the OS programs. The success of these dissemination routes needs to be monitored.

TABLE 2

Summary of significant evaluation design differences between in-school and out-of-school programs

Issue	In-school programs	Out-of-school programs	Analysis
Generalizability of studies to other populations	Assuming implementation is skillful, generalizability is high	Greater potential for geographical diversity of sites within a single field test. However, generalizability will be limited to other populations similar to the organization in question.	Mixed advantages to the two formats. School studies are typically restricted to a limited area, but provide the least sampling bias within that area.
Units of assignment and analysis	Typically, classrooms are assigned to treatment and individuals are measured. Correcting this ~~their~~ weakness can be difficult.	High potential for flexibility in design. Clubs can be used for both assignment and analysis.	Using the same unit provides the ~~es~~ OS format with stronger possibilities for true experimental designs.
Potential for treatment contamination	A significant problem when different treatments are implemented within the same school.	High potential for avoiding contamination.	Significant methodological advantage for the OS format.