Instructional design from theory to practice: A guidebook for designing and implementing effective instruction. Alcohol abuse prevention programs for adolescents.

Linda Ann. Morrow

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INSTRUCTIONAL DESIGN
FROM THEORY TO PRACTICE:

A GUIDEBOOK FOR DESIGNING AND IMPLEMENTING EFFECTIVE INSTRUCTION

ALCOHOL ABUSE PREVENTION PROGRAMS FOR ADOLESCENTS

by

Linda Morrow

A Thesis Submitted to
the Faculty of Graduate Studies and Research
through the Department of Communication Studies
in Partial Fulfillment of the Requirements
for the Degree of Master of Arts
at the University of Windsor

Windsor, Ontario, Canada
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ABSTRACT

Alcohol is the most widely used drug in Canada. The Ontario Ministry of Health (1990) estimated that 83% of the population fifteen years and older consume alcohol. Alcohol is also responsible for more health-related problems than any other drug. Young people are clearly identified as a priority in alcohol abuse prevention strategies, since injuries resulting from alcohol abuse continues to be the number one cause of death for young Canadians.

While the transfer of planning and implementation of prevention programs to the more "grassroots" organizations has empowered communities, many organizations and community groups lack the full theoretical background for designing and then effectively sustaining prevention programs dealing with alcohol use and abuse. Most of those involved have diverse backgrounds, primarily in science and health service fields. As a result, there is considerable variation in knowledge about instructional design and the application of pertinent theory for alcohol abuse prevention programs targeted towards adolescents.

This thesis focuses on identifying an appropriate instructional design model for use in alcohol abuse prevention programs for adolescents and then presents a comprehensive guidebook with instructional tips for implementing effective instruction for this audience. The booklet blends current research from communication theory, learning theory, attitude change and persuasion theory and instructional design theory with practical application strategies. A panel of seventeen peer reviewers critiqued the booklet and commented on its' content and practicality. Preliminary results indicate that designers and facilitators find the instructional "tips" relevant, helpful, and easy to read. Several retained the booklet as a resource for future instruction.
DEDICATION

This work is dedicated to my son Taylor, who, at the tender age of three, is living proof that learning is life-long, and that the most wonderful and important of life's lessons can begin by enthusiastically asking that one question: "Why?"
ACKNOWLEDGEMENTS

I would like to thank all those people who continued to offer support and encouragement during the completion of this thesis - thank-you to Jerry and our families, and my many colleagues in the education, health promotion, and health services field. Thanks to Steve K - good advice, great jokes (at a price).

I would also like to thank those people who agreed to be peer reviewers, I admire and respect them for their continued commitment to keep our children healthy and safe.

Thank-you to the faculty and staff of the Communication Studies Department at the University of Windsor. A special thanks to my readers, Dr. Hugh Edmunds and Dr. Larry Morton.

I continue to be indebted to Dr. Richard Lewis for his patience and encouragement.

I will never again underestimate the power of one person to inspire and motivate another.
# TABLE OF CONTENTS

Abstract ................................................................................................. i

Dedication ............................................................................................... ii

Acknowledgements ................................................................................ iii

List of Tables ........................................................................................ vi

List of Figures ........................................................................................ vii

Chapter 1  Introduction to the Thesis Topic ............................................. 1-7

1. Purpose .............................................................................................. 1

2. Identifying the Problem .................................................................... 4

3. Addressing the Problem - thesis focus ......................................... 5

4. Definitions and Parameters ........................................................... 6

Chapter 2  Methodology ......................................................................... 8 - 11

Chapter 3  Literature Review ................................................................. 12 - 97

1. A Comparative Overview of Instructional Design Models. .... 12
2. Briggs & Wager: Instructional Design Procedures .......... 25

3. Roger Kaufman: Planning Educational Systems:
a Results Based Approach ............................................. 44

4. Dick and Carey: Systematic Design of Instruction ............ 52

5. Smith & Ragan: Instructional Design ......................... 71

Chapter 4 - Qualitative Results ...................................... 98 - 217

1. Part I: Instructional Design Model .............................. 98 - 107

2. Part II: A Guidebook for Designing and
Implementing Effective Instruction ............................... 108 - 189

3. Part III: Peer Review .............................................. 190 - 206
   i) a profile
   ii) instructional strategies
   iii) pre/post reading activities

Chapter 5 - Discussion of Findings ................................. 207 - 213
   i) regarding content
   ii) regarding style and format

Chapter 6 - Conclusions & Recommendations .................. 214 - 217

References .......................................................... 218 - 221

Appendices .......................................................... 222 - 244

Vita Auctoris ......................................................... 245
LIST OF TABLES

Table #1  Fourteen common tasks in model development ............ 16
Table #2  Tasks included in Instructional Design Models .......... 18,19
Table #3  Categorization by origins, theoretical underpinnings purposes and uses and documentation ............... 23,24
Table #4  Stages of Design as Performed by the Expert ............ 28
Table #5  Organizational Elements & their Relationship to Organizational Efforts, Organizational Results and Societal Impact ........................................... 46
Table #6  Sample Methods-Means Identification Form ............... 51
Table #7  Overview of activities for summative evaluation ........ 69
Table #8  Expanded Instructional Events .............................. 86
Table #9  Summary Data of Part I: Peer Review .................... 193
Table #10 Summary Findings of Peer Reviewers: Pre-Reading Survey ........................................... 197 - 200
Table #11 Summary Findings of Peer Reviewers: Post-Reading Survey ........................................... 201 - 206
LIST OF FIGURES

Figure #1    Flowchart Stages of Design ......................... 29
Figure #2    Instructional Curriculum Map .................... 34
Figure #3    Dick & Carey’s Systems Approach Model ......... 53
Figures #4,5 Hypothetical Hierarchical Analysis of Steps in a Problem-Solving Goal ..................... 58
Figure #6    Smith & Ragan’s Instructional Design Model ..... 72
Figure #7    An Outline of Learner Characteristics ............ 82
Figure #8    Alcohol Abuse Prevention Instructional Design Model .................. 98
CHAPTER ONE
INTRODUCTION

"There is nothing so practical as a good theory."

- Professor Kurt Lewin
The Practical Theorist

Alcohol is the most widely used drug in Canada. The Ontario Ministry of Health (1990) estimates that 83% of the population fifteen years and older consume alcohol. Alcohol is also responsible for more health-related problems than any other drug. It is a factor in more than 50% of all traffic fatalities, and 35% of all falls, drownings, and fires. The negative effects of alcohol abuse also reach far beyond just the individual drinker. The Ministry also estimates that alcohol is a factor in one third of all child abuse cases and 60% of all divorces. Michael O'Donnell and Thomas Ainsworth in their work, "Health Promotion in the Workplace" (1991), studied the impact of alcohol use in the work environment. Alcohol plays a role in approximately 47% of industrial accidents in Canada. Employers lose twenty-five cents of every dollar paid in wages to alcoholic employees through lost productivity. Compared to other workers, alcoholic employees file five times more compensation claims, receive three times the sickness benefits, and have an accident rate more than three times higher than their non-drinking colleagues.

The fact that alcohol and substance abuse have become major concerns within the Canadian community has not been lost on governments. The first interdepartmental attempt to co-ordinate Canada's response to this issue dates back to
1987 with the creation of the National Drug Strategy. With a commitment of $270 million, and the involvement of seven federal departments, the Strategy sought to support and enhance alcohol and other drug programming in three traditional areas: prevention, treatment, and enforcement and control (Minister of National Health and Welfare, 1994). A recent renewal of Canada's Drug Strategy also includes a new strategic emphasis which focuses on prevention and treatment aimed at the adolescent population (many of whom are not yet under the influence), and increased activity directed toward the hard to reach, children at risk, and street youth. Government bodies have recognized the need to shift to a bottom-up approach, and this has resulted in a substantial increase in funding for community groups and projects, and increased encouragement for these local groups to diagnose the nature of their drug and alcohol problems and implement their own unique solutions.

The areas defined as prevention and treatment are based on a model called the "risk continuum" as developed by the Addiction Research Foundation (ARF). This model classifies drinking behaviours and the relative risk associated with different levels of alcohol consumption. People are classified as abstainers, problem-free (moderate) drinkers, or problem drinkers with mild to severe problems. The continuum extends from "no risk" (with no alcohol consumption) to "high risk" (where consumption exceeds 35 drinks per week). The continuum model is used to provide a planning framework for alcohol-related prevention initiatives. Programs like Alcoholics Anonymous have traditionally supported alcohol-free lifestyles, however other organizations, including the Ontario Ministry of Health and the Addiction Research Foundation, maintain that the use of alcohol should be an "informed individual choice"
(Ontario Prevention Clearinghouse, 1993). The Ontario Prevention Clearinghouse concurs with the government's focus that alcohol-related prevention initiatives should have two broad goals: to increase the proportion of abstainers and problem-free drinkers; to reduce the proportion of drinkers who experience problems. This can be achieved by either promoting abstinence, reducing the incidence of drinking practices that put people at risk, or reducing the prevalence of drinking practices that put people at risk through early intervention and treatment. Prevention and health promotion programs and initiatives are developed to promote healthy lifestyles and reduce these risks in the general population or in specific groups. Initiatives include policy development or changes (i.e., legislation concerning accessibility and availability), as well as specific programs aimed at changing individual behaviour or factors which influence drinking practices like family, environment, and peer groups.

Health Canada, under the umbrella of Canada's Drug Strategy has, since the reorganization, funded several alcohol-related prevention programs. In a technical report prepared for Health Canada, Eliany & Rush (1992) estimated that there were over 52 alcohol- and drug-specific health promotion/prevention programs in operation during the summer of 1990. A majority of these programs (78%) sought to "provide education and promote awareness" of alcohol and other drug abuse. The most frequently identified target group was youth and children (50%), and 64% of these programs focused their energies on trying to change individual attributes related to knowledge, attitude, intentions, and behaviours. Seventy-five percent of these programs were implemented in elementary and secondary schools, and the principle strategy was one of "influence", that is trying to change knowledge or attitudes of the individual (Eliany & Rush, p. 7, 1992).
In addition, other federal departments, including the Ministry of the Solicitor General and Justice Canada, have also developed and funded youth oriented alcohol prevention programs. Health promotion program strategies have ranged from peer education/mentoring and interpersonal relation techniques to video production and live theatre (see appendix A for a sampling of programs). Young people are clearly identified as a priority in prevention strategies. Statistics support this focus since injuries resulting from alcohol abuse continue to be the number one cause of death for young Canadians.

Identifying the Problem:

While the transfer of planning and implementation to the more 'grassroots' organizations has served to empower our communities, it has brought with it some unique implications. It has become apparent that many of these organizations and community groups lack the full theoretical background for designing and effectively sustaining instruction and prevention programs dealing with alcohol use and abuse. Most of those involved have diverse backgrounds, primarily in science and health services fields. Others have become involved after overcoming personal battles with alcohol or having been personally touched by the consequences of alcohol use and/or abuse. While the Health Programs and Services Branch of Health Canada offers some assistance in developing programs suitable for funding, it is generally left to the applicant to design programs that meet the requirements of the funder. As is obvious from the sample application (appendix B), the emphasis lies with evaluation more than with the presentation of any sound theoretical basis of design. A well presented evaluation
strategy is often sufficient in assuring these funders that programs will be evaluated (albeit in a summative nature) for effectiveness and suitability for the target population. As a result, there is considerable variation in the use of theory in the design of alcohol prevention programs targeted towards adolescents, and these programs have experienced a variable amount of success. The question that remains is what can be done to ensure that health promoters and those designing these programs have easier access to theoretical information which will encourage and enable them to apply these principles in their instructional design? In addition, are there components of existing prevention programs that have been successful in meeting program objectives, and can they now serve as guidelines for the direction of future design?

**Addressing the Problem - Thesis Focus:**

The author will develop a guidebook with a list of principles or "tips" for designing and implementing alcohol-related prevention programs targeted toward the adolescent population. These guidelines or principles will be based on research in the following areas:

- general communication theory
- learning theory
- instructional design theory
- attitudinal change and persuasion theory
- developmental psychology (psychology of adolescents)
- analysis of successful primary prevention programs

Once this guidebook has been developed, it will be reviewed and critiqued by twenty individuals involved in either curriculum design and/or the design and delivery of
health promotion programs. The booklet will be scrutinized to assess whether these principles/tips are currently used and will be used in the future when designing and planning instruction. Individuals will be approached from such organizations as the Addiction Research Foundation, regional community health centres and clinics, schools, etc.

It should be noted that these guidelines and this booklet is not intended to be used solely as an evaluative tool; any particular program should not be deemed as "bad" or a "failure" simply because it does not adhere to several of the principles. The guidelines are intended to serve as an aid during design or formative evaluation.

Definitions and Parameters:

To ensure that this thesis remains focused and manageable, some concepts need to be defined and some parameters need to be set. The following should be considered:

- any programs examined will be alcohol-related programs involving primary prevention, with the focus on providing information and changing attitudes before an identified or entrenched problem develops.
- the target group identified as "teens" or "adolescents" will be males and females between 12 and 19 years of age, those typically found in a secondary school setting.
- the list of principles will be primarily applicable to programs designed to be delivered by an outside agent (not the classroom teacher) in a face-to-face interaction, and usually, but not exclusively, in a classroom setting. Because of the ease of access to the target audience, the school environment is the most
common site for these programs. However, most tips should be transferrable to other settings such as community centres and youth action group sites, which may be able to more successfully target school drop-outs and homeless youth.

- many of the principles or tips within the guidebook will also be applicable to other target populations and other topic areas; some suggestions are clearly recognizable as good rules of thumb for any instructional situation.
CHAPTER TWO
METHODOLOGY

The instructional design guidebook was developed to present both an appropriate instructional design model and provide tips or guidelines based on theory that would help to increase the effectiveness and utility of that design component for the outlined instructional situation.

*Part I - Developing an Instructional Design Model*

The difficulty for many instructional designers, especially for those individuals who are required to both design and implement, lies in deciding which model or models to follow. Andrews & Goodson's work, *A Comparative Analysis of Models of Instructional Design* (1980), was used as a reference to review and analyze the more than forty models of instructional design already in existence. The authors critically analyzed forty models against two separate schema. The first involved scoring all the models based on G.L. Gropper's list of common tasks in model development. The second schema assessed the models based on theoretical legitimacy and transferability to other contexts. This schema examined the evidence of origin, theoretical underpinnings, purposes and uses, and evidence of documentation. Using Andrews & Goodson's criteria it was decided that those models developed by Briggs and Wager (1981), Kaufman (1988), and Dick and Carey (1990) were worth examining in more detail. A more recent model developed by Smith and Ragan (1993) was also examined. Using the various components of these models as a guide, an instructional design model for alcohol abuse prevention programs for adolescents was developed.
Each instructional design tip included in the booklet was presented to enhance the utility of the design component and increase the likelihood of successful instruction. An extensive review of research in the following areas was conducted: communication theory, learning theory, instructional design, attitudinal change and persuasion, developmental psychology, analysis of successful primary prevention programs. Theoretical information or insights that were relevant to the chosen instructional situation were summarized and presented as "tips" for consideration in instructional design.

The contents of the booklet included a description of the steps in the instructional model and a series of related tips or recommendations intended to increase the likelihood of success and link theory to practise. Each tip or recommended guideline included a section outlining the theory from which the guideline was derived. This not only provided legitimacy to the recommendation, but also helped bridge theory and practise. Similarly, the "relevance" section briefly outlined how this instructional design tip is relevant to, and could improve the effectiveness of, the chosen instructional design situation. A sample practical application was presented to help educators better understand how the recommendation could be implemented within actual instruction. Lastly, the "reference" section directed readers to the original source of information should they want to read about the topic or theory in more detail. The size and layout of the booklet were developed in an effort to make the guide more user-friendly and readable.
Part III - Implementing a Peer Review

The guidebook for designing and implementing effective instruction was then given to seventeen individuals who were to act as peer reviewers. The peer reviewers consisted of people who are professionally involved in either curriculum design, the design or delivery of health promotion programs, alcohol abuse prevention for adolescents, teaching of adolescents, etc. A panel of seventeen reviewers was considered sufficient for obtaining information about the utility of the guidebook and the information it contained.

Prior to seeing any material reviewers were first presented with a letter indicating the intent of the thesis and requesting that they outline, in as much detail as possible, how they go about designing or developing instruction for adolescent learners, that is, what steps they routinely consider during the planning or design process. Reviewers were given blank sheets of paper and allowed to use whatever method or combination of methods they felt comfortable with, diagrams, charts, written descriptions, etc. This information was used somewhat as a pre-test to see what components or activities in instructional design individuals were already using in the design process. A brief questionnaire asked reviewers to categorize themselves according to a few demographic questions. Because of the size of the sample, it was not possible to guarantee anonymity, however it was possible to assure respondents that data would be reported in an aggregate form based on commonalities in demographics. This information was also used to determine if there were any significant differences in answers based on employment and educational background.

After returning this outline, reviewers were given another survey which listed all
the instructional components and tips included in the booklet. Prior to reading the booklet reviewers were asked to indicate whether or not they do or would do this activity all the time, sometimes, or never, or if they were unsure of what the component/tip means. They were then asked to fill out a similar survey while reading the booklet which again outlined the components and tips and addressed whether or not, now that they have read about the topic, they would consider doing this in the future. Reviewers were also asked whether they thought the component and/or tip should remain in the booklet (hence its' usefulness) and to provide comments about the topic in question. All this information was analyzed to determine any change in intent after reading the booklet; the various reasons for these opinions; whether or not these components/tips were considered useful and should be included in future editions of the booklet.

Sample surveys and questionnaires can be found in appendix B.
CHAPTER THREE
LITERATURE REVIEW

A COMPARATIVE OVERVIEW OF INSTRUCTIONAL DESIGN MODELS

A major assumption of this project lies in the belief that a good instructional
design model is essential for the creation and implementation of successful instruction.
Reigeluth (1982) likened instructional design and delivery to architecture and
construction. Like a building, instruction should be planned and then created. Architects
begin with the standard concept of what a hospital, church, or library should look like,
then, along with construction personnel, add their personal modifications. Similarly, the
"architects" of instruction - designers, have the ability to provide a blueprint for
instruction that is to be created. Experienced designers should work from a set of models
of instruction to develop a standard blueprint which can be modified when necessary.

The difficulty for many instructional designers and especially for those
individuals who are required to both design and implement, lies in deciding which
model or models to follow. Instructional design models come from many settings
including education, industry, and the military. Therefore, model's origin and intended
use can impact on its applicability to other educational contexts. Andrews & Goodson
(1980) indicated that because several of the early instructional design models came from
industry or the military, they are often viewed as valid only for vocational education.
Some who work in the standard school system or in the world of academia continue to
proclaim that "we're not making widgets, we're molding young minds", and therefore
believe there is no advantage in using a design model which clearly delineates
measurable objectives and outcomes.
However, even for those willing to search out an appropriate model, this search can sometimes be confusing and seemingly endless. Andrews & Goodson (1980), in their work, *A Comparative Analysis of Models of Instructional Design*, identify and analyze more than forty models of instructional design. They contend that the proliferation of so many models can be partly attributed to the resistance of educators to seek out existing models of instructional design before attempting to create their own. They quote A.J. Molnar regarding the inefficiency associated with this attitude:

> The large amount of uncoordinated research activities and the lack of pre-planned linkages between research and practice has led to the existence of an expensive cottage industry in educational technology which tends to retool every academic year. Researchers and educators frequently demonstrate a strong resistance to the use of someone else's innovation. It has been said that if there was a Nobel prize for educational research, we would nominate an entire generation of researchers for their co-discovery of the wheel (Andrews & Goodson, 1980, p. 12).

The number of models alone is compounded by the confusion surrounding the definition of a "model" and its limitations. Silvern (1977, p.168) defines "model" as a "graphic analog representing a real-life situation either as it is or as it should be". Because these "real-life situations" are heavily rooted in time and context, it is essential for the instructional designer to know how and why this model came to be so the designer can determine the suitability of the model for his or her desired instructional goals (Andrews & Goodson, 1980, p. 3). Most models also have various degrees of descriptive, prescriptive, predictive, and/or explanatory elements.
Another related area that needs to be reviewed closely and continues to be cause for concern is the relationship between the total model development and theory. Implicit in the presentation of many models is the prediction that the intended learning will occur when the activities outlined in the model are followed. This confidence often comes from the assertion that within the model there exists strong theoretical underpinnings, especially those related to learning theory, motivation, reinforcement, and so on. However, Andrews & Goodson (1980) are quick to point out that a model is not the same as a theory. Rather, a model might draw from and incorporate a number of theories. They propose that,

While models may help to form an initial investigation into factors of instructional design, theories may allow for a better understanding and control of the learning environment. As we increase our understanding of the processes required for effective instructional design and development, we should explicitly state the constructs and propositions that evolve and, therefore, change the assumptions upon which a model rests (Andrews & Goodson, 1980, p.3).

Models which incorporate specific theoretical constructs lend credibility to the term "design". They also have the greatest potential for transferability and applicability to situations far beyond their original design context or intent. Ironically, a model that is strongly anchored in proven theory and research is also subject to the possibility of wholesale rejection by designers and educators. As Andrews & Goodson (1980) point out, a strong advocate of discovery learning may quickly dismiss a model espousing Skinnerian principles or even one requiring the specification of matching instructional events with pre-determined objectives.
Those who are searching for the model appropriate for their instructional
eendeavours should also be aware of the purpose of instructional design. Andrews &
Goodson (1980) identify four general purposes: 1) improving learning and instruction
through problem-solving and feedback; 2) improving management of design and
development by providing mechanisms for monitoring and control; 3) improving
evaluation processes by outlining designated components and sequences of events,
including feedback and revision events; 4) testing or building learning or instructional
theory by incorporating theory-based design within a model of systematic instructional
design. Lowe and Schwin (1975) noted that most instructional design is a "systematic
process focused on improving the effectiveness and efficiency of learning and instruction
in various educational environments" (p.43). Gagne & Briggs (1974), in their book,
Principles of Instructional Design, state that a primary advantage of a systematic
approach is that it "encourages the setting of a design objective, and provides a way to
know when that objective has been met" (p. 228). Design components are successful in
helping create a "sameness" or standardization of a project’s design efforts. This helps
ensure that no crucial steps are missed, and allows for communication and co-ordination
among individuals involved in the instructional project. In short, everyone should
understand the meaning of "assessing learner needs" if those involved are following the
same model.

While educators have certainly discovered a need for using an instructional
design model, there still remains the burning question - which one? Andrews &
Goodson's efforts to comparatively analyze several design models is helpful in
articulating some areas of inadequacy, as well as highlighting those models with the
potential for applicability. They critically analyzed forty models against two separate schema. The first schema involved comparing all the models to G.L. Gropper's list of ten common tasks in model development (outlined in Table #1). Four additional tasks were added because the authors noted that they were addressed separately by a number of models. All models received a score based on the presence of these fourteen components in their design. These components included clear and definable outcomes, analysis of the learner population, consideration of alternative solutions to instruction, etc.

<table>
<thead>
<tr>
<th>Task Number</th>
<th>Definition</th>
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<tbody>
<tr>
<td>1</td>
<td>Formulation of broad goals and detailed subgoals stated in observable terms</td>
</tr>
<tr>
<td>2</td>
<td>Development of pretest and posttest matching goals and subgoals.</td>
</tr>
<tr>
<td>3</td>
<td>Analysis of goals and subgoals for types of skills/learning required.</td>
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<tr>
<td>4</td>
<td>Sequencing of goals and subgoals to facilitate learning.</td>
</tr>
<tr>
<td>5</td>
<td>Characterization of learner population &quot;as to age, grade level, past learning history, special aptitudes or disabilities, and, not least, estimated attainment of current and prerequisite goals&quot; (Gropper, 1977, P. 8).</td>
</tr>
<tr>
<td>6</td>
<td>Formulation of instructional strategy to match subject-matter and learner requirements.</td>
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<tr>
<td>7</td>
<td>Selection of media to implement strategies</td>
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<tr>
<td>8</td>
<td>Development of courseware based on strategies</td>
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<tr>
<td>9</td>
<td>Empirical tryout of courseware with learner population, diagnosis of learning and courseware failures, and revision of courseware based on diagnosis.</td>
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<tr>
<td>10</td>
<td>Development of materials and procedures for installing, maintaining, and periodically repairing the instructional program.</td>
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<td>11</td>
<td>Assessment of need, problem identification, occupational analysis, competence, or training requirements.</td>
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<tr>
<td>12</td>
<td>Consideration of alternative solutions to instruction.</td>
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<tr>
<td>13</td>
<td>Formulation of system and environmental descriptions and identification of constraints.</td>
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<tr>
<td>14</td>
<td>Costing instructional programs.</td>
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16
As Table #2 indicates, only three models included all fourteen tasks: Briggs & Wager (1979), Gagne & Briggs (1974), and Roberts (1978).

The second schema used by Andrews & Goodson is important when assessing both theoretical legitimacy and transferability to other contexts. This schema examined the evidence of origin, theoretical underpinnings, purposes and uses, and evidence of documentation in each model. The authors contend that, "Knowledge of the origin of a model can help the educator use a particular model in the most appropriate manner" (p.8). The authors identify two discernible sources of origin: theoretical and empirical. Neither researcher alludes to any preference. They determined that 65% of the models analyzed cited some source of theoretical origin (for either the total model or components of the model), and 50% cited an empirical origin (some reported both). While the authors decline to make judgments, a model which has a theoretical foundation, but also includes evidence of experience or research of a viable process, might be viewed as more legitimate and provide valuable information about its applicability to a variety of contexts.
<table>
<thead>
<tr>
<th>Reference for Model</th>
<th>Outcomes</th>
<th>Tasks</th>
<th>Analysis</th>
<th>Sequencing</th>
<th>Learner attributes</th>
<th>Strategy</th>
<th>Media</th>
<th>Development</th>
<th>Tryout/revision</th>
<th>Install/maintain</th>
<th>Need</th>
<th>Alternatives</th>
<th>Constraints</th>
<th>Cost</th>
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<td>1. Army Security Agency, Legere, et al. (1966)</td>
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<td>3. Banathy (1968)</td>
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Note: The models are listed alphabetically, because a chronological sequence reveals no definite evolutionary patterns for those models contained in this review. When examining the models chronologically, it appears only that tasks 3 to 4 and 10 to 14 are reported somewhat more frequently after 1972, but not consistently. A bullet (*) is used to denote the presence of a task in the particular model reviewed, as indicated by the reference for the model.
Table #3 indicates a serious deficiency in some of the models reviewed. Several models place a heavy emphasis on the various functions associated with systems theory, and ignore, or at best, de-emphasize any learning theory base. The researchers cited that 70% of the models emphasized either the control or analysis function of the general systems model. Of this 70%, only 40% also cited a learning theory basis making the systematic instructional design models less effective. Although the systematic approach was developed as a discipline, complete with theoretical underpinnings and a developed methodology, "many of the systematic instructional design models, as described in the literature, represent a series of mechanical or linear steps rather than the complex and rigorous analytical and cybernetic process required for effective application of the general systems approach to instructional design (Andrews & Goodson, 1980, p.13).

Conversely, of the 50% of the models which emphasized learning theory, 70% of these also included the advantages of general systems theory. Even more disconcerting is the discovery that for some models, the authors were unable to accurately identify any specific theoretical underpinnings or origin.

In our search for an appropriate model it is also important to be aware of a model's purpose and use. The developers of various models lay claim to a variety of uses. Some expressly stated their purpose as teaching instructional design (40%), and a majority (90%) were touted as aids for producing viable instructional products in either a formal or non-formal environment, using a small-scale lesson or large-scale curriculum development format. A few (less than 10%) reported cost reduction as their primary purpose.

When reviewing their final category for comparative analysis, the Andrews &
Goodson discovered that the presence of documentation, application, or validation data was woefully inadequate. The researchers stated that, "unless an educator knows whether or not a particular model has been tried out in an actual instructional setting, it will be difficult to make a decision about that model's chance of success in the planned setting. Few of the models reviewed supply any data concerning their effectiveness" (p.12). Of the models reviewed, only 50% reported documentation on the application of the total model, while 35% attempted to provide documentation for some components of the model (p.12). Several model authors asserted that a particular model "worked well", but failed to elaborate or provide supporting data.

Andrews & Goodson's examination of forty instructional design models exposed several serious inadequacies in some of the models. It also highlighted the need for educators and all those designing instruction to be knowledgeable about the existing models, and wary of the wholesale adoption of a particular model. The researchers found that several models failed to provide documentation of application of the models for specific purposes and uses. Some were not really models at all because they failed to describe, explain, or predict elements in their referent system (p. 14). There was also little concern with providing any documentation on the cost effectiveness of the model (p. 13). While this may not concern the model creators, those professionals faced with time pressures, financial constraints, and the responsibility to produce quality instruction cannot afford the luxury of instructional design by "trial and error". Using the results from Andrews & Goodson's work it would appear that models such as those developed by Briggs (1975), Briggs & Wager (1979), Gagne & Briggs (1974), and Kaufman (1972) provide enough detail and explanation to enable potential users to review and apply these
models as intended. Yet, the researchers warn that, "The reader is advised, however, to consider a model that matches the dimensions of the user's context and to make judgments about the adequacy of documentation and theory base before selecting a model to use" (p. 19). However, choosing the appropriate model(s) depending on theory base, purposes and uses, documentation, etc. will not lead to the discovery of the definitive instructional design model. Andrews & Goodson conclude that "it would be ill-advised to recommend that one, and only one, grand pattern be used for all design effort" (p. 14). However, by selecting the most appropriate model and building on it, educators can shift the focus from model proliferation to model evolution. What could result is analogous to a successful collaboration between architect and construction worker.
Table 3. Categorization by origins, theoretical underpinnings, purposes and uses and documentation.

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<td>27. Pennington &amp; Green (1976)</td>
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<td>28. Penta (1973)</td>
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Table 3: Categorization by origins, theoretical underpinnings, purposes and uses, and documentation (cont'd)

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<th>Reference for Model</th>
<th>Origins</th>
<th>Underpinnings</th>
<th>Purposes and Uses</th>
<th>Documentation</th>
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<td>34. Tennyson &amp; Boutwell (1971)</td>
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<td>35. Tosti &amp; Ball (1969)</td>
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<td>36. Tuckman &amp; Edwards (1973); (cf. Davis, 1977)</td>
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<td>37. Vance (1976)</td>
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<td>40. Waters (1978)</td>
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Briggs and Wager: Instructional Design Procedures

The Handbook of Procedures for the Design of Instruction - 2nd Edition was developed by Leslie J. Briggs and Walter W. Wager (1981) of Florida State University. Both editions of the book were developed initially for use in graduate level studies at the university. The authors are quick to note that this collaboration has resulted in a handbook, not a textbook. As a result, readers are encouraged to constantly refer to one or more of three textbooks cited at the beginning of each chapter. The textbooks are said to provide the adequate theoretical background, explanations, and further examples of the various procedures presented in the handbook. It seems somewhat peculiar that the three books cited as primary recommended readings are Instructional Design: Principles and Applications by L.J. Briggs; Principles of Instructional Design, 2nd edition, by R.M. Gagne and L.J. Briggs; and The Conditions of Learning, 3rd. Edition by R.M. Gagne.

While both Gagne and Briggs are well known and respected for their work in instructional design and learning theory, the fact that Briggs is used as the theoretical support for his own instructional design procedures could be viewed as somewhat tautological, or at least suspect. In defense, the authors state that, "In choosing the three textbooks, we have unabashedly selected the ones that are most consistent with the particular 'systems model' presented in this book. It has not been our purpose to review the literature concerning other systems-oriented textbooks which are available (1981, p.v).

As previously noted, the work of Briggs and Wager (1979) is consistent with a systems- oriented model of instruction. The term "model" refers to a particular set of procedures used for carrying out a problem-solving process for a particular purpose. The
"systems approach" to the design of instruction results in a model which follows a particular sequence and ensures that all the components are designed to fit with each other (p. 4).

Briggs and Wager (1981, p. 4) identify twelve features of their systems model which, they assume, contribute to and account for its effectiveness in solving design and instruction problems. They are:

1. All components of the instruction are planned to work together to achieve the goals and objectives of the instruction.

2. Components are analyzed and developed in a planned sequence, although each is reviewed again as new components are planned.

3. The entire design process is orderly but flexible. There is both "feedback" and "feedforward" in iterative cycles of work.

4. The procedures are based on research and theory when possible, supplemented by logic, common sense, and frequent review.

5. Empirical data are gathered to test assumptions underlying the work, and to test the effectiveness of the designed instruction. These data are gathered while the instruction is being planned and first tried out, and also after the instruction has been field tested. These efforts are called, respectively, formative evaluation and summative evaluation.

6. There is a characteristic order of stages in which the work is accomplished

7. The specific functions to be performed by teachers, learners, materials, exercises, media, and tests are planned jointly.

8. A delivery system is developed to include all components needed to make it operate as planned, including: the physical environment, the characteristics of learners and teachers, and the instructional procedures.

9. The overall model of procedures is based on an intellectually consistent set of key concepts. This helps assure compatibility or congruence among the resulting design components.
10. The model is planned to assure an honest and open relationship among the designer, the teacher, and the learner. The resulting instruction is thus humane.

11. The model is consistent with the concept of accountability for the value of goals adopted and for the effectiveness of instruction.

12. The model provides for setting criteria for evaluating the success of the instruction.

These features are said to be embedded in the authors' list of stages in the design of instructional systems, as indicated in Table # 4. These stages are also represented in flow chart form in Figure #1, which identifies some feedback loops and visually remind the designer to look for opportunities to reappraise work in prior stages and modify plans for remaining design stages. The following pages will examine the stages as developed by the authors. Particular attention will be paid to those stages which could be applied to the thesis instructional design problem.

Stage I: Assessment of Needs, Goals, and Priorities

An instructional system is designed to provide a solution to a problem. The designer must clearly define the problem and determine if the desired solution involves offering instruction rather than advocating another activity such as administrative action or policy changes. Unfortunately, the most appropriate method for working from problem to solution is often overshadowed by the practice of selecting a favoured solution and then applying it to a problem. This activity is facilitated in the area of health promotion and health services under the guise of the "needs survey". While it can be a valuable tool for assessing needs, the survey can also be a powerful method for quantifying and legitimizing a particular "pet" project. Perhaps even because of this, the process of honestly assessing the needs, goals, and priorities surrounding a particular health issue is an important and necessary preliminary activity.
## TABLE #4

STAGES OF DESIGN AS PERFORMED BY THE EXPERT

<table>
<thead>
<tr>
<th>State of Design</th>
<th>Chapter in this Book</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Assessment of Needs Goals, and Priorities</td>
<td>2</td>
</tr>
<tr>
<td>2. Assessment of Resources and Constraints, and Selection of a Delivery System</td>
<td>3</td>
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<tr>
<td>3. Identification of Curriculum and Course Scope and Sequence.</td>
<td>2</td>
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<tr>
<td>4. Determination of Gross Structure of Courses</td>
<td>5</td>
</tr>
<tr>
<td>5. Determination of Sequence of Unit and Specific Objectives</td>
<td>6</td>
</tr>
<tr>
<td>6. Definition of Performance Objectives</td>
<td>4</td>
</tr>
<tr>
<td>7. Analysis of Objectives for Sequencing of Enablers</td>
<td>7</td>
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<tr>
<td>8. Preparation of Assessments of Learner Performance</td>
<td>4, 10</td>
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<tr>
<td>10. Development of Media, Materials Activities</td>
<td>8, 9</td>
</tr>
<tr>
<td>11. Formative Evaluation</td>
<td>11</td>
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<tr>
<td>12. Field Tests and Revisions</td>
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<td>13. Instructor Training</td>
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<tr>
<td>14. Summative Evaluation</td>
<td></td>
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<tr>
<td>15. Diffusion and Operational Installation</td>
<td>12</td>
</tr>
</tbody>
</table>
FIGURE 1

1. State objectives and performance standards
   → 2. Prepare tests over the objectives
   → 3. Analyze objectives for structure and sequence
   → 4. Identify essential computerization
   → 5. Prepare problem and essential instruction

1a. Or plan an adaptive program
   → 3a. Or census students or compose goal
   → 5a. Or plan a dual-track program
   → 6. Select media and write prescriptions

7. Develop first-draft materials
   → 8. Small-group tryouts and revisions
   → 9. Classroom tryouts and revisions
   → 10. Performance evaluation

Revisions

Additional Revisions of Materials under: Objectives and Performance Standards

- Follow-up of graduates in advanced courses or on the job is possible. Performance evaluations from these situations provide another source of data for course revisions.
Briggs and Wager (1979) borrow from the work of Burton and Merrill (1977) and Bradshaw (1972) in identifying five kinds of needs: normative, felt, expressed/demand, comparative, and anticipated/future. A "need" is a gap or discrepancy between what is (the present state of affairs) and what is desired (p. 12). Sometimes however, it is difficult to distinguish between wants and actual needs. For example, a teacher may advocate a "need" for a particular course because he or she may "want" to teach it, or someone from administration "feels" it should be taught (p. 17). It is necessary therefore to clearly identify and support a specific need or gap or discrepancy.

Once this gap or need has been identified, than a goal can be set. If instruction is deemed to be the best means to this goal, then resources can be allocated so that an effective instructional delivery system can be designed. Particularly problematic is the lack of sound research which could direct the designer from the expression of goals to specific performance objectives. Goals are traditionally presented in broad terms with phrases like "appreciate", "understand", and so on. These end results are often difficult to measure, and this can make the discrepancies between what is and what should be difficult to detect. This can be particularly challenging when one is dealing with measuring attitude change regarding alcohol use and longer term behavioural intentions. However, the authors do little beyond acknowledging this difficulty, and refer readers to Gagne and Briggs' (1979) technique of task analysis and taxonomy of learning outcomes. Their lists for identifying needs, goals, and priorities taken from work by Burton and Merrill (1977) and Kaufman and English (1979) is brief and succinct, but readers would be hardpressed to apply any of these techniques without reading the original works.
Stage 2: Determining Resources and Constraints; Selection of a Delivery System

Once the needs have been identified, the goals prioritized, and instruction chosen as the appropriate approach, Briggs and Wager suggest that resources and constraints be considered (p. 24). With these limitations in mind, a delivery system is selected. This process also involves breaking down the learning tasks as a progression of courses or modules or units all designed to work toward the defined goals. Gagne and Briggs, in 1979, identified six delivery systems (or instructional contexts) including group, individualized, and small-group instruction, as well as independent-study, work-study, and home-study programs (Briggs and Wager). The first choice delivery system is then reviewed in light of available resources (especially financial), and constraints including administrative, personnel, etc. A delivery system which is effective in goal attainment and developed within constraints is chosen.

While it may be appropriate to specify preliminary delivery systems at this point, this early examination of resources and constraints may be somewhat premature. Certainly the designer must consider the resources and limitations when working through any stage of design. However, a primary goal of instructional design is to develop the most effective method for fulfilling stated goals. This does require a certain amount of "visioning", unfettered by self-imposed limitations. To not allow oneself this privilege means the designer almost immediately "settles for less", rather than aiming for the best scenario and compromising when absolutely necessary.
The authors can be forgiven however for citing some now dated and limited delivery systems. Certainly several additional systems could now be added including computer-assisted instruction, and mediated instruction. However, they are negligent in mentioning only briefly the importance of learners (and learning styles) at this stage, and the influence of the abilities of teachers/instructors. They mention briefly:

"One central focus when selecting a delivery system is, of course, its appropriateness for the goals. Another focus is the characteristics of the learners. A third focus is the assumed learning environment and the capabilities of teachers, all within constraints of costs, time available, and the personnel who are to develop the delivery system (Briggs and Wager, 1981, p. 29).

We will look to others for a better understanding of delivery systems.

*Stage 3: Identification of Curriculum and Course Scope and Sequence*

This stage is clearly based on the traditional educational setting, and would require some modification when designing programs suitable for health promotion. But regardless of whether these units of instruction are called courses, curriculums, or modules Briggs and Wager (1981) have a difficult time outlining the process for determining the appropriate scope and sequence. At the time of writing they acknowledged that "perhaps no group has ever satisfactorily bridged the large gaps between such goal statements and the performance objectives which may be found for individual courses or for a curriculum scope and sequence" (p. 18). The authors further state that a more concentrated effort is needed to successfully form the network of connecting goals and objectives, and making this link with lessons, courses, units of instruction, and so on.
It appears that Briggs and Wager are working toward a top-down approach, moving from general (goals) to more specific (units, lessons). However, stage three could be omitted if the instruction was based on a single event situation. Also, if the determination and sequence of objectives provided adequate guidance for the sequencing of activities, this stage may prove to be somewhat redundant.

Stage 4: Determination of Gross Structure of Courses

The term "course" has varying definitions depending on the instructional setting, however generally courses have at least two characteristics: a recognizable start and finish of instruction, and an organized set of content (p. 74). The authors present a six level model of course design developed by Briggs (1977) which include:

1. need analysis
2. goals definition
3. lifelong objectives
4. end of course objectives
5. unit objectives
6. specific behavioural objectives and their supporting prerequisite objectives

Goals are global in nature and need to be operationalized by defining specific behaviours. Life-long goals are said to add a measurable component to goals which allow them to be further transferred to course objectives. Course objectives are then broken down into unit objectives which will determine what the students will be able to do after finishing the unit. Finally, the designer is directed to create an instructional curriculum map.
(ICM) which diagrams the relationship among the objectives (outlined in Figure #2).

After constructing the course level ICM, the designer is then expected to construct a unit level and a lesson level ICM.

Some of the steps at this particular stage appear somewhat redundant and onerous for this specific thesis design problem. Increasing the levels of course structure may ensure that the goals and objectives are more thoroughly planned and presented, however the time spent creating an ICM for each level of the instruction may be better spent assessing the learners, and developing the materials and activities.

Figure #2 Instructional Curriculum Map
Stage 5: Determination of Sequence of Unit & Specific Objectives

Stage 6: Definition of Performance Objectives

These stages have been grouped together because they are inherently interrelated in terms of defining, categorizing, and sequencing performance objectives. The authors envision stage five as the process of creating a detailed ICM at the more specific unit level of instruction and identifying the specific performance objectives that relate to and comprise a unit of instruction. A crucial part of successful course design is determining which skills need to be learned before a student could demonstrate that he or she has mastered the course objectives. Specifying what the learner is able to do after the instructional experience will not only help the designer choose or design instruction that works, it will also provide the tool for evaluating the effectiveness of instruction. Clearly stated objectives also allow the student to know what is expected in terms of performance (p. 39).

Briggs and Wager (p. 39) recommend using Gagne and Briggs' (1974) five domains of learning outcomes as a basis for developing objectives. These domains are:

1. verbal information
2. intellectual skills
3. cognitive strategies
4. motor skills
5. attitudes

Domains one through three are analogous to Bloom's (1956) cognitive domain, domain five can also be referred to as the affective domain, and motor skills as the
psychomotor domain. Briggs and Wager do a fine job outlining the domains and sub-domains of learning outcomes, as well as the appropriate standard capability verbs and typical action verbs associated with each type of outcome. They also provide adequate and specific instructions for writing objectives. Performance objectives do not describe what the learner receives from instruction, but rather what the learner can do after the instruction that he or she could not do before the instruction, that is, the new capability that the learner has acquired as a result of instruction (p. 46). Borrowing from Gagne and Briggs (1979) the authors identify five components for writing objectives (p. 46)

1. In what environment (situation), and given what kind of test item(s),
2. for what type of learned behaviour (learned capability) the
3. student does what (object)
4. in what observable way (action verb)
5. using what tools, with what constraints, or under what special conditions (tools, constraints, and special conditions).

Of particular interest to this thesis is the development of objectives related to attitudinal change and the relationship of objectives within different domains. Briggs and Wager recommend that if the unit has a terminal attitude objective then other objectives related to it should be mapped on an ICM (p. 97). Research done by Estes (1972) found that attitude change can be facilitated by information about the type and probability of reinforcement. This suggests then that the designer require the learner to master the appropriate verbal information, and once the student has "learned" this information, attitude change will most likely follow. Conversely, Bem (1970) theorized that attitude follows behaviour. In this case there would be a clear relationship between the mastery of skills and behaviour change (Briggs and Wager, 1981, p. 98).
Stage 7: Analysis of Objectives for Sequencing of Enablers

The model developed by Briggs and Wager assumes that learning is cumulative. New skills are related to previously learned skills and will be used later when learning new skills through learning generalization and learning transfer (p. 105). It is important then to identify which prerequisite skills are necessary to facilitate and build upon the learning of the terminal objectives. Gagne (1977b, p. 278) states that "the true meaning of prerequisite is a capability of prior learning which is incorporated into new learning". The authors identify prerequisites as "enabling objectives"; objectives that must be learned to enable the learning of other objectives. Enabling objectives for a particular task may have been learned prior to the task (entry skills), or they may be components of the current instruction (subordinate competencies). As a result, the overall objectives of a lesson (or instructional event) should be mapped, according to the authors, with their subordinate objectives which are analyzed for their enabling objectives, both entry and subordinate.

Stage 8: Preparation of Assessments of Learner Performance

Once the designer has developed appropriate objectives for the learners, the question becomes how does one know whether these objectives have been met? The only way is to observe, measure, and evaluate the student after instruction has taken place. The authors note that this calls for evaluation instruments that are valid, reliable, efficient, and practical in assessing what the learner knows or can do (p. 160). Evaluative methods or tests are useful not only for evaluating learner performance, but also in formative evaluation for assessing instruction and revising first draft materials. Briggs and Wager primarily focus on the standard "test", however they speak to four
characteristics of evaluation which are important regardless of the evaluative format: validity, reliability, efficiency, and practicality. Within health promotion, proper and thorough evaluation is crucial in defending the existence of programs to participants, administrators, media, and especially funders. Evaluation is valid if it measures what it is intended to measure, the objective for which it is intended. For example, does "quizzing" the learners about the possible consequences of drinking and driving provide a measure of an objective that deals with attitudes toward drinking and driving? While providing information may be a precursor to attitude change, mastery of said information is not a valid indicator of attitude change.

Reliable evaluation is stable, adequate measure of objectives. The learner is evaluated adequately enough that the designer is satisfied the instrument truly measures the learner's ability to perform or meet the objective. Efficient use of evaluation time is necessary for obtaining the most valid and reliable evaluation data without sacrificing an inordinate amount of time, money, and resources. Similarly, practicality of evaluation takes into account all factors related to time, effort, space, equipment, administration, and interpretation of evaluative data. For example, if one wanted to measure a change in behaviour after instruction with respect to behaviours regarding alcohol use and risk-taking, it may not be practical to "follow" the individual learners from situation to situation to monitor and record their risk-taking behaviours.
Stage 9: Designing Lessons and Materials

Stage 10: Development of Media, Materials, Activities

After spending considerable time and attention focusing on what to teach, Briggs and Wager now shift to the matter of how to teach. The authors begin with an important assumption that instruction consists of accomplishing several external instructional events. These events may be initiated by the instructor, media, or even by the learners interacting with instructional materials. The purpose of these external events is to stimulate the "internal events" that comprise learning (p. 112). Readers are encouraged to refer to Gagne's research on information processing and theory of human learning, which outlines learning phases and internal events of instruction with information processing. When designing lessons, instructors are directed to account for each event to be taught. These events, as developed by Gagne and Briggs (1979), include:

1. Providing for motivation/attention.
2. Presenting the objectives to the learner.
3. Recalling prerequisite competencies.
4. Providing the stimulus (problem, topic, concept).
5. Providing learning guidance (how to proceed).
7. Providing feedback (reinforcement, knowledge of results).
9. Providing for retention and transfer.

Designers are also encouraged to engage in media selection first, and separately, for each external instructional event planned for the lesson. This allows planners to choose the "theoretically best" medium for each lesson event, and then review its practicality.

The authors provide extensive detail about the bases for media selection, different media and their characteristics, and the advantages and limitations of some typical classroom
media. Few instructional design models have ventured to provide so much detail, and
helpful information. Briggs and Wager's development of a media analysis worksheet, is
extremely practical and effective in linking the instructional event with the selection of
media. It forces the designer to reevaluate the choice and effectiveness of different
media and move beyond those media alternatives (commonly lecture or video) that she
has become accustomed and comfortable with. The listing of prescriptions specify the
content as well as the way the content will be presented (p. 148)

_Stage 11: Formative Evaluation_

_Stage 12: Field Tests and Revisions_

This stage can prove to be one of the most challenging for anyone involved in
designing health or substance abuse prevention instruction. Formative evaluation
requires a considerable amount of testing before the use of materials and actual
instruction is installed. This is not always easy when one is required to quickly develop
the instructional objectives for presentation to administration or funders, then upon
approval, quickly design the program for implementation, and then implement and
evaluate the instruction during the prescribed funding period, and finally be able to prove
it a success to justify continued funding or administrative support. Because the purpose
of instruction is to create the best environment for learning, formative evaluation is
crucial. If done thoroughly it not only helps improve instructional materials and events,
it is also able to reveal defects at the planning stages - in needs analysis, analysis of
objectives, sequence of instruction, and so on (p. 182).

The authors present three stages of formative evaluation developed by William
Dick (1977). They are one-on-one evaluation, small-group evaluation, and field-trial evaluation. A very rough first draft of the material is developed and presented to an individual learner who is able to question or comment on various aspects of the instruction. A posttest is given primarily to detect faulty directions or test items. After the materials have been revised where necessary, they are presented to a small group of learners (5 to 20 individuals). The designer presents the instruction and only answers questions to clarify directions, not to supplement instruction in the materials. The posttest data can more clearly give clues to faults needing correction. Once again revisions are made to materials, media presentation, and test items. The instruction is now tried out in the actual learning environment (the field). Instructors continue to monitor and note any problems, but they do not offer individual supplemental instruction. Test scores are now taken as an indicator of the effectiveness of the materials (p. 188). This is, more often than not, the most common type of formative evaluation that health promoters have the luxury of conducting, and field testing often merges with summative evaluation.

Briggs and Wager (1981) adequately present an outline of formative evaluation procedures, and provide some sample test instruments. However, they focus heavily on evaluating materials-centred instruction, in a single lesson format. These methods would be challenged when expected to evaluate "facilitator-led" instruction, an entire curriculum, or instruction with a high affective or attitudinal component. Nevertheless, formative evaluation continues to be an important component for this instructional design process because it can uncover, among others:
- inadequate provisions for needed interaction among categories of objectives and domains of learning
- omission of needed instructional events, such as guidance to thinking, student responding and feedback, and generalizing experiences
- too much emphasis upon presenting information and too little emphasis upon how well it is learned, recalled, and used
- use of unfamiliar vocabulary
- lack of use of "readability" indexing
- failure to arouse interest or motivation

Stage 13: Instructor Training

Stage 14: Summative Evaluation

Stage 15: Diffusion and Operational Installation

Stage 13 is not a stage of instructional design at all, but rather a commentary on the abysmal training (or lack of) that teachers receive in instructional design. Briggs and Wager state, "When teachers serve as both the designers and the implementors of instruction, there may be no need for special training for the teachers, because they design only the kinds of instruction they already know how to conduct...As a consequence, teachers tend to design lessons so as to employ procedures with which they feel comfortable given their prior training and experience "(p. 206). Moving beyond this comfort zone often results in anxiety, resistance, or at the very least a need for supplemental training. Similarly, the stage identified as "diffusion" is more a formal consideration of the generalizability of the instruction. " A designer may face the choice of designing the very best system he or she knows how to design, with the result of few adoptions and hence little impact; or he or she may settle for less radical change from conventional instruction and achieve wide adoption" (p. 208). This issue requires little discussion at this time, other than to say it is a contentious statement to infer that few
adoptions are equivalent to little impact.

Summative evaluation, or the art of proving the value and effectiveness of your system, is referred to by Briggs and Wager only in passing. They claim it is beyond the scope of their book and refer readers to supplemental readings. It is, of course, a crucial activity in health promotion for justifying expenditures and soliciting financial support. We will be forced to look to others for direction for this important final stage.
Roger Kaufman: Planning Educational Systems - A Results Based Approach

Roger Kaufman is a Professor and Director at the Center for Needs Assessment and Planning at Florida State University. Kaufman prefaces his work by saying that "this is a book for educators who care - care about results, about learner individuality and performance, about helping learners create a better future for themselves and society" (1988, p. 1). Kaufman contends that his system approach to educational planning has a number of distinguishing characteristics, most notably:

1) It is results oriented
2) It places each individual learner at the center of educational planning and management
3) It is a precise way of assuring that the social and personal uniqueness of each person is formally brought to the forefront of planning
4) It emphasizes that both a learner's current and future success are important

Kaufman was among many who emphasized the systems concept in the 1960's and 1970's. All models, he notes, had several features in common including a strong emphasis on results, clear measurable objectives, systematic procedures for reaching these objectives, ways of accounting for the relationships among parts of the system, and a requirement for continuous evaluation and revision. However, the author contends that many of the older models tended to concentrate on fragmented parts of a larger system rather than focusing on more "holistic problems and contexts (such as people and
organizations operating in a societal environment) of the larger system itself" (p. 6).

Kaufman also draws the distinction between systems models, and a more holistic, system model. While the former focused primarily on organizational learning objectives, the system model encourages defining goals and objectives external to the organization as the appropriate starting place for educational planning. Kaufman contends that only the system approach considers both the individual and collective good. Educational goals and objectives should be based upon what is required to survive and be self-sufficient and self-reliant in the world.

Kaufman's system approach has two distinct phases: identifying, scoping, selecting, and prioritizing needs (needs assessment), and eliminating or reducing the needs through a six-step problem solving process (p. 15). Before one is able to move from "what is" to "what should be", it is imperative to first correctly relate what learners, educators, and schools use, do, accomplish, and deliver. To do this Kaufman provides his own framework call the Organizational Elements Model (OEM). The five organizational elements (OEMs), as outlined in Table # 5, are inputs, processes, products, outputs, and outcomes. These OEMs also allow for three domains or levels of planning. Middle-level planning relates to inputs, processes, and products, such as planning curriculum. Comprehensive planning is wider in scope, such as system-wide curriculum planning or planning for an entire high school. Holistic level planning could include an entire district's planning, but should include all the linkages between contributions made by the educator, learner, school, and society. It is, according to Kaufman, intended to be" responsive to current and future societal realities and imperatives" (p. 31).
<table>
<thead>
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<th>INPUTS (raw materials)</th>
<th>PROCESSES (how to do it)</th>
<th>PRODUCTS (en-route results)</th>
<th>OUTPUTS (aggregated products of educational system)</th>
<th>OUTCOMES (the effects of outputs in and for society and the community)</th>
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<tbody>
<tr>
<td>Ingredients, existing human resources; existing needs, goals, objectives, policies, board regulations, laws, money, values, societal and community characteristics, quality of life.</td>
<td>educational means, methods, procedures; &quot;excellence programs&quot;; voucher plans, in-service training; teaching; learning; mediating; managing.</td>
<td>Course completed; competency test passed; competency acquired; learner accomplish'ts; teacher accomplish'ts; the educational &quot;building blocks&quot;.</td>
<td>Graduates; program completors; job placements; certified licensees; etc.</td>
<td>Self-sufficient, self-reliant, productive individual; socially competent and effective; contributing to self and to others; no addictive relationship to others or to substances; financial independence.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INTERNAL (Organization)</th>
<th>EXTERNAL (Societal)</th>
</tr>
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<tbody>
<tr>
<td>Organizational Efforts</td>
<td>Organizational Results</td>
</tr>
</tbody>
</table>
Kauffman lists his system approach as a two-phase process which uses needs assessment to identify and define important needs, and a six step process for planning for change. To identify gaps between what is and what should be in any or all of the OEMs, Kauffman uses system analysis, a method which reveals what is to be accomplished to meet identified needs. Mission and function analysis identify requirements for accomplishment, and methods-means analysis identifies possible solution tactics, methods, and tools. Kauffman recommends nine steps for performing effective needs assessment. They include:

1) Decide to Plan Using Data from a Needs Assessment
   A plan specifies where to go and provides a justification of why to go there. The decision to use a needs assessment also includes a commitment to be proactive.

2) Select a Needs Assessment and Planning Level: Middle, Comprehensive, or Holistic
   Decide how much of the educational or organization's world should be considered. Holistic level needs assessment considers the usefulness of the organization's contributions.

3) Identify the Needs Assessment and Planning Partners
   Successful needs assessment depends upon finding the correct partners to both guide the process and "own" it. These partners include those who will be the recipients of the intervention (i.e. learners), those who will implement the plan (i.e. instructors), and citizens/employers/society who receive the inputs.

4) Obtain the Needs Assessment and Planning Partners' Participation
   These partners must become active, willing contributors to the planning process.

5) Obtain Planning Partners' Acceptance of the Needs Assessment and Planning Level to be Used
   It is important that all partners know and agree upon the level, scope, and expectations of the needs assessment.

6) Collect Needs Data (Both Internal and External)
   Internal data involves performance discrepancies within the educational system or organization. External performance data may include public perceptions and satisfaction, employer evaluations, etc.

7) List Identified and Documented Needs
All planning partners should use a planning matrix to identify needs based on what is and what should be. Needs must be defined as gaps in results, not as gaps in resources. At this point, suggesting solutions should be discouraged.

8) Place Needs in Priority Order and Reconcile Disagreements
Each of the three partner groups (learners/clients, educators/implementers, and society/community) provide their own list of priorities. Then each partner group meets with one of the others to derive a common set of rankings. Finally all groups meet to rank needs.

9) List Problems (Selected Needs) to be Resolved and Obtain Agreement of Partners
A problem is defined as a need selected for resolution. All partners must agree on the problems selected.

When examining needs at a holistic level, Kaufman also requires that one perform a mission analysis. A mission, as defined by the author, is "an overall job - an outcome, output, or product; a completed service; or a change in the condition of something or somebody - that must be accomplished" (p. 92). It is somewhat difficult, based on Kaufman's description, to discern whether this term is analogous to the more recent and common understanding of the term mission, that is a person or organization's overall goal or reason for being. The mission analysis consists of the mission objective and associated performance requirements and the mission profile. The mission objective is a precise statement expressed in performance terms which specifies the results of a mission (p. 93). They are essentially performance objectives that specify results in measurable terms. To qualify as a mission objective, four conditions must be met. The statement must include: what must be displayed to demonstrate completion, who/what is to demonstrate completion, under what conditions is it to be demonstrated, and what criteria will be used to determine if it is done (p. 96).

The mission profile is a management plan that identifies functions that must be
completed, and the sequences in which they are to be completed so the mission can be accomplished. It outlines which functions need to be completed to eliminate the discrepancy that constitutes the problem. The mission profile is often presented in flow chart form, with solid lines and arrows denoting the exact flow an relationship between each function.

Kaufman's system approach to educational planning continues with function analysis. Function analysis proceeds from the mission profile, analyzes what should be accomplished and gives proper order to subordinate or lower order accomplishments, like jobs or tasks, in order to achieve the mission objective and its performance requirements (p. 114). The highest level function is the mission itself, and all other functions derive from it. Kaufman has several rules of function analysis which detail the size of the blocks to be used, how to number the functions using a decimal system, how to connect functions, etc. Function analysis continues, layer by layer, until the functions are no longer clusters of products, but single units of performance (tasks). Tasks, therefore, are units of performance which, when combined, form a function. While many instructional design researchers consider task analysis an essential part of instructional design and planning (see Dick & Carey (1990)), Kaufman considers it an optional activity. He borrows from Mager and Beach (1967, 1988) and limits task analysis to two sub-parts, identifying and ordering the steps to be taken (task listing), and identifying the salient characteristics and requirements of successful task
accomplishment (task description) (p. 144). "The difference", Kaufman states, "between mission analysis, function analysis, and task analysis is a difference in degree rather than of kind" (p. 144).

While mission and function analyses assist the planner in identifying and documenting products to be completed to ensure successful accomplishment of a mission objective, methods-means analysis provides the information necessary to make the best selection of ways and means to do each function, and the advantages and disadvantages of each. "Methods" include the tactics for achieving detailed functions and performance requirements, while "means" is a vehicle by which a tactic may be achieved. A methods-means analysis may take place after all the functions and tasks have been identified or concurrently with a missions, function, or task analysis. As each performance requirement is identified, possible methods-means may also be identified.

Kaufman provides a sample methods-means identification form (see Table #6) which records the function, performance requirements, methods-means possibilities, and advantages and disadvantages of each. This type of analysis forces consideration of alternatives for solving problems. It forces the analyst to consider new and innovative possibilities. While this can be time consuming, it can also be especially liberating in the area of health promotion. Innovative approaches and administrative self-reflection (however forced) helps to prevent the same old answer to the most challenging questions..

While Kaufman devotes more than 162 pages to planning and analysis, he offers little more than a chapter to address the final three steps of the problem solving process - how to select the appropriate solution strategy from among alternatives, determining and
implementing performance effectiveness and efficiency, and revising. In a sense, he has brought us to the top of the mountain, without providing a path down the other side. While his work offers some insight in identifying needs, it could in no way be considered a complete instructional design model. However, Kaufman's insistence on including planning partners, as well as his emphasis on holistic strategic planning, is noteworthy. Similarly, he also offers some practical methods in his outline and use of methods-mean analysis. These ideas may serve as a complement or adjunct to the complete instructional design model which will be developed and used in this thesis.

<table>
<thead>
<tr>
<th>Function</th>
<th>Performance Requirements</th>
<th>Methods-Means Possibilities</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.3.1</td>
<td>8.3.1A Must provide signal return within 10 seconds.</td>
<td>8.3.1A Ajax Model F 8.3.1A Apex Model 10 8.3.1A Contract for a special purpose device.</td>
<td>Available now Costs under $1,500. Simple to use Reliability of .997. Portable.</td>
<td>Not transportable. Reliability is .93. Costs $2,700. Ready spring 1988 Development and design cost of $10,800.</td>
</tr>
<tr>
<td>8.3.1B C</td>
<td>8.3.1B Same as all 8.3.1A MMS</td>
<td>Uses information sequenced by operation. Reliability could be .999</td>
<td>Unit cost would reach 1,500 after 3,500 units delivered.</td>
<td></td>
</tr>
<tr>
<td>8.3.1C M</td>
<td>8.3.1C Same as all 8.3.1A Mms.</td>
<td>Portable. Could be used for performance requirement 8.2.8.4</td>
<td>Ready next summer.</td>
<td></td>
</tr>
</tbody>
</table>

51
Dick and Carey: Systematic Design of Instruction

While Dick and Carey’s model of instructional design was not rated among the highest in Andrew and Goodson’s work it is included for review because of its use as a reference model, in whole or part, by many instructional designers. Dick and Carey (1990) like others, provide a procedural system for the design, development, implementation, and evaluation of instruction. They preface their work by stating, “While our model will be referred to as a systems approach model, we must emphasize that there is no single systems approach model for designing instruction....The systems approach models are an outgrowth of more than twenty-five years of research into the learning process. Each component of the model is based upon theory and in most instances research that demonstrates the effectiveness of that component” (p. 4). The systems approach model presented by Dick and Carey is less complex than some, but contains most of the major components included in other models.

The authors’ model as outlined in Figure #3, consists of ten basic components which will be outlined in more detail in the following pages. Novice instructional designers are directed to follow each step or procedure in order. However, it is recognized that during most design, the creator will incorporate modifications based on experiences, instructional resources, learners, and so on.
Figure #3 - Dick and Carey's Systems Approach Model
Step 1: Identifying the Instructional Goal(s)

The first step in designing instruction involves determining what the learners will be able to do after instruction. This is akin to Kaufman's statement of "what should be". While a needs assessment may identify some gaps between here and there, the designer must be sure that the most efficient and effective way to address these needs is through instruction. Once it is established that instruction is the method of choice, then instructional goals are selected and refined. Because instructional goals tend to be presented as very general statements of behaviour and content, Dick and Carey provide some procedural recommendations for clarifying goal statements. The authors first recommend that the designer write down the goal statement and then generate a list of all the behaviours the learners must be able to perform to demonstrate achievement of this goal. This expanded list of behaviours is then analyzed to determine which behaviours best reflect the achievement of this goal. The designer then ensures that these selected behaviours are included in the goal statement. Finally, this revised goal statement is examined to determine whether learners who demonstrate these behaviours would be considered as having accomplished this broad goal.

Step 2 - Conducting an Instructional Analysis

Once the goal or goals have been identified, the designer must determine what type of learning is required. This involves identifying subordinate skills and procedural steps required to learn the process. The initial activity involves classifying the goals into one of four domains of learning. At this point Dick and Carey borrow heavily from the work of learning theorist, R. M. Gagne. Goal statements are classified as either
intellectual or psychomotor skills, verbal information, or attitudes. Each type will require a different goal analysis technique. A psychomotor skill demands that the learner perform a skillful execution of a physical skill, one that is new and nontrivial. In certain circumstances it may involve some cognitive activity as well. Intellectual skills are those that require the learner to perform a unique cognitive activity - to solve a problem, or perform an activity using previously unencountered information or examples. Four types of intellectual skills include discrimination, concepts, rules, and problem solving. All require the manipulation of symbolic information.

In contrast, verbal information requires only that the learner provide specific responses to specific stimuli. The learner might be asked to state, list, or describe something that was taught in instruction, but there is no symbolic manipulation. Attitudinal goals focus on the learner's ability to make particular choices or decisions under specific circumstances. The goal indicates the direction in which the decision is to be influenced. Dick and Carey note that historically attitudinal goals are usually not goals which can be achieved by the end of instruction. They are often difficult to evaluate in the short term and, as a result, are the most challenging. Health promoters and those involved in primary prevention know first hand the difficulties surrounding the design and evaluation of instruction which is focused on attitude change. What is often measured is the participants' intentions regarding attitude and behaviour change.

The second step in goal analysis is to identify the major steps which learners must perform to demonstrate that they have achieved the goal. These major steps should be sequenced in the most efficient manner possible. Dick and Carey suggest that intellectual and psychomotor goals have steps listed in chronological order. Attitude and
verbal information goals should also be broken down chronologically. If this is not possible, the steps should be sequenced based on some inherent or natural progression such as spatial, familiar to unfamiliar, or easy to complex. The authors also suggest that as a general rule, each goal should have at least three to five steps, and no more than fifteen steps. If a goal involves more than fifteen steps then either the goal is too large to be analyzed, or the steps have been listed in too much detail. Dick and Carey stress the importance of goal analyses as the foundation for the remaining components of instructional design. "The goal analysis is an extremely important step in the instructional design process, because all subsequent design activities depend on the skills that are identified... The final product of your goal analysis should be a framework of skills that provides an overview of what learners will be doing when they perform the instructional goal. This framework is the foundation for the subordinate skills analysis" (pp. 36, 43).

Subordinate skills analysis is the final component of the overall instructional design analysis. Subordinate skills are skills that must be mastered prior to learning how to perform the steps in the goal. The type of approach used for identifying these subordinate skills depends on the domain of the learning goal. Dick and Carey recommend a hierarchical approach for analyzing goals that are classified as intellectual skills. This technique, developed by Gagne, asks the question, "What must the student already know so that, with a minimal amount of instruction, the task can be learned?" (p. 50). Figure #4 indicates diagrammatically the procedure for hierarchical analysis. In order to perform step 2, the student must know rule 1. To learn rule 1, the student must know concept 1 and 2; to learn concept 2, the student must know discrimination 1. The
fact that there are no subsets in steps 1, 3, and 4 indicates that the designer has decided
that there are no skills that the learner must master prior to being taught the step.
Hierarchical analysis continues downward until it has reached the most basic of skills.

Procedural analysis identifies subordinate skills of a psychomotor goal. The
questions asked are, "What would the learners be doing when they do this step?", and
"What does the student need to know or be able to do in order to efficiently perform this
step?" (p. 57). Figure #5 indicates the procedural analysis of a psychomotor goal. Step 1
required two subordinate intellectual skills (I.S.), while two subordinate motor skills
were required to form step 2.

A verbal information goal is best facilitated by using a cluster analysis for identifying
information needed to achieve the goal. The most logical sequence involves identifying
the major categories (or clusters) of information that are implied by the goal. Rather
than drawing a diagram, the authors suggest an outline format with each cluster listed.

Determining subordinate skills for an attitudinal goal involves asking, "What
must the learner do when exhibiting this attitude", and "Why should they exhibit this
attitude?" (p. 58).
FIGURE #4 & #5
HYPOTHETICAL HIERARCHICAL ANALYSIS OF STEPS IN A PROBLEM-SOLVING GOAL & PSYCHOMOTOR GOAL
The answer to the first question usually involves either a psychomotor or intellectual skill, and therefore procedural or hierarchical analyses. This will identify subordinate skills if the learner chooses to do them. For example, if the student is to choose the resist pressure from friends to drink or abuse alcohol, then it is necessary to teach the student peer pressure reversal skills.

![Diagram]

The answer to the second questions usually involves verbal information and constitutes the persuasive aspects of shaping attitudes. This is portrayed by the above diagram.

*Step 3: Identifying Entry Behaviours and Characteristics*

At this point it is necessary to identify what specific skills the learners must have before even beginning instruction, and identify any special characteristics that may impact on the design of instructional activities. Once the subordinate skills have been identified, skills that the designer judges all or most members of the target population already possess are then classified as entry behaviours. A dividing line is drawn across the subordinate skills analysis diagram at the point separating these subskills and the entry level skills. It is the point directly above the entry behaviours where instruction should begin. It is also important to identify any pertinent characteristics that the target population may bring to instruction. For the adolescent population, this may include issues involving reading levels, attitudes toward school and the subject matter, and motivation levels.
Step 4: Writing Performance Objectives

Performance objectives are specific statements outlining what the learners will be able to do when instruction is completed. It identifies the skills to be learned, conditions under which these skills will be performed, and the criteria for successful performance. Dick and Carey's requirements for performance objectives are typical of most systems models. Each objective begins with behaviours that are described in the subordinate skills, and the objective defines the condition, behaviour, and criteria for successful completion of that objective. For example, Dick and Carey (p. 115) state that if the goal is to change the tire of an automobile, the performance objective would be:

Given an automobile with a flat tire, all tools required to change the tire secured in their normal positions in the trunk, and an inflated spare tire secured normally in the wheel well (condition), replace the flat tire with the spare tire (behaviour). Each step in the procedure will be performed in sequence, and according to criteria specified for each step (criteria).

Attitudinal objectives also need to consider circumstances during which the learners are free to make choices. Learners need to feel that their choices are made of their own volition and they cannot know that they are being observed.

Step 5: Developing Criterion-Referenced Test Items

Criterion, or objective-referenced tests are designed to measure an explicit set of objectives, with the intent of evaluating the students' progress with respect to the performance objective, and to provide information about the effectiveness of instruction. Dick and Carey include test development at this stage of instruction design because criterion-referenced tests are constructed to correspond one-on-one with the objectives
that have just been developed. The authors outline, in some detail, three types of criterion-referenced tests and their uses. The pretest, which is administered before instruction, measures entry behaviours or prerequisite skills and tests specific skills which will be taught during instruction. While the pretest can be used in comparison with the posttest to measure the increase in learning after instruction, it is also valuable during formative evaluation to determine if some of the students have partial knowledge of the content. This will help the designer decide if some instruction for the lower level skills can be eliminated.

Embedded test items are like practice items and are used almost exclusively for intellectual skills. They measure whether the student is able to do a skill immediately after it was taught. Embedded test items are also used almost exclusively in formative evaluation.

Posttests are given after initial instruction to assess all the objectives, especially the most important objectives. Dick and Carey provide an important reminder about the purpose and function of posttests. They are not only to be compared with pretests to determine gains in learning, or to be solely used as an "end of the unit" test, as often happens in traditional educational settings. The posttest is also designed to flag areas of instruction that are not working. If a student fails to perform important objectives the designer should be able to identify where in the learning process the instruction failed. This can be considered threatening to some because it tends to shift the focus and responsibility from the student or learner to the designer or instructor. Dick and Carey continue to provide direction for writing test items, and developing the instruments to measure performance, products, and behaviours or attitudes. Assessment in the
attitudinal domain is particularly difficult because affective objectives are concerned with learners' attitudes or preferences. It is difficult to measure attitudes unless the learners state their preference or the instructor observes behaviours and infers their attitudes.

Dick and Carey include the development of criterion-referenced test items immediately following the creation of performance objectives because they believe it would be easier to match the test item with the objective. However many instructors, in practice, may be more inclined to leave this task until the end of the design process during summative evaluation. This may have two results: the creation and use of test items that do not directly measure identified performance objectives, or even more extreme, a design process which ignores altogether the formative evaluation component and fails to benefit from the results. This has, on more than one occasion, been the folly of some health promoters who, only as an afterthought, quickly develop some evaluation instruments to satisfy (or justify) their contractual obligations with their funders.

Step 6: Developing an Instructional Strategy

Few researchers who have developed their own models of instructional design venture into the area of instructional strategies and the design of instructional materials in any great detail. With new technological advances and the increasing variety of instructional settings, the choices, and hence, selection, can be unwieldy. Dick and Carey adequately outline the important components of an instructional strategy and borrow heavily from Gagne and Briggs' work on events of instruction.

The authors (p. 162) identify and explore five major components of an
instructional strategy:

1. preinstructional activities
2. information presentation
3. student participation
4. testing
5. follow through

There are several preinstructional activities that a designer needs to consider. Dick and Carey identify three: motivating learners, informing them of what they will learn, and ensuring they have the necessary entry behaviours or prerequisite knowledge.

All three necessitate that the instructor have extensive knowledge of his or her target audience. The designer must know the motivation level of the students and the circumstances under which they came to instruction (were they forced?), as well as what will, and will not, interest the learners. The learners need to know the objectives of the instruction so they can determine and focus on relevant instruction. Both designer and learner benefit from discussing appropriate prerequisite skills. As the authors note, "It prepares learners for the instruction that is to follow, and provides information for the designer on the variability of students' entry behaviours" (p. 163).

The second component involves effective presentation of information. Designers are directed to refer to the instructional analysis to determine the instructional sequence. Instruction would begin with lower level skills, or subordinate capabilities, followed by instruction on integrating and practicing all the steps to the instructional goal (p. 164). One must also determine how much instruction to provide and how to "chunk" this material. Instructors may present information objective-by-objective or combine several
related objectives followed by a student activity. Dick and Carey warn that the amount of information to be presented depends on the age level of the learners, complexity of the material, whether the activity can be varied, and the amount of time required to include all the events in the instructional strategy (p. 164). The next step is to determine what information, concepts, rules, and principles need to be presented to the students. These activities are not easy tasks, but unfortunately the authors do not provide insight or direction as to how these difficult decisions can be made.

Dick and Carey's remaining components involve student participation, testing, and follow-through activities. They believe that the learning process is enhanced by providing students with activities relevant to the objectives, an opportunity to practice newly acquired skills, and feedback based on their performance. Testing encompasses both criterion-referenced tests described earlier, but may also include some embedded attitudinal questions as well. This will allow learners to indicate what they think of the instruction during instruction. Follow through activities include plans for remediation and/or enrichment. While these plans are part of the instructional strategy, detailed plans are not usually developed until formative evaluation identifies a need for them (p. 166). Dick and Carey then offer some specific details for designing instructional strategies for intellectual skills, verbal information, motor skills, and attitudes.

Also of particular interest is the designer's ability to motivate the learners. The authors borrow from the work of John Keller (1987) who developed the ARCS model for instructional motivation. Keller's components include attention, relevance, confidence, and satisfaction. In order for learners to be motivated to learn the instruction, the designer must develop strategies to gain and sustain their attention. Learners also need to
understand the relevance of the instruction to their lives. They must also feel confident that they have the skills and knowledge to be successful. Finally, Keller states that learners must derive some sort of satisfaction from the instruction. This may take the form of reward or reinforcement or a more intrinsic satisfaction derived from having mastered a new skill.

Step 7: Develop and/or Select Instruction

Based on the instructional strategy, actual instructional material can now be produced or selected, depending on the availability of developmental resources. Dick and Carey suggest designing materials as if they were self-instructional materials. The students should be able to learn the behaviour from the materials without intervention from the instructor or other students. This is done regardless of the actual method of delivery, because it prohibits the designer from relying on the instructor as motivator and decision-maker. However, decisions about the intended development and delivery mode should be made prior to developing the materials, because it can have an impact on budget considerations.

Once the instructional strategy for each objective is reviewed, then the designer can research whether there are existing instructional materials which can be modified to suit the purpose. If new materials need to be developed then a method for media selection must be identified. The authors suggest using Reiser and Gagne’s model (1983) which examines the best medium for instruction. By answering questions about the particular skill to be taught, the designer follows the path through a flow diagram which refers to possibilities called candidate media. However, this model assumes that each
lesson or unit of instruction contains objectives which all fit in the same domain of learning. For larger units or clusters of objectives, a mix of media may need to be used. And of course, media selection is always impacted by budgetary and time constraints, availability of equipment and technical capabilities at the site of instruction, and other practical considerations.

Dick and Carey suggest writing a rough draft of the instructional materials which will be used by the student and then check these materials for sequence, flow, accuracy and clarity of ideas, completeness, etc. It is apparent here that the authors' ideas and examples are limited to the more traditional educational setting. They also recommend the completion of other components including a student manual and instructor's guide. While these materials still remain the most common end results of an instructional strategy, one wonders if this is so because they are the most studied, presented, and familiar.

*Step 8: Designing and Conducting Formative Evaluation*

*Step 9: Revising Instructional Materials*

Cronbach (1975) and Scriven (1967) were the first researchers to publically identify the need for, and importance of, formative evaluation. Formative evaluation is defined as "the collection of data and information during the development of instruction which can be used to improve the effectiveness of the instruction" (Dick and Carey, 1990, p. 234). At that time, (and still today), many instructional products were marketed and distributed to students without any prior attempt to evaluate and revise.

Dick and Carey also use a three-phase approach to formative evaluation of
original instruction. One-to-one, small-group, and field-test evaluation are all stages that have been described previously. In addition, instructional materials can be reviewed by subject matter specialists. The authors state that formative evaluation "distinguishes the instructional design process from a philosophical or theoretical approach" (p. 244). Rather than speculating about instructional effectiveness, instruction is actually tested with learners. Entry behaviours that have been theoretically developed will now, hopefully, be validated. For example, if learners who do not have the entry behaviours struggle with instruction, while those who do are more successful, then the line between entry behaviours and instruction was drawn correctly. The authors also suggest conducting evaluation with learners of varying abilities and varying degrees of attitudes (positive, neutral, and negative) to instruction. Revisions can be implemented by developing a "materials revision analysis" table that describes problems, evidence that changes are needed, and sources of evidence cited for each component in the materials. Finally, Dick and Carey recognize that the purpose of formative evaluation is to gain feedback from learners that will direct revisions and make instruction as effective as possible. Therefore, the designer should be prepared for information that indicates materials may not be as effective as hoped.

Step 10: Conducting Summative Evaluation

Summative evaluation, the final component of Dick and Carey's instructional design model, is defined as," the design of evaluation studies and the collection of data to verify the effectiveness of instructional materials with target learners. Its main purpose is to make "go no-go" decisions about maintaining currently used instructional materials
or about adopting materials that have the potential for meeting an organization's defined instructional needs" (p. 290). Its two main phases, usually overseen by an external evaluator, are expert judgment and field trials. Experts can decide whether the materials meet the defined needs of the organization. Field trials document the material's effectiveness with the target group in the intended setting. Table #7 presents the overview of activities for summative evaluation. The expert judgment phase involves determining the congruence between the organization's needs, characteristics of the target learners, and the characteristics of the instructional materials. In addition, the accuracy and completeness in content are reviewed, as well as the utility of the materials. This phase also includes evaluating the adequacy of the components of the instructional strategy. This is analogous to one-to-one formative evaluation. Information can also be collected from organizations who are using these current materials, assuming the materials being evaluated are not entirely original materials. Dick and Carey provide sample forms for extracting all this information.

While Table #7 outlines the stages involved in the field trial evaluation, the authors provide little detail on each evaluation activity associated with field trials. They only summarize by stating that, "the main purpose of the field trial is to locate both the strengths and weaknesses in the materials, to determine their causes, and to document the strengths and problems" (p. 292).

This model of instructional design is presented by Dick and Carey in a seemingly straightforward, step by step fashion. They provide practical steps to ensure more effective design of instruction. They acknowledge however, that in practice, activities and steps tend to get muddled. While the authors may pride themselves on their
<table>
<thead>
<tr>
<th>Planning</th>
<th>Preparing</th>
<th>Implementing/Collecting Data</th>
<th>Summarizing and Analyzing Data</th>
<th>Reporting Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design evaluation (Field Trial)</td>
<td>Obtain Instruments Set schedule for instruction and testing Create/Modify syllabus</td>
<td>Describe limitations of design</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Describe resources, facilities, equipment needed</td>
<td>Obtain resources, facilities, equipment</td>
<td>Adequate? (Observation, Interview, Questionnaire)</td>
<td>Describe problems x resources, facilities, and equipment</td>
<td>Recommendations Rationale</td>
</tr>
<tr>
<td>Describe ideal entry behaviors/characteristics of target group</td>
<td>Select sample Verify entry behaviors (data) Schedule learners</td>
<td>Learner performance? (Pre-Posttests) Learner attitudes? (Observation, Interview, Questionnaire)</td>
<td>Item x objective analysis by group and individual</td>
<td>Explanation, Recommendations, Rationale</td>
</tr>
<tr>
<td>Describe number of groups and individuals needed</td>
<td></td>
<td>Cross-test summary by group and individual by objective Attitude summary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Describe skills/capabilities of instructors or managers Describe number of instructors needed</td>
<td>Select instructors Verify skills Schedule instructors</td>
<td>Validity of implementation? Modifications? (Observation, Interview)</td>
<td>Describe problems x instructor x objective</td>
<td>Recommendations and Rationale</td>
</tr>
<tr>
<td>Plan and develop any training needed for instructors/managers</td>
<td>Provide training for instructors</td>
<td>Training effective? (Observation, Interview)</td>
<td>Describe implementation problems x objective x activity</td>
<td>Recommendations and Rationale</td>
</tr>
</tbody>
</table>
thoroughness and determination to maintain a system of checks and balances, the myriad of forms and analysis sheets used for several of the instructional components, especially evaluation, can be daunting for the novice designer. In a perfect situation, where time and budget constraints are minor or non-existent, the completion of a long list of analyses charts and forms would be ideal. However, under the most practical of situations this detail could not only discourage the less seasoned veterans, but may result in a form of paralysis by analysis.
Smith and Ragan - Instructional Design

Smith and Ragan's work in instructional design is among the most recent. While their work was developed well after Andrews and Goodson's review of models of instructional design, the authors make mention of this review. "Andrews and Goodson (1980) have described 40 such models for systematic design of instruction. In this text we will recommend a simple model of design. It is similar to the design models suggested by Dick and Carey (1985), and Davis, Alexander, and Yelon (1974)" (Smith and Ragan, 1993, p. 7).

Smith and Ragan's instructional design process model is illustrated in Figure #6. As with most researchers studied, there are a number of assumptions underlying this process model. The authors contend that to design effective instruction, the designer must be clear as to what should be learned as a result of instruction. "The 'best' instruction is that which is effective (facilitates learners' acquisition of the prescribed knowledge and skills), efficient (requires the least possible amount of time necessary for learners to achieve the objectives), and appealing (motivates and interests learners, encouraging them to persevere in the learning task)" (p. 9). In addition, Smith and Ragan surmise there should be congruence with respect to objectives, learning activities, and evaluation. Evaluation includes evaluation of both instruction and learner's performance. Of particular interest is the authors' view that learners should be evaluated in relation to the stated objectives, not how they "stack up" against fellow students (p. 9). This certainly flies in the face of norm-referenced testing.

Smith and Ragan are the first of the several theorists studied thus far to distinctly
Figure #6 - Smith and Ragan's Instructional Design Model

Analysis
- Learning Environment
- Learners
- Learning Task
- Write Test Items

Strategy
- Determine
  - Organizational Strategies
  - Delivery Strategies
  - Management Strategies
- Write and Produce Instruction

Evaluation
- Conduct Formative Evaluation
- Revise Instruction
acknowledge and provide historical insight into the various theory bases that have shaped the directions of instructional design. These theories are the source of principles from which many of the final prescriptions arise. They also speak to the matter of academic integrity as providing a rationale and defense for the designer's decisions and actions. General systems theory is the basis of many of the models of instructional design. Andrews and Goodson (1980) identified that 70% of the forty models reviewed employed some elements of systems theory. Instruction and the instructional environment is seen as a system on several different levels. For example, the information processing model includes the individual as a system processing information from the environment. The instructional environment can be viewed as a series of systems. Even in the most traditional of settings there are systems called classes, schools, districts, etc. Systems theory has also provided tools such as critical path techniques and flow charts. Both became organizational aids for representing procedures for complex projects, as well as methods for representing task analysis.

Communication theories have also had a notable impact on the field of instructional design. Of particular importance is the concept of "feedback" and its role in how information is communicated from one person to another. The authors note that the feedback loop within Schramm's Communication Model substantiates the need for responses from, and interaction with, learners during instruction (p. 16). Feedback is also critical in the formative evaluation step. Certainly communication issues also play a role in decisions about media selection and the characteristics of various media as channels for the instructional message. Schramm's model and other communication models also provide insight on the learner's ability and inability to decode the
instructional message.

The authors feel that it is imperative that instructional designers have knowledge of those theories which attempt to describe, explain, and predict learning. While learning theories tend not to be too prescriptive, two categories of learning theory that has influenced instructional design are behavioural and cognitive learning theories. One has to look no further than the specification of behavioural objectives and performance-based assessments to see the impact of behaviourism on the design process. While most designers now go beyond the strict limitations of the behaviourist paradigm, there are still related and relevant issues associated with the importance of the environment on learning, the connection between stimulus and response, and empirical evaluation of materials under development.

Smith and Ragan note that currently cognitive learning theories are the dominant theoretical influence on instructional design practice. While systems theory has influenced the steps in instructional design, how each step is conducted has been greatly influenced by cognitive psychology. Cognitive learning theories emphasize factors within the learner, and the cognitive structures which mediate between instructional stimuli and responses. Particularly, information processing theory, in contrast to behavioural theory, describes learning as a "series of transformations of information (ie. processing) through a series of postulated structures within the brain" (p. 18).

Instructional theories are those that designers draw from most directly. They are often more prescriptive than the classifications of theories discussed previously. Gagne and Dick (1983) describe instructional theories as "an attempt to relate specified events comprising instruction to learning processes and learning outcomes, drawing upon
knowledge generated by learning research and theory" (Smith and Ragan, 1993, p. 21). There are several instructional theories, some of which have been described earlier, including Keller's ARCs Model, Gagne's theory on conditions of learning, and Bloom's Model of Mastery Learning.

**Instructional Analysis: Analyzing the Learning Context**

Smith and Ragan refer to this type of instructional analysis as "front end analysis", analyzing the instructional context, prospective learners, and the learning task. Analyzing the learning context involves two steps: substantiating a need for instruction in a certain context area (needs analysis), and describing the learning environment in which the instructional product will be used.

The concept of a needs analysis or assessment has been examined in detail already, but Smith and Ragan offer some practical insight as to whether a needs assessment should be conducted. One can determine whether a formal needs assessment should be conducted by answering the following six questions:

1. Are there learning goals that are not being met by our students?
2. Is existing instruction being delivered efficiently?
3. Is instruction unappealing, and therefore, impeding the motivation, interest, and perseverance of learners?
4. Is instruction for unachieved learning goals being presented already?
5. Should new learning goals be added to the curriculum?
6. Has there been a change in the composition of the learner population?

Less than favourable answers to any of these questions could call for a formal needs assessment.

The second phase of analysis involves thinking about the system in which the instructional product will be placed. This "instructional system" consists of all factors
that affect and are affected by the learning that is taking place: learners, instructional materials, the instructor, instructional equipment and facilities, and the community organization. For example, the level of experience and preferences of the teachers/instructors will impact on the design of instructional materials. Inexperienced teachers may benefit from more structure and organization within the materials. Some media may not be usable in some learning environments because of limited hardware capability, or even availability of instructors with adequate experience.

*Instructional Analysis: Analyzing the Learners*

One of Smith and Ragan's major contributions to the field of instructional design is their concise, yet insightful explanation regarding the analysis of the learner. Few other researchers thus far have treated this area with such importance and detail. The authors feel that this area cannot be regarded only in passing. "The danger in not analyzing the characteristics of an audience is assuming that all learners are alike. An even more common error is assuming that the learners are like the designers...This hidden form of ethnocentrism can play havoc with the design of instruction" (p. 43). The authors also note that some instructional designers also find themselves describing the characteristics that they hope their learners have (like an adequate literacy level), rather than the actual characteristics of their target audience.

To analyze learner characteristics, Smith and Ragan developed a matrix with four categories. When examining a target audience or population, a designer will see similarities among people, as well as differences between people. Similarities may include sensory capacities and information-processing capabilities and limits.
Differences may include intelligence, aptitudes, and prior learning experiences. Further, some similarities and differences are stable and relatively unchanging over time, while others are constantly changing over time. For example, while people's eyesight, hearing, and sense of taste may vary somewhat, our sensory capabilities are more alike that they are different. This has obvious implications when designing audiovisual presentations, interactive computer games, and so forth. Yet these aspects seem quite easy to misjudge.

Characteristics associated with information processing also have implications for design. For example, we all have, for the most part, the same capacity for temporary storage of non-meaningful information units (7 plus or minus 2). These do not vary with intelligence level or age (p. 45). Similarly, most people also adhere to the principles developed by Gagne called the conditions of learning; the conditions which must exist within the learner and the learning environment.

Intelligence quotient (IQ), a stable individual difference, is often defined as an "aptitude for school learning" (p. 46). Though not without its critics, IQ indices are often used to predict what learners will need with respect to study time, practice, perseverance, etc. Though IQ scores can change if a person is subjected to a particularly rich or deprived environment, they are generally stable and highly resistant to quick change through intervention. Similarly, cognitive styles, or the ways people receive and process information is another type of stable individual difference. Knowing a person's cognitive style will not only help to predict whether an individual is likely to perform well or poorly on a particular task, but why this is so. Smith and Ragan cite an example using the concept of field dependency. An individual with a field dependent cognitive style would have a more difficult time isolating details within complex information or
diagrams.

The authors also identify three psychosocial traits that have an impact on instructional design: trait anxiety, trait locus of control, and academic self-concept. A high anxiety level can inhibit learning unless instructional modifications like frequent feedback, clear expression of expectations, and overlearning are included to reduce the negative impact of anxiety. Locus of control, defined as whether a person attributes success of failure to internal characteristics or external forces, can also impact on instruction. Modifications to the amount of structure in the learning situation can be made based on whether the learner has an internal or external locus of control. Quite naturally, a person's assessment of his or her academic ability can also accelerate or impede learning.

Smith and Ragan also identify three other stable differences which may need to be considered when designing instruction: gender, ethnicity, and racial group identification. These differences are noted not because members of various groups may process information differently, but rather because these groups may have common experiences and backgrounds because of their group membership. Therefore, there may be some relevant contexts and examples that should be incorporated into the design.

Within the category identified as changing similarities includes changes within intellectual, language, psychosocial, and moral development. Changing similarities are defined by the authors as those learner characteristics that appear to develop in a predictable pattern over time. Some educators strictly adhere to these developmental stages and consider them fairly impervious to change even after instruction. Instructional designers, not surprisingly, tend to believe that developmental states can be advanced
intentionally through the proper instruction. Work by such theorists as Piaget, Erikson, and Chomsky are examples of developmental theories that are illustrative of changing similarities. Of particular interest for those who design instruction with attitudinal objectives is Kohlberg's stages of moral development. Kohlberg (1963) theorized that people develop morality through a series of stages. The preconventional morality stage is characterized by a period of egocentrism, during which people suppress their own desires because of fear of punishment. Acts of kindness are performed with the expectation that they will be returned in kind. The conventional morality stage is characterized by moral behaviour that is maintained to please an authority figure or adhere to prescribed laws. The final stage of moral development is postconventional, or principled morality. A person entering this stage may initially act accordingly because of an awareness of certain social values. Eventually behaviour is guided by universal principles such as human dignity and fairness.

Finally, Smith and Ragan acknowledge that there are certain differences between people that change over time and quite obviously have implications for the instructional designer. The same developmental theories that were just viewed as similarities can also be examples of changing differences. Although individuals in a particular target audience may be at a similar developmental stage, it is possible for these learners to fall within two or more stages. For example, research has indicated that even among adults, there is some variability in Piaget's formal operations stage.

Specific prior learning is, according to the authors, the most important changing difference to consider about the audience. While each participant will have a storehouse of "general world knowledge", it is the specific, relevant, background knowledge and
skills that have potential implications for instruction. The designer needs to know what background knowledge and skills about the instruction that the learners possess, and whether there is a wide variation in this knowledge. In short, Smith and Ragan state, "the more designers know about the relevant knowledge and skills that the learners already have, the more effective and efficient they can make the instruction" (p. 55).

In Figure #7, Smith and Ragan also provide a list outlining the major characteristics and sub-characteristics that should be used when describing a target audience. Depending on the instructional task, some characteristics may be more critical than others. There are several sources the designer can attend to when acquiring this information including teachers, trainers, surveys, assessment instruments, personnel profiles, texts, articles, etc. The authors also impress upon the readers the importance of the relationship between learner analysis and instructional strategies (to be outlined later). They provide the following list (p. 56) of instructional techniques that vary according to learner characteristics:

- speed of presentation (pace)
- number of successful experiences learners should have in practice
- types of statements to convince students of the relevancy of instruction
- techniques for gaining and focusing attention and the frequency of use of these techniques
- context of examples and practice items
- amount of structure and organization
- medium/media of instruction
- level of concreteness/abstraction
- grouping of students
- size of instructional chunks
- response mode (written, oral, etc.)
- number and difficulty of examples and practice
- type of feedback given after practice items
- level of learner control
- reading level
- vocabulary and terminology used
- amount and types of reinforcement
- amount of time allowed for instruction

Analyzing the Learning Task:

Once the needs assessment has been completed the designer is now aware of the significant gaps that exist. However, Smith and Ragan are quick to caution that these gap statements alone are not sufficient guides for designing instruction. The authors identify task analysis as the method for transforming gap statements into a list of objectives that explicitly describe what the learners will know or be able to do at the completion of instruction and the prerequisite skills and knowledge that learners will need in order to achieve the objectives (p. 65). Smith and Ragan (p. 65) identify the primary steps involved in a learning task analysis as: writing the instructional goal; determining the types of learning of the goal; conducting an information-processing analysis of that goal; conducting a prerequisite analysis and determining the type of learning of the prerequisites; writing performance objectives for the instructional goal and each of the prerequisites. The authors proceed to describe methods for creating instructional goals which are similar, if not identical to, previous work done by Dick and Carey. They also recognize Gagne's work regarding the domains of learning as the most fundamental and widely used referent for designing instructional materials. Therefore, the second step of the task analysis involves describing these domains of learning and the types of objectives suitable for each.

The third step of task analysis involves analyzing the goal through information-processing analysis. The authors attribute this technique to Briggs and Dick and Carey as a way of breaking down the goal into prerequisites, identifying what the students need to
FIGURE # 7 - AN OUTLINE OF LEARNER CHARACTERISTICS

<table>
<thead>
<tr>
<th>COGNITIVE CHARACTERISTICS:</th>
</tr>
</thead>
<tbody>
<tr>
<td>General aptitudes</td>
</tr>
<tr>
<td>Specific aptitudes</td>
</tr>
<tr>
<td>Developmental level, such as Piaget's levels of cognitive development</td>
</tr>
<tr>
<td>Language development level</td>
</tr>
<tr>
<td>Reading level</td>
</tr>
<tr>
<td>Level of visual literacy, ability to gain information from graphics</td>
</tr>
<tr>
<td>Cognitive and learning strategies</td>
</tr>
<tr>
<td>General world knowledge</td>
</tr>
<tr>
<td>Specific content knowledge</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PSYCHOLOGICAL CHARACTERISTICS:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interests</td>
</tr>
<tr>
<td>Motivations</td>
</tr>
<tr>
<td>Motivations to learn</td>
</tr>
<tr>
<td>Attitude toward subject matter</td>
</tr>
<tr>
<td>Attitude toward learning</td>
</tr>
<tr>
<td>Academic self-concept</td>
</tr>
<tr>
<td>Anxiety level</td>
</tr>
<tr>
<td>Beliefs</td>
</tr>
<tr>
<td>Attribution of success ie. locus of control</td>
</tr>
<tr>
<td>Relationships to peers</td>
</tr>
<tr>
<td>Feelings toward authority</td>
</tr>
<tr>
<td>Tendencies toward cooperation or competition</td>
</tr>
<tr>
<td>Moral development, such as Kohlberg's stages of moral development</td>
</tr>
<tr>
<td>Socioeconomic background</td>
</tr>
<tr>
<td>Racial/ethnic background, affiliations</td>
</tr>
<tr>
<td>Job position, rank</td>
</tr>
<tr>
<td>Role models</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PHYSIOLOGICAL CHARACTERISTICS:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensory perception, such as visual, auditory, tactile, and olfactory acuity</td>
</tr>
<tr>
<td>General health, which may influence tendency toward fatigue as well as many other health-related factors</td>
</tr>
<tr>
<td>Age</td>
</tr>
</tbody>
</table>

82
learn to attain the goal (p. 72). The analysis describes the mental processes that the learner might go through while completing the goal. Conducting a prerequisite analysis is a logical progression from the information processing analysis. As with Dick and Carey's subordinate skills analysis, this technique examines in detail what the learner must know or be able to do to achieve each step. The task is broken down until the point is reached where all students have the described knowledge and skills. These skills that all learners possess prior to instruction are, as stated before, entry skills. The information-processing steps and the prerequisites for each step are then converted into performance objectives. Smith and Ragan also borrow from Mager (1962) and define a proper performance objective as having a description of the terminal behaviour, the conditions of demonstration of the behaviour, and the description of the performance statement or criterion.

*Assessing Learner Performance:*

Smith and Ragan also include assessment of student performance at this stage because, like Dick and Carey, it is easier to ensure that the assessment items will match the instructional objectives. More specifically, the conditions and behaviours specified in the objectives should be considered in the writing of each assessment item. They also recognize that evaluation serves two purposes: to assess the learners' achievement of objectives, and to evaluate the effectiveness of instruction. While norm-referenced tests are commonly used for selection decisions, criterion-referenced assessment instruments are acknowledged as the method most useful in determining whether the learner has mastered a particular skill and in identifying learning gaps.

The authors also identify three major formats of assessment that can be used to
examine learners' performance: observation, simulations, and traditional pencil and paper (or more recently computer generated) tests. Simulations, particularly, can be a valuable technique for assessment of higher order rule learning and attitude change. In addition, the authors spend considerable time outlining various forms of assessment items based on the type of learning outcomes. For example, assessment of declarative knowledge objectives involves the learners' ability to recall or recognize information that has been presented to them. Because the learners are not asked to apply this information, brief recall items such as fill-in-the-blanks or short answer questions are sufficient.

Instructional design which has an affective component or seeks to change an attitude can be assessed through direct self-report, indirect self-report, and observation. Each has its strengths and weaknesses; self-report can be skewed in favour of social acceptability, and observation can be time consuming and costly.

Since most instruction must include assessment of a number of objectives, Smith and Ragan also suggest that the designer develop an assessment instrument blueprint. This blueprint would include the instructional objectives and the forms of the items (i.e. multiple choice), as well as the total number of items in the assessment instrument. The proportionality of items, that is, the percentage of items that come from each objective, is also determined, with the more critical objectives being given a larger proportion. If the designer is not going to be present for the assessment, then directions for administration need to be provided including such specifics as how to respond to learners' questions, what materials are needed, the time allowed, etc. At the very least, directions must be provided for the learners so that they are aware of length and time limits, special cautions or instructions for answering the questions. The scoring methods and "weighting" of
marks should also be explicit. The final component of the instrument blueprint is assigning a suggested passing or mastery criterion for the entire assessment instrument. A designer may wish to refer to the identified mastery levels for the individual objectives. There may also be a specific minimum performance level for certain critical objectives.

Smith and Ragan's outline of an assessment instrument blueprint is an effective addition to the area of assessment. It can provide succinct direction, especially for the novice designer, and help ensure that all elements of assessment are considered carefully.

*Instructional Strategy:*

Smith and Ragan discuss instructional strategies in the context of Reigeluth's work on organizational, delivery, and management strategies. Organizational strategy refers to how the instruction will be sequenced and what content will be presented. Delivery strategy characteristics include what instructional media will be used and the grouping of learners. Management strategy includes scheduling and allocation of resources needed to implement the instruction. Instructional and cognitive psychologists have researched what activities the designer can use to facilitate the mental operations necessary for effective learning. While the strategies may vary somewhat depending on the type of objective, there are some general characteristics that seem to facilitate learning. Smith and Ragan highlight some of these generalities by combining the pattern of the lesson, introduction, body, conclusion, and assessment with Gagne's nine events of instruction. This expanded list of instructional events is outlined in Table # 8.
### TABLE # 8 - EXPANDED INSTRUCTIONAL EVENTS

<table>
<thead>
<tr>
<th>INTRODUCTION</th>
<th>BODY</th>
<th>CONCLUSION</th>
<th>ASSESSMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activate attention</td>
<td>Recall prior knowledge</td>
<td>Summarize and review</td>
<td>Assess performance</td>
</tr>
<tr>
<td>Establish instructional purpose</td>
<td>Focus attention</td>
<td>Transfer knowledge</td>
<td>Evaluate feedback and remediate</td>
</tr>
<tr>
<td>Arouse interest and motivation</td>
<td>Employ learning strategies</td>
<td>Remotivate and close</td>
<td></td>
</tr>
<tr>
<td>Preview lesson</td>
<td>Practice</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Evaluate feedback</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The introduction not only prepares learners for the lesson, it promotes selective attention and enhances the use of relevant information into working memory. The introduction also establishes expectations regarding a particular learning goal.

Activating attention to the lesson enables the learners to focus on the task at hand.

Establishing the purpose involves informing the learner of the instruction and the learning goals. This seems to facilitate learning, and as Smith and Ragan coin it, allows the learner to "sit in the driver's seat". Arousing interest and motivation involves impressing on the learners the importance and relevance of the material to be taught.

This may be particularly challenging when teaching the adolescent population about issues that are likely to effect them in the more distant future. Instructional designers must build into the lesson the relevancy, immediacy, and importance of the instructional content. Previewing the lesson allows the instructor to provide an overview of what will
be taught and again brings to the forefront the expectations of the instructor and the learner.

Within the body of the instruction the learner will be asked to recall relevant knowledge that may have been stored in long-term memory, but would be useful in mastering the new objectives. How this is done may be dependent on the objective domains and whether the recall is controlled by the learner (generative strategy) or induced by the instructor (supplantive strategy). Learners also need to be introduced to the materials they will be learning. The specifics of how this information is delivered depends greatly on the creativity and flexibility of the designer. Learners can be presented with examples and non-examples through an expository sequence or they may be encouraged to induce the concept through a discovery sequence.

Either way, the instructor must continuously reinforce and refocus attention throughout the lesson.

Smith and Ragan also identify three additional events of instruction that should be included in the body of the instruction. This includes assisting and prompting learners to use effective strategies depending on the learning outcome type. The learners must also be given ample opportunity to practice and actively interact with the material being learned. Lastly, the learners should receive informational feedback about the appropriateness of their responses during practice. For example, learners given periodic feedback about their progress during practice may be given information about incorrect solution strategies, or simply told if their answers are correct or incorrect.

The expanded events of instruction within the conclusion allows the learner to review and synthesize the most critical aspects of the lesson. This may be accomplished
through an instructor-led summary, additional or extended practice, or a graphic organizer - a technique which visually and spatially shows the main points in a lesson and how they are related to one another. Students should also be aware of ways to transfer their new knowledge and skills to other situations and future learning tasks. Finally, the instructor should build into the lesson statements that bring closure to the instruction as well as serve to remotivate the learners and encourage them to apply their new skills and/or knowledge. This is also an ideal opportunity to re-emphasize the importance of learning.

The final event of instruction involving assessment has been discussed in detail when reviewing other instructional design models. Smith and Ragan include assessing performance, evaluating feedback, and seeking remediation as their final event, and these do not vary greatly from other work reviewed.

However, Smith and Ragan contend that this expanded list of instructional events does not adequately address the pattern for organizing an entire course or unit. The authors use work from Posner to classify curriculum organization patterns into five categories: world-related structure, inquiry-related structure, utilization-related structure, learning-related structure, and concept-related structure. The Elaboration Theory developed by Reigeluth in 1979 combines the strengths of both concept-related and prerequisite-based macro strategies. Reigeluth indicated that instructional content can be taught using any one of three content structures: conceptual, theoretical (principle-based), or procedural. The designer must first determine which of the three should be emphasized, and then the most general and fundamental concepts, principles, or procedures are taught first. These overarching generalizations taught at the application
level are referred to as 'epitomes'. After this epitome is taught and practiced, then more
detailed content is presented or "elaborated". Each level of elaboration is based on
prerequisites. Furthermore, each level of elaborated instruction is related to other levels
through synthesizing and summarizing statements. Smith and Ragan recommend
considering Elaboration Theory as a structure for designing units and courses. At this
level, elaborated instruction is said to result in more integrated and motivated learning.

It is at this point that the authors embark on a detailed discussion and
examination of the most appropriate strategies for the various types of learning
outcomes. Several chapters are devoted to outlining strategies for designing for concept,
rule, problem-solving, cognitive strategy, and psychomotor skill lessons. The authors
offer strategies for eliciting change, motivation, and interest. These strategies will not be
reviewed presently, but will be referred to when necessary throughout this thesis.

*Designing Delivery and Management Strategies*

Delivery strategy involves deciding upon the most effective medium (media) of
instruction and determining the most appropriate grouping strategies. While medium
refers to the physical means by which the instructional message will be communicated, it
is important that the designer consider the instructional situation and then determine the
appropriate media choice, rather than trying to force the instruction to "fit" the available
media. The authors also mention the on going debate regarding the overall superiority of
any one particular medium over another. They acknowledge work by Clark and Salomon
(1986) who concluded that, "Past research on media has shown quite clearly that no
medium enhances learning more than any other medium regardless of learning task,
learner traits, symbolic elements, curriculum content, or setting" (Smith and Ragan, 1993, p. 344). Salomon instead presented a media attribute theory which recognize that both the media and the learner use symbols to represent, store, and manipulate information. Furthermore, some of the same symbol systems employed by the learners are acquired from the symbol systems employed by the media. Salomon's theory contends that "the closer the symbol systems of a particular medium are to the mental representations and skills required to complete a specific instructional task, the easier the learning will be" (p. 344). This symmetry, identified as supplantation, is beneficial specifically for learners who have difficulty with the cognitive processing required to complete a task. Salomon also suggested a relationship between the learner's perceived level of difficulty of a particular medium and the amount of mental effort invested in learning. His research indicated that whichever media learners perceive as the most difficult are also the media that require the most mental effort. This more intensive mental application also results in more learning. However, it is footnoted that this relationship has not always been replicated. Research on undergraduate education majors done by Cennamo, Savenye, and Smith (1990) found the opposite to be true. The harder the medium, the greater the mental effort, the less the amount of learning taking place.

The conclusion that one reaches as a result of various research is, according to Smith and Ragan, the determination that some media are more effective and efficient than others at delivering the conditions that facilitate learning based on the types of learning outcomes. Therefore, each medium must be judged by its' attributes, and a number of practical and contextual considerations including time, facilities, and
funding.

Smith and Ragan also address the interaction patterns of individualized instruction and group learning. Individualized instruction allows the learner to work alone with the materials and the instruction can be modified and adapted based on the needs and traits of the learner. Group learning, through traditional lecturing techniques, still remains the most widely used delivery method in the education system and most training institutions. However, the term "group learning" can be somewhat of a misnomer since most lecture situations allow little if any opportunity for interaction among learners or audience members. Especially within large groups, learning continues to be very much an individual experience, even though the learner does not have the ability to dictate an individual pace.

There are also several factors and learning situations that may impact on decisions regarding the most optimal grouping strategy. The nature of the learning task influences strategies for grouping. Smith and Ragan quote research completed by Romiszowski in 1981 which examined the relationship between the nature of the learning task and optimal groupings. In general, Romiszowski stated that while factual information may be learned individually, concepts and procedures can be learned in groups. In particular principles, especially social principles, and others learned through inquiry, are best learned in groups where people can engage in "analytical conversations". In addition, the content matter under study may bring with it a predisposition toward groupings. Smith and Ragan cite computer-related learning as being conducive to pairs or triads, and most effective in a cooperative learning environment. Learner characteristics also influence grouping decisions. Locus of
control, variation in prior knowledge and ability levels, as well as perceptions, skills, and preferences are often considered.

In a more pragmatic vein, factors relating to context such as facilities, equipment, and production capabilities will impact on the designer's ability to choose from a variety of grouping alternatives. Furthermore, the relationship between a contextual factor like media selection and grouping can be reciprocal. Selecting a computer-based strategy often can imply individualized or small group instruction, while at the same time, choosing to use large group instruction will also determine which media are candidates.

Production of Instruction

The last step in the instructional strategy phase of the model involves the production of instructional materials. The authors recognize that while many instructional designers acquire the services of media production specialists, some also produce their own materials. Regardless, all should have a basic understanding of the production process so they can effectively plan and communicate these strategies to their consultants or collaborators. Smith and Ragan discuss basic concepts regarding the production of print-based, computer-based, video, and teacher-based instruction. While the authors provide a good overview of general production consideration, as well as samples of various production worksheets, readers are encouraged to peruse the readings and references list for texts on producing materials for a particular medium.

Formative and Summative Evaluation

As with almost all the instructional design models reviewed thus far, Smith and
Ragan's final component involves a discussion of formative and summative evaluation. They describe the four stages of formative evaluation as: design reviews, expert reviews, learner validation, and ongoing evaluation. A few of these components have already been described in some detail. Design review occurs prior to the actual development of any instructional materials. Smith and Ragan suggest the review and evaluation of each stage of design—goals, learner and context analysis, assessment specifications and blueprints, etc. as a method for confirming accuracy at each stage. For example, the authors state the goal can be reviewed to re-confirm the presence of a real instructional need. The task analysis can be revisited to see if the points identified as entry level skills are accurate. Assessment specifications and blueprints can also be evaluated for their validity by content and testing experts. Expert reviews also provide information about the accuracy and timeliness of content, appropriateness of instruction for the target learners, and the adherence of the instructional strategies to principles of instructional theory.

Learner validation includes formative evaluation techniques described earlier based on one-to-one, small group, and field trial evaluation. The authors emphasize that collection of data from the design, review, experts, and learners should not end once the instruction has been implemented. The authors state, "subsequent revisions of the instruction may be dictated by many factors, some of which are changes in the entry level skills of the targeted learners, changes in the content, and changes in the facilities, equipment, or social mores of the learning context. Some of this data gathering may dovetail with information gathering for summative evaluation" (p. 407).

Summative evaluation, to review, is the activity of collecting, analyzing, and summarizing data so a judgment can be made regarding the effectiveness and efficiency
of instruction. These result in decisions regarding the continued use of the current instruction. Smith and Ragan reiterate several procedures for conducting summative evaluation including determining the goals of evaluation, selecting the orientation and design of the evaluation, as well as determining the evaluation measures. The evaluator may assess payoff outcomes, learning outcomes, attitude outcomes, level of implementation, and cost. It is at this point that unintended outcomes can also be documented and added to summative data.

Of particular interest in Smith and Ragan's instructional design model is their discussion of what constitutes "appropriate" instructional design. It is refreshing to see how the authors address the criticisms surrounding the amount of time and effort it takes to employ instructional design principles. Novice designers, especially, can be under the impression that all instructional design projects should undergo the same amount of intense analysis and effort. Smith and Ragan contend that these sentiments about the cumbersome nature of design and its impracticality while valid, are not sufficient cause for abandoning the integrity of systematic instructional design. "We would suggest, however, that rather than discard the tools of instructional design when situations make it difficult to use them to their fullest, it is better to learn ways of tailoring their application to the situation. This is the basic idea behind "appropriate design". The concept of appropriate design speaks to the feasibility and advisability of instructional design in real-world situations". The appropriate design concept suggests that it is possible to apply various levels of effort depending on available resources, criticality of the task, level of designer accountability, and the expectations/requirements of the client. Designers may be forced to improvise when personnel and physical resources do not
allow for a full implementation of the design procedures. The extent to which a learning
task is seen as critical should also influence the level of design effort. Instruction which
involves providing skills related to hazardous or life-threatening situations will adhere to
a more stringent design format. Similarly, a detailed design effort is necessary when all
learners must be able to perform at the same skill level, or when some skills or
knowledge are central to learning or are critical to future learning.

Closely related to criticality is the accountability that the designers and
instructors have regarding the effects of training and poor performance as a result of
instruction. The authors note that there have been several instances of civil liability suits
initiated against instructional agencies because the instruction was considered
inadequate. This certainly makes a case for being fully aware of the expectations and
requirements of the client agency or organization. Not all projects can be allowed
unlimited design time and financial resources. The designer must be aware of the client's
priorities and know when a moderate effort will yield satisfactory results.

In a final effort to provide direction, Smith and Ragan identify four possible
adaptations of instructional design depending on the situation. All techniques involve
either skipping or combining design steps, or "watering down" design tasks to
accommodate the constraints of the situation. The layers of necessity model, developed
by Tessner and Wedman (1990) emphasizes performing the design process in multiple
layers, with each layer representing a complete cycle of design activity. The model has
five fundamental phases: situational assessment, goal analysis, instructional strategy
development, materials development, and evaluation and revision. Each of these phases
can have various degrees of sophistication and formality depending on the situation and
resources.

The rapid prototyping technique developed by Tripp and Bishelmeyer (1990) uses an overlapping approach in which the analysis phase overlaps with both the development and formative evaluation phases (Smith and Ragan, 1993). So, an experienced designer who can anticipate the results of a needs assessment can combine steps and begin the design work while doing the front-end analysis.

At times, skipping steps may be advantageous, and the "windows of opportunity" strategy developed by Noel in 1991 does just this. Based on his work involving the design of middle school curriculum in Botswana, Noel identified opportunities where some, not all, systematic design procedures were timely and appropriate. "The opportunity was seized to make substantial improvement by using a particular phase of the process as a 'tool'" (p. 437).

The final approach involves using computer resources to assist in design. There are dozens of software programs available, however the authors note that there is little research evidence confirming when various software would be most appropriate.

While these four strategies have at least partly addressed the need for flexibility in design, they do not, say Smith and Ragan, contradict the need for a full understanding of the complete design process. The authors state, "Knowledge of the full instructional design process assists people who need to make such compromises. They are in a good position to (1) predict problems that may occur and (2) develop "work-arounds" for
deficiencies resulting from compromise" (p. 437).
ALCOHOL ABUSE PREVENTION

INSTRUCTIONAL DESIGN MODEL

FIGURE #3
CHAPTER FOUR
QUALITATIVE RESULTS

PART I: INSTRUCTIONAL DESIGN MODEL

Instructional design theorists suggest the need for flexibility in design. Some, like Smith and Ragan (1993) devote considerable text to acknowledging the need for practicability in instructional design and translating this practicality into an "appropriate" instructional design model. However, regardless of which components are eventually chosen to form the design system, there is a demonstrated need for designers to become familiar with the variety of possibilities, to understand the case made by each theorist and each model presented, and to weigh the advantages, disadvantages, and practicality of all the components presented. Only then, can an instructional designer confidently develop the "appropriate" design based on her real-world situation.

Figure #8 illustrates the instructional design model which will be used for this instructional situation. It contains all the necessary steps to design effective instruction in alcohol abuse prevention for adolescents. Admittedly one cannot predict all the variables that may affect a designer's time, ability, resources, or motivation to include all the steps outlined. Even with similar situations and design problems, a designer may need to modify the model by skipping steps or combining components. However, to maintain the integrity of instructional design, one should not begin with a compromise, but rather an appropriate design which can facilitate the most effective instruction. The components or steps of this design, and their origins, will now be outlined briefly.
Assess the Needs and Priorities

At first glance, it may seem unnecessary to assess whether there is a need to provide instruction in alcohol abuse prevention to adolescents. The answer seems obvious considering the amount of personal and societal problems that have, and could occur, as a result of alcohol abuse. However, as Briggs and Wager (1981) and Kaufman (1988) indicate, a needs assessment involves much more. Needs assessment can help determine whether instruction is the most favourable method for addressing a particular gap in knowledge, attitude, or behaviour. It can also be specific to a particular, identified population who, while part of a larger group, may have specific needs or differences that set them apart and warrant instruction. Needs assessment can also identify specific areas of concern or gaps that will then be the basis of not only the goals and objectives, but the entire instruction itself. For example, a needs assessment may identify that a particular group of adolescents from low socio-economic backgrounds are particularly vulnerable to alcohol abuse because abuse is more prevalent in the family, or perhaps there is a greater susceptibility to peer pressure. This may then result in an identified need to develop coping and resiliency strategies, as well as peer pressure reversal techniques. The direction and focus of instruction does not come from a "feeling", but from the completion of a systematic and objective research technique.

Kaufman (1988) also indicated the importance of planning partners. These planning partners, which may include learners, instructors, employers, funders, etc., will also need to negotiate the priorities or identified needs and determine the allocation of resources to these needs. Within the health promotion field, there is an increasing demand from funders for the well-developed plan that identifies needs and justifies
spending. Kaufman (1988, p. 65) states, "A plan specifies where to go and provides a justification of why to go there. The decision to use a needs assessment also includes a commitment to be proactive".

**Identify Instructional Goals**

Once particular needs or gaps have been identified, and it has been determined that instruction is the best way to address these needs, then instructional goal statements can be developed. Briggs and Wager (1981) quickly summarize the importance of the link between identified needs and instructional goals. Goals, they state, are traditionally presented in broad terms using words like "appreciate" and "understand". While these statements may appear general, they are crucial in providing the overall direction and foundation for the development of performance objectives. Dick and Carey (1985) also include this step in their instructional design model. Their procedural recommendations for clarifying goal statements allow the designer to outline behaviours which would reflect the achievement of the overall goal(s). It should be made clear that instructional goals are different from performance objectives, a component of this model which will be presented later. Instructional goals are broader, general statements and not subject to prior analysis based on domains of learning. Performance objectives are specific and use these domains to describe the condition, behaviour, and criteria for successful completion of that objective.
Conduct an Instructional Analysis

Conducting an instructional analysis is an essential component in this instructional design model. One needs to look no further than the world of advertising and marketing to understand the importance of analyzing the audience, the product, and the message. Millions of dollars are spent each year by major corporations on market and audience research. Even in the area of social marketing, this type of research is becoming increasingly recognized. Larry Hershfield, Manager of Health Communications Unit at the Centre for Health Promotion has stated that, "Fifty percent of time and resources should be spent on audience analysis" (1996, p. 3).

Not knowing your target audience or learners and the context in which their learning will take place creates the potential for instruction based on stereotyping. Important and complex group characteristics can get relegated to sweeping generalizations. For example, learners from lower socio-economic conditions are assumed to have lower reading levels, are in greater need of explicit direction to complete tasks, and will be more difficult to motivate. Smith and Ragan have already pointed out the dangers of this by stating, "The danger in not analyzing the characteristics of an audience is assuming that all learners are alike. An even more common error is assuming that the learners are like the designers" (1993, p. 43).

While Dick and Carey (1985) identified instructional analysis in their model, the format developed by Smith and Ragan (1993) offers the most practical and detailed treatment for instructional analysis. The model presented now has incorporated their format by including the following subcomponents: analysis of the learning context,
analysis of the learner, and analysis of the learning task.

Analyse the Learning Context

In this instance, analyzing the learning context does not necessitate substantiating a need for instruction through a needs analysis since this has been performed in a prior step. There is a need however for describing the learning environment in which the instructional product will be used. This also includes analyzing the instructional materials, instructor, equipment, facilities, and when appropriate, the community.

Analyse the Learners

A particularly important subcomponent included within this instructional design model is Smith and Ragan's process for analyzing the learners. While there are a number of factors which could be considered, Smith and Ragan's matrix examining the major similarities and differences among learners is certainly an adequate starting point. In addition, within most instructional settings there may also arise some homogeneous qualities about a group which would make a particular area worth examining in more detail. In this particular instruction, the learners are adolescents, therefore it might be advantageous to spend some time on psychosocial and moral development. The authors also provided a list of major characteristics and sub-characteristics that may be used when describing a target audience.

Analyse the Learning Task

A final component of instructional analysis involves analyzing the learning task.
This process allows the instructional designer to transform gap statements into a list of cohesive and measurable objectives. The steps provided by Smith and Ragan (1993) are somewhat cumbersome and repetitive, however analysis techniques drawn from Dick and Carey (1985) and Gagne (1985) prove sufficient. Goals can be classified into various domains of learning and analyzed according to this classification. Following Dick and Carey's model, these goals are then broken down into major steps which outline what the learner must do to demonstrate mastery of this goal. Identification of subordinate skills and entry behaviours are also included in this process.

Write Performance Objectives

This is considered, by all the theorists reviewed, an essential component of any instructional design model. Again, the work of Gagne and Briggs (1979, p. 46) identify five components for writing objectives:

1. In what environment (situation), and given what kind of test item(s),
2. for what type of learned behaviours (learner capability) the
3. student does what (object)
4. in what observable way (action verb)
5. using what tools, with what constraints, or under what special conditions (tools, constraints, and special conditions).

At the very least it is necessary to include steps 2,3, and 4. The need for clear and appropriate instructional objectives (along with sufficient evaluation) cannot be overstated. In health promotion particularly, there is a growing movement among government funders and supporters to require a system be set in place which includes measurable tracking instruments and one which will create a climate of accountability. Community health centres themselves have been, in the last year, repeatedly asked to provide documentation on their cost savings and program effectiveness in both the
clinical and health promotion areas.

**Develop an Instructional Strategy**

While this component is drawn from the work of Smith and Ragan (1993), their work in turn originates from work of Gagne (1985) and Reigeluth (1987). The sub-component identified as organizational strategy includes how the instruction will be sequenced and what content will be presented. The five major components of an instructional strategy outlined by Dick and Carey (1985) namely preinstructional activities, information presentation, student participation, testing, and follow-through, are combined with Gagne and Briggs' (1985) events of instruction. While the effective learning strategies may vary, some general characteristics seem to facilitate learning. Delivery strategies include an examination of various instructional media and the grouping of learners. With respect to choice of media, one can conclude, as Smith and Ragan (1993) have done, that each medium should be judged by its' attributes, and some media are more efficient and/or effective than others at delivering the conditions that facilitate learning based on the types of learning outcomes. Similarly, the nature of the learning task may also impact on decisions regarding the most optimal grouping strategy. Whether the grouping strategy involves individualized instruction or group learning, it is at this point in the instructional design model where the group strategies can be considered.

Reigeluth (1987) included a third component, management strategy, which includes the scheduling and allocation of resources. It is not included here as a major subsection of the instructional strategy component. Scheduling and allocation of
resources is a consideration throughout the entire model, and could certainly be included within the organizational and delivery strategies.

**Design and Conduct Formative Evaluation**

All the instructional models reviewed also included a formative evaluation component. Because a major objective of instruction is to create the best environment for learning, formative evaluation is crucial. Briggs and Wager (1981) acknowledge that formative evaluation helps to improve instructional materials and events, and is also able to reveal defects in the planning stages of any of the other steps or components in the model. Dick and Carey (1985) also impressed upon their readers the importance of formative evaluation by saying that it "distinguishes the instructional design process from a philosophical or theoretical approach" (p. 244). Rather than speculating about instructional effectiveness, instruction is actually tested with learners. Both Briggs and Wager (1981) and Dick and Carey (1985) advocate using a three-phase approach which includes one-to-one, small-group, and field-test evaluation. Alcohol abuse prevention material would also benefit from review by subject matter specialists.

**Design and Conduct Summative Evaluation**

Once again, most instructional design models presented in this review included a step identified as summative evaluation. Briggs and Wager (1981) only mention it in passing, Dick and Carey (1985) and Smith and Ragan (1993) devote considerable attention to its components and importance. The collection of data to verify the effectiveness of instructional materials is a crucial activity in health promotion. It is
essential in determining whether a program of instruction should be continued and in what direction. It is integral for justifying expenditures and soliciting continued financial support. Programs with outside or government funding almost always require external evaluators. These evaluators comment on and document the material's effectiveness with the target group in the intended setting, as well as the completeness and utility of the materials. This information is almost always translated into decisions regarding the sustainability and continued funding of instruction.

**Revise Instruction**

Implicit in this instructional design model is the planned intention to revise instruction based on results of formative and summative evaluation. Obviously evaluation is useless if it is not used as a practical guide for directing change. While the model indicates a direct link between evaluation and revision, it should be understood that the focus of this revision can originate from any one or more of the instructional design components outlined in this model.
Instructional design theories have been developed and adapted to address different instructional situations. The instructional design model and the "instructional design tips" presented in the following pages are based on instructional design literature. While the model is both a compilation and an adaptation of various theories and models, the steps involved in this particular alcohol abuse prevention instructional design model were chosen because of their importance in maximizing the potential for effective design and instruction and because they acknowledge and address the need for practicality in design models. The instructional design tips serve as both an adjunct to the model and as a pragmatic illustration of the link between theory and practice.
Instructional Design Model:

The following diagram illustrates the instructional design model with all the necessary steps to design effective instruction in alcohol abuse prevention for adolescents. Admittedly one cannot predict all the variables that may affect a designer's time, ability, resources, or motivation to include all the steps outlined. Even with similar situations and design problems, a designer or instructor may decide to modify the model by skipping steps or combining components. However, to maintain the integrity of instructional design, one should not begin with a compromise, but rather an appropriate design which can facilitate the most effective instruction. The components or steps of this design are outlined in the following pages.
**Instructional Design Tips:**

Following a description of the steps in the instructional design model, there are a series of "tips" or recommendations intended to increase the likelihood of success and link theory to specific practical application. While the design tips are in no way intended to be an exhaustive list of considerations, they are gleaned from areas involving both pertinent theory and practical concerns. The format of presentation is as follows:

**Instructional Design Tip:** Succinctly states the recommendation or principle related to that design step.

1. **Theory:** Outlines the theoretical bases for the recommendation and/or provides theoretical information which can expand on its usefulness.

2. **Relevance:** Briefly discusses how this instructional design tip is relevant to, and could improve the effectiveness of, the chosen instructional design situation - alcohol abuse prevention for adolescents.

3. **Practical Application:** Provides a few practical ways of applying the recommendation, and hence the theory, to instruction. Applications are presented as examples only for linking theory and practice.

4. **References:** Cites references from which the theories were derived should designers or instructors want to obtain additional, more in-depth
At first glance it may seem unnecessary to assess whether there is a need to provide instruction in alcohol abuse prevention to adolescents. The answer seems obvious given the amount of personal and societal problems that have occurred, and could occur, as a result of alcohol abuse and at-risk drinking behaviour. A "need" is described as a gap or discrepancy between what is (the present state of affairs), and what is desired or what should be. However, as Briggs and Wager (1981) and Kaufman (1988) indicate, a needs assessment can help to determine whether instruction is the most favourable method for addressing a particular gap in knowledge, attitudes, or behaviour. It can also examine a particular identified population who, while part of a larger group, may have specific needs or differences that set them apart and warrant a different type of instruction. Needs assessments can also identify specific areas of concern or gaps that will then be the basis of not only the goals
and objectives, but the instruction itself. Assessing the needs of a population will ensure that the direction and focus of instruction is based on systematic research. Roger Kaufman (1988, p. 65) states that, "a plan specifies where to go and provides a justification of why to go there. The decision to use a needs assessment also includes a commitment to be proactive". Smith and Ragan (1993) outlined several reasons when and why a needs assessment may be required. These include possible recognition that learning goals are not being met; current instruction is inefficient and/or ineffective; there is a lack of appeal or interest in current instruction; new learning goals have been added; there has been a change in the learner population.
IDENTIFY INSTRUCTIONAL GOALS

Once needs or gaps have been identified and prioritized, and it has been determined that instruction is the best way to address these needs, then instructional goal statements can be developed. Briggs and Wager (1981) summarize the importance of the link between identified needs and instructional goals. Goals are traditionally presented in broad terms using words like "appreciate" and "understand". While these statements may appear general, they are crucial in providing the overall foundation and direction for the development of performance objectives. A goal statement describes what the learners will be able to do after the instructional experience. This is similar to Kaufman's statement about "what should be". Dick and Carey (1985) recommended that the designer write down the goal statement and then develop a list of all the behaviours the learners must be able to perform to demonstrate achievement of this
goal. The designer then checks that these selected behaviours are included in the goal statement. Finally, this revised goal statement is examined to determine whether the learners who demonstrate these behaviours would be considered as having accomplished this broad goal. It should be noted that instructional goals are different from performance objectives, another component of this model. Instructional goals are broader, general statements that often apply to the entire instructional program. Performance objectives are more specific and must describe in detail the condition, behaviour, and criteria for how the learners must perform.
Conduct an Instructional Analysis

Conducting an instructional analysis is an essential component in this instructional design model. One needs to look no further than the world of advertising and marketing to understand the importance of analyzing the audience, the product, and the message. Millions of dollars are spent each year by major corporations on market and audience research. Even in the area of social marketing, this type of research is becoming increasingly recognized. Larry Hershfield, Manager of Health Communications Unit at the Centre for Health Promotion has stated that, "Fifty percent of time and resources should be spent on audience analysis" (1996, p. 3).

Not knowing the target audience or learners and the context in which their learning will take place creates the potential for instruction based on stereotyping. Important and complex group characteristics can get relegated to sweeping generalizations. Smith and Ragan (1993, p. 43)
have pointed out that, "The danger in not analyzing the characteristics of an audience is assuming that all learners are alike. An even more common error is assuming that the learners are like the designers". The format designed by Smith and Ragan (1993) offers a practical and detailed method for instructional analysis. It breaks the analysis into three areas: analyzing the learning context, analyzing the learners, and analyzing the learning task.

*Analyzing the Learning Context:*

The designers must look at as many aspects as possible about the learning context or environment where instruction will take place. This procedure consists of identifying all factors that affect and are affected by the learning that is taking place and may include analyzing the instructional materials, instructor, instructional equipment and facilities, and the community or organization. For example, the level of experience and preferences of the teachers/instructors will impact on the design of
the instructional materials. As well, some media may not be usable in some learning environments because of limited hardware capability, or the availability of instructors with adequate experience.

*Analyzing the Learner Characteristics:*

A particularly important subcomponent included within this instructional design model is a process for analyzing the learners. Smith and Ragan (1993) caution that some instructional designers find themselves describing the characteristics that they hope their learners have (like an adequate literacy level), rather than the actual characteristics of their target audience. To analyze learner characteristics, Smith and Ragan focus on four categories.

1) Stable similarities: Similarities may include sensory capacities and information processing capabilities and limits. Some similarities and differences are stable and relatively unchanging over time, while others
are constantly changing. Characteristics associated with information processing also have implications for design. We all have, for the most part, the same capacity for temporary storage of nonmeaningful information units (7 plus or minus 2). These characteristics do not vary with intelligence level or age.

2) Stable differences: Smith and Ragan identify three stable differences which may need to be considered when designing instruction: gender, ethnicity, and racial group identification. These differences are noted not because members of various groups may process information differently, but rather because these groups may have common experiences and backgrounds because of their group membership. As a result, there may be some relevant contexts and examples that should be incorporated into the design.

3) Changing similarities: This category includes changes in
intellectual, language, psychosocial, and moral development. Changing similarities are defined as those learner characteristics that appear to develop in a predictable pattern over time. These may include developmental stages like those researched by Piaget, Erickson, and Kohlberg.

4) Changing differences: A designer must acknowledge that there are certain differences between people that change over time and quite obviously have implications for instruction. Specific prior learning is a very important changing difference to consider about the audience. While each participant will have a storehouse of "general world knowledge", it is the specific, relevant, background knowledge and skills that have potential implications for instruction. Smith and Ragan (1993, p. 55) suggest that, "the more designers know about the relevant knowledge and skills that the learners already have, the more effective and efficient they can make the instruction".
**Analyzing the Learning Task:**

When the goal(s) have been identified, the designer should determine what type of learning is required. This step involves identifying the procedural steps required to learn the process and successfully accomplish the goal. It involves classifying the goals into one of four domains of learning using categories developed by learning theorist R. M. Gagne. Goal statements can be classified as either intellectual, psychomotor, verbal information or attitude goals. Each type will require a different goal analysis technique. A psychomotor skill demands that the learner perform a skillful execution of a new physical skill. Intellectual skills are those that require the learner to perform a unique cognitive activity - to solve a problem, or perform an activity using previously unencountered information or examples. It also involves the manipulation of symbolic information. Verbal information requires only that the learner provide specific responses to specific prompts. The learner may be asked to state, list, or describe something that was taught
in instruction, but there is no symbolic manipulation. Attitudinal goals focus on the learner's ability to make particular choices or decisions under specific circumstances. Attitude change goals are not usually goals which can be achieved by the end of instruction, and are therefore the most challenging. What is often measured is the participants' intentions regarding attitude and behaviour change. The second step in analysis is to identify the major steps which the learners must perform to demonstrate that they have achieved the goal. These major steps should be sequenced in the most efficient manner possible. For example intellectual and psychomotor skills could have steps listed in chronological order.

Subordinate skills analysis is the final component of the overall instructional design analysis. Subordinate skills are skills that must be mastered prior to learning how to perform the major steps in the goal. Learning theorist M. Gagne phrases it as, "What must the student already know so that, with a minimal amount of instruction, the task can be learned?" Subordinate skills are different from entry behaviours which
are skills the learners must have before even beginning instruction, for example an entry level skill or behaviour may be a certain level of literacy. If however an instructor was teaching the mechanics of a proper golf swing, then it would be necessary first to learn to keep the knees bent and keep the eyes on the ball. These would be subordinate skills. The line which separates entry level behaviours and subordinate skills is where instruction should begin.
WRITE PERFORMANCE OBJECTIVES

This step is considered by all the major instructional design theorists as an essential component of any instructional design model. For an instructor to confidently know that the learners have successfully mastered the instruction, she must decide precisely what the learners were expected to know or demonstrate. Performance objectives are specific statements outlining what the learners will be able to do when instruction is completed. It identifies the skills to be learned, conditions under which these skills will be performed, and the criteria for successful performance. Each objective begins with behaviours that are described in the subordinate skills. For example, Dick and Carey (1990) state that if the instruction involves changing the tire on an automobile, then the performance objective may be:

Given an automobile with a flat tire, all tools required to change the tire secured in their normal positions in the trunk, and an inflated space tire secured normally in the wheel well (condition), replace the flat tire with the spare
tire (behaviour). Each step in the procedure will be performed in sequence, and according to criteria specified for each step (criteria).

In health promotion there is a growing movement among government funders and supporters to require that a system of accountability be set in place which includes measurable tracking instruments such as clearly outlined performance objectives. Most evaluative efforts focus on the abilities of the learners after instruction as compared to the initial goals and performance objectives.
Organizational strategy refers to how the instruction will be sequenced and what content will be presented. Delivery strategy includes what instructional media will be used and the grouping of learners. The five major components of an instructional strategy outlined by Dick and Carey (1985) namely preinstructional activities, information presentation, student participation, testing, and follow-through, as well as the events of instruction developed by Gagne are outlined by Smith and Ragan in the attached diagram.

The introduction not only prepares learners for the lesson, it also promotes selective attention and enhances the use of relevant information into working memory. The introduction also establishes expectations regarding a particular learning goal. Arousing interest and motivation involves impressing on the learners the importance and relevance of the material to be taught. This may be particularly challenging when teaching
the adolescent population about issues that are likely to effect them in the more distant future. Instructional designers must build into the lesson relevancy, immediacy, and importance of the instructional content.

Within the body of instruction the learner will be asked to recall relevant knowledge and will also be introduced to the materials she will be learning. The specifics of how this information is delivered depends greatly on the creativity and flexibility of the designer. Learners can be presented with examples and non-examples or may be encouraged to induce the concept through discovery learning. Learners also need to be assisted and prompted to use effective strategies depending on the learning outcome type. They should be given ample opportunity to practice what has been learned. The instruction is also more effective if learners are given feedback about the appropriateness of their response. The final category in the events of instruction includes assessing performance, evaluating participant feedback, and identifying situations for remediation.
Delivery strategies also include an examination of various instructional media and the grouping of learners. The nature of the learning task may impact on decisions regarding the best grouping strategy. Whether the grouping strategy involves individualized instruction or group learning, it is at this point in the model where optimal group strategies can be considered.
Cronbach (1975) and Scriven (1967) were the first researchers to identify the importance of formative evaluation. Formative evaluation is defined as "the collection of data and information during the development of instruction which can be used to improve the effectiveness of the instruction" (Dick & Carey, 1990, p. 234).

Formative evaluation helps to improve instructional materials and events, and is able to reveal defects in the planning stages of any of the steps or components in the model. Rather than speculating about instructional effectiveness, instruction is actually tested with learners. This stage can prove to be one of the most challenging for anyone involved in designing health or substance abuse prevention instruction. Formative evaluation requires a considerable amount of testing before the use of materials and actual instruction is installed. This is not always easy when one is required to quickly develop the instructional objectives.
for presentation to administration or funders, then upon approval quickly
design the program for implementation and evaluation during the
prescribed funding period. Because the purpose of instruction is to create
the best environment for learning, formative evaluation is crucial in
identifying areas for revision. Smith and Ragan (1993) outline four stages
of formative evaluation.

1) Design reviews: Instructional design reviews occur prior to the
actual development of any instructional materials. For example, the goal
can be reviewed to reconfirm the presence of a real instructional need.
The task analysis can be revisited to see if the points identified as entry
level skills are accurate.
2) Expert reviews: These reviews provide information about the accuracy and timeliness of content, appropriateness of the instruction for the target audience, and the adherence of instructional strategies to principles of instructional design theory.

3) Learner validation: Three stages of learner validation are one-on-one evaluation, small group evaluation, and field trial evaluation. A rough draft of the material is developed and presented to an individual learner who is able to question or comment on various aspects of the instruction. A posttest is given primarily to detect faulty directions or test items. After the materials have been reviewed, they are presented to a small group of learners (5 to 20 individuals). The designer presents the instruction and only answers questions to clarify directions. Once again, the posttest data can more clearly identify possible areas needing correction. Revisions are made to materials, delivery strategy, and test items. The instruction is then tested in the actual learning environment.
(the field). Test scores are now taken as indicators of the effectiveness of the instructional program. Field trials are sometimes retained for summative evaluation as well.

4) Ongoing evaluation: Dick and Carey (1990) recognize that the purpose of formative evaluation is to gain feedback that will direct revisions and make instruction as effective as possible. Therefore, the designer should be prepared for information that indicates materials and instruction may not be as effective as hoped. Collection of data should not end once instruction has been implemented. Subsequent revisions may be dictated by changes in content, facilities, even social mores. Some of the data may be combined with summative evaluation.
**DESIGN AND CONDUCT SUMMATIVE EVALUATION**

Summative evaluation is the activity of collecting, analyzing, and summarizing data so a judgment can be made regarding the effectiveness and efficiency of instruction. It is also at this point that unintended outcomes can be documented and added to the summative data. Dick and Carey (1990) note that the predominant contribution of summative evaluation is that it provides data for decisions about maintaining currently used instructional materials or about adopting materials that have the potential for meeting an organization's defined instructional needs. Its two main phases, usually overseen by an external evaluator, are expert judgment and field trials. Experts can decide whether the materials meet the defined needs of the organization. Field trials document the material's effectiveness with the target group in the intended setting.
Implicit in this instructional design model is the planned intention to revise instruction based on results of formative and summative evaluation. While the model indicates a direct link between evaluation and revision, it should be understood that revision can originate from any one or more of the instructional design components outlined in this model.
INSTRUCTIONAL DESIGN TIPS
Tip 1.1

Determine whether there is a legitimate need for instruction by assessing needs.

Theory

The origin of this component of instructional design is not only based on theory, but has pragmatic considerations as well. It is also a fundamental question that needs to be addressed before instruction can be fully planned or implemented. Assessing the needs of the prospective audience is crucial for both designing appropriate instruction and for substantiating the need for instruction to funders. Too often curriculum/instruction is designed and implemented because the instructor feels the "need" to teach it. With limited funding and resources this "teaching from the gut" is no longer acceptable. The need for instruction must be substantiated through some sort of needs assessment. There must be a clear understanding of what gaps exist between what is and what should be. Smith and Ragan (1993) recommend that the designer ask the following questions to determine whether a formal needs assessment should be conducted:

1) Are there learning goals that are not being met by the learners?
2) Is instruction unappealing, and therefore, impeding the motivation, interest, and perseverance of the learners?
3) Is instruction for unreached learning goals being presented already?
4) Should new learning goals be added?
5) Has there been any change in the composition of the learner population?

Relevance

Since many of the alcohol abuse prevention programs are funded by government and foundations through the grant process, identifying the need for the instruction (and hence the
money) is crucial. Equally important is the realization that effective instruction should bridge the gap between a recognized need and a desired or preferred outcome. There are several programs designed to instruct adolescents about alcohol with the intention of changing attitudes and behaviours. If it already exists in its most efficient form then there is no point in reinventing the wheel.

Practical Application

Collecting information about what is currently being done, or not done, in the area of alcohol abuse prevention, and the resulting consequences, will help to substantiate a need for further instruction. Are there statistics which indicate that a significant portion of the target audience continues to engage in at-risk drinking behaviour, and experiencing negative consequences as a result? If there is existing instruction that addresses alcohol abuse prevention, is there evidence that it may not being delivered efficiently or effectively? Is there a need for instruction to be targeted to a different population (i.e. younger, street youth, aboriginal youth) that research has indicated are experiencing problems with alcohol?

References

Tip 1.2

Include a variety of stakeholders and planning partners to help with the needs assessment and plan the instruction.

Theory

A stakeholder, in this situation, is someone who is most likely to be affected by whatever action is taken, and who preferably has an interest in what will take place. Kaufman (1988) proposed that successful needs assessment depends upon finding the correct partners to both guide the process and “own” it. These partners could include those who will be the recipients of the instruction (i.e. participants/learners), those who might actually implement the plan (i.e. instructors), those who have expertise in that particular area, and others who may be less directly affected (i.e. citizens). It is well documented that people who participate in the planning of the initiative are more likely to be committed to it and go a long way to ensuring its success. While it may appear unwieldy at times, needs assessment includes collecting data from a variety of sources and people who can provide input and offer additional perspectives can prove to be invaluable.

Relevance

Alcohol use among adolescents is also seen as a societal problem and often the symptom of other problems related to family or environment. Since so many people can be affected by the negative consequences of at-risk drinking, it is only logical then to provide opportunities to receive their input and include them in the planning. Funders are also looking for evidence of collaborative partnerships among different interest groups when planning health promotion and disease prevention programs.
Practical Application

It makes sense to include young people or potential participants in the discussion about the needs assessment and in the planning stages of instruction. These young people are the “consumers” and can give the designer valuable insight about their perceptions regarding alcohol use, what myths exist about alcohol use, and what methods would most likely be successful in gaining the attention of the participants. These young people, if they are interested and invested in what is about to take place, can also serve as supporters and act as opinion leaders for their peers. However, because this group may only provide one perspective, particularly one that is biased with respect to what is needed, look to representatives from other stakeholder groups such as the police, the court system, parents, community groups like MADD, addiction professionals, the medical community, the education system, etc.

References

Tip 1.3
Identify gaps between the current situation and the desired outcome as the difference between 'what is' and 'what should be'.

Theory

Briggs and Wager (1979) defined "need" as a gap or discrepancy between what is (the present state of affairs) and what is desired. Identifying gaps is the foundation of the needs assessment. Kaufman (1988) cautioned that gaps should be defined as gaps in results, not in resources. It is at this stage where visioning can take place uncluttered by the harsh realities of financial and resource constraints. While reality may dictate that all needs cannot be addressed, these needs must still be identified since many needs are strongly interrelated.

Relevance

Because the adolescent population may not see alcohol abuse as an issue and may be less able to articulate their needs, there is an increased possibility that those interested in designing the instruction will decide what needs exist based on their own values and perceptions. While this is understandable, the most effective designers gather evidence as to where the gaps exist and why, rather than forging ahead based on the designer or instructor's need to feel gratified.
Practical Application

Collect data to identify where the gaps occur. Data collection may include surveys regarding adolescents' drinking behaviour and testing knowledge of information about alcohol use and abuse (i.e. a majority of young people do not know that there is the same amount of pure alcohol in a regular beer or a glass of wine as there is in a shot of whiskey). Many hospitals keep data regarding the number of drinking and driving incidents and what age groups are involved. Often people's perception and concern with the issue is enough to warrant action.

References


Tip 2.1

Develop instructional goals so that the focus is on the behaviours of the learners, not the instructor.

Theory

Several instructional designers and researchers have recognized the importance of setting and clearly defining instructional goals. Briggs and Wager (1979) suggest that once particular gaps or needs have been identified, then goals need to be set that will address these gaps and provide overall direction for the instruction. Dick and Carey (1990) include the identification of instructional goals as the first step in their instructional design model. It will be difficult to determine whether or not instruction is a success or has made an impact unless it is first made clear what it was designed to accomplish and what the learners are expected to know, how they are expected to behave, or what their attitudes are expected to be as a result of instruction.

Because instructional goals tend to be presented as very general statements of behaviour and content, Dick and Carey (1990) provide some procedural recommendations for clarifying goal statements. The authors recommend that the designer write down the goal statement and then generate a list of all the behaviours or intended behaviours the learners must be able to perform to demonstrate achievement of this goal.

Relevance

Once again, funders often require that proposals include clear identification of program and instructional goals. More importantly however, the development of goals culminating from researched needs is an important foundation for several other components in instructional design including performance objectives and evaluation.
Practical Application

There has tended to be a great variance in the ways instructional goals have been written. "To teach the student about responsible drinking habits" is not a goal. A more appropriate goal may be, "After instruction, the students will be able to identify ten (10) behaviours associated with at-risk drinking". If an even broader goal is necessary, it may be written as, "After instruction, participants will have a better understanding of the possible negative consequences of alcohol abuse". However, it is important to remember that the more general the goal statement, the more difficult it may be to evaluate.

References


Tip 2.2
When developing instructional goals, begin with the end in mind.

Theory

Because instructional goals tend to be stated in rather general terms, they are sometimes difficult to substantiate at the end of instruction. Because these goals will be subject to evaluation, they should be statements of what learners should be able to do at the conclusion of instruction and must have a degree of measurability. Smith and Ragan (1993) note that instructional goals are stated in performance terms because they should describe what performance learners will demonstrate - what observable things learners must be able to do to show they have learned. Without clear statements it is difficult to develop more specific performance objectives and continue with the other steps in the instructional design model.

Relevance

Most alcohol abuse prevention programs focus on meeting several goals involving knowledge, behaviour, and attitude change. Attitudinal goals, particularly, may be difficult to evaluate. However regardless of the focus, the recommendations, as outlined above, still apply. Funders, administration, and even potential participants are looking for accountability and measures of success.
Practical Application

Instructional goals are generally more inclusive and less precise than performance objectives. For example, if the instructional goal includes a statement such as, “When encouraged by a peer to drive after drinking, the learner will understand how to use peer pressure reversal skills.” Be clear as to how the learners’ “understanding” will be measured. What will the learner need to demonstrate or perform to indicate her understanding of peer pressure reversal skills?

References

Tip 3.1
To ensure that instruction begins at the appropriate level for the learners, identify what skills the learner must know before beginning to receive instruction.

Theory

The skills that the learners need to know prior to instruction are called entry level skills or entry behaviours. Entry behaviours are important because they fall directly below the skills that the facilitator plans to teach. They are the initial building blocks for the instruction. Entry level skills relate specifically to the instruction that is about to take place and should be listed, or at the very least confirmed, prior to instruction. For example, do the learners have decision-making skills and the ability to analyze problems and potential solutions? Because most instruction relies on some form of written material, an adequate level of reading ability is required. Dick and Carey (1980) note that if the facilitator feels that it is necessary to test the reading ability of the learners and identify a minimum requirement for instruction, then reading is an entry behaviour.

Facilitators must be cautious when identifying entry behaviours with respect to assumptions about what the learners should already know. If the instructor assumes that the learners have a variety of entry behaviours, which in fact a majority of the target population do not have, then the instructional materials will not be as effective with most of the learners. If, on the other hand, the instructor assumes the target population has far less skills than they actually have, then the materials may not really be needed by the learners, and objectives may be designed which the learners have already mastered.

Relevance

When providing any type of instruction it is important to prepare materials and content that are as appropriate for the target audience as possible. This requires that the instructor
know something about the learners, their abilities, what they know, and what they need to know. While there are guidelines as to where adolescents may be with respect to intellectual ability, and cognitive and social development, there still may be a wide variance between individuals. While it is true that instructors cannot design instruction that will meet the needs and abilities of everyone, some fairly quick research can be done to determine if a majority of the learners have particular knowledge, abilities, or attitudes.

Practical Application

Because the focus is on prevention, the designer may not identify many entry level skills that are prerequisites for instruction. However, it would be worthwhile to identify what the young learners already know (or think they know) about alcohol so that instruction can build from there. A pre-test which combines questions regarding knowledge, attitudes, and behaviour would provide information not only for designing instruction, but also for comparison after instruction. Questions could test the learners’ knowledge about the physical effects of alcohol, her attitude toward alcohol consumption, and her consumption levels. Because some adolescents experience test anxiety, the pre-test could be labelled a “pre-opinion survey”. While the instructor may decide that an entry level skill must be a particular level of literacy, it may be necessary for materials to be provided in several modalities, and in written forms other than text. While it may not be considered an entry level skill, the facilitator may require that the learners be of a certain age and have a certain amount of emotional maturity, especially if the instruction involves active learning and candid discussion.

References

Tip 3.2

Choose a facilitator that the participants would regard as credible, attractive, and similar to themselves.

Theory

Several researchers have studied the importance of developing a rapport with the audience when the goal is attitude change or persuasion. Singletary (1976) stated that high credibility sources have more persuasive influence than low credibility sources. Expertise, that is knowledge and experience about the topic, is usually the most important component of high source credibility. Research also indicates that attractive sources are more influential, however attractiveness has several components. Physical attractiveness plays a part in persuasion, but facilitator-audience similarity also contributes to the attractiveness of the facilitator. Instructors who are similar in background, experience, attitude, or ideology will be more influential.

However, Katz and Bernstein (1975) note that if the goal is compliance only, the credibility and attractiveness of the source(facilitator) are of lesser importance. The source’s influence will last only as long as the behaviour of the learner can be monitored. However, if internalization of the concept is the goal, the credibility of the source is very important, and the attitude will persist as long as it is congruent with the receiver’s belief system.

Relevance

While for some situations it is not particularly necessary that the audience “like” the facilitator, it creates a more pleasurable experience (for both instructor and learner) if the two parties “connect”. Adolescents particularly may need to be able to relate to the facilitator in order to feel comfortable to discuss and express their opinions. A facilitator that is perceived to have a world view that is very different from a young person’s may be viewed with suspicion.


Practical Application

There are many ways that a facilitator can develop rapport and be perceived as attractive to the audience. The key is to know the audience and have at least a basic understanding of their current attitudes, interests, and needs. Be aware and make reference to current events that young people would be aware of and interested in. Acknowledge and state an understanding of the importance of peers as an influence of behaviour; make reference to the allure of drinking and its status as a popular pastime for young people. However, likability alone is not enough; since adolescents are known to challenge, a facilitator must also know what he or she is talking about.

References


Tip 3.3
Because adolescents tend to be egocentric, provide a ‘safe’ environment for learning and one that allows for group discussion of ideas and attitudes.

Theory

Piaget’s (1954) four stages of cognitive development includes formal operations, a mental system for controlling sets of variables. This ability to think hypothetically, consider alternatives, and analyze one’s own thinking also brings about another characteristic of this stage studied by Elkind (1978) called adolescent egocentrism. This is the assumption that everyone else shares the same thoughts, feelings, and concerns. Adolescents become somewhat preoccupied with analyzing their own beliefs and attitudes, and often believe that they are being scrutinized by others in the same intense way. Because of this, imperfections in appearance or social blunders are devastating because ‘everyone is watching’. A facilitator that creates a ‘psychologically safe’ environment may help adolescents to recognize and understand the differing views of their peers.

Recent research from a prevention program delivered in Windsor, Ontario called the P.A.R.T.Y. Program (Prevent Alcohol and Risk-Related Trauma in Youth), found a significant correlation between the opportunity for participants to discuss risk-taking with other peers, and the declared intention to reduce risk-taking behaviour.

Relevance

Facilitators may assume that lack of participation or discussion from the learners is a result of uninteresting or ineffective instruction. This may not necessarily be so. Special efforts may need to be made to overcome the sensitivity resulting from egocentrism and the fact that attitudes toward alcohol are highly influenced by peer pressure and social norms.
Practical Application

Building an environment of trust takes some time, however some group norms can be established which lets participants know that any ideas or attitudes expressed will remain confidential among the participants only. Providing positive feedback (ie. "thank-you for your honesty") for those who are willing to speak first may also encourage others to follow.

References


Tip 3.4

When dealing with issues involving ‘right or wrong’ and similar issues involving moral decisions, recognize that participants may be at different stages of moral reasoning.

Theory

Lawrence Kohlberg (1963, 1981) proposed a sequence of stages of moral reasoning. He divided moral development into three levels:

Level One, Preconventional moral reasoning: includes situations where judgment is based solely on personal needs and others’ rules. Rules are obeyed to avoid punishment or only when the behaviour will elicit some type of reward.

Level Two, Conventional moral reasoning: involves judgment based on others’ approval, family expectations, traditional values, loyalty to laws and country.

Level Three, Postconventional reasoning: individuals are assumed to be able to consider the underlying, individual values that are involved in decision-making. There is an orientation toward society-agreed upon standards and universal ethical principles involving conscience, human dignity and equality. It is assumed that each stage represents a higher level of maturity and that individuals are expected to move through each stage as they mature physically, socially, and cognitively.

Subsequent research by Gilligan (1977) has indicated that in reality the stages are seldom separate, sequenced, or consistent. Decisions can be greatly influenced by the situation. There is also some question as to whether the ability to reason at a higher level always impacts on actual behaviour. People do not always act consistently with their principles.

Relevance

Instructional designers and facilitators sometimes assume that the audience has the same values as they have or are motivated by the same moral convictions. As a result alcohol abuse prevention programs often focus on the detrimental effects of risk-taking behaviour
on the individual’s family and friends, future, society as a whole, etc. This may create problems for adolescents who are alienated from their family, are actually following their friends’ actions to gain acceptance, do not spend a considerable time thinking about or planning for the future, and do not see the relationship between their actions and the impact on society in general. For many participants change will occur if the benefits are immediate and meets short-term individual needs.

Practical Application

Since the designer may not know exactly where the participants are with respect to stages of moral development, it would be practical for the designer to offer several incentives for engaging in healthy behaviour. Making reference to the effects on family and friends is certainly important, however also include effects on the future that are relevant to this age group. For example, have them list all the things that are important to them now (i.e. sports, girl/boy friend, school, work/money, car). Have them check off those things that could be affected if they were involved in a car crash and were paralyzed, or if they were charged with impaired driving. If they were paralyzed they could not play sports; statistics indicate that 95% of relationships fail when one partner is seriously injured; they could not work and make money as they had previously planned without significant modifications. An impaired driving conviction results in a license suspension which would have an impact on relationships, work, freedom, etc. These negative consequences to negative behaviour are focused on areas that are of immediate concern to adolescents.

References


Tip 4.1

Make the performance objectives of an instructional session available to the learners and include objectives in written instructional guides.

Theory

Fleming and Levie (1978) suggested that instructional content be organized in logical patterns to help facilitate attention, memory, and cognitive processing. Smith and Ragan (1993) noted that when outlined to learners during instruction, objectives help learners focus their attention and efforts on the most important content, and allows learners to conduct periodic assessments of their own learning. They also conclude that objectives stated in performance terms should also be listed in the documentation of instructional guides. The objectives can assist other trainers and/or administrators in making decisions about the suitability of the instruction for their particular situation.

Relevance

Adolescent learners may need to see the performances objectives to focus their attention and efforts. If instruction is given in a classroom environment, students also tend to be very concerned with what may be “tested”. Objectives help both the instructor and the learner know what the expected outcomes are.
Practical Application

If the program is presented in a workshop format introduce the agenda and learner objectives at the beginning of each session. If a learner package is used list the learner objectives at the beginning of each section or topic. These can also be reviewed by participants and other parties interested in using the program.

References


Tip 4.2

When developing performance objectives, begin with the end in mind.

Theory

Objectives will be the target of evaluation and must therefore be stated in specific, and measurable performance terms. Dick and Carey (1990) suggested that one way to evaluate the clarity and feasibility of an objective just written is to try to construct a test item that will be used to measure the learners' accomplishment of the task described in the objective. If the designer cannot produce a logical test item that parallels the objective, then the objective needs to be reviewed. Similarly, the designer can ask a colleague to develop a test item as well. If this test item is very different from the designer's, then the objective should be reviewed for clarity.

Relevance

Funders and administrators will be looking for accountability through concise measurement tools.
Practical Application

Performance objectives need to include three components - description of the terminal behaviour or performance; a description of the conditions of demonstration of the behaviour; description of the performance standards or criteria. A sample performance objective may be, "Given a sample scenario involving at-risk drinking, the learner will be able to identify all the at-risk drinking practices and provide three written examples of alternative safe drinking behaviours".

References


Tip 4.3
When developing objectives addressing attitudes and attitude change, specify by inferring from what can be observed.

Theory

Kemp (1985) stated that some behaviours in the attitudinal or affective domain are difficult to identify, name, or measure. For example, if the learning objective is, "To develop a positive relationship toward company clients", then evidence of accomplishment may include such actions as being courteous to clients, providing service promptly, etc. Kemp cautioned however that examples such as these are only an indication of an attitudinal objective and do not measure it directly. Mager (1972) suggested that when developing attitudinal objectives that will be evaluated, plan ahead for specific indicator behaviours that represent positive actions relating to those attitudes. Eisner (1969) recognized that some important objectives may not result in measurable outcomes. He used the term 'expressive objectives' to describe those objectives where specific outcomes cannot be easily stated. An expressive objective allows for self-discovery, originality, and creativity. For example, "to develop a feeling of personal adequacy in athletic performance" may be an expressive objective.

Relevance

Most alcohol abuse prevention programs include an affective component that tries to set the stage for attitude change. Unfortunately, because attitude change primarily involves a cognitive restructuring, it is difficult to quantify. Changes in behaviour as a result of attitude change may also be slow to arise. What may need to be measured are behavioural intentions - self-reported claims to adjust behaviours in future situations.
Practical Application

If the performance objective involves, for example, an attitude change regarding drinking and driving, include within the objective specific indicator behaviours which may 'prove' the change. A change in attitude may be demonstrated by the participant’s willingness to plan ahead and designate a driver, demonstrated support of peers who display responsible drinking and driving behaviour, willingness to sign a parent–child “safe ride home” contract.

References


Tip 5.1
Develop rapport with the participants by using a variety of techniques which will establish a "common ground" with the participants.

Theory

Several researchers have discussed the importance of developing a rapport with the audience especially when the goal is attitude change or persuasion. While attractiveness and credibility increase the likelihood of having a greater persuasive influence, having the ability to connect with the audience is also important. Once again, the key is to know the audience and have a basic understanding of their interests and needs.

Relevance

Adolescents particularly, often are less tolerable of people who are quite a bit different from themselves. Facilitators that can find common ground have the ability to connect with the audience and make the audience feel that the facilitator is understanding of their attitudes and needs, while at the same time credible as an authority figure.
Practical Application

There are many ways that a facilitator can find a common ground with the audience. Use examples that are relevant to young people, refer to their life experiences and the world that they live in. Sometimes the use of humour, when appropriate, is an effective tool for establishing common ground.

References


Tip 5.2

In order for learning to take place the facilitator must capture and maintain the attention of the participants. Provide content in a way that is novel or unique.

Theory

Vernon (1952) and Helson (1974) concluded that attention is drawn and maintained when there is a balance between the new and the familiar, the complex and the simple, the uncertain and the certain. While this may seem like a series of contradictory statements, they stress that familiarity in excess in either content or teaching methods can lead to boredom, while novelty in excess can produce anxiety. Attention is drawn to what is different, to items and content that are in contrast to immediate past experience or to lifelong experience. However, Fleming and Levie caution that change or novelty should be used to direct attention to the most relevant ideas in a message, rather than the marginal or superficial.

Louis and Sutton's (1991) model of "switching cognitive gears" proposed that individuals are motivated to pay close attention when:
1) presentation of the content is unusual, unfamiliar, or novel
2) presentation of content represents a discrepancy between expectations and reality
3) an external or internal request causes an individual to deliberately increase the level of conscious attention - that is when someone tells them to pay attention.

Relevance

Obtaining and maintaining the attention of the learners are particularly challenging with the adolescent population. This is a generation that has been exposed to a variety of media and persuasion techniques. Many educators have also complained that many young students do not have the ability to recognize the important facts and information from all the content
presented to them in a learning situation. Therefore, it may be worthwhile to point out particularly important information and be more forceful in directing the attention of the learners.

**Practical Application**

There are a number of ways that the facilitator can maintain the interest of the participants and present alcohol use information in an interesting manner. Start the learning session with an ice breaker or some activity that will capture the attention of the participants. Move the instruction out of the classroom and into an environment that is new or unfamiliar to the learners. Review the material or information that must be covered and see if there are natural opportunities for active participation and active learning. Young learners used to the traditional lecture method may want to get some hands-on experience.

**References**


Tip 5.3

In order for learning to take place the facilitator must adapt instruction to accommodate different learning styles. Use a variety of instructional formats and media to present content.

Theory

Fleming and Levie (1978), after reviewing the work of several theorists, determined that more learning will occur when information is presented in two modalities, (ie. visual and auditory), than when received in one modality. While changing instructional formats and media will help to maintain interest in the content, it also helps to address the different learning styles among the participants. Learning style consists of distinctive behaviours which serve as indicators of how a person learns from, and adapts to, her environment. It is a combination of cognitive, affective, and physiological factors that determine how a learner perceives, interacts with, and responds to the learning environment. Some characteristics of learning styles are relatively stable, while others change as a result of maturation, exposure to different instructional strategies, and the learning environment. Younger children tend to be more tactile and kinesthetic. As they mature, the majority of people tend to become more visual learners, with auditory skills coming in second. However, it is agreed by researchers and practitioners alike that individuals process information differently and that learning styles are usually multidimensional.

Relevance

This is a generation that has been exposed to a variety of techniques designed to maintain their attention and persuade them. While it may not always be possible to identify and categorize the participants according to identified learning styles, using a variety of instructional formats and media will allow the participants to identify with the learning environment and will help to maintain interest as well.
Practical Application

Again, many young people are familiar with the traditional lecture method and may welcome different instructional formats and use of media for instruction. Some people are visual learners and learn best through visual stimulation and presentation of material. Others learn best through auditory means, or through listening attentively. Some prefer to watch, some like to participate, and some like to discuss. Regardless of the learning style, change formats often, or even offer instruction in two modalities at the same time, and participants are more likely to remember the material presented.

References

Tip 5.4
Create an introductory organization to the material that is to be learned (an advance organizer) and make this organization apparent to the learner.

Theory

McKeachie (1974) and Mouly (1973) found that this general principle applies to most learning situations. Learning that is meaningful to the learner is acquired more readily and retained longer. The concept of “meaningfulness” can be defined and attained in several ways. Biehler (1971) and several others theorized that acquisition or learning will be facilitated when material to be learned is organized and that organization is made apparent to the learner. Often facilitators have an outline or agenda which indicates the topics and pace of the instruction, but this information is never presented to the learners. However, the beginning of a unit of instruction should contain an introduction to the material which is relatively general (an advance organizer). This helps the material become meaningful for the learner because an advance organizer provides some predictable pattern and familiarity. Learners can also benefit from having the opportunity to cognitively organize instructional materials Units of instruction should be organized in some apparent logical basis, like chronological, simple to complex, concrete to abstract, or from familiar to unfamiliar.

Relevance

This adjunct to effective instruction is a general principle that would apply to most audiences, including the adolescent population. It will enable the participants to follow the facilitator’s train of thought, and enable the participants to see any necessary links between concepts.
Practical Application

Clearly outline with the learners what topics will be covered and what relationship each topic has to another. When introducing a new topic contrast or compare it with what the learner already knows or has been taught. For example, “After the class today you will know the only effective method for getting sober. Even though most of you may think that having strong coffee after drinking will make you sober ....”

References


Tip 5.5
To better facilitate learning, organize specific content using an obvious and appropriate patterning progression i.e. chronological, sequential, familiar to unfamiliar, easy to complex.

Theory

Proper organization of content will help the facilitator remember the various steps she needs to present and will also help the participants make sense of the content as one step builds upon another. Fleming and Levie (1978) recommend that, regardless of the learners’ ages, instructors should divide difficult concepts into small, relatively easy steps. Even numbering the steps in a series of events gives organization to perception and memory. They state that, “patterns of relationships will be facilitated where objects and events are encountered as comprising or contributing to a common idea, pattern, rhythm, structure, or organization” (1978, p. 73). In other words, learning research indicates that stimuli or content that is properly patterned or “chunked” are much more readily learned than when presented in an unpatterned way. Research also clearly indicates that individuals will create a pattern or organization to material when one does not exist, so it is worthwhile for the designer to pre-pattern content in a way that is consistent with objectives.

Dick and Carey (1980) suggest that intellectual and psychomotor goals could have steps listed in chronological order, that is, one activity must be accomplished prior to the attempt of the next one. Attitude and verbal information goals may also be listed chronologically or topically.

Relevance

Regardless of the instructional content, organizing and pre-patterning what is to be presented is an important instructional design principle. Adolescents may need more direct guidance in recognizing the patterns and relationships of each concept to one another.
Practical Application

When presenting the impact that alcohol abuse has on the individual and community, present the impact on the individual and move from there outward to the family and the community in general. If content includes information about the physical, psychological, emotional, and social consequences of drinking, label the categories and at the beginning of each new topic, remind the students what has been covered previously, and that while discussed individually, each area impacts on the other. If discussing peer pressure reversal skills, outline the type of situation that the participants may encounter and then identify step by step how they may go about practicing these skills. When discussing effective decision-making skills, work with the participants in identifying a logical process for making decisions.

References


Tip 5.6

Use role models as examples of how positive behaviour can lead to positive results.

Theory

This technique is based on Albert Bandura’s work (1977) involving social learning and modeling. According to Bandura, learning is acquired and shaped by the positive and negative reinforcements resulting from one’s own behaviour, as well as observation of other people’s behaviour and its consequences for them. Bandura recognized the potential for using modeling as a way of directing and changing behaviour. The behaviour of role models can be observed in person or through various communication channels. The more attractive and competent a model appears to be, the more likely learners will adopt that model’s behaviour. Bandura noted that “near peers”, models who are slightly older than the target audience and who resemble the target audience, are often used in educational programs to depict behaviour and attitudes that young people are being encouraged to imitate.

Those involved in designing mass media campaigns also recognize the importance of using role models. Backer, Roger, and Sopory (1992) cautioned that the most effective promotional campaigns choose their positive role models for social learning carefully, since these individuals can quickly become negative role models through personal scandal. With respect to substance abuse prevention, health communication designers have found that campaigns directed toward high-risk youth should use peer models, rather than celebrity adults, since this group views most adults with suspicion.

Relevance

The adolescent population is very much influenced by group and social norms and peer pressure. Using a positive role model, one who learners can affiliate with and look up to, will help to direct the learners’ attitude and behaviour.
Practical Application

Provide examples of people who have made responsible choices about alcohol use. Follow Bandura’s suggestion and use “near peers”, models slightly older than the participants. Since the focus is on prevention, try to avoid using role models who have experienced some degree of alcohol abuse and then “lived to tell about it”. These addiction stories can sometimes be seen as glamorous and the behaviour during addiction far more enticing than the responsible behaviour.

References


Tip 5.7
To encourage participants to more carefully examine their current beliefs, present the participants with situations that challenge their current attitudes or behaviours, highlight any inconsistencies in their current attitudes and behaviours.

Theory

This technique is based largely on Festinger's work on cognitive dissonance (1957). A person experiences dissonance when her behaviour and attitude are not consonant or consistent. This sense of cognitive uncomfortableness can be alleviated by doing one of several activities:

- Changing one of the elements (attitude or behaviour) to make it more consonant or consistent.
- Seeking out additional information that supports the behaviour.
- Changing the importance of the cognitions so the inconsistency isn't as disturbing.

Festinger's research has also added to the attitude precedes behaviour/behaviour precedes attitude debate. People can be induced by rewards or threats to behave in ways that are inconsistent with their attitudes. The larger the incentive, the greater the compliance, however this will not get individuals to like or agree with the induced behaviour. Dissonance is aroused if the incentive is just enough to cause the behaviour without being recognized as sufficient justification for the behaviour. If the person believes that the attitude-inconsistent behaviour was freely chosen, then attitude change is more likely to happen as the means for justifying the behaviour.
Relevance

This strategy can be applied when examining change in either the attitude or the behaviour. If a person's general attitude is that drinking or driving is wrong but, on several occasions engages in this activity, she is likely to experience some dissonance if she felt she had freedom of choice. Similarly, if an individual has a noncommittal attitude toward drinking and driving, but does not engage in this activity, then she could be persuaded that this behaviour constitutes a standing belief in responsible drinking habits.

Practical Application

Several alcohol abuse prevention programs have included drinking and driving contracts where participants sign a contract or make a public commitment with a family member or friend not to drive after drinking and to call for a ride home. Similarly, once adolescents have made a public commitment to drink responsibly, there is a greater likelihood that positive attitude change will result. Provide follow-up activities and support systems such as student clubs (ie. OSAID - Ontario Students Against Impaired Driving), workshops, discussions, etc.

References


Tip 5.8
Provide opportunities for role-playing to enhance self-persuasion.

Theory

Janis and Mann (1977) indicated that role playing can be an effective technique for changing attitudes as long as people have enough background information on the issue to allow them to improvise and present a reasonably sound position. Role-playing is effective because participants must search out information that will support the role assigned. It is more effective than passive exposure because people tend to value and remember the arguments that they generate more than the arguments generated by others. In the process of gathering information and trying to persuade others, an individual is more likely to also persuade herself as she is forced to examine previously unexplored information and attitudes.

Zimbardo and Leippe (1991) also indicated that an effective way to change attitudes and behaviour is to get individuals to espouse ideas or role-play behaviours that oppose their current attitudes. Role-playing also affects self-attribution as well as self-persuasion. Self-attribution indicates that people will attribute the behaviour to internal, dispositional qualities such as personality or character, rather than external, environmental influences. Counter-attitudinal role-playing creates a climate for generating one’s own arguments for change.

Relevance

Some adolescents have a rather egocentric view of their environment. Role-playing allows participants to investigate alternative points of view that may help them discover and empathize with the different attitudinal positions of those around them like parents, peers, law enforcement, society, etc.
Practical Application

Assign participants various roles that may be in opposition to their currently held values or attitudinal position. Allow them the opportunity to gather information or reflect on information already presented so that they can effectively present their role. Develop a role play situation that participants would be familiar with or could relate to. For example, present a situation where a teen is involved in a drinking and driving incident. Roles could include participation of the police, peers, parents, injured people, etc. Also take the opportunity to debrief or discuss how each person felt playing their various roles.

References

Janis, I.L. & Mann, L. Effectiveness of emotional role-playing in modifying smoking habits and attitudes. Journal of Experimental Research in Personality, 1, 84 - 90.

Tip 5.9
Provide an opportunity for practice and review to help learners remember important concepts and skills.

Theory

Practice and review does not simply mean repetition and drill. Fleming and Levie (1980) noted that simple repetition or drill, by itself, can be one of the least effective strategies. In fact, the strategies used by the learner in practice and review influences the time required to form an association between concepts and the probability of recalling it. Designers need to include methods that will incorporate both familiarity and structure. Anderson and Faust (1973) noted that allowing learners to practice in varied contexts or situations can increase retention of the material and improve its range of utility. If information or skills can be transferred to a variety of situations then the learner has the opportunity to practice the appropriate response and generalize what she has learned to other situations. This allows for a review which repeats the essential ideas, but also extends to new contexts, problems, or relations.

Anderson and Faust (1973) also discovered that transfer of learning improves when the learning environment resembles the testing or application environment, or where learning is practiced using "realistic" simulations. If the instruction involves some relatively complex concepts, Clark (1971) suggested the instructor allow time for the learner to review both examples and nonexamples of the concepts.

Relevance

Integral to most alcohol abuse prevention programs is instruction related to peer pressure reversal skills and effective decision-making. Because many of these skills may be new to this young target population, they will need plenty of opportunity to practice these skills in simulations which closely resemble their own real-life situations.
Practical Application

After teaching strategies and techniques that promote responsible drinking practices allow the learners to practice these new skills within meaningful and relevant situations. Let the learners develop and write out role-play situations/scenarios based on their own life experiences. They can then exchange situations and practice the skills within a small group or through large group discussion. If the instruction involves a series of lessons, provide a review of material that was previously taught at the beginning of each lesson and briefly indicate how it relates to what will be taught next. This is known as the “review plus new” method.

References


Tip 6.1
Evaluation through learner validation is crucial. Conduct some small group evaluation activities to make instruction more effective.

Theory
The stages of learner validation include one-to-one evaluation, small group evaluation, and field trial evaluation. If a designer has the luxury and the time to conduct one-to-one formative evaluation then the most obvious errors in instruction can be identified and removed. However, if time and financial constraints are necessary considerations, small group evaluation will allow the designer to identify areas that require change or revision. Dick and Carey (1990) note that small group evaluation refers to the number of learners in the evaluation process, not necessarily the setting in which the learners use the materials or experience the instruction. If the design dictates individual instruction, then the learners would work individually in the same way the instruction and materials were intended. They proceed to participate in instruction exactly as it was designed, with the instructor intervening as little as possible in the process. Learner difficulties and feedback are recorded as part of the revision data. If possible, in-depth debriefings can be conducted with some learners. Smith and Ragan (1993) stated that many designers prefer talking with learners, especially young learners, because they are more willing to explain their opinions orally than to write them. It is also advantageous to have a small group for instructor-led training, especially if the instructional strategy incorporates group activities or discussions. It also limits any less than successful effects of untried instruction to a small group of learners.

Relevance
As with most programs, it is sometimes difficult for the designer to predict which components of the instruction will be successful and which will require modifications to content and/or delivery strategy. Adolescent learners can also be very limited in terms of their patience and motivation to work with materials that do not gain their interest almost imme-
Therefore, it is advantageous to work with a small group to modify any activities or methods that may make the instruction less effective with potential learners who can be particularly demanding.

**Practical Application**

If the instruction is taking place within a school setting, enlist the help of the school teachers or administrators to find a small group who would be willing to participate in the process. Be clear that a variety of students are required, with a variety of skills and attitudes. Those learners who appear to be willing to openly express their ideas and criticisms may be debriefed more in-depth. Those who may be less willing to openly share their ideas could be asked to answer questions and express their ideas in writing. Regardless of the method used, all participants who took part in learner validation should receive some communication later which indicates that opinions were acted upon when appropriate and that modifications were made to make the instruction more effective.

**References**


Tip 6.2
Because learners' attitudes have a critical impact on their learning, include a measurement of their attitudes in formative evaluation during the small group evaluation process.

Theory

Smith and Ragan (1993) note that an attitude questionnaire can provide helpful information to explain problems that might surface during performance or practice. The attitude questionnaire examines such topics as the length and difficulty of the instruction, use of and effectiveness of media, difficulty of practice exercises and test questions, as well as overall attitude toward the topic of instruction. The researchers recommend that if the attitude data produces low results then the designer must consider the possible long-term effects of negative attitudes. If the long-term effects have the potential of impacting posttest performance then the designer may want to consider specific comments and take action. She also may consider using additional motivational strategies to increase interest such as relevant statements and scenarios, human interest stories, etc.

Relevance

During adolescence attitudes toward the subject matter and learning in general can have a significant impact on the receptiveness of the learner and the success of the instructional program. Attitude questionnaires can also provide helpful information that may explain performance problems associated with practice and pre/posttest comparisons.
Practical Application

Develop a questionnaire or opinion poll which asks specific questions about several components of the instructional program. Participants can comment on the difficulty, vocabulary, and length of lesson. Choice and effectiveness of media can also be rated, as well as general attitude toward the subject of alcohol use and responsible drinking. Allow plenty of space for written comments, and ask participants to be candid about their comments since the purpose of the questionnaire is to get the “bugs” out of the lesson and possibly revise content so the program is as effective as possible.

References

Tip 6.3
When conducting small-group evaluation, carefully select learners who are representative of the intended target population.

Theory
Dick and Carey (1990) recommend that the designer select a group of eight to twenty learners who are as representative of the intended target population as possible. Often within a school setting random selection is not possible, so if the target population consists of persons with varied skills and backgrounds, then the designer should include representatives from each group in the evaluation sample. As Dick and Carey (1990) indicate, these should include:
- males and females
- low, average, and high achieving learners
- learners with various ethnic backgrounds and first languages
- learners who are familiar with the subject and those who are not
- younger, inexperienced learners and more mature learners

Relevance
There can be considerable variance in the levels of knowledge, skill, and experience among adolescents. This could have a significant impact on the understanding and success of instruction. It is through small-group evaluation that the designer can determine if the instruction and materials are culturally sensitive, and generally appropriate.
Practical Application

Identify a group of learners who represent the target population. Arrange for a group of eight to twenty learners to participate. While learners should be motivated to participate so that feedback will be generated, recognize that a highly motivated group can sometimes be a biased sample because they include primarily people who are willing to participate instead of people who are a truly representative group. Administer the instruction as planned. During pretest, instruction, and posttest, take notes regarding suggestions for instructors who will use the instruction and materials, or about changes that may be necessary in the instruction or procedures as a result of observation.

References


Tip 7.1
Before selecting the design for summative evaluation determine the goals of evaluation by identifying the questions that need to be answered.

Theory

When beginning the evaluation activities it is equally important to keep the beginning (original objectives) in mind. The questions that need to be answered during summative evaluation can be defined by various stakeholders including funding agencies and the participants themselves. Smith and Ragan (1993) offer the following list to consider:
- Does the instruction solve the problem identified in the needs assessment?
- Did the learners achieve the objectives of the instruction?
- What are the learners’ attitudes toward the instruction?
- What are the costs associated with implementing the instruction?
- Was the instruction implemented in the same fashion as it was designed?
- Were there unexpected outcomes that resulted from the instruction?

Because of time and financial constraints it is often not possible to answer all these questions. Where to focus time and energy may be dependent on the needs and requirements of the funders, administration, or other stakeholders. Other factors to consider include identifying what decisions will be made as a result of the evaluation and which questions, when answered, will provide the best possible information; the practicality of gathering the information; the uncertainty associated with answering the questions.

Relevance

Designers and facilitators will want to determine whether or not the instruction ultimately addresses and solves the needs that were originally identified. This will, more often than not, be directly linked to continued funding and/or administrative support for the instruction. Because the positive effects of prevention programs are often short-lived, summative evaluation will allow the designer to determine if there are any longer term, measurable changes in attitudes or behaviour.
Practical Application

Regardless of the methods used for summative evaluation, the results should address the original objectives. When presenting summative evaluation data, compare the results to the original objectives or what the instruction was intended to accomplish in the first place. Be aware of what the funders or administration requires in terms of information. What criteria do they have for instruction to be considered a success? Do they need to be apprised of information related to the likelihood that the instructional program can be implemented in other communities, for other target audiences, under different instructional environments?

References

Tip 7.2

When conducting summative evaluation enlist the services of an external evaluator, or an impartial designer.

Theory

Smith and Ragan (1993) indicated that the role of the instructional designer in conducting summative evaluation is sometimes controversial. The designer who actually designed and/or provided instruction is likely to have a strong investment and hence a strong bias to find the instruction effective. Other researchers contend that no one would know the instructional program and its potential strengths and weaknesses better than the person who designed it. It is less problematic to hire an external evaluator, however, often an organization does not have the financial resources to do so, and an internal evaluator must be used. If this is the case, use an internal evaluator who has had minimal involvement with that particular program. To eliminate any possible questions regarding the integrity of the evaluation, there should be careful and complete documentation of the evaluation procedure.

Relevance

Summative evaluation data is critical for determining the effectiveness of the instruction and justifying continued funding. However, often designers become teachers become evaluators, and in this circumstance the results can be biased.
Practical Application

Many programs that are financially supported by government require the use of external evaluators, so funds should be set aside in the budget as needed. The evaluator can even be chosen from an associated agency or educational institution. Whether the evaluator is external or internal choose a person who has knowledge and experience in the instructional design process and the criteria for evaluating instruction. This person should not have a strong personal investment in the materials and can be objective about the strengths and weaknesses of the materials evaluated.

References


**Tip 7.3**

Do not conduct summative evaluations during the first implementation of the instructional program.

**Theory**

Conducting summative evaluations and collecting summative data too early can lead to erroneous data and premature conclusions. Smith and Ragan (1993) suggested that most programs delivered during the first implementation are rarely delivered as they were designed to be delivered. There is a learning curve associated with facilitating new instruction, and the trainer is often becoming familiar with the instruction as well.

**Relevance**

Data from summative evaluation is often used to make decisions regarding the continued use and utility of the instructional program. It would be unfair to draw these conclusions from the initial implementation when the facilitator is making adjustments along the way.
Practical Application

If the duration of the program lasts six weeks, use summative evaluation techniques during the second offering of the six week program, after the instructional strategy and materials have been modified.

References


PART III: PEER REVIEW

i) Peer Reviewers - A Profile

In total, seventeen reviewers participated in both parts of the review process. Reviewers were asked to outline, in as much detail as possible, the strategies they use when designing instruction. Individuals were then asked to read and comment on the guidebook. As an additional request, reviewers answered three questions that would provide some pertinent demographic information.

Of the seventeen reviewers, five are currently employed as teachers, four perform counselling services, six are involved in health promotion as either health promoters, curriculum developers, or social marketers. Two individuals categorized themselves as 'other' - a Registered Nurse and a Co-ordinator of Trauma Care.

The educational backgrounds of the reviewers varied considerably. Four respondents held degrees or diplomas in education, while four others had degrees or diplomas in Social Work. Five reviewers had backgrounds in Health Sciences; five individuals had degrees or diplomas in the Social Sciences. One had obtained a secondary school diploma and training in law enforcement. Of the seventeen reviewers, five individuals had obtained two degrees or diplomas in different disciplines.

When asked about their most recent project involving the design and implementation of an instructional program, workshop, lecture, etc. thirteen of the seventeen reviewers indicated that they had been involved in a project within the past year. All reviewers had been involved in at least one project since 1995. This indicates that all the reviewers have relevant and current experience in the design and/or delivery
of some sort of instruction. As a result, information regarding effective instructional
design should be both timely and relevant.

**ii) Peer Reviewers' Instructional Strategies**

All reviewers were asked to provide details about their instructional design
strategies. The instructions are presented in appendix B. In summary, the reviewers
were given the following directions:

On the sheets provided please outline, in as much detail as
possible, how you go about designing or developing instruction
for adolescent learners. That is, when faced with developing your
own prevention programs or instruction for adolescents, what things
or steps do you routinely consider during the planning or design
process? Please feel free to use any method or combination of
methods you like to provide this information - draw diagrams, charts,
provide written descriptions, etc.

Peer reviewers were not given any of the other materials until they completed this
task. The instructions were deliberately "vague" so as to allow the reviewers the freedom
to comment and describe as many aspects or issues as they wished.

All reviewers opted to outline their design strategies through written description.
These descriptions were carefully reviewed and comments were coded according to the
components of the instructional design model developed. As appendix C indicates,
comments were captured and slotted into the appropriate component area. No individual
reviewer commented on or made reference to all the components of the instructional
design model. Table #9 indicates the number of reviewers who claimed to consider the
various instructional design steps when planning and implementing instruction.
Table #9 - Summary Data of Part I: Peer Review

<table>
<thead>
<tr>
<th>Instructional Design Component</th>
<th># of Reviewer References</th>
<th>Instructional Design Component</th>
<th># of Reviewer References</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Needs/Priorities</td>
<td>7</td>
<td>4. Objectives</td>
<td>8</td>
</tr>
<tr>
<td>2. Goals</td>
<td>4</td>
<td>5a) Organizational Strategy</td>
<td>3</td>
</tr>
<tr>
<td>3a) Analyze Context</td>
<td>3</td>
<td>5b) Delivery Strategy</td>
<td>9</td>
</tr>
<tr>
<td>3b) Analyze Learners</td>
<td>11</td>
<td>6. Formative Evaluation</td>
<td>8</td>
</tr>
<tr>
<td>3c) Analyze Task</td>
<td>5</td>
<td>7. Summative Evaluation</td>
<td>8</td>
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<tr>
<td>8. Revise Instruct'n</td>
<td>3</td>
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</tr>
</tbody>
</table>

While the sample size and selection method prohibits any traditional quantitative analysis, the trends are interesting. Eleven of seventeen peer reviewers made reference to activities that involved analyzing the learners. Many reviewers commented on the importance of considering the age of the audience, identifying their needs, abilities, beliefs, values and knowledge. Two reviewers referred to the need to focus on topics which are relevant to adolescents and correspond to the current trends or interests. The reasons why so many reviewers did identify the need to analyze or consider the learners may be that the adolescent population is renowned for its distinctiveness in personality and interest; those who have had the opportunity to instruct this target group also know that they are quick to dismiss both information and presenter should the learning experience be less than relevant, age appropriate, or entertaining.

It is not surprising that eight of the seventeen reviewers included writing performance objectives and conducting summative evaluation as part of their design.
activities (though the eight who write performance objectives were not, in all cases, the eight who followed up with summative evaluation). For many of those employed within the non-profit sector, government funders and other funding bodies have demanded the inclusion of relevant outcome indicators in the planning or design stages. However, the fact that only 44% indicated they consider objectives and evaluation a necessary component of instructional design is somewhat alarming. It makes one wonder how the remaining individuals determine and define success. If one were to liberally equate identifying instructional goals with performance objectives as a means of providing overall direction the percentage increases slightly to 55%. Similarly, if one combines both formative and summative evaluation activities, the number of references increases to 83%.

Few reviewers identified the impact of the learning context or learning task on the success of instruction. As a result most may not appreciate the impact of the learning environment on the learner and facilitator. Also, as reviewer #14 indicated by stating, "what specific information do I want them to have?", the nature of the information and learning task may lend itself to a particular instructional strategy.

Many reviewers commented on activities performed during the delivery of instruction. Reviewers noted the importance of attention-getting activities and activities that allow participants to get actively involved. It is not unusual for facilitators, regardless of experience and background, to comment on specific delivery strategies since this action is an extremely visible component of the instructional design process.
iii) Peer Reviewers - Pre- and Post Reading Activities

a) Pre-Reading Survey:

Prior to reading the instructional guide reviewers were asked to indicate whether or not they would engage in any of the instructional components and tips which would be explained in detail in the booklet. Table # 10 summarizes their responses to this pre-reading survey. Most reviewers indicated that they would engage in most of the design tips "all the time" or "sometimes". There are however some notable exceptions. Two reviewers indicated that they would never/currently never include stakeholders and planning partners in helping with the needs assessment and while planning instruction (Tip #1.2). Seven reviewers indicated they would never select learners who are representative of the target population when conducting small group evaluation (Tip #6.3). When one considers the relatively few reviewers who included evaluation in their own instructional design activities one wonders whether these results reflect a rejection of the selection of learners or the overall concept of small group evaluation. Less than half the reviewers intend to or actually use the services of an external evaluator during summative evaluation (Tip #7.2). Similarly, very few agreed that they would not conduct summative evaluation during the first implementation of the program (Tip #7.3).

Of all the components and tips presented, reviewers indicated they were unsure about the meaning of concepts related to Tips #4.3 and #5.4. That is, prior to reading the booklet they were unsure about measuring attitudinal objectives from what can be inferred. A few reviewers were also unsure about strategies involving advance organizers.
Most reviewers claimed that they always develop instructional goals focused on the behaviours of the learners (Tip #2.1), provide a psychologically "safe" environment for the participants (Tip #3.3), recognize and account for the learners' level of moral reasoning (Tip #3.4), create a common ground with participants (Tip #5.1), and use a variety of instructional formats to accommodate different learning styles (Tip #5.3).

b) Post-Reading Survey:

Table # 11 presents a summary of findings from the post-reading survey. Reviewers were able to fill out the survey after reading the booklet or, if they wished, while reading the booklet. Overall, most reviewers agreed that the tips presented should remain in the guide. Those tips that were questioned in the pre-reading survey continued to produce some discussion and apprehension. Three reviewers recommended that Tip #4.3 be dropped from the guide. This tip referred to inferring attitude change from what can be observed. Not surprisingly, the same number indicated that they would not include this activity the next time they plan instruction. While most readers agreed to keep Tip #1.2, which made reference to the inclusion of stakeholders and planning partners, four readers claimed they would not incorporate this activity into their plans for instruction. Six readers indicated they would not plan to choose a facilitator the participants would regard as credible, attractive, and similar to themselves (Tip #3.1). Three people will not use advance organizers (Tip #5.4), nor will four readers select representative learners when conducting small group evaluation (Tip #6.3).
Eight reviewers do not agree that summative evaluation should not be conducted during the first implementation (Tip #7.3).

Another area of disagreement continued to involve Tip #7.2. While most were not opposed to keeping this tip in the guide, seven reviewers indicated that they would not enlist the services of an external evaluator or an impartial designer during the summative evaluation stage.
<table>
<thead>
<tr>
<th>INSTRUCTIONAL DESIGN COMPONENT/TIP</th>
<th>A I DO/WOULD DO THIS ALL THE TIME</th>
<th>B I DO/WOULD DO THIS SOMETIMES</th>
<th>C I NEVER DO/WILL NEVER DO THIS</th>
<th>D I'M NOT SURE WHAT THIS MEANS</th>
<th>E NO ANSWER</th>
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</thead>
<tbody>
<tr>
<td>1. ASSESS NEEDS &amp; PRIORITIES</td>
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<tr>
<td>1.1 Determine whether there is a legitimate need for instruction by assessing needs.</td>
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<td>6</td>
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<tr>
<td>1.2 Include a variety of stakeholders and planning partners to help with the needs assessment and plan the instruction.</td>
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<td>10</td>
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<td>1.3 Identify gaps between the current situation and the desired situation as the difference between 'what is' and 'what should be'.</td>
<td>8</td>
<td>8</td>
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<tr>
<td>2. IDENTIFY INSTRUCTIONAL GOALS</td>
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<tr>
<td>2.1 Develop instructional goals so that the focus is on the behaviours of the learners, not the instructor.</td>
<td>12</td>
<td>3</td>
<td>1</td>
<td>1</td>
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<td>2.2 When developing instructional goals, begin with the end in mind.</td>
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<td>6</td>
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<td>3. CONDUCT AN INSTRUCTIONAL ANALYSIS.</td>
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<tr>
<td>3.1 To ensure that instruction begins at the appropriate level for the learners, identify what skills the learner must know before beginning to receive instruction.</td>
<td>7</td>
<td>8</td>
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<td>3.2 Choose a facilitator the participants would regard as credible, attractive, and similar to themselves.</td>
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<tr>
<td>3.3 Because adolescents tend to be egocentric, provide a 'safe' environment for learning and one that allows for group discussion of ideas and attitudes.</td>
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<tr>
<td>INSTRUCTIONAL DESIGN COMPONENT/TIP (cont'd)</td>
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<td>3.4 When dealing with issues involving &quot;right or wrong&quot; and similar issues involving moral decisions, recognize that participants may be at different stages of moral reasoning.</td>
<td>15</td>
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<tr>
<td>4. WRITE PERFORMANCE OBJECTIVES</td>
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<td>4.1 Make the performance objectives of an instructional session available to the learners and include objectives in written instructional guides.</td>
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<td>10</td>
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<tr>
<td>4.2 When developing performance objectives, begin with the end in mind.</td>
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<td>9</td>
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<td>4.3 When developing objectives addressing attitudes and attitude change, specify by inferring from what can be observed.</td>
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<td>6</td>
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<td>5. DEVELOP AN INSTRUCTIONAL STRATEGY</td>
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<tr>
<td>5.1 Develop rapport with the participants by using a variety of techniques which will establish a &quot;common ground&quot; with the participants.</td>
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<tr>
<td>5.2 In order for learning to take place the facilitator must capture and maintain the attention of the participants. Provide content in a way that is novel or unique.</td>
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<tr>
<td>INSTRUCTIONAL DESIGN COMPONENT/TIP (cont'd)</td>
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<td>5.3 In order for learning to take place, the facilitator must adapt instruction to accommodate different learning styles. Use a variety of instructional formats and media to present content.</td>
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<td>5.4 Create an introductory organization to the material that is to be learned (an advance organizer) and make this organization apparent to the learner.</td>
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<td>5.5 To better facilitate learning, organize specific content using an obvious and appropriate patterning progression ie. chronological, sequential, familiar to unfamiliar, easy to complex.</td>
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<td>5.6 Use role models as examples of how positive behaviour can lead to positive results.</td>
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<td>5.7 To encourage participants to more carefully examine their current beliefs, present the participants with situations that challenge their current attitudes or behaviours, highlight any inconsistencies in their current attitudes and behaviours.</td>
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<td>5.8 Provide opportunities for role-playing to enhance self-persuasion.</td>
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<td>5.9 Provide an opportunity for practice and review to help learners remember important concepts and skills.</td>
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<tr>
<td>INSTRUCTIONAL DESIGN COMPONENT/TIP (cont'd)</td>
<td>A I DO/WOULD DO THIS ALL THE TIME</td>
<td>B I DO/WOULD DO THIS SOMETIMES</td>
<td>C I NEVER DO/ WILL NEVER DO THIS</td>
<td>D I'M NOT SURE WHAT THIS MEANS</td>
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<td>6. DESIGN AND CONDUCT FORMATIVE EVALUATION</td>
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<td>6.1 Conduct some small group evaluation activities to make instruction more effective.</td>
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<td>6.2 Because learners' attitudes have a critical impact on their learning, include a measurement of their attitudes in formative evaluation during the small group evaluation process.</td>
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<td>6.3 When conducting small-group evaluation, carefully select learners who are representative of the intended target population.</td>
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<td>7. DESIGN AND CONDUCT SUMMATIVE EVALUATION</td>
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<td>7.1 Before selecting the design for summative evaluation determine the goals of evaluation by identifying the questions that need to be answered.</td>
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<td>7.2 When conducting summative evaluation enlist the services of an external evaluator, or an impartial designer.</td>
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<td>7.3 Do not conduct summative evaluation during the first implementation of the instructional program.</td>
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<td>8. REVISE INSTRUCTION</td>
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**Table 1.1 - Summary Findings of Peer Reviewers: Post-Reading Survey**

- **Column 1**: 1.1 - Assess needs for instruction by determining whether there is a need to improve skills.
- **Column 2**: 1.2 - Include a variety of stakeholders and assess instructional needs.
- **Column 3**: 1.3 - Identify gaps between the current situation and the desired situation and plan the instructional plan.
- **Column 4**: 2.1 - Develop instructional goals so that the focus is on the behaviors of the learners, not the instructor.
- **Column 5**: 2.2 - When developing instructional goals, begin with the end in mind.

The table outlines steps for instructional planning and development, emphasizing the importance of identifying gaps, assessing needs, and planning instructional goals. It suggests that the focus should be on learners' behaviors rather than the instructor's actions.
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4. WRITE PERFORMANCE OBJECTIVES

4. Write performance objectives in written

Instructional materials and include objectives in written

Instructional materials available to the

participant. The participant’s recognition that

the environment is safe and similar issues involving

the right

3.4 When dealing with issues involving “right

the discussion of ideas and attitudes

for learning and one that allows for group

experience. Provide a safe environment

and be open to the participants

3.3 Because adolescents tend to be

similar to themselves

3.2 Choose a facilitator the participants

beginning to receive instruction.

What skills do the learner need to know before

appropiate level for the learner’s identity

3.1 To ensure that instruction begins at the

ANALYSIS

3.2 Conduct an Instructional

Component/Tip

INSTRUCTIONAL DESIGN

4.1 Make the performance objectives of an

Instructional materials available to the

participant. The participant’s recognition that

the environment is safe and similar issues involving

the right

3.4 When dealing with issues involving “right

the discussion of ideas and attitudes

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3.2 Conduct an Instructional

Component/Tip

INSTRUCTIONAL DESIGN

4.1 Make the performance objectives of an
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**Strategy**

- Develop an instructional design

**Recommend**

- Review the next time I will do this
- You keep this in mind

**Instructional Design**

- No answer
- No answer
- No answer
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5.3 In order for learning to take place, the facilitator must adapt instruction to meet the needs of individual learners.

5.4 Create an introduction to the material that is to be learned (an overview).

5.5 To better facilitate learning, organize the organization apparent in the course.

5.6 Use a variety of instructional formats to accommodate different learning styles.

5.7 To encourage participation in more research, positive behavior can lead to positive results.

6.2 Use role models as examples of how unfamiliar, easy to complex, chronological, sequential, familiar to appropriate, patterned progression.

In their current attitudes and behaviors, highlight any inconsistencies or real challenges to their current beliefs.

Carefully examine their current beliefs.

5.1 Plan the next time I will do this B

VETS

RECOMMEND

YOU KEEP

THIS IN

GUIDE

INSTRUCTIONAL DESIGN

NO

ANSWER

NO

ANSWER

NO

ANSWER

NO
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**SUMMATIVE EVALUATION**

6. 'When conducting small-group evaluation, carefully select learners who are representative of the intended target population.'

6.2. 'Because learners' attributes have a direct impact on their learning, include appropriate evaluation outcomes.'

6.1. 'Conduct some small group evaluation effective activities to make instruction more meaningful.'

6. DESIGN AND CONDUCT FORMATIVE EVALUATION

5.9. 'Provide an opportunity for practice and enhance self-persuasion.'

5.8. 'Provide opportunities for role-playing to

**INSTRUCTIONAL DESIGN**

YES

**STANDARDS**

YES

**GUIDE THIS IN THE NEXT TIME I WILL DO THIS B**

RECOMMEND A

NO

NO
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8. Review Instructional Program

7.3 Do not conduct summative evaluation during the first implementation of the program.

7.2 When conducting summative evaluation, enlist the services of an external evaluator or an impartial designer.

7.1 Before selecting the design for this component, you keep in mind that questions that need to be answered, goals of evaluation, by identifying the summative evaluation deciding the INSTRUCTIONAL DESIGN.

Component/Design

Yes

No

Yes

No

Yes

No

Yes

No

Yes

No

Yes

No

Yes

No

Yes

No
CHAPTER FIVE
DISCUSSION OF FINDINGS

i) Regarding Content:

After reading the booklet peer reviewers were given the opportunity to comment on the instructional design steps and the tips presented. Several reviewers commented on the utility of the booklet and the importance of having a more formalized plan or structure for instructional design. However, these activities were reserved for on-going programs or programs of some length and investment rather than single presentations or guest lectures. One peer reviewer verbally commented, "If you think I'm going to do all this for a quickie, one day presentation, you're nuts". Most other comments made reference to specific tips and suggestions.

Assess Need and Priorities

One peer reviewer stressed the importance of this stage in instructional design, and the lack of community co-ordination in assessing not only who needs what, but who is currently offering what. "I think often people want to offer services because they think they can do it better, but it ends up being a duplication". A few readers commented that often needs assessment has already been done prior to their involvement. One health promoter stated, "If I am asked to come in by a regular teacher I assume a needs assessment has been done". This can be a dangerous assumption, especially if the classroom teacher is following an edict from administration or a curriculum document, or is fulfilling their own personal need.

Five readers commented that while including stakeholders may be a great idea
(Tip #1.2), it is generally not feasible considering time constraints and the constant pressure to serve many masters. Interestingly, four of the five individuals who responded as such worked in a more formalized hospital setting with a fairly rigid organizational structure and a traditional program focused perspective. Others who commented on the importance of including stakeholders touted its advantages such as offering a wide range of perspectives and an increase in community ownership and support. These individuals also worked for non-profit agencies that relied on donations and community financial resources.

**Identify Instructional Goals**

This section prompted very little comment and most were in agreement. This is not surprising since variations of outcomes-based instruction have been bantered about in all areas of industry for several years. One reviewer commented that while it is crucial to have goals, one must also be sensitive to emerging needs and results as well. Thus, while it is true that, "if you don't know where you're going you'll never know when you get there", it is also true that "if you always know where you're going, you will never get anywhere else".

**Conduct an Instructional Analysis**

Several reviewers stated that while they understood the theoretical basis of Tip #3.2, they were not convinced that an attractive and similar facilitator is necessary for success. Some cannot choose a facilitator and therefore their ability to apply this principle is limited. One curriculum developer commented that, "We have no control
over who delivers the material once it goes into the schools".

After reading the section involving moral decisions, one peer reviewer copied it and taped it to his wall. He stated that while counselling clients he often needs to be reminded that these clients do not necessarily have the same moral perspective that he does. "This particular section was of the greatest interest to myself. Even older learners tend to be trapped emotionally at the age when they started to use (drugs and alcohol)". One reviewer correctly commented that background and culture may also influence what is considered right or wrong to an individual.

*Write Performance Objectives*

Once again, a large majority of reviewers agreed that establishing performance objectives is necessary. They continued to question the ability to successfully measure attitude change. Most who have been in the alcohol abuse prevention field, and hence the "attitude change" field, recognize the difficulties. An instructional designer responded to Tip #4.3 by saying, "This is difficult. You can set outcomes, which can be easily assessed and then measure these. "Attitudes" are a product of knowledge and skills. Measuring attitudes is tough - it can be faked". A classroom teacher questioned the validity of attitude change results in a "phony" atmosphere. "The real judge", she stated, "would be outside of the original learning atmosphere". These comments seem to capture the frustration of many involved in the health promotion field. There is increasing pressure from funders and the community for quantifiable results and causal relationships. However, because primary prevention defines itself as intervention prior to the entrenchment of abuse, definitive results may not been seen for years, if at all.
Some programs rely on declared behavioural intentions, that is self-report data from adolescents claiming they will designate drivers, drink responsibly, and not engage in at-risk drinking behaviours. However, as time progresses even the best of intentions can be circumvented by environmental pressures and confounding factors.

*Develop an Instructional Strategy*

Most readers have had the opportunity to instruct adolescent learners and commented that, as instructors, they quickly became cognizant of the fact that adolescents are extremely restless in situations that are not interesting or entertaining. There is also an increased need to develop rapport or a common ground with these learners (Tip #5.1) because they are less tolerable of people who are quite a bit different from themselves or appear judgmental. The readers who claimed they would not use Tip #5.4 took exception to the opportunity to make the advance organizers available to participants. One reader cited it as too cumbersome and time-consuming.

The use of role models (Tip #5.6) can be somewhat tricky. As one reader stated, "Yes, I agree, but you have to be careful in your selection of these role models". Some do not retain their unblemished record, others who arrive to tell their story about overcoming substance abuse often are seen by teen participants as being glamorous. The life during addiction can fascinate and appeal to the audience more than the recovery process.

*Design and Conduct Formative Evaluation*

Issues involving evaluation seem to be impacted the most by time and financial
constraints. In addition, despite the clear delineation in the booklet regarding the
different concepts and functions of formative and summative evaluation, there seems to
be no compelling evidence to suggest that the reviewers approached them as distinct.
Several readers agreed that the tips should remain the guide, however some admitted that
the tips had no impact on their plans to conduct (or not conduct) formative evaluation.
One reader succinctly recognized, "It's not followed often".

Design and Conduct Summative Evaluation

The use of an external evaluator met with considerable opposition. Comments included:

- "Due to the cost and lack of staff in my agency this would not
  be practical".

- "Who is going to do this based on funding etc.... (not me)".

- "Not necessary".

Not using an external evaluator or an impartial designer to evaluate may be
fiscally responsive, but it can, no doubt, impact on the validity of the data and the overall
evaluation results. Those involved with the program may have expertise in areas other
than evaluation. Similarly, an individual who has either developed or delivered the
instruction or is a stakeholder may be too "close" to objectively evaluate it. Even those
with the best of intentions know where they want to be and may make an extra effort
(albeit unconscious) to get there. This will certainly impact on any revisions to
instruction, as well as provide misleading information to decision-makers and those
interested in replicating the instruction in their communities.

Revise Instruction

This component appears to be regarded as a "given". No specific comments were made. Logic prevails in that there would be no need to evaluate if one did not intend on using these results to modify future instruction.

i) Regarding Style and Format:

While the peer reviewers spent most time commenting on the efficacy and practicality of content, several reviewers made comments and provided suggestions regarding the format and overall design of the booklet. One reviewer noted that each "Tip" section should immediately follow the corresponding component of design. This would be helpful in establishing a more direct connection between the stage of instructional design and practical tips and applications. It would also help to address another criticism made by a few readers. Some commented that while the first section (steps in instructional design) is necessary, it is too dry and technical. One reviewer commented that, "the real meat is in the tips section". Another reviewer observed that, "to me it was dry and technical in the first part - more theoretical which does not appeal to me personally. I enjoyed the second half of the booklet and the practical application". Another reviewer felt that "the practical application part is very helpful".

Overall, the guide was well-received and appreciated by individuals who work with adolescents and within alcohol abuse prevention. However, the issues of time and
CHAPTER SIX
CONCLUSIONS & RECOMMENDATIONS

i) Content:

1. While there were certainly some variations in opinions about which instructional components and tips were most important and practical, there did not seem to be any clear indication that a particular educational background resulted in one specific perspective or paradigm with respect to instructional design. Most variations were adaptations to "real world" obstacles. Even those who had professed little background in education and instructional technology had, through their own personal and professional development, acquired strategies for designing effective instruction. This serves as a testament to the endurance and commitment of this group of individuals.

2. Only one peer reviewer commented specifically on the instructional design model and the sequence of components. He suggested developing evaluation strategies immediately following the development of instructional goals. While several design models included a comprehensive task analysis, it is unlikely, given the time pressures and financial constraints, that most instructors involved in health promotion and substance abuse prevention would be willing to perform this activity.

3. Preliminary data from this group indicated that few practitioners distinguish between formative and summative evaluation. Most evaluative data collected is the result of formative evaluation. These short-term, immediate results can be summarized quickly for reports to funders and administration. Collecting summative information can be
more laborious and challenging, particularly when working within the affective domain. There is sufficient evidence to support the notion of providing designers and instructors with continued professional development in formative and summative evaluation strategies. Providing innovative and cost effective strategies for summative evaluation will assist designers and satisfy funders who are searching for evidence of long-term changes in attitude and behaviour.

4. The hesitancy and inability of these practitioners to apply Tip #7.2 and use an external evaluator also supports the need for effective direction to those who are required to not only design and implement, but to evaluate as well. This could be in the form of formative and summative evaluation workshops, or providing a list of strategies for maintaining and ensuring objectivity when evaluating your own programs.

5. Clearly some reviewers saw the advantages of including stakeholders in the planning stages, while others did not. Having some input from those who will participate, fund, or in some way benefit from the instruction will increase the likelihood that needs will be correctly identified and met, and that community ownership will increase. Those employed in disciplines such as health and education should be exposed to the strategies used by community-based, non-profit agencies which are generally more attentive and diligent in including a variety of voices. From a cost-benefit perspective, even the most rudimentary attempts are better than nothing.

6. While this thesis focused on alcohol abuse prevention and adolescents, it is clear that
the instructional design model can be used for a variety of instructional endeavors. The utility of the model extends far beyond the original application. Similarly, some of the tips presented can also be applied to other instructional situations with a different target audience. This is particularly true of those principles gleaned from communication and instructional design theories.

ii) Booklet Format & Structure:

7. The "tips" section of the booklet was well-received and provided the necessary amount of information to support and enhance the recommendation. The topic headings appealed to both types of readers - those who are theory-driven, and those more interested in practical application.

8. The instructional component should be followed immediately by the "tips" section that corresponds to that particular topic. In this way, recommendations will be interspersed with steps in instructional design.

9. The first section outlining the components of instructional design should be reviewed and perhaps rewritten to make it less "dry and technical".

10. A table of contents should be developed or a summary of topics so that readers can be directed immediately to an area of interest. For example, if a reader is struggling with writing objectives she could be directed to only those pages which discuss or make reference to objectives.
iii) Future Considerations:

11. The surveys administered to the peer reviewers provided a cursory look at the opinions, difficulties, and needs associated with instructional design. Conducting focus group interviews or expanding the sample size would help to identify some additional areas of discussion and provide more detailed information about what would be useful and practical content for the guidebook.

12. Since the instructional design model and many of the tips are transferable to other instructional situations, this booklet could be the first in a series of reference guides. A second booklet could focus on designing and implementing effective instruction for senior citizens, etc.

13. Many of the peer reviewers cited time and money as constraints. Others indicated they would not engage in these instructional design activities for individual presentations and "one shot" talks. This may necessitate an abbreviated instructional design model or design and implementation strategies that would serve them well based on the brief planning time and actual length of the instruction. For these situations, more direction may be needed so that instructors can fulfill their responsibilities without losing the integrity of their instruction.

14. The instructional guidebook would serve well as an adjunct for a facilitator-led workshop in instructional design or as part of computer-based training. The inclusion of relevant worksheets and activities would enhance the learning environment and adhere to adult learning principles.
REFERENCES


Projects delivered by Atlantic Office

Alcohol Awareness and Prevention
Drug and Alcohol Strategy for Youth Committee
Roddickton
Roddickton, Newfoundland
A0K 4P0
Contact Person: Ms. Gortie Bromley

- The goal of this project is to promote the development of healthy attitudes and behaviours which preclude the abusive use of alcohol. This project includes skills development, problem-solving, goal setting, relaxation techniques, coping skills, social interactions and conversational skills, peer education/mentoring, and community awareness/education.

Needs Assessment, Off-Reserve Aboriginal Youth
Native Council of P.E.I. Alcohol
Drug Abuse Program
33 Allen Street
Charlottetown, Prince Edward Island
C1A 2V6
Contact Person: Josephine MacLean

- The purpose of the project is to conduct a community oriented needs assessment of alcohol and drug abuse issues with off-reserve Aboriginal youth between the ages of 13 and 26. The needs assessment will be carried out through focus groups which will determine the extent of drug/alcohol problems within the target group; the social factors which influence native youth to abuse drugs and alcohol; the ability of native youth to access prevention programs; and the barriers that prevent native youth from these programs.

Alcohol and Drug Assessment Program
Lions Huggy Youth Treatment
Centre Board
P.O. Box 3186
Station B
Fredericton, New Brunswick
E3A 5G9
Contact Person: Donna Dawkins

- The goal of this project is to assist in the development of youth-directed health promotion and alcohol and drug prevention programs in five junior high schools in the Fredericton area.
The Health Promotion Fund

December 8, 1994

Community Support Program of Canada's Drug Strategy

Projects delivered by Ontario Office

Video Resource
Council on Drug Abuse
P.O. Box 5634
Station A
Toronto, Ontario
M5W 1N8
Contact Person: Fred Burford

- The goal of this project is to develop and produce a video for youth and young adults at high risk of drug and alcohol abuse. Youth who have past users will work on the script and will be featured in the video. The video will be integrated into CODA's existing prevention programs and will be made available to other groups wishing to use it.

Projects delivered by British Columbia/Yukon Office

"Life Science" - Prevention Project for Secondary Schools
Green Thumb Theatre
for Young People
1885 Vanues Street
Vancouver, British Columbia
V5L 2H6
Contact Person: Peter Zednik

- "Life Theatre", based on an exploration of underlying factors contributing to alcohol abuse, will be developed and produced with the guidance of youth and appropriate youth workers in the field of substance abuse prevention and addictions.

Projects delivered by Alberta/Northwest Territories Office

A Collaborative Approach to Alcohol and Drug Support for Youth at Risk
Southern Alberta Partners for the Prevention of Substance Abuse
1005 - 17 Street N.W.
Calgary, Alberta
T2N 2E5
Contact Person: Joan B. Robertson

- The purpose of this project is to support communities in the development of programs for at risk youth facilitating the involvement of youth in the development of instructional and promotional materials, community liaison and networking, peer support and volunteer activities.
The Health Promotion Fund

December 8, 1994

Community Support Program of Canada's Drug Strategy

Projects delivered by Alberta/Northwest Territories Office

Self-Esteem
Eagle Ridge Youth Group
P.O. Box 308
Rocky Mountain House, Alberta
T0M 1T0
Contact Person: Lynda Stone

Grant: $25,000.00
Status: Current F/Y
Telephone: (403) 729-2033

# 6555-2-0215
01/01/94 to 09/30/94

* This project wishes to develop and implement a highly participatory prevention program for high-risk youth using many community resources to provide information, experience and support to increase self-esteem and choice over drug and alcohol use issues.

Summary

Total Number of Projects: 7
August, 1997

Thank-you for agreeing to take part in the research portion of a graduate thesis focusing on instructional design and alcohol abuse prevention programs for adolescents.

On the sheets provided please outline, in as much detail as possible, how you go about designing or developing instruction for adolescent learners. That is, when faced with developing your own prevention programs or instruction for adolescents, what things or steps do you routinely consider during the planning or design process?

Please feel free to use any method or combination of methods you like to provide this information - draw diagrams, charts, provide written descriptions, etc.

I would ask that you complete this activity and return the attached sheets as soon as possible. Please call me at 254-1661 ext. 2419 if you have any questions, and to arrange for pick up of the material.

After completing this activity you will receive additional information to read regarding instructional design, and a few short questionnaires.

Thank-you again for your interest and co-operation.

Sincerely,

Linda A. Morrow
Graduate Student
AN ADDITIONAL REQUEST ......

Once again thank-you for agreeing to take part in the research portion of this thesis. Because of the small sample size, (twenty participants) and the nature of the project, the answers you provide and the comments you make are not anonymous.

However, you can be assured that the data results will appear in text as group data not individual results. Individuals will be identified as part of a group with similar characteristics based on primary responsibilities, experience, etc.

I ask you then to please answer the following questions which will provide the necessary demographic information required for this project.

Q1. Please place an (X) beside the one category which best describes your employment position or primary responsibility within the work environment.

  ___ Teaching (classroom, public or separate school system; elementary or secondary)
  ___ Counselling (including child & youth worker, social worker, etc.)
  ___ Health Promotion (including health promoter, curriculum developer, social marketer)
  ___ Injury Prevention, Public Relations
  ___ Other (please specify) ____________________________

Q2. Place an (X) beside the category(ies) which describes your educational background.

  ___ Degree or Diploma in Health Sciences ie. B.Sc., Nursing, E.M.C.A., etc.
  ___ Degree or Diploma in Education ie. B.Ed, E.C.E., etc.
  ___ Degree or Diploma in Social Work ie. B.S.W., M.S.W.
  ___ Degree of diploma in Social Sciences ie. BA, MA, etc.
  ___ Secondary School Diploma or equivalent
  ___ Other (please specify) ____________________________
Q3. In the space provided below, briefly describe your most recent project involving the design and implementation of an instructional program, workshop, lecture, talk, etc.

This project was completed in 19 _____.

THANK-YOU!
PLEASE READ THESE INSTRUCTIONS BEFORE PROCEEDING

STEP 1: BEFORE EXAMINING THE BOOKLET, PLEASE COMPLETE THE QUESTIONNAIRE LABELLED 1.

STEP 2: READ THE BOOKLET ENTITLED "INSTRUCTIONAL DESIGN: FROM THEORY TO PRACTISE..."

THIS BOOKLET WAS DESIGNED TO BE AN EASILY READABLE GUIDE FOR PEOPLE WHO HAVE THE RESPONSIBILITY OF DESIGNING AND/OR IMPLEMENTING INSTRUCTION FOR THE ADOLESCENT TARGET GROUP. IT RECOGNIZES THAT PROFESSIONALS HAVE A VARIETY OF BACKGROUNDS AND A VARIABLE AMOUNT OF KNOWLEDGE WITH RESPECT TO INSTRUCTION AND THE DIFFERENT THEORIES WHICH MAY AFFECT INSTRUCTION.

STEP 3: AFTER READING THE BOOKLET, COMPLETE THE QUESTIONNAIRE LABELLED 2. FEEL FREE TO REFER BACK TO THE BOOKLET AT ANY TIME. THE COMPONENTS/TIPS MAY BE EVALUATED ON A VARIETY OF TOPICS INCLUDING UTILITY, CLARITY, SUITABILITY, ETC.

IF YOU HAVE ANY QUESTIONS PLEASE FEEL FREE TO CONTACT ME AT 254-5577 EXT. 2419.

WHEN COMPLETE PLEASE CALL ME AT THE ABOVE NUMBER TO ARRANGE FOR PICK-UP

THANK-YOU AGAIN FOR YOUR TIME AND ASSISTANCE.

LINDA A. MORROW
Please read the instructional design component/tip listed and place an 'X' in the appropriate box to indicate your response as either A, B, C or D.

<table>
<thead>
<tr>
<th>INSTRUCTIONAL DESIGN COMPONENT/TIP</th>
<th>A I DO/WOULD DO THIS ALL THE TIME</th>
<th>B I DO/WOULD DO THIS SOME TIMES</th>
<th>C I NEVER DO/WILL NEVER DO THIS</th>
<th>D I'M NOT SURE WHAT THIS MEANS</th>
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</tr>
<tr>
<td>3c) ANALYZE LEARNING TASK</td>
<td>- literature review</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4. WRITE PERFORMANCE OBJECTIVES</td>
<td>- make an outline of objectives</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>5. DEVELOP INSTRUCTIONAL STRATEGY</td>
<td>(see below)</td>
<td>(see below)</td>
<td>(see below)</td>
<td>(see below)</td>
</tr>
<tr>
<td>5a) ORGANIZATIONAL STRATEGY</td>
<td>- make an outline stating topic areas</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>5b) DELIVERY STRATEGY</td>
<td>- find out what is known to work or be more effective</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Appendix C
<table>
<thead>
<tr>
<th><strong>6. CONDUCT FORMATIVE EVALUATION</strong></th>
<th>- get feedback</th>
<th>- in order to gauge effectiveness must be clear, concise and comprehensive evaluation, professional review and input</th>
<th>- should be reviewed by peers</th>
<th>- self, peer evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>7. CONDUCT SUMMATIVE EVALUATION</strong></td>
<td>- evaluation is important</td>
<td>- will allow developers to make changes</td>
<td>- ask specific questions about what works</td>
<td>- evaluation and assessment pre/postests of students are compared</td>
</tr>
<tr>
<td><strong>8. REVISE INSTRUCTION</strong></td>
<td>- change/tailor message based on feedback</td>
<td></td>
<td>- evaluation and program modification is ongoing</td>
<td></td>
</tr>
<tr>
<td>DESIGN STEP</td>
<td>REVIEWER #10</td>
<td>REVIEWER #11</td>
<td>REVIEWER #12</td>
<td>REVIEWER #13</td>
</tr>
<tr>
<td>-------------</td>
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</tr>
<tr>
<td>1. ASSESS NEEDS &amp; PRIORITIES</td>
<td>- discuss with teachers regarding needs of students</td>
<td>- identify the needs, wants and priorities</td>
<td>- analyze students' needs</td>
<td></td>
</tr>
<tr>
<td>2. IDENTIFY INSTRUCTIONAL GOALS</td>
<td></td>
<td>- identify health goals - is it attainable and realistic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. CONDUCT INSTRUCTIONAL ANALYSIS</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>3a) ANALYZE LEARNING CONTEXT</td>
<td></td>
<td>- assess physical environment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3b) ANALYZE LEARNERS</td>
<td>- trends among the age group of adolescents</td>
<td>- identify teen's beliefs, values, and knowledge</td>
<td>- assess needs and abilities - accommodation for diverse learners</td>
<td>- estimate reading level</td>
</tr>
<tr>
<td>3c) ANALYZE LEARNING TASK</td>
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</tbody>
</table>

<p>| 4. WRITE PERFORMANCE OBJECTIVES | | | | | | | |
| 5. DEVELOP INSTRUCTIONAL STRATEGY | (see below) | (see below) | (see below) | (see below) | (see below) | (see below) |</p>
<table>
<thead>
<tr>
<th>5a) ORGANIZATIONAL STRATEGY</th>
<th>5b) DELIVERY STRATEGY</th>
<th>6. CONDUCT FORMATIVE EVALUATION</th>
<th>7. CONDUCT SUMMATIVE EVALUATION</th>
<th>8. REVISE INSTRUCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- preparing overheads</td>
<td>- development of various teaching methods</td>
<td>- simple and known to more uncomplicated and unknown</td>
<td>- evaluation related to outcomes</td>
</tr>
<tr>
<td></td>
<td>- design one key</td>
<td></td>
<td></td>
<td>- evaluation is based on the objectives, focus test</td>
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<tr>
<td></td>
<td>action Getting</td>
<td></td>
<td></td>
<td>- pre/post questions</td>
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<tr>
<td></td>
<td>phrase</td>
<td></td>
<td></td>
<td>- continual evaluation of program</td>
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<td></td>
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<td>- program reviewed or evaluated to see how well it worked</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- a systematic evaluation approach</td>
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<td>- make appropriate revisions</td>
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</tbody>
</table>

- use management by objectives approach
- needs to be interactive and concrete rather than lecture
- use role playing, some didactic
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