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AIDS education: The effect of three instructional methods on retention of changes in knowledge, attitudes, and intention to act

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AIDS EDUCATION: THE EFFECT OF THREE INSTRUCTIONAL METHODS ON RETENTION OF CHANGES IN KNOWLEDGE, ATTITUDES, AND INTENTION TO ACT

A Dissertation

Submitted

In Partial Fulfillment

of the Requirements for the Degree

Doctor of Education

Approved:

Dr. Charles Dedrick, Co-Chair

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May 1994

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ABSTRACT

The purpose of this study was to compare the effectiveness of three instructional methods (unit only, unit plus infusion, and infusion only) for teaching high school students about Acquired Immune Deficiency Syndrome (AIDS). Education, offered consistently and over time, can assist individuals in developing positive health behaviors associated with the prevention of AIDS. Successful implementation of community and school-based education programs can save many lives in the years ahead (Taff, 1987).

Four sections (N = 80) of a health education course were randomly assigned to one of four treatment conditions. The unit only treatment consisted of the presentation of the 4-session, Red Cross WEDGE program taught by a certified AIDS educator. The infusion only treatment consisted of the infusion of AIDS related information into 11 lessons of the regular health curriculum taught by the school's health teacher. The unit plus infusion treatment consisted of both the WEDGE unit and the infusion lessons. The fourth section was a control group that received neither the WEDGE unit or the infusion lessons. All participants completed the AIDS Assessment Instrument for Measuring Student Outcomes (AAIMSO) at three times of testing: before the presentation of the WEDGE unit (pretest), after the presentation of the WEDGE unit

(immediate posttest), and after the 11 week infusion period (delayed posttest). The test yielded a score for each of the following components: knowledge, attitude, and intention to act.

A repeated measures 4 x 3 ANOVA was used to determine if there were differences in scores obtained on the AAIMSO as a function of instructional method, time of testing, and interaction of time of testing and instructional method. Additionally, correlation analyses were performed to examine the pattern of interrelationships among the various components of the AAIMSO.

Results revealed that the correlation coefficients between attitude and knowledge as well as attitude and intention to act were statistically significant (values in the neighborhood of .43). No statistically significant correlations were found between knowledge and intention to act.

On the knowledge component of the AAIMSO, results of the ANOVA revealed a statistically significant main effect for instructional method, a significant time of testing effect, and significant interaction effect. On the attitude component results indicated a significant main effect for time of testing and a significant interaction effect. For the intention to act component no statistically significant effects were found.

From the interaction effects it is inferred that, although at pretest students exhibited high levels of knowledge, the WEDGE unit was effective in increasing students' scores on the knowledge components of the AAIMSO. The WEDGE unit was also effective in fostering more desirable attitudes toward AIDS related issues. The changes observed from pretest to immediate posttest among students receiving the WEDGE unit were maintained over time. The lack of changes observed in the intention to act component could be attributed to initial low risk behaviors as well as the lack of specificity of behaviors assessed by the AAIMSO.

Results showed that the infusion method did not yield significant changes in scores from immediate posttest to delayed posttest. The lack of impact of the infusion only method can be explained by schema theory. The lack of change among the unit plus infusion method might be explained by a ceiling effect on the AAIMSO after receiving the WEDGE unit. The implications of these findings for developing effective school-based AIDS education programs are discussed.

CHAPTER 1

THE PROBLEM AND ITS SETTING

Acquired Immune Deficiency Syndrome (AIDS) and the human immunodeficiency virus (HIV) that causes AIDS have reached epidemic proportions in recent years. June 5, 1993, marked 12 years since the first published report in the United States of what we now know as AIDS. During this time, the number of AIDS deaths has increased each year, from 135 deaths in 1981 to 34,986 in 1992 (Centers for Disease Control and Prevention, 1993). Projections are that the cumulative numbers of deaths from AIDS will approach 400,000 by the end of 1994, and that approximately 1 million Americans are currently infected with the HIV virus (Centers for Disease Control, 1992). The Centers for Disease Control (1988) reported that, because this deadly virus is transmitted almost exclusively by behavior that individuals can modify, educational programs to influence relevant behavior can be effective in preventing the spread of HIV. Popham (1993) stated:

> In the absence of a vaccine or effective medicine, our best hope for dealing with the HIV epidemic is to educate people so that they don't engage in the behaviors that place them at risk of HIV infection. Because HIV is not easily transmitted, properly educated people can readily avoid infection. (p. 559)

The state of Iowa has mandated the inclusion of AIDS Education in the K-12 educational setting through two state mandates. The Human Growth and Development Mandate

requires that school districts provide every elementary and secondary school student, with parental consent, instruction about human immunodeficiency virus infection and acquired immune deficiency syndrome and its prevention (Iowa Legislative Summary, 1988, p. 9). The second state mandate regarding AIDS education, the Health Education Mandate, requires one unit of health education to address twelve components of health including AIDS prevention (Iowa Department of Education, 1991). Each of these mandates require that AIDS education be addressed at the 9-12 level but make no requirements for the amount of instructional time, instructional methods, or program evaluation.

The need for effective AIDS education is clearly evident when examining the number of AIDS cases. The commitment of the Department of Education is evident when examining the state mandates regarding AIDS education. The need for research to determine the most appropriate and effective instructional methods is a challenge for all involved in the education to prevent the spread of AIDS. Not only must educators be concerned about the knowledge that our students obtain, but also about the attitude and behavior changes that take place as a result of AIDS instruction. These outcomes are crucial components in preventing the behaviors that cause AIDS transmission. The problem addressed by this study is the need for effective

AIDS education at the high school level for retention of changes in knowledge, attitudes, and behaviors.

Justification for the Study

Former Surgeon General C. Everett Koop (1986) issued statements to the public addressing his recommendations for AIDS education. He emphasized that the education of young people is a joint responsibility of parents, educators, and community leaders. He stated that "we cannot disregard the responsibility to educate our young. The need is critical and the price of neglect is high" (p. 5).

These statements by former Surgeon General C. Everett Koop typify the concern of AIDS education leaders across the nation. Considering the current statistics, this concern is justifiable. Nationwide, as of September 30, 1993, a total of 339,250 AIDS cases have been reported along with 201,775 AIDS-related deaths (Centers for Disease Control, 1993). Before the year 2000, over a million and a half Americans likely will have died of AIDS. Millions more will have been infected with HIV, the human immunodeficiency virus that causes AIDS (Johnston & Hopkins, 1990).

To put into perspective the large scale of this epidemic, one can consider the statement made by W. James Popham (1993) as he stated:

> If the current HIV epidemic could, by some unimaginable miracle, be totally halted tomorrow, more Americans would still end up dying from AIDS than were killed in Vietnam, Korea, World War II, World War I, and the Civil War combined. In those five conflicts more than 560,000 U.S. military personnel lost their lives. Yet, even by conservative estimates, all but a small percentage of the more than one million currently HIV-infected Americans will die because of AIDS within the next decade. (p. 559)

In 1989, AIDS was the second leading cause of death among U.S. men 25-44 years of age, causing 14% of deaths among men in this age group. AIDS surpasses heart disease, cancer, suicide, and homicide as a cause of death for men in this age group. For women 25-44 years old, AIDS was the sixth leading cause of death in 1989 (Centers for Disease Control, 1992). The American Foundation for AIDS Research (1993) cites the Congressional Select Committee on Children, Youth, and Families' report that indicated a 62% increase within the last two years in the spread of AIDS among teenagers and young adults (ages 13-24). They questioned that, if everyone knows about AIDS, then why are so many of our youth becoming infected with HIV, the virus that causes AIDS? This is a pressing concern of those who work with the prevention of AIDS.

Major strides in our understanding of AIDS have been made since the disease was first diagnosed in 1981. A great deal has been learned about the disease, the methods of transmission, and the methods of prevention. New avenues of research are producing hopeful methods of

treating HIV infection and AIDS. This research offers hope, but there is still no vaccine against AIDS and still no cure for AIDS (Volberding, 1988).

Because there is no cure for AIDS at this time, efforts must be directed toward the prevention of HIV infection. According to Taff (1987), information and education can help in the development of positive health behaviors associated with disease prevention. Schools are in a position to reach large numbers of adolescents with accurate information about AIDS prevention methods to stop the spread of AIDS. Schools are in a position to play a key role in the prevention of AIDS by providing accurate information focused on the exploration of knowledge, attitudes, and behaviors regarding AIDS infection.

Efforts in curriculum development and implementation are being encouraged by many groups including the Centers for Disease Control (CDC) which issued a statement asserting that:

> The nation's public and private schools have both the capacity and responsibility to help assure that young people understand the nature of the AIDS epidemic and the specific actions they can take to prevent HIV infection, especially during their adolescence and young adulthood. (CDC, 1988, p. 2)

The issue of AIDS education is a major national public health concern. The National Council of Chief State School Officers has unanimously adopted a policy urging each state to offer effective education about AIDS that is

scientifically accurate, age appropriate, and reflective of community values to every child in grades K-12 (Taff, 1987).

Schools across the nation are now in the early stages of program development, implementation, and evaluation. Several models of program development and evaluation have been suggested in the literature. The majority of the studies and guidelines recommend that an AIDS education component be a part of a comprehensive school health program. It is also recommended that parental and community involvement is part of the planning and evaluation of the program. Instructional evaluation leading to determinations on program effectiveness is discussed in the literature as a valuable means for finding answers to questions and determining if newly-developed and existing AIDS education programs are actually doing what they are designed to do. According to Fetro (1988), program evaluations can uncover important information that can be used in making decisions about future program directions.

Purpose of the Study

The purpose of this study is to compare the relative effectiveness of three instructional methods for teaching AIDS prevention. To define an effective AIDS education program, current literature on health education models and

research on acquisition and retention of knowledge, attitudes, and behaviors will be briefly summarized to establish a theoretical base. The state mandates regarding AIDS education will be presented to set the context for the inclusion of this curricular content in high school health education programs. To investigate the impact of alternative instructional methods, data will be collected from a sample of 9th-12th grade students enrolled in one of four sections of a required high school health education course.

Because Iowa is one of the states that mandates through the State Department of Education that AIDS education be taught at the high school level, this research can be used to assist planning for effective AIDS education at the state and local level. If it is agreed upon that AIDS is a dangerous threat to our nation's adolescents and that public and private education is a valuable avenue of delivery of AIDS prevention strategies to adolescents, then it is necessary to encourage specific and systematic evaluation of AIDS education instruction. To accomplish this task, research must begin to ask what should be done to provide the most effective delivery of instruction and compare these findings to current classroom practices.

Only with careful examination of instructional practices will alignment with and discrepancies between

theoretical recommendations and classroom practices begin to surface. This study will add to the existing body of knowledge on the subject of effectiveness of AIDS education instruction by comparing the impact of a one unit method, a one unit plus infusion method, an infusion only method, and a control group on the scores obtained on three components (knowledge, attitude, and intention to act) of the AIDS Assessment Instrument for Measuring Student Outcomes (AAIMSO) at three different times of testing (pretest, immediate posttest, and delayed posttest).

Research Questions and Hypotheses

This study looks at the impact of three instructional methods on changes and retention of changes in knowledge, attitudes, and intention to act. To answer the research questions presented here, a 4 x 3 ANOVA with repeated measures over one factor will be used. Instructional Method (one unit only, one unit plus infusion, infusion only, and control group) will be the between subject factor. Time of testing (pretest, immediate posttest, and delayed posttest) will be the within subject factor.

Research Question 1

Are there differences in scores obtained on the knowledge component of the AIDS Assessment Instrument for Measuring Student Outcomes (AAIMSO) as a function of instructional method?

H1: There are differences on scores obtained on the knowledge component of the AAIMSO as a function of instructional method.

Ho: There are no differences on scores obtained on the knowledge component of the AAIMSO as a function of instructional method.

Research Question 2

Are there differences in scores obtained on the knowledge component of the AAIMSO as a function of time of testing?

H1: There are differences on scores obtained on the knowledge component of the AAIMSO as a function of time of testing.

Ho: There are no differences on scores obtained on the knowledge component of the AAIMSO as a function of time of testing.

Research Question 3

Is there an interaction between instructional method and time of testing on the knowledge component of the AAIMSO?

H1: There is an interaction between instructional method and time of testing on the knowledge component of the AAIMSO.

Ho: There is no interaction between instructional method and time of testing on the knowledge component of the AAIMSO.

Research Question 4

Are there differences in scores obtained on the attitude component of the AAIMSO as a function of instructional method?

H1: There are differences in scores obtained on the attitude component of the AAIMSO as a function of instructional method.

Ho: There are no differences in scores obtained on the attitude component of the AAIMSO as a function of instructional method.

Research Question 5

Are there differences in scores obtained on the attitude component of the AAIMSO as a function of time of testing?

H1: There are differences in scores obtained on the attitude component of the AAIMSO as a function of time of testing.

Ho: There are no differences in scores obtained on the attitude component of the AAIMSO as a function of time of testing.

Research Question 6

Is there an interaction between instructional method and time of testing on the attitude component of the AAIMSO?

H1: There is an interaction between instructional method and time of testing on the attitude component of the AAIMSO.

Ho: There is no interaction between instructional method and time of testing on the attitude component of the AAIMSO.

Research Question 7

Are there differences in scores obtained on the intention to act component of the AAIMSO as a function of instructional method?

H1: There are differences in scores obtained on the intention to act component of the AAIMSO as a function of instructional method.

Ho: There are no differences in scores obtained on the intention to act component of the AAIMSO as a function of instructional method.

Research Question 8

Are there differences in scores obtained on the intention to act component of the AAIMSO as a function of time of testing?

H1: There are differences in scores obtained on the intention to act component of the AAIMSO as a function of time of testing.

Ho: There are no differences in scores obtained on the intention to act component of the AAIMSO as a function of time of testing.

Research Question 9

Is there an interaction between instructional method and time of testing on the intention to act component of the AAIMSO?

H1: There is an interaction between instructional method and time of testing on the intention to act component of the AAIMSO.

Ho: There is no interaction between instructional method and time of testing on the intention to act component of the AAIMSO.

Definitions of Terms

For the purpose of this investigation the following research terms will be utilized:

AIDS: Acquired Immune Deficiency Syndrome. A disease caused by a virus known as HIV, in which the body's immune system is seriously damaged, leaving it vulnerable to infections and some rare cancers that ultimately result in death (O'Malley, 1989, p. 9).

Health Education Mandate: Mandate established by Iowa Department of Education requiring one unit of health education at the 9-12 level to include personal health, food and nutrition, environmental health, safety and survival skills, consumer health, family life, human growth and development, substance abuse and nonuse, emotional and social health, health resources, prevention, and control of communicable disease, including sexually transmitted and acquired immune deficiency syndrome (Iowa Department of Education, 1991).

HIV: Human Immunodeficiency Virus. The virus that caused AIDS (O'Malley, 1989, p. 10).

High-Risk Behavior: Those behaviors that increase the chance of harm to one's body including the chance of being infected with the AIDS virus. High-risk behaviors include intravenous drug use and anal intercourse (American Red Cross, 1987).

Human Growth and Development Mandate: Mandate established by the Iowa Department of Education directing the board of directors of each public school to study the provisions for health instruction to pupils in grades kindergarten through 12 and makes recommendations to the board concerning the district's curriculum on each of the following topics of instruction: (a) self-esteem, responsible decision making, personal responsibility, goal

setting; (b) interpersonal relationships; (c) discouragement of premarital adolescent sexual activity; (d) family life and parenting skills; (e) human sexuality, reproduction, contraception, family planning, prenatal development including awareness of mental retardation and its prevention, childbirth, adoption, pre- and postnatal support, and male and female responsibility; (f) sex stereotypes; (g) behaviors to prevent sexual abuse or harassment; (h) sexually transmitted diseases including AIDS and their cause and prevention; (i) substance abuse treatment and prevention; (j) suicide prevention; and (k) stress management (Iowa Department of Education, 1991).

Infusion: The incorporation of one topic into another process (Iowa Department of Education, 1989, p. 24).

Retention: Broadly, remembering or memorizing (Hawes & Hawes, 1982, p. 192).

Assumptions

The following assumptions for this study are acknowledged:

1. Pretest, immediate posttest, and delayed posttests will provide the necessary data to test the hypothesis of this study.

2. The knowledge, attitudes, and intention to act of the students can be determined by the scores on the pretests and posttests.

3. Students will answer honestly to the questions asked.

4. The instructor will present the lesson as requested and keep accurate notes on class proceedings.

Limitations/Delimitations

The following limitations for this study are acknowledged.

1. The study will be done at one high school located in a rural Midwestern state.

2. The participation in the study will be voluntary by teacher and students.

3. The method of instruction will be randomly assigned to an intact class, but random selection of students will not be possible.

4. The same instructor will instruct all classes to help control for confounding factor of instructor that would result from having different instructors deliver the various treatments.

5. The sessions will be audio taped and reviewed by the researcher and one additional certified health education instructor to determine treatment fidelity.

CHAPTER 2

REVIEW OF THE LITERATURE

The review of the literature for this research study is organized into four major sections. First, the theoretical foundation for the development of effective health education programs is discussed. This includes an outline of various health education models and attitude theory discussing the relationship of knowledge to attitudes and behaviors. Second, the literature regarding AIDS and AIDS education will be examined to highlight the need for evaluation studies on the effectiveness of various instructional approaches to AIDS education. This section will summarize the recommendations of various sources regarding AIDS education as well as discuss related research in the area of AIDS education. Third, the literature on learning, memory, and retention will be briefly explored and related to the area of health education. Finally, the mandates dealing with health education in Iowa will be presented and explored as an impetus for research into the most effective instructional methods for presenting AIDS education programs.

Theoretical Foundation for Effective Health Education

Attempts to understand why people engage or do not engage in certain health-related behaviors is an area of concern for many health educators. The theories and models

aimed at understanding these behaviors have become increasingly complex. With the onset of the AIDS epidemic, renewed efforts to study how individuals use knowledge to incorporate health messages into behavior patterns has become an important area of study. Becker and Joseph (1988) contended that reports of AIDS-related knowledge and attitudes generally parallel the pattern of behavioral changes. Anderson et al. (1990) indicated that knowledge about AIDS is related to self-reported decrease in risk behaviors. Examined here are a variety of models and theories that can serve to help understand how exploring knowledge levels of, and attitudes toward, AIDS can effect behavioral changes and reduce the incidence of AIDS transmission. They are: (a) the Health Belief Model, (b) the Health Decision Model, and (c) the Precaution-Adoption Process Model.

Health Belief Model

The Health Belief Model (HBM) was designed to examine the failure of people to practice disease prevention techniques or participate in health screening programs (Rosenstock, 1974). The components of this model were derived from a body of literature that focused on behaviors that resulted from two factors: the personal value placed on a goal and the individual's belief that a behavior would be helpful in achieving the goal (Becker, 1974).

Translated into the context of health-related behavior, these factors point out that an individual's desire to avoid illness and the belief that a behavior will prevent illness are major factors in health behavior choices. The Health Belief Model consists of three primary dimensions: perceived susceptibility, perceived severity, and the evaluation of an advocated or recommended behavior. The HBM has served as a major organizing framework for explaining and predicting acceptance of health and medical recommendations and has received support in both retrospective and prospective studies examining preventive health behaviors (Janz & Becker, 1984). Sorensen et al. (1991) summarized the importance of the HBM as follows:

> The health belief model suggests that if we raise the threat of infection, increase response and self-efficacy, and improve communications, people can be helped to change their attitudes toward the threat and reduce risky behavior. This model has become a guiding principle in designing AIDS prevention programs such as mass media campaigns, flyers with AIDS prevention messages, and individual and group counseling. (p. 60)

Becker and Joseph (1988) cited the use of this model in an AIDS study done using multivariate analyses to describe the contributions of the components of the Health Belief Model. Knowledge regarding AIDS, and the perceived value of behavioral change in reducing one's risk of AIDS, were both consistently related to various measures of risk reduction.

Health Decision Model

A second model of health education that has implications for AIDS prevention education is the Health Decision Model (HDM). This model, a recent reformulation of the HBM, examines more closely the actual context in which decisions are made regarding health-related behavioral changes (Eraker, Becker, Strecher, & Kirscht, 1985). Similarly to the HBM, this model includes the three components of perceived severity, susceptibility, and evaluation of an encouraged behavior. Additionally, it highlights the importance of experience, knowledge, and social interaction. By the addition of these dimensions to the HBM formulation, it is believed that theorists have moved closer to the process that a person uses to decide on behavior changes that will reduce the risk for illness and disease. Neither of these two models attempts to address the process of actual behavioral change. The process of behavioral change is especially important regarding AIDS-related behaviors because the decision to engage in safe-sex practices involves important emotional, psychological, and social consequences (Conner et al., 1990).

Precaution-Adoption Process Model

The Precaution-Adoption Process Model (PAP) highlights the decision to change health-related behaviors and the

dynamic nature of these changes (Weinstein, 1988). This model views behavior change as an on-going process and is sensitive to the changes that take place as behavioral changes proceed. The model examines five stages that people go through as they make behavioral changes. The first stage is the acquisition of knowledge about the health risk. The second stage is characterized by the belief that others are at significant risk. The third stage is the recognition of some personal risk. The fourth stage involves the decision to take precautions to reduce risk, and the final stage is the actual behavior changes. Each stage is dependent on the preceding stage; however, individuals move back and forth among the stages as their knowledge, beliefs, values, and actions change.

Each of these models presents background information important to understanding the components of effective AIDS prevention education. They also serve as a theory base to explore effective instructional methods.

Relationship of Knowledge to Attitudes and Behaviors

Apparent from the examination of the various models of health education is the fact that knowledge alone is not sufficient for the improvement of health and the reduction of risk behaviors. To fully understand the need for effective education to prevent the transmission of AIDS, it is essential to examine the attitudes and behaviors

surrounding this issue as well as the level of knowledge regarding AIDS.

Behavioral Intention or Rational Action Model

An alternative perspective to risk reduction was presented by Ajzen and Fishbein (1973). They presented preventative action as a rational act resulting from the intent to act. Intent is the result of two causal factors according to this model: (a) subjective norms in the form of social approval of the action in question; and (b) personal attitudes toward the act. This model points out the importance of addressing the attitude component of AIDS education because it stresses that intentions to act are the immediate antecedent to behavior and that attitudes are one of the predictors of intentions (Sabini, 1992).

Research done by Anderson et al. (1990) reported that students who knew more about AIDS transmission were less likely to report being involved in high risk behaviors such as having two or more sexual partners, and more likely to report consistent condom use. The sample for the Anderson study was drawn from a national probability sample of all high schools in the United States, stratified to ensure that all regions as well as metropolitan and nonmetropolitan areas were represented. Completing the self-administered questionnaires were 8,098 students. The purpose of the study was to determine if exposure to AIDS

education and increased AIDS knowledge, examined as two separate independent variables, lowered the reported incidence of risky sexual behavior (multiple partners, lack of condom usage) when background factors (age, gender, and race) were controlled for. The study revealed that exposure to AIDS education did not have a direct impact on the reduction of reported risky sexual behaviors; however, increased knowledge was related to a reduction in the number of high risk behaviors reported. The results of the study suggested that AIDS education may have an indirect effect on risk behaviors by increasing knowledge. Holtzman et al. (1991) reported findings similar to those of Anderson et al. (1990) when investigating HIV knowledge and drug injection among high school students. Regression analysis in the Holtzman et al. study revealed that students with higher scores in HIV knowledge were less likely to ever have injected drugs. The author maintained that although a causal relationship cannot be established, HIV knowledge may play a role in maintaining low levels of drug injection behaviors (Holtzman et al., 1991).

In the research of similar health issues including smoking, alcohol consumption, and sexually transmitted diseases, work has been done to attempt to determine the relationship among knowledge, attitudes, and behaviors. Analysis of the impact of education on attitude change has

revealed important findings. Rabinowitz and Zimmerli (1974) found that the experimental group in their study showed significant change ($p < .01$) in attitude toward smoking following an educational program aimed at reducing smoking. Walbek (1973) reported similar findings in her study of four different instructional programs attempting to change the knowledge, attitudes, and behaviors of mothers regarding nutritional practices. The influence of education on attitude change may be summarized as follows:

> Education seems to be able to initiate direct or indirect changes in attitude, particularly if the educational program is directed at altering an individual's perception of a behavior on one or more attributes. (Iverson & Portnoy, 1977, p. 32)

The relationship between education and behavior change is not as strong as that reported for knowledge and attitude changes. In health education, program planners must strive to develop programs that facilitate the adoption of health-enhancing behaviors. A review of the literature documenting effects of human sexuality education revealed that although knowledge and attitude changes are often found, the programs had little effect on sexual behavior (Kirby, 1984).

According to Lewis, Battistich, and Schaps (1990), many school-based approaches to prevention of drug abuse and teen pregnancy have been implemented and evaluated, but there is still little scientific evidence indicating that

these programs have substantial effects on the use of drugs (other than tobacco), or on sexual activity. Whereas factual information that raises the students' awareness of the life threatening nature of AIDS is fundamental, instructional goals must also include skill development as a means to decision making and behavior change (Allensworth & Symons, 1989). Popham (1993) stated:

> Working against biological drives and culturally approved practices, an AIDS education program that consists of just a few hours of factual information will have little or no impact on adolescents' sexual behaviors. Research evidence shows us that knowledge alone won't do the trick when it comes to modifying young people's high-risk behaviors. Altering the sex-related behaviors of young people is unbelievably difficult. (p. 560)

Kirby (1992) concurred as he reported findings from three studies of curricula based on social influence approaches and social learning theory. Each of the curricula was based on social learning theory or variations such as: (a) social inoculation theory, (b) social influence theory, and (c) cognitive behavioral theory. Evaluations of each of these three curricula provided evidence of behavior change. Social inoculation theory postulates that there exists a process of social inoculation that is similar to physiological inoculation. People develop a resistance to social pressure when they recognize the forms of pressure, become motivated to resist that pressure, and then practice resisting weak forms of

that pressure (McGuire, 1964). Bandura's (1986) social learning theory provided another portion of the social influence theory. This theory stated that the likelihood of a behavior is determined by the understanding of what must be done to avoid an outcome, the belief that one can demonstrate the behavior, the belief that the behavior will lead to success, and the anticipated benefits for accomplishing the behavior.

Another model that has implications for AIDS education programs is the cognitive-prevention model. The cognitive-prevention model proposed by Schinke and Gilchrist (1981) is based on three components: activities to personalize information, training in decision making and assertive communication skills, and practice in applying those skills in personally difficult settings and situations. Studies of curricula incorporating these theories suggested that curricula based on social influence approaches and social learning theory are more effective than curricula based on other approaches because they are more likely to address behavior change (Kirby, 1992).

The work of these authors has direct implications for this study because the main focus of this investigation is the role of instructional methods on change in knowledge, attitudes, and intention to act. Therefore, it is essential to consider the relationships among these

components and to examine the impact of instructional methods on the patterns of scoring for each of these components in order to assess the effectiveness of the instructional method.

AIDS and Effective AIDS Education

The AIDS epidemic presents a variety of challenges for those involved in education. It is well known that the risk of exposure to AIDS can be minimized by choosing to engage in specific behaviors such as abstaining from intercourse, using latex condoms, and avoiding the sharing of intravenous needles. However, as Garrity (1991) pointed out, the challenge of educating for behavior change is more complicated. She stated:

> Experience has clearly demonstrated that the simple provision of facts or promotion of abstinence is not enough. Human beings tend to be resistant to behavioral change in general, and when faced with changing sexual and drug-use behaviors, a stubborn resistance to behavioral change may emerge, which is directly related to specific characteristics shared by these behaviors. Sex and drug-related experiences, which involve the powerful appeal of sensations that alter the experience of one's life, may serve as expressions of power and identity; they have become a medium of exchange in many people's lives, and invoke mixed messages of approval/censure from the media and society. (p. 58)

This statement points out that AIDS education is a very complex issue and one that requires careful examination in order to provide the most effective intervention. Popham (1993) concurred as he pointed out that the failure to provide satisfactory AIDS education may be due to the lack

of understanding about how potent the intervention must be. He says that it is difficult to develop an effective program of AIDS prevention because the behaviors that put students at risk for infection are hormonally driven and societally sanctioned.

Since the beginning of the AIDS crisis, parents, community organizations, and national agencies have called on schools for intervention measures regarding AIDS transmission. Moreover, nationally respected proponents of AIDS education, such as the Surgeon General, the President's Commission on the HIV Epidemic, and the National Academy of Sciences, have also called for comprehensive health education programs for all school-aged children (Haffner, 1988).

As of 1990, 32 states required AIDS education as a part of their mandated curriculum. Of those states, 17 states require that AIDS education be included in their health education program, 7 states require AIDS to be a part of family life education, sex education, human growth and development, or parenting skills, 4 states require AIDS to be added to a communicable disease requirement, 2 states add AIDS to a sexually transmitted diseases requirement, and 5 state specify no context for AIDS education (National Association of State Boards of Education, 1990). By 1992,

6 additional states are requiring AIDS education, but no breakdown of the requirements is given (SIECUS, 1992).

This trend toward the requiring of AIDS education programs is a necessary step in the right direction. The question of the effectiveness of these programs is the next important aspect. In one review of AIDS curricula by the staff of the Centers for Disease Control cited in Haffner (1988), it was found that two thirds of the curricula advocated programs that consisted of only one hour or one class period. One fourth of the curricula did not address abstinence or condom use, and fewer than one third emphasized that it is specific behaviors that put people at risk. Several sources have advocated guidelines, goals and principles that should be addressed in effective AIDS education programs. Selected recommendations will be reviewed here.

Centers for Disease Control Guidelines for Effective School Health Education to Prevent the Spread of AIDS

These guidelines advocate programs that are developed to address the needs and developmental levels of school-aged youth, provide education about AIDS at each grade from late elementary through high school, and are planned in cooperation with educators, administrators, parents, and community members. The guidelines stress the importance of education about AIDS that is part of a comprehensive school

health education program that establishes a foundation for understanding the relationships between personal behavior and health.

Regarding the training of personnel, it is recommended that a team of representatives including school and community members receive training about the nature of the disease as well as prevention methods. In addition, it is recommended that educators responsible for the presentation of materials to students receive additional training.

The principle purpose of AIDS education is stated as the prevention of HIV infection. Educational programs are to be established to assure that young people acquire the knowledge and skills they will need to adopt and maintain types of behaviors that will eliminate their risk of becoming infected according to this set of guidelines. The program goals are divided according to current participation in high-risk behaviors with continued abstinence recommended for those who do not participate in high-risk behaviors and safer practices recommended for those who currently participate in high-risk behaviors.

The content of the program is recommended according to age level with emphasis on the understanding of essential factual information as well as opportunities to learn about emotional and social factors that influence types of behaviors associated with HIV transmission. It is

recommended that schools allow sufficient personnel time and resources to assure that policies and programs are well planned and sequenced with well-trained teachers and adequate materials. It is stated as being crucial that adequate classroom time be provided at each grade level to assure that students acquire essential knowledge appropriate for that grade level, and that there is time for questions and discussions.

The program assessment component of these guidelines involves a series of assessment criteria to be used to monitor the extent to which schools are providing effective health education about AIDS. The assessment criteria include community involvement, AIDS education as a part of a comprehensive school health program, qualifications of teachers, age-appropriate content, the recommendation of abstinence or mutually monogamous relationships, the avoidance of high-risk behaviors, sufficient time and materials, and the assessment of outcomes of AIDS education programs (Centers for Disease Control, 1988 pp. 1-13).

Sex Information and Education Council of the United States

The recommendations from this organization, summarized by executive director, Haffner (1988), stated that AIDS prevention programs for young people should have five primary goals:

1. Programs should be designed to eliminate misinformation about HIV and to reduce the panic associated with the disease. Included in this goal is the need for information that addresses the fears about casual transmission by presenting accurate data and information to address the social aspects of the disease.

2. Programs should be designed to help young people delay premature sexual intercourse. It is pointed out that the average age for first intercourse is 16 and that teens are becoming sexually active at younger ages than ever before.

3. Teenagers who are sexually active should receive information and services so that they will use condoms each and every time they have any kind of intercourse. The report states that less than one in four teenagers report condom use at each intercourse even though condom usage has been shown to be effective in stopping the transmission of AIDS.

4. All AIDS education programs should warn of the dangers of drug use. Stressed in this goal is the fact that alcohol and drugs can impair the ability to make good decisions and that intravenous drug usage presents risk of contracting the HIV virus if needles are shared.

5. AIDS education programs should encourage compassion for people with AIDS and for people who are HIV

infected. Education can play a major role in ending the discrimination and promoting understanding toward AIDS infected people.

In addition to specifying goals, eight principles that underlie effective AIDS education programs are outlined. They include:

1. AIDS education should be integrated into comprehensive health or sexuality education programs.

2. AIDS education programs need to be designed to reach all children.

3. AIDS education should be offered in multiple sessions at each grade level and through numerous instructional techniques.

4. Programs should emphasize increasing teenagers' perceptions of their vulnerability to HIV infection rather than the provision of biomedical information.

5. Programs must provide ample opportunity for behavioral skill development.

6. AIDS education programs should be value-based.

7. AIDS education should be "sex positive." (AIDS programs should emphasize that sexuality is a positive aspect of life and that genital activity is only one aspect of sexual behavior.)

8. AIDS education should be empowering. Young people need to know that they can control their exposure to HIV by their own decision making (Haffner, 1988, pp. 66-69).

Centers for Disease Control-Appraising an HIV Curriculum

This set of guidelines presents a series of recommendations for the evaluation of a curriculum to be used to deliver AIDS education to adolescents (Popham & Hall, 1992). The guidelines are as follows:

1. The content of the HIV education program should be chosen after considering the current status of the students.

2. A preliminary appraisal of an HIV curriculum's likely success can be determined by reviewing the internal characteristics of the curriculum. Included in this recommendation are seven internal characteristics: (a) instructional psychology, (b) functional knowledge, (c) vulnerability perceptions, (d) HIV related attitudes, (e) interpersonal skills, (f) involvement of parents and guardians, and (g) adequate duration. For the purposes of this study, adequate duration will be defined. Adequate duration is emphasized by Popham and Hall as they point out that meaningful changes can rarely be brought about by short-duration instructional programs. The authors of this work concede that knowledge may be obtained in an hour or two of instruction; however, behavior

modification is seldom possible in such a short time. They also point out that no definitive research evidence has established the minimum length of an effective AIDS education; however, the results of investigations in other health-related areas suggest that an instructional program must last closer to 12-15 hours than 1-3 hours to have a realistic chance to modify student's behavior. This report also states that "ideally, once the initial AIDS education is offered, periodic booster sessions should be carried out" (Popham & Hall, p. 9).

3. Attention should be given to the degree to which the HIV curriculum is implemented as planned.

4. An HIV curriculum should be evaluated primarily on the basis of its impact on students. It is recommended under this guideline that assessment is routinely carried out to assess the impact of the program on student's knowledge, attitudes, and behavior (Popham & Hall, pp. 1-10).

AIDS Resource Manual for Educators

This guide was published by the Iowa Department of Education and the Iowa Department of Public Health (1987) listing goals and recommended components for inclusion in AIDS curriculum. It stated that the goal of AIDS education is to prepare individuals to protect themselves and others from infection. It should encourage students to act

responsibly and make decisions that will contribute to their health and well-being. Guidelines for development and presentation of AIDS education programs are as follows:

1. Accurate and relevant information is presented emphasizing those personal behaviors that put a person at risk for acquiring the AIDS virus and those that help avoid infection.

2. Attitudes that are conducive to healthy living are promoted through AIDS education. Education should be directed toward student acceptance of the possibility of exposure to the HIV virus and the need to practice preventive behaviors according to this document.

3. Skill acquisition should be emphasized including decision making and problem solving relative to AIDS.

In addition to the above mentioned guidelines and recommendations published and distributed by organizations concerned with AIDS education, several individuals considered experts in the area of AIDS education have added to the literature base regarding effective AIDS education programs. Haffner (1988) advised that AIDS education be integrated into existing comprehensive health curricula, that it be discussed following units on self-esteem, family and personal values, decision-making, communication skills, drug abuse, and peer pressure. Haffner also recommended that programs provide an opportunity for behavioral skill

development, and include a variety of activities to increase knowledge, explore attitudes, and facilitate desired behavioral outcomes.

These guidelines and recommendations provide a framework for the evolution of effective AIDS education programs. They also provide a focus for research on effective AIDS education.

Research on Effective AIDS Education

Although the AIDS virus was initially identified in the early 1980s, educational programming and the research to evaluate it did not surface in the literature until the mid to late 1980s. A study by DiClemente, Zorn, and Temoshok (1986) assessed adolescents' knowledge, attitudes, and behavior about AIDS in San Francisco. Data were obtained from 1,326 14-year-old to 18-year-old high school students enrolled in a required Family Life Education class. A self-report questionnaire was given. It consisted of 30 questions which evaluated students' knowledge about AIDS and 11 questions that addressed attitudes and beliefs regarding personal susceptibility, severity, and the need for AIDS education.

The findings of the study suggested that students possess some knowledge of AIDS, although this knowledge was uneven. Ninety-two percent correctly indicated that sexual intercourse was a mode of transmission for the AIDS virus;

however, only 60% were aware that a condom could lower the risk of getting the disease. Less than one-half reported that kissing was not a mode of transmission. With respect to adolescents' attitudes and beliefs about AIDS, 78% reported being afraid of getting AIDS and over one-half said they would rather get any other disease than AIDS. Eighty-seven percent thought it was important for students to receive AIDS education.

A similar study, conducted by Strunin and Hingson (1987), involved 963 Massachusetts 16-19 year olds who were selected by random-digit dial sampling. The results of that study showed that, although 98% of the respondents were aware that AIDS could be transmitted through intercourse between two men, 8% were not aware that AIDS could be transmitted by intercourse between a man and a woman. Twenty-nine percent did not know AIDS could be transmitted by vaginal fluids. Twenty-two percent were unaware that AIDS was transmitted by semen. When examining behaviors of the respondents, it was revealed that drugs had been injected by 1% of the respondents and 55% had had sexual intercourse. Of the sexually active adolescents, 15% said they had changed their sexual behavior because of concern about AIDS. There were no significant differences in knowledge about AIDS between the sexually active and nonactive adolescents. Eight percent of the respondents

reported worrying a great deal about AIDS, 14% somewhat, 24% a little, and 54% said they did not worry at all. When asked how likely it was that they would contract AIDS, 1% thought it was very likely, 7% somewhat likely, 31% a little likely, and 61% did not think it was likely at all. Ninety-seven percent of the respondents thought information about AIDS should be available in schools.

During the Spring of 1988, a massive campaign was undertaken by the Centers for Disease Control to gather data about AIDS related knowledge, beliefs, and behaviors among adolescents. This project was undertaken to assist AIDS educators in the planning of AIDS education, as well as the setting of program priorities, allocating of resources, and monitoring of changes among adolescents. Data collection took place in 30 states during February-May 1989. A questionnaire for anonymous self-administration was developed by departments of education with technical assistance from the Centers for Disease Control. School response rates ranged from 27 to 100% with sample sizes from 303 to 10,279 students. From 33 to 86% of the students reported having been taught about AIDS at school. The findings of this study indicate that varying proportions of students knew HIV infection cannot be transmitted by blood donation (32-75%), mosquito bites (22-67%), use of public toilets (44-85%), or blood tests

(59-82%). Most students knew that HIV can be transmitted by sharing needles (93-100%) or from having sexual intercourse without a condom (74-98%).

Rates of reported IV drug use were 2-5%, and rates of sexual intercourse were 27-76%. In addition, 7-40% of all respondents reported having four or more partners. At each site, more males than females reported being sexually active.

Helgerson and Petersen (1988) investigated the knowledge of 657 junior and senior high school students and found that only 57% identified mosquitos and 44% identified blood donations as safe regarding the transmission of HIV. Only 42% of the students realized a person could be infected with HIV and not have full blown AIDS. The majority of the students in this study did not know that they could not contract AIDS by shaking hands with someone with the disease (75%) and that eating in a restaurant was not a means of transmission (82%). Forty-nine percent of the students indicated that they wanted to learn more about the disease.

Miller and Downer (1988) surveyed 11th grade history students to assess their knowledge and attitudes regarding AIDS. From this survey information, a 50-minute lesson was developed to address knowledge and attitudes about AIDS. Posttests were administered one week after instruction and

compared to pretest scored for percentage of correct responses to knowledge questions and percentage of tolerant responses to attitude items. Differences were analyzed using paired t-test analyses and chi-square test methods. Percentage change and significance for each question was calculated based on total group response to an item. Eight weeks following the lesson, posttests were distributed to measure retention. Only 53 of the original 114 completed the retention testing. Correlation of pretest and posttest scores for the 114 students revealed statistically significant changes in knowledge and attitudes following the AIDS lesson. Students demonstrated a 13% increase in knowledge and a 19% increase in tolerant attitude responses. Fifty additional students were tested at the retention testing and compared to the 53 students who had had the lesson. The AIDS knowledge among these students was 15% less with tolerant attitude responses 19% less than those students who received the lesson.

Alteneder, Price, Telljohann, Didion, and Locher (1992) assessed the effectiveness of a one period AIDS education program for seventh and eighth grade students (N = 585) assigned to an experimental or control group by school. A 35-item questionnaire designed to measure knowledge, attitudes, and beliefs about AIDS was used as a pretest prior to intervention and as a posttest 3 weeks

later. The AIDS education program consisted of a lecture and slide presentation. It involved a one hour program focusing on AIDS transmission, high-risk behaviors, and personal beliefs. Three-way analysis of variance indicated significant differences between pretest and posttest for knowledge, attitude, and belief for those who received the program versus those who did not by grade level and gender. The studies cited here indicate that some research has been done to assess the level of knowledge of students and that research is beginning to address the question of the effectiveness of AIDS education programs in impacting changes in knowledge, attitudes, and intention to act.

Learning, Memory, and Retention

Because this study will compare three teaching methods in the retention of knowledge, attitudes, and intention to act changes over time, the literature on learning, as well as memory and retention will be briefly discussed. Specifically, the important variables that affect learning and long term retention will be explored.

Learning Theory

In the early 1970s, many psychologists began to move from a behaviorist to a cognitive view of interpreting learning. Resnick and Klopfer (cited in Bellon, Bellon, & Blank, 1992) stated, "Cognitive scientists share Piaget's constructivist view of learning, asserting that people are

not recorders of information but builders of knowledge structures" (p. 396). Brophy (1987) viewed cognitive learning as follows: "Learning refers to information processing, sense making, and comprehension or mastery advances that occur during the acquisition of knowledge or skill" (p. 41). Several models have been proposed and will be discussed here to interpret learning in light of cognitive learning theory.

Advanced organizer model. Ausubel (1960) maintained that presenting information that organizes the instruction that follows will improve learning and retention by providing a base into which the more detailed information can fit. This model is designed to strengthen students' cognitive structures. Ausubel maintained that cognitive structure is the most important factor in determining how well new information can be acquired and maintained. This model focuses on the increased stability and clarity of prior knowledge to strengthen cognitive structure and facilitate the acquisition of new information (Weil & Joyce, 1978).

According to Mayer (1979), there are five characteristics of an advance organizer:

1. The organizer should include a short set of verbal or visual information.

2. The organizer should be presented prior to learning a larger body of to-be-learned information.

3. The organizer should contain no specific content from the to-be-learned information.

4. The organizer should provide a means of generating the logical relationships among the elements in the to-be-learned information.

5. The organizer should influence the learner's encoding process. This encoding may provide a new general organization as an assimilative context that would not have normally been present or activate a general organization from the learner's existing knowledge that would not have normally been used to assimilate the new material (Mayer, 1979, p. 382). This model emphasizes the importance of preexisting knowledge structures in the processing of new pieces of information.

Information processing model. The information processing model of learning has implications for this study because it shows that new information is filtered through established cognitive structures. In order to establish the necessary cognitive structures, an intensified instructional effort is needed such as the WEDGE program presented in this study. The established cognitive structure can then more effectively process the

infusion information presented in the context of other topics.

Information processing is summarized by Good and Brophy (1990) as they describe how humans develop cognitive structures that represent and organize knowledge. They contend that new information is then filtered through the existing structures to interpret in reference to familiar material. The levels of processing concept is described in Goetz, Alexander, and Ash (1992). They contended that information can be processed in different ways or at different levels, with deeper levels becoming more meaningful. This deeper processing will produce more fully-developed and longer-lasting memory of the information.

The work of each of these researchers has important implications for this study because it is designed to study whether the WEDGE unit provides the necessary advance organizers and whether the repetition of instructional concepts used during the infusion lessons impacts the degree of retention. If the WEDGE unit provides the advance organizers necessary to adequately process the infusion information, the combination of the two methods (unit plus infusion) has potential for a high degree of effectiveness.

Schema theory. The work of Jean Piaget is summarized in Goetz et al. (1992) and provides an additional perspective from which to view learning theory. In this work, cognitive development is described as the process of developing and modifying cognitive structures that represent information. Piaget used the term schema to refer to these cognitive structures. These schemata guide the acquisition and processing of new knowledge. According to this view, the new knowledge is either assimilated (fit into existing schema) or accommodated (knowledge structure is changed to match new experience). These works emphasize the importance of adequate acquisition of information prior to the examination of memory and retention.

Memory and Retention

Several factors have been noted as affecting retention in empirical studies. Among them are the degree of original learning, retention interval, methods of testing retention, and individual differences. Each of these factors will be presented here.

Degree of original learning. As described in the previous section, the acquisition of information is an important factor in memory and retention. A study done by Hurlock and Montague, cited in Farr (1987), showed that the initial learning is the single most important variable related to skill retention over a period of non-use. They

contended that any variable that leads to high initial levels of learning, such as high ability or frequent practice, will facilitate skill retention. Good and Brophy (1990) suggested:

> If the material is intended to be learned permanently or applied later, there should be practice to the point of overlearning and sufficient review thereafter to ensure that the students can retrieve the learning quickly when they need it. (pp. 219-220)

Practice and review will be included in this study as the infusion groups are taught additional lessons regarding AIDS prior to the retention posttest measure.

Another important aspect of retention is the prior knowledge of the subject before instruction. Gagne, Bell, Yarbrough, and Weidemann (1985) studied middle school students' learning and retention on familiar topics as compared to learning and retention of unfamiliar topics. Students were tested immediately following instruction and again 4 weeks following instruction. The results of this study suggested that two students with different amounts of prior knowledge on a topic who reach the same level of mastery on a topic will not retain equal amounts of material over time.

Retention interval. The main conclusion that emerges out of the research on retention intervals is that, as the retention period gets longer without use of the learned skill or knowledge, decay tends to increase (Farr, 1987).

Farr cites the work of Gardlin and Sitterly that showed that the longer the retention interval, the greater the skill loss. This work also pointed out that the amount of decay is highly task-specific and sensitive to additional factors such as the amount and type of training. Work with military training showed that even after up to two years of no practice on motor tasks, retraining trials led to rapid relearning. Active practice or rehearsal has been shown to improve retention, and distributed practice is generally more effective that massed practice (Good & Brophy, 1990).

Individual differences. Individual differences, as used in the learning and memory literature, most often apply to differences in abilities, usually the broad ability known as general intelligence. An explanation for why ability differences can substantially affect retention is examined in the works of several authors including Hurlock and Montague cited in Farr (1987). They concluded that higher ability learners achieve higher levels of learning than lesser ability learners and, therefore, when memory decay occurs, the more able learners maintain their advantage. They also recognized that there should be no differences in retention between these groups if they have both learned to the same degree.

The research cited above points out the need to equate the four groups of learners involved in this study of

methods of teaching AIDS education to assure that ability levels are not significantly different. It also validates the use of a pretest-posttest design because it shows the importance of equated achievement of initial learning. From the literature on learning, memory, and retention, it is evident that multiple factors influence the degree of learning and retention of students. Each of these factors must be carefully considered when planning and delivering initial instruction as well as when presenting the infused lessons. This literature also validates the use of the instructional methods employed by this study because it emphasizes the importance of the presentation of an organized, intensified instructional unit (WEDGE unit) as well as the repetition of information over time (infusion lessons).

State of Iowa Mandates Regarding AIDS Education

The final section of this review of the literature will explore the state of Iowa educational mandates regarding AIDS education. It is important to understand these mandates because they represent the requirements enforced by the Department of Education as they check for compliance. A phone conversation to the state education consultant assigned to AIDS education revealed that the mandates are included in the set of state mandates but are left to the district for local interpretation. There is no

requirement for instructional time, teacher training, concepts addressed, or evaluation procedures (J. Harris, personal communication, November 12, 1992). The two mandates affecting AIDS education are the Human Growth and Development mandate and the Health Education mandate.

Human Growth and Development

On July 1, 1988, Senate File 2094 and Senate File 2157 were passed under the Educational Standards and Curriculum legislation. Senate File 2094 added the topics of human sexuality, self esteem, stress management, and interpersonal relationships to the list of subjects to be taught under the minimum standards specified in Section 256.11 of the Code of Iowa. It also provides that AIDS be covered when students receive instruction about the characteristics of communicable diseases. Under this mandate, the board of directors of each school district is required to establish a resource committee to study and make recommendation about the instruction in topics related to human growth and development. These topics include:

1. Self esteem, responsible decision making, personal responsibility, and goal setting
2. Interpersonal relationships
3. Discouragement of premarital adolescent sexual activity
4. Family life and parenting skills

5. Human sexuality, reproduction, contraception, prenatal development, and male/female responsibilities

6. Sex stereotypes

7. Behaviors to prevent sexual abuse or sexual harassment

8. Sexually transmitted diseases including acquired immune deficiency syndrome, and their causes and prevention

9. Substance abuse treatment and prevention

10. Suicide prevention

11. Stress management (Iowa Legislative Summary, 1988, p. 9).

Senate File 2094 further requires the school district to provide parents or guardians of students in the district with information about human growth and development. A student is not required to receive instruction in human growth and development if a parent or guardian requests in writing that the student is excused.

Senate File 2157, an act which directs the Department of Public Health to implement a comprehensive AIDS prevention plan, also includes a provision which requires schools to provide every elementary and secondary school student instruction about HIV infection and AIDS and its prevention (Iowa Legislative Summary, 1988).

Health Education Mandate

The second mandate regarding AIDS education is the Health Education mandate which took effect on July 1, 1990. This mandate requires Health Education to include personal health, food and nutrition, environmental health, family life, substance abuse, human sexuality, self-esteem, stress management, and interpersonal relationships, mental and emotional health, and the prevention and control of disease and the characteristics of communicable diseases, including acquired immune deficiency syndrome (Iowa Administrative Code 281-12.5,(4), (e), 1989). In grades 9-12, it is required that, at a minimum, one unit of Health education be offered and taught, but it is not required that every student be enrolled in health classes. A letter of explanation of the implications of the Health and Human Growth and Development mandates was sent out from the Iowa Department of Education director, Dr. William Lepley on June 30, 1989 (5 D.o.E. Decl. Rul. 11). The letter explained that because the Iowa Department of Education is authorized and empowered to monitor all public schools for compliance with the accreditation standards set by the General Assembly and the State Board of Education, the Department requires documented evidence from each school seeking accreditation that the standards are being met. All subject matter mandated by statute or rule for

accreditation must be taught in accordance with law if a school is to receive or renew its accreditation status. Therefore, all accredited schools must include human growth and development and health, as prescribed, in the appropriately designated grade levels and subjects areas. The implications of these two mandates for this study are that every school district is required to teach AIDS education. These mandates emphasize the importance that the Iowa Department of Education has placed on AIDS education and also highlight the need for evaluation of program effectiveness.

Summary

In this review of the literature, four major areas were presented. The theoretical foundation for the development of effective health education programs was explored with several models of health behaviors and implications for health education programs presented. The research specifically conducted to uncover knowledge, attitudes, and behaviors regarding AIDS was presented, along with recommendations for effective programs that have been suggested by various experts. Literature about learning, memory, and retention was briefly discussed to explore instructional variables that affect retention. Finally, the state of Iowa mandates regarding AIDS education were presented to set the stage for research to

be carried out in an Iowa school. It is stressed that although AIDS education is required in Iowa, there are no requirements for instructional time, specific content, or program evaluation.

This literature suggests that an effective AIDS education program should include attention to the cognitive, affective, and behavioral aspects of learning as well as be patterned after recommended guidelines for content and delivery. The literature also suggests that attention be given to research on learning, memory, and retention in order to develop and deliver educational programs that have the greatest possibility of impacting students' acquisition and retention of information.

From the review of the literature also comes the rationale for the inclusion of the methods employed by this study. The WEDGE unit is proposed as a method of providing information for the development of cognitive structure regarding AIDS. The infusion method of instruction was chosen as a method to be employed by this study after reviewing the literature on state mandates and determining that the infusion of AIDS information is the recommended method of instruction. The unit plus infusion method surfaces as a method of potential effectiveness from the literature on learning, memory, and retention, specifically schema theory.

CHAPTER 3

DESIGN OF THE STUDY

Design

The design for this study was the non-equivalent group design described by Campbell and Stanley (1963). Given the importance of learner ability on learning and retention, it was important to establish that the four groups (unit only, unit plus infusion, infusion only, and control) were equivalent with respect to this factor. To establish equivalency among four groups, data were collected on students' science and total Iowa Test of Educational Development (ITED) scores as well as their grade point average. These measures were selected to represent general learner ability.

Subjects

This study was carried out in a rural 9-12 high school with an enrollment of approximately 400 students. Four health education classes, all taught by the same instructor, were selected to participate in the study. The course, a graduation requirement, enrolled seventry-seven 10th graders and three 11th graders. Females comprised 57% of the sample, and males comprised 43% of the sample. Sections ranged in size from 18-24 students for the Fall semester of 1993. Total enrollment was 80 students;

however, complete data were only available for 77 students. There was no prerequisite for enrollment in the course.

Variables

The first independent variable for this study was the method of instruction used to teach four intact classes. It involved the following levels: (a) a one unit method, (b) a one unit plus infusion method, (c) the infusion only method, and (d) the control group.

The second independent variable in this study was the time of testing. Each student was tested at three intervals to assess their knowledge, attitudes, and intention to act. The first assessment took place as a pretest 3 weeks prior to the presentation of the WEDGE unit (to the 2 groups receiving the unit). The second assessment followed immediately after instruction of the WEDGE unit, and the third assessment took place at the end of the semester, after the 11-week infusion method was completed.

The dependent variables for this study were the three scores on the AIDS Assessment Instrument for Measuring Student Outcomes (AAIMSO): knowledge, attitude, and intention to act (Popham & Hall, 1992). For the knowledge and attitude component, high scores indicate the most desired level. In regard to the intention to act

score, low scores indicate the lowest risk actions or the most desired level.

Instrument

The AIDS Assessment Instrument for Measuring Student Outcomes (AAIMSO) was developed in 1992 by IOX Assessments Associates in an effort to address educational objectives dealing with HIV-relevant knowledge, attitudes, and behaviors. The instrument was designed to be a self-report device. The AAIMSO consists of 46 questions divided into the following three sections: (a) 15 questions designed to address knowledge about AIDS transmission and prevention; (b) 25 questions designed to explore attitudes toward AIDS education, persons with AIDS, and public response to the epidemic; and (c) 6 questions designed to measure intention to act. (See Appendix A.)

The instrument was developed and critiqued by IOX and non-IOX personnel, then pilot tested with 275 tenth graders from the Sacramento area. The data were analyzed to assess the internal consistency coefficient (Cronbach's Alpha) and test-retest stability coefficient for the knowledge and attitude scores. For the intention to act section of the instrument, an item-agreement index was computed based on the degree to which individual items were answered the same by students on separate occasions of testing. Initial reliability testing resulted in an internal consistency

alpha of .70 for the knowledge component of the test and .87 for the attitude component. Identical item agreement was 80% on the knowledge component, 61% on the attitude component, and 86% on the intention to act component of the test. The test-retest correlation coefficient was reported as .76 for the knowledge component and .85 for the attitude component.

Because students were responding to personal information regarding opinions and activities involving sex and drug use, confidentiality was assured by use of a coding system rather than names. Students coded the instrument with their middle initial and birth date so that matching of instruments could be done without revealing the identity of the student. Upon completion of the instrument, students were instructed to place it in an envelope that was sealed by the instructor after all students completed the instrument. The sealed envelope was given to the researcher following each administration of the test. Approximate time for administration of the test was 30 minutes.

Procedure

Four sections of health education offered to high schools students were involved in this study. Information on science ITED scores, total ITED scores, and grade point average was examined to determine if the groups were

equivalent in those measures in order to establish similar ability levels. A pretest was administered to all four groups in early September. Three of the four groups then received instruction about AIDS as described below.

The One Unit Only Group

The one unit group was taught a four class period unit on AIDS education through a variety of instructional techniques including lecture, discussion, worksheets, videos, group activities, and a presentation by a guest speaker who is HIV infected. The unit was presented by a Red Cross Health Educator through a program called the WEDGE program. (See Appendix B for WEDGE goals, objectives, and outline.) The WEDGE program was funded by a grant through the Iowa Department of Education. The WEDGE program was originally sponsored by the San Francisco Department of Public Health through funding by the Centers for Disease Control. A 1989 pilot study of the WEDGE program involved 565 high-school age participants who completed pretests and posttests measuring knowledge, attitudes and behavioral intentions. The results of the pilot study indicated that knowledge was high both before and after the intervention, and that changes in behavioral intentions and attitudes were documented (Legion, Levy, Cox, & Shulman, 1990).

Following the recommended format of the WEDGE program, the topic for each day was presented by the Health Educator. An introduction with explanations of the objectives of the unit was presented followed by an introductory lecture and time for questions. The unit continued with content presented to students through a variety of teaching techniques focusing on knowledge, attitudes, and behaviors that dealt with the issue of AIDS. An AIDS infected guest speaker made a presentation to the classes during one of the four sessions. Discussion questions and lecture materials were prepared prior to class and followed as a guideline. Following the presentation of the unit, the unit only group moved on to subsequent units of health education but received no additional AIDS information in those units.

Unit Plus Infusion Group

The unit plus infusion group received the same four class period WEDGE unit as the unit only group followed by AIDS education information infused into subsequent units for the next 11 weeks. The regular health education instructor presented these lessons. She has 20 years of experience and is certified in health education. One lesson per unit focused on AIDS education in the context of the other health units. Infusion lessons were taught by

lecture, discussion, group activities, and video tapes. (See Appendix C.)

Infusion Only Group

The infusion only group received the infusion of AIDS information into 11 weeks of topics at the same time as the unit plus infusion group. The infusion only group did not receive the unit presented by the Red Cross Health Educator but did receive AIDS information infused into the regular curriculum.

The Control Group

The control group received no AIDS instruction during the research period. They received AIDS instruction during the semester following the research.

Following the presentation of the four class period WEDGE program unit, all groups were given the AAIMSO for the second time as an immediate posttest. WEDGE program lessons and infusion lessons were audiotaped and reviewed by the researcher as well as one additional certified health instructor to assure similar content and instruction to each group. A checklist was devised and used to determine if the stated goals and objectives for each lesson were addressed. (See Appendix E.) After 11 weeks had elapsed, the test was administered for a third time to all groups as a delayed posttest.

Data Analysis

To examine the equivalency of the four intact sections that received different methods of instruction, initial data analysis was conducted. A series of ANOVAs was performed to determine if the groups that received different methods of instruction were statistically equivalent to each other with respect to the three measures of academic ability as shown in Table 1. No statistically significant differences were found between groups on these measures at the .01 level of significance.

Table 1

Equivalency Measures Comparing Groups

Measure	SS	df	MS	F	p
SCIENCE					
Between Ss	4992	3	1664	2.52	.065
Within Ss	43610	66	660		
ITED					
Between Ss	5143	3	714	3.23	.028
Within Ss	33933	64	530		
GPA					
Between Ss	1.33	3	.44	0.71	.548
Within Ss	42.5	68	.62		

A repeated measures 4 x 3 ANOVA was used to determine if there was a difference in scores obtained on each component of the AAIMSO as a function of instructional method, time of testing, and interaction of time and instructional method. Each student was assessed three times, and on each occasion, three component measures were obtained (knowledge, attitude, and intention to act) resulting in nine scores for each student. Statistically significant differences were followed up with post hoc analysis whenever it was necessary. Additionally, correlation analysis were performed to examine the pattern of interrelationships among the various components of the AAIMSO.

CHAPTER 4

RESULTS

This chapter presents results of the data analysis procedures performed to answer the following research questions:

1. Are there differences in scores obtained on the knowledge component of the AAIMSO as a function of instructional method?

2. Are there differences in scores obtained on the knowledge component of the AAIMSO as a function of time of testing?

3. Is there an interaction between instructional method and time of testing on the knowledge component of the AAIMSO?

4. Are there differences in scores obtained on the attitude component of the AAIMSO as a function of instructional method?

5. Are there differences in scores obtained on the attitude component of the AAIMSO as a function of time of testing?

6. Is there an interaction between instructional method and time of testing on the attitude component of the AAIMSO?

7. Are there differences in scores obtained on the intention to act component of the AAIMSO as a function of instructional method?

8. Are there differences in scores obtained on the intention to act component of the AAIMSO as a function of time of testing?

9. Is there an interaction between instructional method and time of testing on the intention to act component of the AAIMSO?

A 4 x 3 ANOVA with repeated measures on one factor was conducted separately for each one of the dependent variables. Tukey procedures were performed as a post hoc analysis following statistically significant main effects. Simple main effect analyses were performed following statistically significant interaction effects. Additionally, correlation analyses were performed to examine the pattern of interrelationships among the various components of the AAIMSO. This analysis will be presented first, followed by the results of the series of ANOVAs designed to test the research hypotheses.

Correlations Among Components of the AAIMSO

Table 2 shows Pearson product-moment correlation coefficients among the various components of the AAIMSO by time of testing. The correlation between knowledge and attitude was .33 at the time of the pretest and .46 both at

immediate and delayed posttest. All of these values were statistically significant. The correlation between knowledge and intention to act was .004 at pretest, .14 at immediate posttest, and -.12 at delayed posttest. None of these values reached statistical significance. The correlation between intention to act and attitude was -.27 at pretest, -.33 at immediate posttest, and -.30 at delayed posttest. All of these values were statistically significant.

Table 2

Correlation Matrix for Student' Scores Among Components of the AAIMSO

	Knowledge	Attitude	Intention to Act
PRETEST			
Knowledge	1.00	.334*	.004
Attitude		1.00	-.279*
Intention to act			1.00
IMMEDIATE POSTTEST			
Knowledge	1.00	.462*	.146
Attitude		1.00	-.339*
Intention to act			1.00
DELAYED POSTTEST			
Knowledge	1.00	.468*	-.120
Attitude		1.00	-.308*
Intention to act			1.00

Note. *$p < .05$

Research Questions 1-3 (Knowledge Component of the AAIMSO)

Research Questions 1, 2, and 3 examined the effect of the instructional method, time of testing, and the interaction between instructional method and time of testing on the knowledge component of the AAIMSO. Results showed that there was a significant main effect for instructional method, $F(3, 77) = 6.10$, $p < .0009$, a significant main effect for time, $F(2, 147) = 12.73$, $p < .0001$, and a significant method by time interaction, $F(6, 147) = 5.44$, $p < .0001$. (See Table 3 & Figure 1.) Table 4 presents the means and standard deviations for the knowledge component of the AAIMSO.

Table 3

ANOVA Summary Table for the Knowledge Component of the AAIMSO as a Factor of Instructional Method and Time of Testing

Source	df	SS	MS	F	p
BETWEEN SUBJECTS	80				
Instructional methods	3	143.66	47.88	6.10	.0009
Error between	77	604.92	7.85		
WITHIN SUBJECTS					
Time of exam	2	51.80	25.90	12.73	.0001
Interaction	6	66.33	11.05	5.44	.0001
Error-within	147	298.99	2.03		
TOTAL	235	1183.40			

Figure 1. Scores on the knowledge component of the AAIMSO.

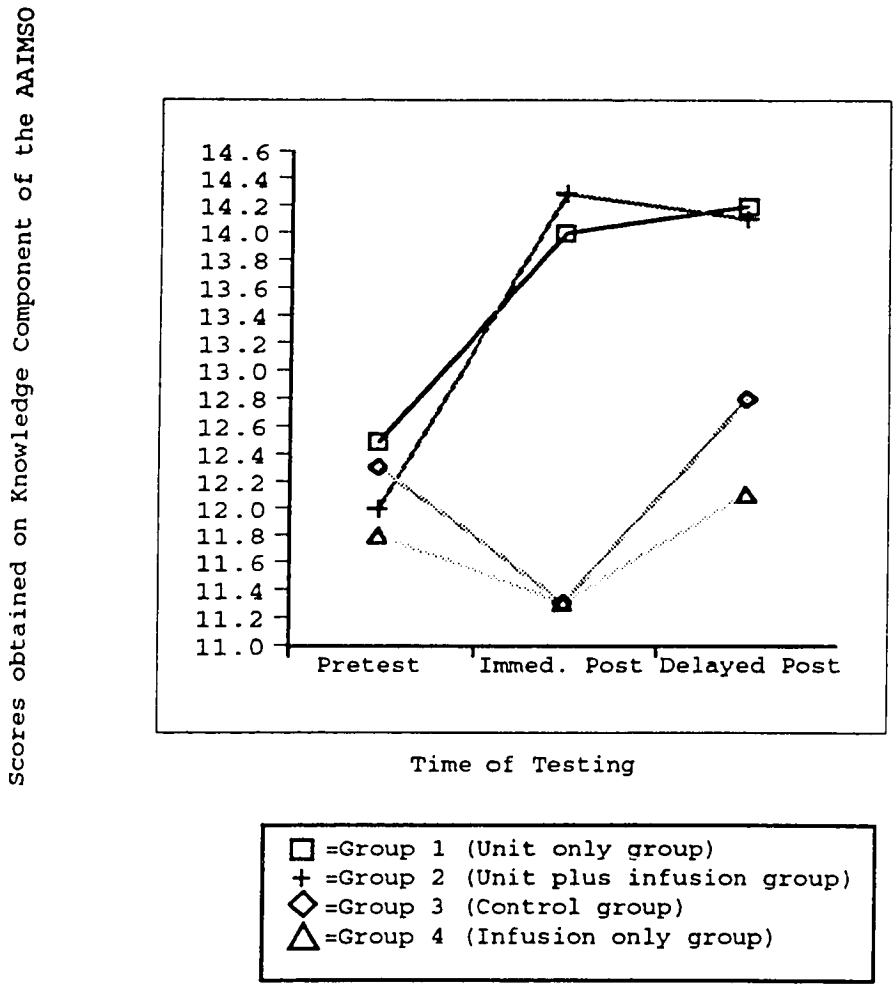

Table 4

Means and Standard Deviations for the Knowledge Component of the AAIMSO by Time of Testing, Group, and Totals

	Pretest			Immed. Post			Delayed Post			Total		
	n	M	SD	n	M	SD	n	M	SD	n	M	SD
G1	19	12.5	1.8	19	14.0	.97	18	14.2	1.0	56	13.6	1.5
G2	23	12.0	1.6	21	14.3	.01	22	14.1	.8	66	13.4	1.6
G3	20	12.3	2.2	18	11.3	2.3	19	12.8	1.4	57	12.2	2.1
G4	20	11.8	2.8	19	11.3	2.5	18	12.1	3.5	57	11.7	2.9
Total	82	12.1	2.1	77	12.8	2.9	77	13.3	2.1			

Note. *G1 = Unit Only Group, G2 = Unit Plus Infusion Group, G3 = Control Group, and G4 = Infusion Only Group

Possible scores on the Knowledge component of the AAIMSO ranged from 0-15.

Tukey procedures showed that significant differences in knowledge scores were found between the unit only group (M = 13.6) and the infusion only group (M = 11.7) as well as between the unit plus infusion group (M = 13.4) and the infusion only group. The control group (M =12.2) did not differ significantly from the other groups. With respect to the time factor, scores at all three times differed from each other: pretest (M = 12.1), immediate posttest (M = 12.8), delayed posttest (M = 13.3).

The simple main effect analysis showed that at the time of the pretest, no statistically significant

differences were found among groups, $F(3, 78) = .41$, n.s. At the time of the immediate posttest, there were statistically significant differences among instructional methods, $F(3, 73) = 15.20$, $p < .0001$. The unit plus infusion group ($M = 14.3$) differed from the control group ($M = 11.3$) and from the infusion only group ($M = 12.8$). The unit only group ($M = 14.0$) differed from the control group and from the infusion only group. The unit only group and the unit plus infusion group did not differ from each other, and the control group and the infusion only group did not differ from each other. At the time of the delayed posttest, there were statistically significant differences among groups, $F(3, 73) = 5.05$, $p < .003$. The unit only group ($M = 14.2$) differed from the infusion only group ($M = 12.1$), and the unit plus infusion group ($M = 14.1$) differed from the infusion only group. The control group did not differ significantly from the other groups ($M = 12.8$).

A second main effect analysis was conducted to examine changes in knowledge scores over time for each instructional method. Results indicated that for the unit only group statistically significant differences, $F(2, 35) = 10.35$ $p < .0003$, were observed between pretest ($M = 12.5$) and immediate posttest ($M = 14$) as well as delayed posttest ($M = 14.2$). Results indicated that for the unit plus

infusion group statistically significant differences, $F(2, 41) = 37.31$, $p < .0001$, were observed between pretest (M = 12) and immediate posttest (M = 14.3) as well as delayed posttest (M = 14.1). Results indicated that for the infusion only group there were no statistically significant differences among the three testing times, $F(2, 35) = .19$, n.s. Results indicated that for the control group statistically significant differences $F(2,36) = 4.63$, $p < .016$, were observed between immediate posttest (M = 11.3) and delayed posttest (M = 12.8).

Research Questions 4-6 (Attitude Component of the AAIMSO)

Research Questions 4, 5, and 6 examined the effect of the instructional method, time of testing, and the interaction between instructional method and time of testing on the attitude component of the AAIMSO. Results showed that there was no statistically significant main effect for instructional method, $F(3, 77) = 2.41$, n.s. There was a statistically significant main effect for time of testing, $F(2, 146) = 7.80$, $p < .0006$, and a statistically significant method by time of testing interaction $F(6, 146) = 4.02$, $p < .0009$. (See Table 5 & Figure 2.) With respect to the time factor, Tukey procedures yielded significant differences between the pretest (M = 104) and the immediate posttest (M = 108), as well as between the pretest and the delayed posttest (M =

Table 5

ANOVA Summary Table for the Attitude Component of the AAIMSO as a Factor of Instructional Method and Time of Testing

Source	df	SS	MS	F	p
BETWEEN SUBJECTS	80				
Instructional Methods	3	1955.33	651.77	2.41	ns
Error Between	77	20825.69	270.46		
WITHIN SUBJECTS					
Time of exam	2	581.11	290.55	7.80	.0006
Interaction	6	889.72	149.94	4.02	.0009
Error-within	146	5540.73	37.26		
TOTAL	234	24138.81			

107). Table 6 presents the means and standard deviations for the attitude component of the AAIMSO.

The simple main effect analysis showed that at the time of the pretest, no statistically significant differences were found among groups, $F(3, 76) = .11$, n.s. At the time of the immediate posttest, there were statistically significant differences among groups, $F(3, 74) = 5.36$, $p < .002$. The unit only group ($M = 111$) differed from the infusion only group ($M = 101$), and the unit plus infusion group ($M = 112$) differed from the infusion only group. At the time of the delayed posttest,

Figure 2. Scores on the attitude component of the AAIMSO.

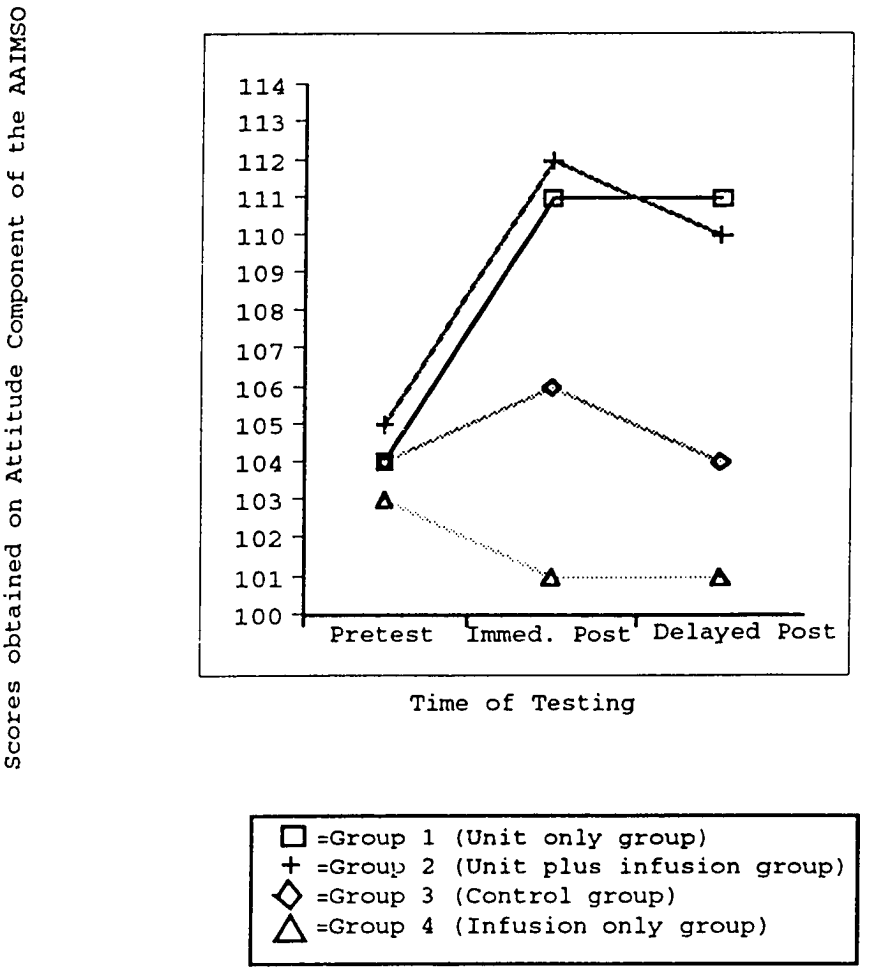

Table 6

Means and Standard Deviations for the Attitude Component of the AAIMSO by Time of Testing, Groups, and Totals

	Pretest			Immed. Post			Delayed Post			Total		
	n	M	SD	n	M	SD	n	M	SD	n	M	SD
G1	19	104	10.9	19	111	9.6	18	111	10.0	56	109	10.5
G2	22	105	9.7	21	112	6.8	22	110	9.2	65	109	9.1
G3	19	104	10.0	19	106	8.6	19	104	11.8	57	105	10.1
G4	20	103	12.1	19	101	13.1	18	101	15.9	57	102	13.5
Total	80	104	10.5	78	108	10.5	77	107	12.3			

Note. *G1 = Unit Only Group, G2 = Unit Plus Infusion Group, G3 = Control Group, and G4 = Infusion Only Group

Possible scores on the Attitude Component of the AAIMSO ranged from 25-125.

no statistically significant differences were found among groups, $F(3, 73) = 2.73$, n.s.

A second main effect analysis was conducted to examine changes in attitudes scores over time within each instructional method group. Results indicated that for the unit only group statistically significant differences, $F(2, 35) = 8.94$, $p < .0007$, were observed between pretest ($M = 104$) and immediate posttest ($M = 111$) as well as delayed posttest ($M = 111$). Results indicated that for the unit plus infusion group statistically significant differences, $F(2, 40) = 8.61$, $p < .0008$, were observed between pretest

($\underline{M}$ = 105) and immediate posttest ($\underline{M}$ = 112) as well as delayed posttest ($\underline{M}$ = 110). Results indicated that for the infusion only group there were no statistically significant differences among the three testing times, $\underline{F}(2, 35) = 1.77$, $\underline{p}$ n.s. Results indicated that for the control group there were no statistically significant differences among the three times, $\underline{F}(2, 36) = 1.23$, n.s.

Research Questions 7-9 (Intention to Act Component of the AAIMSO)

Research Questions 7, 8, and 9 examined the effect of the instructional method, time of testing, and the interaction between instructional method and time of testing on the intention to act component of the AAIMSO. Results showed that there was no significant main effect for instructional method, $\underline{F}(3, 76) = .71$, n.s., no significant main effect for time of testing, $\underline{F}(2, 142) = 2.52$, n.s., and no significant interaction effect, $\underline{F}(6, 142) = .56$, n.s. (See Table 7.) Table 8 presents the means and standard deviations for the Intention to Act Component of the AAIMSO.

Table 7

ANOVA Summary Table for the Intention to Act Component of the AAIMSO as a Factor of Instructional Method and Time of Testing

Source	df	SS	MS	F	p
BETWEEN SUBJECTS	79				
Instructional Methods	3	7.64	2.54	0.71	.551
Error Between	76	274.61	3.61		
WITHIN SUBJECTS					
Time of exam	2	3.70	1.85	2.51	.085
Interaction	6	2.49	0.41	0.56	.759
Error-within	142	104.95	0.73		
TOTAL	229	394.96			

Table 8

Means and Standard Deviations for the Intention to Act Component of the AAIMSO by Time of Testing, Group, and Totals

	Pretest			Immed. Post			Delayed Post			Total		
	n	M	SD	n	M	SD	n	M	SD	n	M	SD
G1	19	8.78	.91	19	8.68	1.52	18	9.11	1.40	56	8.85	1.29
G2	21	9.42	1.43	21	9.14	1.23	22	9.36	1.61	64	9.31	1.42
G3	18	8.55	0.92	17	8.76	0.97	17	9.05	1.56	52	8.78	1.77
G4	20	8.90	1.29	19	8.84	1.11	19	9.05	1.47	58	8.93	1.28
TOTAL	78	8.93	1.19	76	8.86	1.22	76	9.15	1.49			

Note. *G1 = Unit Only Group, G2 = Unit Plus Infusion Group, G3 = Control Group, and G4 = Infusion Only Group

Possible scores on the Intention to Act Component of the AAIMSO ranged from 6-18 with the lower score representing the lower risk.

CHAPTER 5

SUMMARY OF FINDINGS, DISCUSSION, AND RECOMMENDATIONS

Summary of Findings

The purpose of this study was to compare the relative effectiveness of three instructional methods for teaching AIDS prevention. Effectiveness was assessed by comparing four groups of students in regard to their knowledge, attitudes, and intention to act as measured by the AIDS Assessment Instrument for Measuring Student Outcomes (AAIMSO). These groups consisted of the unit only group, the unit plus infusion group, the infusion only group, and the control group. Students were tested on three occasions (pretest, immediate posttest, and delayed posttest). The main findings of this study will be summarized for each of the three components of the AAIMSO.

Knowledge about AIDS

A statistically significant main effect for instructional method, time of testing effect, and interaction effect were found for the knowledge component of the AAIMSO. An examination of the differences among groups at the different times of testing yielded partial support to initial expectations. As it was expected, prior to treatment the groups were similar in their knowledge about AIDS. As it was expected, the two groups that received the WEDGE program scored higher on the immediate

posttest as compared to the two groups that did not receive the WEDGE program. These changes were maintained over time as no significant differences were found between immediate and delayed posttests for these two groups. Contrary to expectations, the infusion method did not affect knowledge scores. The groups that received the infusion lessons did not change scores from immediate posttest to delayed posttest. The control group's scores changed from immediate posttest to delayed posttest despite the fact that they did not receive AIDS instruction during that period.

Attitudes about AIDS

A statistically significant main effect for time and significant interaction effect for instructional method and time of testing were found on the attitude component of the AAIMSO. Results showed that the two groups that received the WEDGE unit increased scores from pretest to immediate posttest. The scores obtained on the immediate posttest were maintained on the delayed posttest. The infusion only group and the control group showed no significant changes in scores over the three times of testing.

Intention to Act

When examining the results of the analysis on the intention to act component of the AAIMSO, there was no statistically significant main effect for instructional

method or time of testing, and no statistically significant interaction effect. Intentions to act scores fell in the low risk category at the time of the pretest; therefore, large changes in the intention to act score were not desirable.

Discussion

In the state of Iowa, AIDS education is required through two state mandates. The purpose of this study was to compare the effectiveness of three instructional methods employed to comply with those mandates. More specifically, this study compared the effectiveness of the one unit approach relative to an infusion approach. The findings of this study will be discussed with a focus around three major themes. First, the relationship among the three components will be discussed in light of previous research. Implications for the development of effective AIDS education will be highlighted. Second, the effectiveness of the WEDGE program will be discussed and compared to previous studies examining the effectiveness of other programs that follow a unit approach to AIDS education. Finally, the findings relating to the effectiveness of the infusion method of instruction will be presented and discussed in light of learning theory.

The Relationship of Knowledge, Attitudes, and Intention to Act

A significant correlation between knowledge and attitude was found at the time of the pretest, immediate posttest, and delayed posttest. Higher levels of knowledge were associated with more positive attitudes toward AIDS related issues. Attitude and intention to act were also correlated. Higher scores on the attitude component of the AAIMSO were associated with lower risk scores on the intention to act component of the test. The patterns of correlations found in this study are consistent with the theory of reasoned action developed by Ajzen and Fishbein (1973). This theory predicts that knowledge will be more closely related to attitude than to intention to act. The weak relationship between knowledge and intention to act found in this study could be interpreted as supporting the Ajzen and Fishbein claim.

Alternatively, the lack of correlation found between knowledge and intention to act could be due to the instrument used for this study. First, scores on the intention to act component of the test revealed that most students reported a low incidence of risk behavior with the consequent restriction of range and attenuation of correlation coefficients. Second, Ajzen and Fishbein (1973) noted that knowledge and attitude are better

indicators of specific rather than general behaviors. The behaviors measured by the AAIMSO, however, tend to be fairly general. This generality could be due to the fact that it is problematic to talk in schools about specific sexual behaviors (e.g., anal sex), and it is also problematic to include them in an assessment instrument to be used in schools. To more precisely evaluate the impact of educational intervention programs, therefore, instruments that address specific behavioral practices that lead to AIDS infection are needed.

Effectiveness of the One Unit Method for AIDS Education

One of the instructional methods examined by this study was the one unit method. For the purposes of this study, the Red Cross WEDGE program was selected as the one unit to be presented. The four class period program consisted of lecture, discussion, a video presentation, and a presentation by a speaker who was HIV infected. The Red Cross WEDGE program (named after a football play that requires great teamwork) was shown in this study to be effective in raising the knowledge scores and attitude scores of the students who received it.

The increase in knowledge and attitude scores following the WEDGE program observed in this study were similar to those reported by Legion et al. (1990). Data from 565 high school age participants who completed the

four session program indicated that the students were high in knowledge both before and after the WEDGE program and that "clear but modest changes in behavioral intentions and attitudes were documented" (p. 17). In this study and the previous one cited, it is evident that the WEDGE program is effective. Both the Legion study and this one fail to indicate which of the attributes of the program account for its effectiveness.

One of the issues that must be considered from the results of evaluation of the WEDGE program is whether or not this approach to instruction would be as effective if it were presented by the regular classroom teacher. The "novelty effect" involved in the administration of a new treatment may play a part in explaining the effectiveness of the WEDGE program (Borg & Gall, 1989). Because the WEDGE program was taught by guest speakers and differed from the regular instruction, scores may be influenced by the novelty of the situation. The impact of the HIV infected speaker might have been crucial in the changes observed in this study. Legion et al. (1990) stressed the importance of an AIDS infected speaker presenting to the class during one session. They contended that:

> People with AIDS can play a critical role in helping to change attitudes and behaviors that are based on fear and denial, by their mere presence, and by their willingness to speak out and address relevant issues directly. Individuals and communities benefit from contact with people with AIDS and from the attitudinal

> changes that come about when people are brought together with others who are able to address the impact of HIV/AIDS from personal experience. (p. 14)

Currently, the WEDGE program is funded through a grant from the Department of Education. If that funding were cut, schools would be faced with having to provide the instruction without the assistance of the WEDGE program speakers. The availability of an AIDS infected person to make the presentation may be a problem in the rural districts of Iowa. Further research is needed to address the issue of whether school personnel can implement the WEDGE program and examine if this implementation is effective.

The pattern of scoring revealed in this study as a result of the WEDGE program can be compared to other studies that have used one unit only approaches. The findings presented in this study showed that students who received the WEDGE program only increased in knowledge scores an average of 12% from pretest to immediate posttest. Students who received the WEDGE program plus infusion lessons increased 19% on the knowledge score from pretest to immediate posttest. The increases for both of the groups were found to be statistically significant. These percentages can be compared to those obtained by Alteneder et al. (1992) who presented a one-hour lecture and slide program. Students increased their knowledge from

8-14% following the unit in AIDS education even though pretest knowledge was already high. Miller and Downer (1988) also gave students one-class period program, finding a 13% increase in knowledge scores one week after an education program. This gain was retained at retesting 8 weeks after.

With respect to the attitude component of the AAIMSO, groups that received the WEDGE program showed changes in attitude scores of 7% from pretest to immediate posttest. Both groups maintained these increases at the time of the delayed posttest. The increase in scores revealed in this study is consistent with those of Conner et al. (1990) who found that attitudes toward AIDS were "of a generally more productive nature" following AIDS instruction (p. 82). Their study involved a ten week college course designed to address AIDS topics from a biological, psychosocial, legal, and ethical aspect. Lecture, discussion, and a panel of HIV infected speakers were included in the instruction of the course.

When considering the intention to act component of the AAIMSO, the findings of this study showed that there were no significant changes in scores for any of the groups of students. Two factors can account for this finding. First, the lack of change in these scores could be due to the initial low risk behaviors reported by students. The

low incidence of risk behaviors could be attributed to high levels of knowledge students exhibited before the intervention. Previous research has shown that students who know more about AIDS transmission are less likely to report being involved in high risk behaviors such as having two or more sexual partners, and more likely to report consistent condom use (Anderson et al., 1990). A second factor to consider when discussing the intention to act component of the AAIMSO is the floor effect of the instrument. Because the intention to act score was reported as low at the time of the pretest, the possibility of change on that score was not only restricted but also undesirable.

Effectiveness of the Infusion Method for AIDS Instruction

Both the Human Growth and Development mandate and the Health Education mandate describe the curricular content regarding AIDS to be addressed by the school. Given that school districts have local control over the curriculum, these mandates make no requirements on the amount of time or the instructional methods to be included in the delivery of AIDS education. The Human Growth and Development Mandate requires that AIDS education as well as other human development topics be infused into the existing health curriculum. In a Declarative Ruling for the Department of Education, the concept of infusion in regard to the Human

Growth and Development mandate was stated as follows: "In the case of the human growth and development subject matter, the General Assembly apparently chose to require infusion of it into the health curriculum" (5 D.o.E. Decl. Rul. 11). It should be noted that although the infusion of topics is required, there is no clear definition of infusion, nor is there empirical evidence that any one of several potential operational definitions of infusion will result in effective intervention. A review of the literature on the topic of curricular infusion failed to uncover any studies that examined its effectiveness.

In this study it was found that the infusion method, defined as infusing AIDS related content into 11 lessons of the regular health education curriculum, was not effective in increasing students' knowledge and attitudes toward AIDS. This finding is important given that teaching about AIDS through an infusion approach would meet the state requirements for AIDS education as set by the Human Growth and Development Mandate. The lack of effectiveness of the infusion method as defined by this study surfaces as an important issue with implications for many curricular areas. Legislation in recent years has mandated the infusion of topics such as multicultural education, global education, career education, and technology education into the curriculum. The lack of substantive empirical evidence

supporting the infusion of these topics into existing curriculum as an effective method of addressing these topics, raises questions regarding whether of not those mandates provide for the necessary education on those topics.

The lack of effectiveness of the infusion method documented here can be explained by the lack of a cognitive schema to process information infused into the curriculum. Ausubel (1960) maintained that cognitive structure is the foremost factor governing whether new material is potentially meaningful and how well it can be acquired and retained. He defines cognitive structure as the knowledge a person has of a particular subject matter and how well organized, clear, and stable it is. The information processing model described by Good and Brophy (1990) also stresses cognitive structure as it describes how new information is filtered through established cognitive structures. The work of Piaget which was summarized in Goetz et al. (1992) also pointed out the need for children to develop cognitive schemata in order to guide the acquisition and processing of new knowledge. Piaget viewed cognitive development as the process of creating and adapting mental structures through interaction with one's environment.

Schema theory offers an explanation for the ineffectiveness of the infusion only model of instruction. When students were presented with pieces of information about AIDS infused into other health topics without an established knowledge base about AIDS, the information could not be processed because adequate cognitive structures had not been established. The need for a well-developed cognitive structure in order to process pieces of infused information presents a critical issue in the area of curriculum mandates. If material is required to be infused into the existing curriculum with no provision made to assure that the appropriate cognitive structure has been developed, the processing of that new information will be hampered. If classroom teachers are interpreting the mandates that AIDS education be infused into the curriculum as the process of incorporating the information into existing areas of the curriculum, there exists great possibilities that the foundation of cognitive structure does not exist. If the students do not have the background information to process in order to understand the importance of AIDS education and prevention, it is possible that they will not recognize the infused lessons as important concepts presented to lower their risk of becoming infected with the deadly AIDS virus.

It is particularly important to understand that the finding that infusion alone is not an effective instructional strategy has implications that go beyond the area of AIDS education. It also raises questions about the many other curricular areas that are recommended as infusion areas. It becomes evident that further investigation is needed to assess the effectiveness of the infusion method, as defined by this study, as an instructional method. More research needs to be conducted to examine whether infusing material into the existing curriculum is an appropriate method of covering mandated material.

Summary

This study compared the relative effectiveness of a one unit approach, an infusion approach, and one unit plus infusion approach to delivering AIDS education in high school. Results revealed that the WEDGE program was effective in impacting students' scores on the knowledge and attitude components of the AAIMSO. Results also revealed that covering mandated curricular material through infusion only approaches might not yield significant amounts of learning among students. Considering the findings presented in this study, the following recommendations for further research are made.

Recommendations

1. Further research can be done to compare effectiveness of the WEDGE program to other programs using the one unit approach such as those presented by Miller and and Downer (1988) and Alteneder et al. (1992).

2. A study with the regular classroom teacher presenting the WEDGE program is also needed in order to assess the impact of an outside Health Educator as compared to the regular classroom teacher. Because the WEDGE program is funded through a grant, efforts must be made to determine if alternate methods of delivery of the program are as effective.

3. The purpose of education in general, and AIDS education in particular, is to impact the behavior of the student while in school as well as in later adult life. The question remains about the long-term effect of the intervention since this study only covered a 12-week period. For example, most students in the study reported no or limited sexual activity. It is expected that as these students get older involvement in sexual activity will increase. To assess the effectiveness of an educational intervention, it is recommended that a longitudinal study be conducted following students through high school and beyond. Because some effects, such as delaying the initiation of sexual activity, may take up to

two years to detect, long-term follow-up must be initiated with students tracked over time (Kirby, 1992).

4. This study revealed that the infusion of AIDS content into 11 health related lessons was ineffective in affecting change in scores for knowledge, attitude, and intention to act. Curricular infusion, however, is not a clearly defined concept, and it is implemented differently in different schools. Further research needs to be done to examine how the infusion mandate is operationalized in Iowa. Furthermore, these various operational definitions can be compare to establish their relative effectiveness.

5. As noted earlier, one of the problems encountered in this study was the ceiling and floor effects of the AAIMSO. Further research on the effectiveness of instructional methods for AIDS education with a population similar to the one used in this study needs to use instruments that avoid assessing very general knowledge, attitudes, and intentions to act. Given the strong behavioral component of the AIDS education, it is critical that the instrument is designed to assess specific behaviors.

6. A replication of this study using a different sample is recommended in order to establish the replicability of these findings given the eratic pattern of scoring of the control group.

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APPENDIX A

AIDS Assessment Instrument for Measuring Student Outcomes

KNOWLEDGE OF HIV AND AIDS

DO NOT put your name on this survey. Your answers will be kept secret. No one will know how you answered these questions. Use only the code as shown on the overhead.

DIRECTIONS: Read each question. Carefully check the one answer that fits best. Some of the questions use the phrase "having sex." This means sexual intercourse.

		I am sure it's true.	I think it's true.	I don't know.	I think it's false.	I am sure it's false.
1.	You can't get AIDS if you have sex only once or twice without a condom.	( )	( )	( )	( )	( )
2.	A person can "pass" an HIV-antibody test (test negative) but still be infected with HIV.	( )	( )	( )	( )	( )
3.	Condoms are 100% effective in preventing HIV.	( )	( )	( )	( )	( )
4.	Males can pass HIV on to others through their semen.	( )	( )	( )	( )	( )
5.	You can get HIV by sitting on the seat of a toilet that a person with AIDS has used.	( )	( )	( )	( )	( )
6.	Abstinence from sex and drugs is the best way for teenagers to avoid getting HIV.	( )	( )	( )	( )	( )
7.	You can get HIV from drinking from the same glass or water fountain that a person with AIDS drank from.	( )	( )	( )	( )	( )
8.	HIV can be found in semen, vaginal fluids, and blood.	( )	( )	( )	( )	( )

		I am sure it's true.	I think it's true.	I don't know.	I think it's false.	I am sure it's false.
9.	A person can get HIV by sharing drug needles.	( )	( )	( )	( )	( )
10.	HIV can be found in breast milk.	( )	( )	( )	( )	( )
11.	Once you are infected with HIV, you are infected for life.	( )	( )	( )	( )	( )
12.	People infected with HIV are usually very thin and sickly.	( )	( )	( )	( )	( )
13.	Some people have gotten HIV by swimming in the same pool as someone with AIDS.	( )	( )	( )	( )	( )
14.	You can get HIV from a mosquito bite.	( )	( )	( )	( )	( )
15.	If you want to keep from getting HIV, using "lambskin" condoms is just as good as using latex condoms.	( )	( )	( )	( )	( )

YOUR VIEWS

DO NOT put your name on this survey. Your responses will be kept secret. No one will know how you answered these questions.

DIRECTIONS: This survey asks you to say whether you agree or disagree with a set of statements. Please read each statement, then indicate whether you Strongly Agree (SA), Agree (A), are Not Sure (NS), Disagree (D), or Strongly Disagree (SD) by circling the answer you want.

Examples:

		Strongly Agree SA	*Agree* A	*Not Sure* NS	*Disagree* D	*Strongly Disagree* SD
1.	Teenagers should eat three balanced meals each day.	SA	(A)	NS	D	SD
2.	Teenagers should watch less television.	SA	A	NS	D	(SD)

BEFORE STARTING, PLEASE READ THE FOLLOWING: Some of the statements in this survey use the phrase "having sex." This means having sexual intercourse. There are also statements about HIV. HIV is the virus that causes AIDS.

Please go on to the next page. ⇒

		Strongly Agree SA	*Agree* A	*Not Sure* NS	*Disagree* D	*Strongly Disagree* SD
1.	If your friends want you to do something that you think might not be safe, you should at least try it.	SA	A	NS	D	SD
2.	It's okay not to have sex while you are a teenager.	SA	A	NS	D	SD
3.	It's okay for teenagers to have sex without a condom if they know each other well.	SA	A	NS	D	SD
4.	A teenager can inject drugs once in a while without a risk of getting infected with HIV.	SA	A	NS	D	SD
5.	Teenagers are at risk of getting infected with HIV if they engage in sex without a condom.	SA	A	NS	D	SD
6.	To keep your friends, you should go along with most things your friends want you to do.	SA	A	NS	D	SD
7.	People who don't have sex before they get married are strange.	SA	A	NS	D	SD
8.	It is not smart to have sex without using a condom.	SA	A	NS	D	SD
9.	Using needles to inject steroids or drugs is a bad idea.	SA	A	NS	D	SD
10.	It's okay to have sex without a condom because your chance of getting infected with HIV is very low.	SA	A	NS	D	SD
11.	Teenagers should learn how to resist pressures from their friends.	SA	A	NS	D	SD
12.	It's a good idea for teenagers not to have sex.	SA	A	NS	D	SD

Please go on to the next page. ⇒

		Strongly Agree SA	*Agree* A	*Not Sure* NS	*Disagree* D	*Strongly Disagree* SD
13.	People who share drug needles shouldn't worry because they probably won't get infected with HIV.	SA	A	NS	D	SD
14.	Teenagers should realize that if they're not careful, they could get infected with HIV.	SA	A	NS	D	SD
15.	When friends want you to do things you don't feel like doing, there's no harm in going along.	SA	A	NS	D	SD
16.	Using a condom doesn't make sex less pleasurable.	SA	A	NS	D	SD
17.	Anyone who shares needles is taking a chance of getting infected with HIV.	SA	A	NS	D	SD
18.	If teenagers are careful about choosing sexual partners, they won't get infected with HIV.	SA	A	NS	D	SD
19.	Teenagers should be more willing to resist pressures from their friends.	SA	A	NS	D	SD
20.	These days it makes a lot of sense to wait to have sex until you get married.	SA	A	NS	D	SD
21.	If people think they might have sex during a date, they should carry a condom.	SA	A	NS	D	SD
22.	Teenagers who don't have sex are wasting their teen years.	SA	A	NS	D	SD
23.	People who use condoms during sex don't trust the person they're with.	SA	A	NS	D	SD

Please go on to the next page. ⇒

		Strongly Agree SA	*Agree* A	*Not Sure* NS	*Disagree* D	*Strongly Disagree* SD
24.	People who share drug needles should clean the needles with bleach.	SA	A	NS	D	SD
25.	HIV is something that teenagers should think about when they date.	SA	A	NS	D	SD

YOUR INTENTIONS

DO NOT put your name on this survey. Your responses will be kept secret. No one will know how you answered these questions. Use only the code as shown on the overhead.

DIRECTIONS: This survey asks you personal questions about your intentions during the next three months. To make sure your answers are private, you will complete this survey in a special way. Read each question and find the answer that is MOST true for you. Then find the letter that goes with that answer in the row of letters between the lines. Put an X through the letter in that row (between the two lines).

Example No. 1: In the next three months, which one of the following do you intend to do?

A. I intend to gain weight.

B. I intend to lose weight.

C. I intend to stay the same weight.

O P Q R S T U V W X Y Z A B X D E F G H I J K L M N

Example No. 2: In the next three months, which one of the following do you intend to do?

A. I intend to walk to school.

B. I intend to take a bus to school.

C. I intend to get to school in another way.

S T U V W X Y Z A X C D E F G H I J K L M N O P Q R

TO PROTECT YOUR PRIVACY: Your classmates have *different* versions of this survey. *For the same question*, the letters are in a *different* position on your survey and your classmates' surveys. This is done so that no one can easily see your answers. Some of the questions in this survey ask about "having sex." This means having sexual intercourse.

1. In the next three months, which one of the following do you intend to do?
   A. I don't intend to use alcohol.
   B. I intend to use alcohol.

O P Q R S T U V W X Y Z A B C D E F G H I J K L M N

2. In the next three months, which one of the following do you intend to do?
   A. I don't intend to use drugs.
   B. I intend to use drugs.

U V W X Y Z A B C D E F G H I J K L M N O P Q R S T

3. In the next three months, which one of the following do you intend to do?
   A. I don't intend to inject drugs or steroids.
   B. I intend to inject drugs or steroids.

L M N O P Q R S T U V W X Y Z A B C D E F G H I J K

4. In the next three months, which one of the following do you intend to do?
   A. I don't intend to have sex.
   B. I intend to have sex with one person.
   C. I intend to have sex with two or more people.

S T U V W X Y Z A B C D E F G H I J K L M N O P Q R

5. In the next three months, which one of the following do you intend to do?

   A. I don't intend to have sex.

   B. I intend to use condoms with my sexual partner(s).

   C. I don't intend to use condoms with my sexual partner(s).

QRSTUVWXYZABCDEFGHIJKLMNOP

6. In the next three months, which one of the following do you intend to do?

   A. I intend to be tested for HIV because I think I may be infected.

   B. I don't intend to be tested for HIV even though I think I may be infected.

   C. I don't intend to be tested for HIV because I am unlikely to be infected.

HIJKLMNOPQRSTUVWXYZABCDEFG

APPENDIX B

WEDGE Program Lesson Goals and Content Outline

WEDGE Program Lesson Goals and Objectives

Day 1
Goal:
Provide adolescents with information on the facts about HIV/AIDS transmission.
Objectives:
Describe the facts about HIV/AIDS transmission.
Identify myths and misinformation about HIV/AIDS.
Discuss the effects of HIV/AIDS on the body.
Outline primary prevention strategies against HIV/AIDS.
Outline risk reduction strategies against HIV/AIDS.

Day 2
Goals:
To help adolescents examine personal feelings, attitudes and beliefs about AIDS related issues.
To provide adolescents with opportunities to integrate AIDS facts into personal, real-life issues.
Objectives:
Express feelings and thoughts about HIV/AIDS more comfortably.
Examine feelings about casual contact with HIV/AIDS infected people.
Examine personal beliefs and attitudes about HIV/AIDS and related issues.

Day 3
Goal:
To introduce adolescents to the psychological, emotional, and social impacts of living with HIV/AIDS.
Objectives:
Describe some of the emotional and social consequences of living with HIV/AIDS.
Describe behaviors which place a person at risk for exposure to HIV/AIDS.
List at least 2 ways to avoid exposure to HIV/AIDS.

Day 4
Goal:
To provided adolescents an opportunity to integrate the factual, emotional, and social aspects of HIV/AIDS presented during the preceding sessions.
Objectives:
Assess personal risk of exposure to HIV/AIDS.
Describe HIV/AIDS.
Describe HIV/AIDS prevention and risk reduction methods.
Discuss how and why people put themselves at risk for HIV/AIDS infection.
Identify at least two community resources available for HIV/AIDS information and services.

Appendix C

Infusion Lesson Plans

INFUSION LESSONS NUMBER 1 and 2

Lesson 1--Lecture and Discussion

Lesson 2--Group Activity, Presentation and Discussion

Topic: Sexually Transmitted Diseases

Background: During this unit students will explore the characteristics, consequences, and symptoms of a variety of sexually transmitted diseases. Emphasis will be placed on methods of avoiding sexually transmitted diseases and treatment of the diseases if the are contracted.

The infusion lessons on AIDS will focus on the behaviors that result in AIDS and the similarities and differences between AIDS and other sexually transmitted diseases. The fact that there is no cure for AIDS at this time will be stressed.

Objectives: 1. Students will become familiar with the behaviors that cause sexually transmitted diseases including AIDS.

2. Students will list the similarities among AIDS and other sexually transmitted diseases.

3. Students will list the differences between AIDS and other sexually transmitted diseases.

4. Students will compare symptoms for different sexually transmitted diseases including AIDS.

5. Students will compare treatments for different sexually transmitted diseases including AIDS.

Content: 1. Lecture on facts regarding sexually transmitted diseases including AIDS using Glencoe Health and AIDS and Society by Mary Bronson Merki as a reference.

2. Questions and discussion regarding the transmission, symptoms, and treatments for different sexually transmitted diseases including AIDS.

3. Students break into groups of three or four and are assigned one sexually transmitted disease as a research topic. Time is allowed and references are distributed enabling students to research the following three questions.

1. How is this sexually transmitted disease similar to other sexually transmitted diseases?

2. How is this sexually transmitted disease different from other sexually transmitted diseases?

3. What specific facts do I know about this sexually transmitted disease in regard to transmission, symptoms, and treatments?

4. Students present to class summarizing their research about the disease their group explored.

5. Discussion of information and clarification of questions.

INFUSION LESSON NUMBER 3

Topic: Family Life

Background: During this unit students will examine the different types of families and family lifestyles. An overview of family types with advantages and disadvantages of each type will be presented. Students will be encouraged to explore their own backgrounds and beliefs to help determine the family type they would most like in the future.

The infusion lesson on AIDS will focus on the possible consequences of choosing a homosexual lifestyle or choosing a family lifestyle that involves multiple partners. The risk factors of homosexual behaviors and multiple sex partners will be presented and discussed.

Objectives: 1. Students will list and define six family types.

2. Students will list the advantages and disadvantages of each family type.

3. Students will identify specific risk factors for AIDS involved with homosexual lifestyles and lifestyles involving multiple partners.

Content: 1. Lecture on family types.

2. Lecture and discussion on advantages and disadvantages of different family types.

3. Students brainstorm list of characteristics they want in their own family type in the future.

4. Students share lists with classmates and discuss reasons for inclusion of characteristics.

5. Teacher led discussion of risk factors involved with lifestyle choices including homosexual and lifestyles involving multiple partners when considering AIDS.

6. Teacher led discussion of how these risks can be minimized.

INFUSION LESSON NUMBER 4

Topic: Family Health

Background: During this unit students will become aware of the different components of family health (physical, emotional, social, and mental) and the ways that family health can be encouraged. Factors that facilitate or discourage healthy behaviors will be examined.

The infusion lesson on AIDS will include a discussion of how a terminal disease affects each of the aspects of health. Emphasis will be placed on the fact that many people are involved in the care of a terminally ill family member and each has difficulties that result from the illness.

Objectives: 1. Students will list the components of family health.

2. Students will compile a list of resources that can be used to help families cope with the changes that accompany life.

3. Students will examine the effect that life events have on the health of a family. (example--death,

divorce, marriage, new baby, retirement, terminal illness) events.

4. Students will explain the effect of different life events including a terminal illness such as AIDS has on family health.

Content: 1. Teacher led review of the components of family health from previous lesson.

2. Class brainstorms a list of the factors and events that influence family health.

3. Students work in groups of three or four and are assigned one life event that can affect family health. Lists will be compiled to outline the effect of the different life events on the physical, emotional, social, and mental health of the family members.

4. Students share lists and discuss the resources that could be used to help the family cope with the stress of the changes.

INFUSION LESSONS NUMBER 5 and 6

Lesson 5--List activity and Newspaper activity
Lesson 6--"A Letter From Brian" video tape

Topic: Relationships

Background: During this unit students will examine the different aspects of human relationships and the factors that influence relationships. Characteristics of effective relationships, stages in relationships, the importance of good relationships, and problems in relationships will be topics for lecture, discussion, and activities in this unit.

The infusion lessons on AIDS will include the exploration of how AIDS can affect a relationship and the feelings of people and their loved ones as they discover that they are infected with AIDS.

Objectives: 1. Students will become aware of how AIDS can affect a relationship.

2. Students will explore a variety of sources for articles about people who are infected with AIDS and the impact it has had on their relationships.

3. Students will view the video tape "A Letter From Brian" and write a reaction paper.

Content: 1. Each student will compile a list of the ways that AIDS could affect a relationship.

2. Share lists with class and discuss.

3. Using newspapers, magazines and other resources available in the classroom, locate one article about AIDS and its effect on a relationship. Read article and share highlights of the article with class.

4. Each student summarizes information from articles in two sentences to state the effect that AIDS has on relationships in their opinion.

5. View video tape "A Letter From Brian" and write a one page reaction to the video that answers the following questions.

1. How would you feel if your best friend disclosed that he/she was infected with AIDS? Would it change your relationship? If yes. how?

2. Which character in the video did you empathize with the most? Why?

3. Which character in the video did you empathize with the least? Why?

4. In what ways does AIDS affect the family members of the AIDS victim?

5. What was the most important thing that you learned from viewing this video?

INFUSION LESSONS NUMBER 7 and 8

Lesson 7--Lecture on Human Reproduction

Lesson 8--Guest Speaker, Birth Control

Topic: Human Reproduction and Birth Control

Background: During this unit students will learn the basic facts about human reproduction and birth control as well as examine the decisions and consequences involved with these topics. Emphasis will be placed on understanding human reproduction and birth control in order to make wise decisions regarding the student's health and the health of their children.

The infusion lessons on AIDS will point out the risk that AIDS poses to the development and delivery of healthy babies and safeguards that can be taken to minimize the risk of contracting and transmitting AIDS.

Objectives: 1. Students will summarize the reproduction process.

2. Students will list factors that pose risks to the development and delivery of a healthy baby including AIDS.

3. Students will discuss ways to minimize the risk of contracting and transmitting AIDS.

4. Students will examine different methods of birth control and their role in preventing pregnancy and sexually transmitted diseased including AIDS.

Content: 1. Lecture on human reproduction.

2. Students view overheads of the reproductive process as teacher explains each part of the process.

3. Lecture and on risk factors to development and delivery of a healthy baby including AIDS.

4. Guest speaker from Allen Womens Health Center on methods of birth control and their role in preventing pregnancy and sexually transmitted diseases including AIDS.

INFUSION LESSON NUMBER 9

Topic: Marriage

Background: This unit covers the history of marriage in different cultures, the role of marriage in today's society, the selection of a partner, and the necessary adjustments for a successful marriage. The infusion lesson on AIDS will be incorporated into an activity on the selection of a marriage partner.

Objectives: 1. Students will examine their own beliefs regarding the characteristics of a desirable marriage partner.

2. Students will gain an awareness of how their attitudes and beliefs compare and contrast with those of their classmates.

3. The students will compile a list of characteristics that they are seeking in a marriage and discuss in small groups why those characteristics are important to them.

Content: 1. Teacher introduce activity called "Would You Marry?" Distribute activity sheets and allow time for completion.

2. Go through activity sheet and allow students to discuss the reasons for their answers.

3. Students compile list of characteristics that they are seeking in a marriage partner and discuss in small groups.

ACTIVITY SHEET

WOULD YOU MARRY??

Please answer yes, no, or undecided to each of the following questions. We will discuss each of the questions when everyone has finished. Use the space after the question to explain your answer if needed.

Would you marry someone.....

1. who was 15 years older than you?
2. who was of a different race?
3. who was an atheist?
4. who had lost a leg in an accident?
5. who was extremely good looking?
6. who drank alcohol excessively but promised to quit?
7. who was infected with AIDS?
8. who had parents whom you could not stand?
9. who was unemployed?
10. who had been married before?

11. who worked 70 hours per week?

12. who had poor personal hygiene?

INFUSION LESSONS NUMBER 10 and 11

Topic: Child Development and Parenting

Background: During this unit students will learn about the process of child development from conception through preschool age. The physical, emotional, social, mental, and intellectual growth and development of the child will be explored.

The infusion lessons on AIDS will contain information on how AIDS is transmitted from mother to baby as well as the care and prognosis of AIDS infected babies.

Objectives: 1. Students will explain the two main ways that the AIDS virus is transmitted from mother to baby.

2. Students will describe a plan of action they think should be followed to help reduce the number of AIDS infected babies born each year.

3. Students will gain an awareness of the difficulties faced when a baby is born AIDS infected by viewing a video tape entitled "Pediatric AIDS".

Content: 1. Teacher lecture on topic of AIDS transmission from mother to child.

2. View overheads of transmission routes of AIDS from mother to baby.

3. Teacher led discussion of transmission of AIDS from mother to baby with time allowed for student questions.

4. Students describe in writing a plan of action that they think could be followed to reduce the number of AIDS infected babies.

5. Students view video tape "Pediatric AIDS" and discuss.

Appendix D

Checklist for Treatment Fidelity

Checklist for Treatment Fidelity

Please indicate whether or not the objective was addressed in the presentation by placing a checkmark in the appropriate column.

WEDGE Program Objectives

The following objectives were addressed during the WEDGE presentation:

yes	no	Following the presentation of the WEDGE program, the student will:
___	___	Describe the facts about HIV/AIDS transmission.
___	___	Identify myths and misinformation about HIV/AIDS.
___	___	Discuss the effects of HIV/AIDS on the body.
___	___	Outline primary prevention strategies against HIV/AIDS.
___	___	Outline risk reduction strategies against HIV/AIDS.
___	___	Express feelings and thoughts about HIV/AIDS more comfortably.
___	___	Examine feelings about casual contact with HIV/AIDS infected people.

___ ___ Examine personal beliefs and attitudes about HIV/AIDS and related issues.

___ ___ Describe some of the emotional and social consequences of living with HIV/AIDS.

___ ___ Describe behaviors which place a person at risk for exposure to HIV/AIDS.

___ ___ List at least 2 ways to avoid exposure to HIV/AIDS.

___ ___ Assess personal risk of exposure to HIV/AIDS.

___ ___ Describe HIV/AIDS.

___ ___ Describe HIV/AIDS prevention and risk reduction methods.

___ ___ Discuss how and why people put themselves at risk for HIV/AIDS infection.

___ ___ Identify at least two community resources available for HIV/AIDS information and services.

Infusion Lesson Objectives

The following objectives were addressed during the infusion lessons:

yes	no	Following the presentation of the infusion lessons, the student will:
___	___	Become familiar with the behaviors that cause sexually transmitted diseases including AIDS.
___	___	List the similarities among AIDS and other sexually transmitted diseases.
___	___	List the differences among AIDS and other sexually transmitted diseases.
___	___	Compare symptoms for different sexually transmitted diseases including AIDS.
___	___	List and define six family types.
___	___	List the advantages and disadvantages of each family type.
___	___	Identify specific risk factors for AIDS involved with homosexual lifestyles and lifestyles involving multiple partners.
___	___	Compare treatments for different sexually transmitted diseases including AIDS.
___	___	List the components of family health

___ ___ Compile a list of resources that can be used to help families cope with the changes that accompany life

___ ___ Examine the effect that life events have on the health of a family.

___ ___ Explain the effect of different life events including a terminal illness such as AIDS has on family health.

___ ___ Become aware of how AIDS can affect a relationship.

___ ___ Explore a variety of sources for articles about people who are infected with AIDS and the impact it has on their relationships.

___ ___ View the video tape "A Letter From Brian" and write a reaction paper.

___ ___ Summarize the reproduction process.

___ ___ List factors that pose risk to the development and delivery of a healthy baby including AIDS.

___ ___ Discuss ways to minimize the risk of contracting and transmitting AIDS.

___ ___ Examine various methods of birth control and their role in preventing pregnancy and sexually transmitted diseases including AIDS.

___ ___ Examine beliefs regarding the characteristics of a desirable marriage partner.

___ ___ Gain an awareness of how their attitudes and beliefs compare and contrast with those of their classmates.

___ ___ Compile a list of characteristics that they are seeking in a marriage and discuss in small groups why those characteristics are important to them.

___ ___ Explain the two main ways that the AIDS virus is transmitted from mother to baby.

___ ___ Describe a plan of action to follow to help reduce the number of AIDS infected babies born each year.

___ ___ Gain an awareness of the difficulties faced when a baby is born AIDS infected by viewing a video tape entitled "Pediatric AIDS".

Appendix E

Human Subjects Review Information

The University of Northern Iowa

September 2, 1993

Mrs. Denise Kerns Schares
126 Palmer Dr.
La Porte City, IA 50651

Dear Mrs. Kerns Schares:

Your project, "AIDS Education: The Effect of Three Instructional Strategies on Retention of Changes in Knowledge, Attitudes and Intention to Act", which you submitted for human subjects review on August 30, 1993 has been determined to be exempt from further review under the guidelines stated in the UNI Human Subjects Handbook. You may commence participation of human research subjects in your project.

Your project need not be submitted for continuing review unless you alter it in a way that increases the risk to the participants. If you make any such changes in your project, you should notify the Graduate College Office.

If you decide to seek federal funds for this project, it would be wise not to claim exemption from human subjects review on your application. Should the agency to which you submit the application decide that your project is not exempt from review, you might not be able to submit the project for review by the UNI Institutional Review Board within the federal agency's time limit (30 days after application). As a precaution against applicants' being caught in such a time bind, the Board will review any projects for which federal funds are sought. If you do seek federal funds for this project, please submit the project for human subjects review no later than the time you submit your funding application.

If you have any further questions about the Human Subjects Review System, please contact me. Best wishes for your project.

Sincerely,

Norris M. Durham, Ph.D.
Chair, Institutional Review Board

cc: Dr. David A. Walker, Associate Dean
Dr. Charles Dedrick

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