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PREPARATORY VOCATIONAL EDUCATION GRANT PROPOSAL

A Project

Presented to the

Faculty of

California State University,

San Bernardino

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

in

Education:

Vocational Education Option

---

by

Vernon Keith Matthews

June 2000

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June 2000

Approved by:

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Joseph A. Scarcella, Ph.D., First Reader

6/12/00

Date

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Ronald K. Pendleton, Ph.D., Second Reader

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ABSTRACT

This thesis was written as part of a process to secure funds for developing a "Preparatory Vocational Education" training academy for entry-level "Irrigation Technicians." Research revealed that funding for vocational program development was being awarded to "All-inclusive" or academy-style programs. These programs provide instruction necessary for students with zero experience to compete as entry-level journeymen. This project is based on a partial proposal draft for a U.S. Department of Labor Grant (see Appendix).

Chapter One presents context, purpose, and significance of the problem. Limitations and delimitations are discussed. Terms are defined, and project organization is abbreviated.

Chapter Two is the Literature Review. It expands upon Chapter One. Supporting evidence was cited.

Chapter Three details project methodology. It includes Proposal Content Validation, Plan of Action, Budget, and Writing Tips.

Chapter Four presents Conclusions, Recommendations, and a Summary. It reveals information extracted from the project and offers considerations for future endeavors.

ACKNOWLEDGMENTS

Special thanks go to Dr. Pendelton, Timothy Thelander, and especially Dr. Scarcella. Their time, patience, instruction, advice, and support are appreciated. Additional thanks go to Adrienne Carter and Donna Shea, for guiding me through my edits.

My family's love and support gave me the foundation and encouragement necessary to pursue a Master's Degree. Also, I owe a debt of gratitude to my parents, in-laws, and grandfather's spirit for their financial and moral support. They helped make this degree possible.

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CHAPTER ONE

Background

Introduction

This project was written as part of a process to secure funds for developing a "Preparatory Vocational Education" training academy for entry-level "Irrigation Technicians." Research revealed that funding for vocational program development was being awarded to "All-inclusive" or academy-style programs. These programs provide instruction necessary for students with zero experience to compete as entry-level journeymen. This project is based on a partial proposal draft for a U.S. Department of Labor Grant (see Appendix).

Research indicates that All-inclusive "Irrigation Technician" programs do not exist. Developing this program would positively impact the employable status of the current and future irrigation workforce. Funding is required to develop such a program. The purpose of the resulting proposal is to procure necessary funding.

Context of the Problem

A thorough review of available information indicated that irrigation technician development programs for low socioeconomic workers do not exist. Irrigation technicians,

or up and coming technicians, acquire their education through trial and error experiences on the job. The following was derived through research:

1. Current methods fail to meet the breadth, width, and depth of training considered safe and acceptable by vocational educators.
2. A Preparatory Education Academy program could correct this anomaly.
3. Funding will be an essential step in developing a preparatory program.

If funding is obtained, a high-quality training academy could be produced. A strong grant proposal will be needed to obtain this financing.

Purpose of the Project

To secure funding to design a vocational academy for Entry-Level Irrigation Technicians.

The Goal

The goal is to provide necessary skills to qualify otherwise unemployable or borderline employable persons in the job market.

The Target Audience

The academy attendees are non-college bound students who cannot attend current Irrigation Technician programs.

The Results

The graduates could have promising futures. These technicians could be qualified to fill a "gap" in the irrigation industry that has broadened with time. Through funding for the Irrigation Academy, a program could be developed that would present a truly dynamic solution for solving employers problems throughout Southern California, by providing new growth to heal a chronic social and economic wound. Increasing the employability of the American workforce would be a "win/win" opportunity.

Significance of the Project

"Preparatory Vocational Education Programs" provide Americans with opportunities for developing marketable skills within a career cluster (Scarcella, 1999). The field of Ornamental Horticulture is very large and labor intensive. It is unlikely that machines or computers can significantly impact the number of employees a landscape contractor requires. A weighty component of the landscape industry is irrigation. Arguably it is the most important ingredient in landscaping.

Effects

Historically, landscapers transformed California deserts into plush paradises. Water was a limited commodity. Irrigation water was needed, as were resources to use it

efficiently. This constituted the primary focus of Irrigation Technicians. Their jobs required a multitude of skills and a significant amount of knowledge (Corona/Norco Unified School District, 1999). Specific skills included:

1. A working knowledge of electricity, hydraulics, computer programming, ornamental plants, soil/water/plant relationships, heavy equipment, and power equipment.
2. Problem solving using higher cognitive thought domains.
3. Skills necessary to apply theory to the physical environment.

Most problems encountered by technicians started at Bloom's Taxonomy "Evaluation" level (Bloom, 1969; and Gronlund, 1993). Empowering a worker to handle these tasks could satisfy a crucial vocational employment niche.

Potential

This project may help procure funding necessary to develop a Preparatory Vocational Educational Academy to produce trained workers with the marketable knowledge, skills, and abilities necessary for entry level Irrigation Technicians.

Assumptions

The following assumptions were made regarding this project:

1. An effective Preparatory Vocational Education Academy for Irrigation Technicians could be developed.
2. One or more available funding organizations would be interested in financing this type of program.

Limitations and Delimitations

During the development of this project, limitations, and delimitations were noted. These limitations and delimitations are presented in this section.

Limitations

The following limitations apply to this project:

1. The proposal targeted an academy developed around the needs of the local or Southern California Region of the United States.
2. The proposal targeted an academy developed to meet the needs of students with limited academic abilities.

Delimitations

The following delimitations applied to this project:

1. Although designed for the local region, the proposal and resulting academy could be generalized to other states.
2. It could be modified and applied to students with good academic skills.

Definition of Terms

The following terms are defined as they apply to this project.

1. Academy: An inclusive vocational development program that encompasses a variety of interrelated subject matters (Neufeldt and Guralnik, 1988).
2. All-inclusive Program: A comprehensive program designed to bring students with little or no experience to an employable status in a trade (e.g. an Academy) (B. Andrews, personal communication after an interview, November, 1999).
3. As-builts: A common and well established industry phrase for a set of detailed drawings depicting what was actually installed, versus what was shown in the installation plan (e.g. actual location of valves and pipes) (Wolff, Lang, and Christopher, 1992).

4. Backflow Device: A device that protects drinkable water from water that might become contaminated (Fischer, 1995).
5. Call-back: Refers to when a contractor is "called back" to a job to fix or finish something at the contractors expense (Neufeldt and Guralnik, 1988).
6. Fault Finder: A device used to locate underground wires and breaks in underground wires. Industry slang (Rainwater, 2000 [personal communication]).
7. Fertigation: Fertilizing through irrigation systems (Walker, 1999; Burt, 1999).
8. Memorandum of Understanding: A form of contract or written agreement (Basanese, 1998).
9. Piece Work: An industry term for accomplishing something through the accumulation of several disjointed experiences or applications (C. Ackerman, Personal Communication, November, 1999).
10. Soft-skills: Those skills that include the ability to learn, to think, to get along with others, and to demonstrate a willingness to work (J. A. Scarcella, personal communication presented in a Vocational Education Masters program lesson, November, 1999.)

11. Technician: A person responsible for handling the technical aspects of a job or vocation (Mitchell, 1998).

Organization of the Project

This project was divided into four chapters. Chapter One provides an introduction to the context of the problem, the purpose of the project, the significance of the project, limitations and delimitations, and definition of terms.

Chapter Two represents the results of a literature review performed in support of the project. Chapter Three explains the methodology used to develop the project. Chapter Four presents conclusions and recommendations drawn from the development and implementation of the project. References follow chapter four, and the project is presented in the appendix.

CHAPTER TWO

Review of the Literature

Introduction

Chapter Two consists of a discussion of relevant literature. Seven different aspects are addressed and summarized. These aspects are:

Purpose of the Project.

1. Magnitude of the Project.
2. Describing the Job and the Technician.
3. Current Educational Opportunities.
4. Preparing for Employment.
5. Meeting the SCANS 2000 Objectives.
6. Availability of Grants and Funding.
7. Summary.

Purpose of the Project

This thesis was written as a part of a process to secure development funds for a "Preparatory Vocational Education" program or academy. A series of interviews revealed that much of the money available for Welfare-To-Work, School-To-Work, and Government Sponsored Career Advancement/Development curricula has been targeted for "all inclusive" programs (B. Andrews, personal communication after an interview, November, 1999). These

comprehensive programs were designed to bring students with little or no experience and minimal education to an employable status in a specific trade.

Social Benefits

It is estimated that only 88% of American adults living below the poverty line are holding down jobs (National Public Radio KVCR 91.9 FM San Bernardino, CA, information provided in a public radio broadcast on March 28, 2000). Providing career advancement opportunities to this traditionally poor socioeconomic portion of society could profoundly affect their lives. Career improvements positively affect low socioeconomic cultures (Biehler and Snowman, 1997). Self-esteem would improve. The effects carry over to families and friends. Better jobs, education, and employment are important indications of social status and worth in disadvantaged communities.

Academy

The knowledge, skills, and abilities to be developed would be included in the academy. A curriculum containing co-requisites in addition to core subjects would include an initial screening requirement. It could qualify as an all-inclusive Welfare-To-Work, School-To-Work, and/or Career Advancement/Development program.

Successful students could compete for entry level jobs as landscape irrigation technicians. The Landscape Industry is a major market in Southern California, across the nation, and around the world (U.S. Department of labor, 1998; Association Generales des Productuers de Mais, 1999). Irrigation Technicians are an integral part of this industry (Shank, 1998).

Landscapes' Future

Research suggests the landscape irrigation industry is growing. Landscape and horticultural services are identified by the Standard Industrial Classification 0780. Between 1993 and 1997, the number of people employed in San Bernardino County's landscape industry rose 130% to 2,151. In the same time period, the average annual payroll rose 145% to $34,791. In 1993, the industry was the fifth largest industry in the County. In 1997, it was the third largest (U. S. Census Bureau, 1999). The need to supplement our lives with comforting signs of nature around the home and in parks is expected to increase (Time Magazine, 1999).

In Southern California's near future, the need for more technicians will grow stronger. Land use will become more concentrated. Vandalism, technology, and limitations on water will increase (Association Generales des Productuers de Mais, 1999). Past irrigation practices must change. This

was reflected by Cal Trans. Conditions affecting new construction, such as increased angle of slopes due to limited space, forced a paradigmatic shift in their approach to landscaping and landscape problem solving (Namba, 1999). New situations require new mind-sets. New mind-sets require a new breed of troubleshooter. Currently, the Irrigation Technician field does not meet this need.

Magnitude of the project

Working class employees are being required to operate at technician levels. Development of training programs for workers are essential. Without necessary qualifications, workers will not be able to gain the knowledge and skills required for advancement (Hodson and Sullivan, 1995). This was supported by trends in the American workforce, as illustrated in the book "Work Based Learning." The authors' present three pie graphs (Figure 1). They indicated 65% of the future workforce needs will be reliant on skilled workers, vs. 20% in 1950, and 35% in 1991 (Hoerner and Wehrley, 1996).

Industry Concerns

The need for trained employees is the primary concern of the irrigation industry (Figure 2). This was based on a survey of the top 100 landscape contractors in the United

States. It is consistent with Hoerner and Wehrley's findings regarding the need for a skilled workforce.

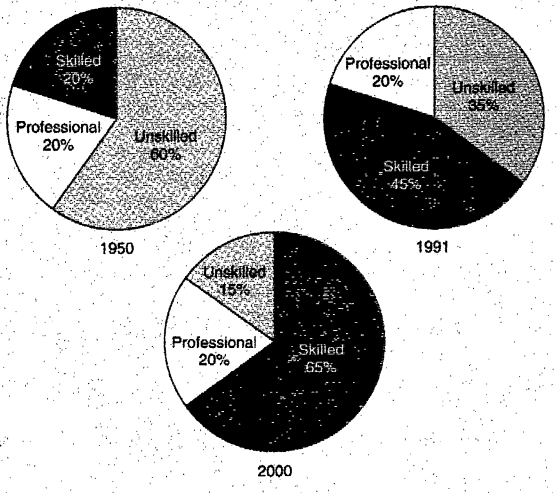

Figure 1. Depicts the Changing Needs of the American Workforce (Reprinted from "Work Based Learning, The Key to School-to-Work Transition", 1996). It illustrates changing trends in the American Workforce.

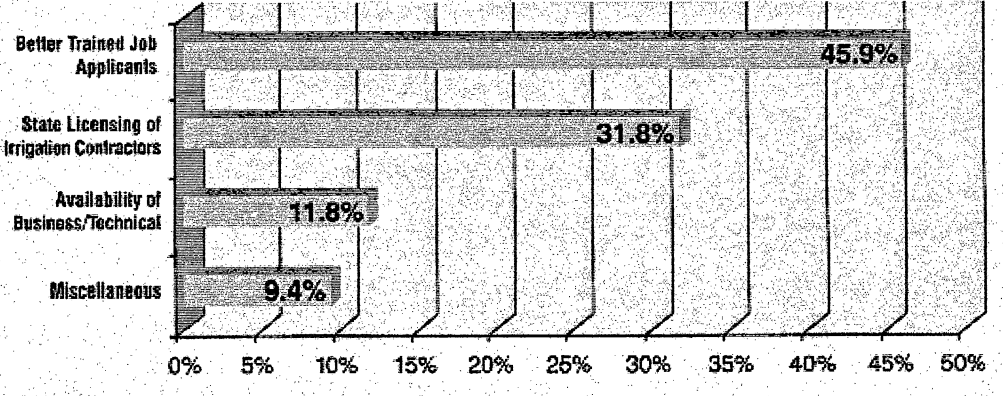

Figure 2. What would you change, shows (in descending order) the four most desired changes United States irrigation

contractors would like to see (Irrigation Association, 1998a). It illustrates business concerns in the irrigation industry.

Describing the Job and the Technician

Landscaping is a fast-paced industry. Irrigation concepts and theories have been established for many years and were derived from agricultural research and adapted to landscaping. However, technology on all levels became the industry standard. This affects how traditional theories and concepts are applied (Desrues, 1999). Irrigation controllers use computer-generated data to make decisions. Advanced plastic manufacturing techniques maximize the uniformity of sprinklers. Studies in low volume/high efficiency emitters redefined water application techniques.

Water Supplies

Irrigation is the only reason landscape plants survive in Southern California. Irrigation water, as with domestic water, is in critically short supply. Small amounts of water are going to be a costly commodity in the region (Thurston, 1999). Ninety-nine percent of the world's water cannot be used to irrigate since it is salt water (Desrues, 1999). Technology is required to successfully solve these problems.

The Technician

Irrigation Technicians resolve most technical problems encountered in landscape irrigation systems, both new and old (Mitchell, 1998). Technicians have to be skilled in:

1. Basic sprinkler design concepts.
2. Applied hydraulic calculations.
3. Basic electrical and electronic theories and applications.
4. Soil hydrology.
5. Basic horticultural needs.
6. A wide range of construction techniques and equipment use (Corona/Norco Unified School District, 1999; Mitchell, 1998).

Knowledge of Technology

Technological advances in landscape irrigation are an ongoing process. The Irrigation Technician (as previously described under "The Technician") needs to be aware of these technologies (Barnes, 1999; Burt, 1999; Dyer, 1999; Irrigation Association, 1998b; Shank, 1998; Walter, 1999). Technicians need to develop competency in locating and using modern technology, with an eye towards preparing for future technology (Barnes, 1999; Irrigation Association, 1999; Shank, 1998). These competencies would include, but not be limited to:

1. Basic sprinkler design.
2. Effective use of soil moisture sensors.
3. Fertigation techniques.
4. Global Positioning Systems (GPS).
5. Global Information Systems (GIS).
6. Fault finders.
7. Computer networked satellite systems (Barnes, 1999; Burt, 1999; Corona/Norco Unified School district, 1999; Dyer, 1999; Irrigation Association, 1998b; Shank, 1998; Walter, 1999).

Dedication to Problem Solving

Most irrigation employees work long physically demanding days. What sets irrigation technicians apart from other irrigation employees is their ability to problem solve and work on problematic systems in uncomfortable situations (Mitchell, 1998; Namba, 1999). For example, technicians work at the bottom of large holes, covered in mud, with temperatures below freezing.

Business Knowledge

Basic understanding of business is an important attribute for Irrigation Technicians. The number three need identified in the survey of the top 100 landscape contractors was being trained in business (Irrigation Association, 1998a; Vaner Kooi, 1998). Irrigation

Technicians are a costly adjunct to the landscaper. Technicians interlace with both contractors and their customers.

Laborers, equipment, call-backs, technology, and contracts all forfeit company money. Good business management systems can produce a profit. Making a business work successfully is referred to as "Best Management Practice" (BMP) (Basanese, 1998).

Water Conservation

Water conservation is a universal concern (Association Generales des Productuers de Mais, 1999). Successful irrigators help conserve water (Desrues, 1999). Between dwindling water supplies and water use contracts or "Memorandums of Understanding" (MOU's), irrigation businesses are being held accountable for water conservation. Most water conservation practices involve Irrigation Technicians, since the MOU's are centered on efficient water use and accelerated plant growth (Basanese, 1998). Good technicians should be able to translate restrictive business practices into customized water management solutions.

Soft-Skills

Irrigation technicians are in demand because of their technical skills. However, the ability to work with others

in difficult circumstances is an underlying key to their success. Technicians should be able to communicate with their employers. It is essential that communication is clear and understood. Technicians have to deal with customers directly. Feedback is not always positive. What gives one qualified technician an advantage over another is business Soft-skills. Soft-skills are tactful interpersonal skills (J. A. Scarcella, vocational education class lecture, November, 1999).

Applied Knowledge

Many field problems are due to illegal installations. For example, improper use of backflow devices are common. Unresolved problems could cost money, jail time, and possibly a loss of life (Blau, 1998; Fischer, 1998). Technicians have to:

1. Read and write clearly.
2. Be familiar with relevant laws and apply them.
3. Tactfully share information verbally and in writing (Basanese, 1998).

They must accomplish this while protecting their employer's interests and fulfilling contractual obligations.

Current Educational Opportunities

Most Irrigation Technicians compile several years of field experience before proceeding to trade school or

college. Then they must meet prerequisites or minimum academic recommendations. To receive formal training, technicians must already possess the ability to:

1. Read and write.
2. Perform a variety of mathematical calculations.
3. Apply critical thinking skills (University catalog, 1999-2000).

Most Irrigation Technician's work requires problem solving. However, current educational opportunities necessitate a scholastic background that most prospective Irrigation Technicians do not have.

Higher Education

California State Polytechnic Universities in Pomona and San Louis Obisbo offer formal irrigation technology curricula. California State Polytechnic University in Pomona provided detailed information regarding their Landscape Irrigation Systems major, in the 1999-2000 winter quarter catalogue. These programs were offered under schools of engineering. These curricula are only available to qualified students. California State Polytechnic University in Pomona also offers a series of public seminars. These seminars cover several irrigation related topics (Cal Poly [Flyer], 1999). The advertisement attempts to limit enrollment to students meeting certain criteria by stating: "These courses

would be most beneficial to participants who have some knowledge of irrigation and are comfortable with basic algebra."

Kansas State University offers an Irrigation Association based course. It prepares students for placement within the golf course irrigation trade. It requires university acceptance. The program is under the Department of Horticulture, Forestry, and Recreation Resources (Reaves, 1999).

Education on the Internet

There are a few Internet sites offering simple irrigation design lessons, intended for the layperson. One of the best sites simplified the content of landscape Irrigation Classes developed by Professor Yo Tsi Hung Ph.D., an Agricultural Engineering professor who taught at California's State Polytechnic University in Pomona California. Jess Stryker (1999) published it on the Internet. The content is superb, but has limitations. Many facts and figures are based on various manufacturers' laboratory tests and do not match actual field conditions. These limitations are not communicated to the reader, nor are indications or solutions offered. For example, the guide used manufacturer test data on new water meters and simple friction calculations for generic pipe. Therefore,

calculations are made using invalid data. Influences of the surrounding demographics further distort the calculations. This Internet site was also limited to remedial design concepts. Solutions for anomalous situations were not offered. Hydraulic engineering lessons to synthesize solutions were not provided.

Industry Sources

Retailers provide books and pamphlets on irrigation design, installation, and troubleshooting. Nearly all are intended for retail customers yet landscapers often use them (Home Base, 1999; Orbit, 1999: Rain Bird, 1999; Toro, 1995). Few are of any value and contents are over-simplified. They overlook or avoided critical design aspects (e.g. imperfect spacing situations, performance limitations, proper selection of related materials, hydraulic limitations, and geographic considerations). Toro and Rain Bird offer the most comprehensive design pamphlets. They present well-defined parameters that block readers from designing anything unusual or maximizing system efficiency. Misapplication of design guides enforces the need to have properly trained Irrigation Technicians enter the landscape workforce (Home Base, 1999; Orbit, 1999; Rain Bird, 1999; Toro, 1995).

Hunter Industries offers monthly Technical Tips to irrigation contractors via mailers. Contractors have to be on the mailing list to receive them. The complete volume of Technical Tips is available on compact discs by special order. Technical Tips only cover basic information (Hunter Headlines, 1999).

Technical Manuals can be useful, but require high levels of understanding and a formal education. An example is the Hunter Industries Technical Manual (Hunter, 1996). This manual consists of a variety of irrigation and landscape irrigation related formulas. Most formulas require prior knowledge of basic algebra and insight into irrigation concepts. Limited formal education prevents most landscape irrigation workers from using technical manuals (Cal Poly [Flyer], 1999).

Seminars

Some irrigation manufacturers offer design seminars, typically lasting two days. In theory they cover beginning and intermediate design aspects. In reality, they are limited to rudimentary design applications. Students have to read well and be able to perform simple math prior to attending seminars (Toro University, Beginning Irrigation Design School, and Intermediate Irrigation Design School [design manuals, no date]). These seminars are also a form

of advertisement, limited to customized design techniques. Formulas and processes are altered to keep the novice student from using competitors merchandise. For example, by identifying values by unusual names will prevent other sources from offering support or solutions. Manufacturers teaching custom terms can force customer loyalty. For instance, Hunter Industries created and introduced shortcut formulas for students that used Friction Factors that were only available in Hunter literature (1996). However, designers who use this shortcut are restricted and required to abide by the Hunter design literature.

Certifications

Presumably, the Irrigation Association is the world leader in applied landscape irrigation technologies. They established and offered a variety of irrigation designer and technician certificates. These are not easy to obtain. They require a high level of reading comprehension. As demonstrated by the number of college level textbooks required for self-study (Pair, C. H., Hinz, W. H., Frost, K. R., Sneed, R. E., Schiltz, T. J., and Sears, R. C., 1983). To enter certificate programs, students must qualify their background and experience. This is a formal application process presented to an Irrigation Associations panel. Different certificates require different levels of prior

experience and that prerequisites be met. Most programs are self-study. This impacts the prospective technician with poor academic skills, because the qualifying process is often unobtainable.

Irrigation Association Certificate Programs are held at specific times and locations (Irrigation Association, 1999). Applicants pay fees and obtain approval from the Irrigation Association before receiving study materials. Typically, certificate programs coincide with major irrigation and landscape trade shows. Exams are given at these shows. To complete enough certificates to become an Irrigation Technician requires several years.

Suppliers

Research suggests most suppliers have improperly educated employees teaching customers irrigation technology. People with minimal understanding of the material are responsible for educating the blue-collar worker. Some suppliers have experts on staff, often former contractors or designers. The majority failed in their own business ventures, but learned lessons and obtained some knowledge. This made them self-proclaimed "experts." Few are actually qualified. Fewer have a formal understanding of instructional techniques and teaching skills. This makes them unsuitable as educators (Irrigation Association,

1998a). Commonly, instructional material is prepared by a specific product manufacturer. Lessons contain customized information that forces learners to use specific products (Home Base, 1999; Lawn Genie, 1998; Orbit, 1999; Rain Bird, 1999; and Toro, 1995). Persons with very limited backgrounds are teaching carefully censored material to a gullible audience.

Normally suppliers target an audience lacking formal training in the industry. They rarely have more than a sixth grade education. This is the same audience that the Irrigation Academy would seek.

Education Summary

Extensive research indicates that comprehensive or quality irrigation technician programs are not available for most industry employees. It is unlikely that any program exists where the general irrigation workforce can acquire necessary skills (Irrigation Association, 1998a). Either several years are dedicated to on-the-job-training or the technician must attend a college or university to receive formal training. The majority of training is done as piece-work at the parts supplier level (Irrigation Association, 1998a).

Currently Irrigation Technicians are more apt to develop skill and understanding through a series of

misguided endeavors than through instruction. Prospective technicians must be willing and able to attend a variety of disordered classes and seminars, then synthesize the information learned on-the-job.

Preparation for Employment

A critical aspect of making this academy worthwhile will be preparing graduates for job interviews. This process includes completing applications, providing references, the physical interview, and finally, paperwork. It may or may not be a long involved process. Prospective employees have to pass a variety of evaluations. They may repeat this process several times prior to gaining employment. Some evaluations will be objective and others subjective. Great importance must be given to understanding and navigating evaluations (Kennedy, 1996).

Meeting the SCANS 2000 Objectives

The Irrigation Academy will embody the Federal Governments SCANS 2000 findings. SCANS is a U.S. Department of Labor Document (1998). It examined the demands of the workplace as it pertained to young people. Results were broken into five competencies and three supportive Foundation Skills. All eight skills will be supported in the Entry-Level Irrigation Technician Academy. These competencies are:

1. Resources: Students will be taught how to find, use, and apply appropriate resources.
2. Interpersonal Skills: Interpersonal or "soft-skills" will be developed and enforced as a curriculum requirement.
3. Information: Problem solving work requires endless absorption and processing of critical information.
4. Systems: Irrigation technicians use systematic approaches to develop information to solve problems resulting from one or more system failures. Understanding and applying system concepts will be paramount.
5. Technology: Technological advances in landscape irrigation is ongoing. The Irrigation Technician Academy will apply new technology through theory and practice (Barnes, 1999; Burt, 1999; Corona/Norco Unified School District, 1999; desrues, 1999; Dyer, 1999; Irrigation Association, 1998b; Mitchell, 1998; J. A. Scarcella, personal communication presented in a Vocational Education Masters program lesson, November, 1999; Shank, 1998; Walter, 1999; U. S. Department of Labor, 1998).

The three supporting foundation skills are represented in the following ways:

1. Basic Skills: Reading, writing, and math will be taught and applied constantly throughout the academy.
2. Thinking Skills: Utilizing common business practices and holistic approaches to problem solving (students would be required to ask "why" and answers will often be questions).
3. Personal Qualities: This includes business practices and employment preparation.

The Entry-level Irrigation Technician Academy embraces the exact content prescribed by SCANS 2000.

Availability of Grants and Funding

Each grant funding organization has it's own criteria and procedures. The grant application has to be carefully read prior to submission. Within funding organizations, there are a wide variety of required formats often conflicting with each other. Repetition of information and application procedures are two primary areas of conflict. Who qualifies is another major variance (Pfau Library, 1999; and U.S. Department of Education, 1999). Some require a Ph.D. and affiliation with an educational institution. Some require a Ph.D. or professional consultant. Others require

applicants to be United States citizens. Examples of additional inconsistencies included:

1. Application open and close dates.
2. Involvement of human subjects.
3. Funding limits determined by the technology involved.
4. Length of the project (Cortez, 1991; Pfau Library, 1999; and U.S. Department of Education, 1999).

Selecting the Grant Format

To enhance success of a grant proposal, outlines adopted from two grant writing manuals were used. One was designed for teachers, the other for a variety of specific grants (Karges-Bone, 1994; Cortez, 1991). The basic information was synthesized to fit the majority of educational grants. This project requires the grants be carefully selected and their formats checked against these books.

Summary

The literature important to this project was presented in Chapter Two. A holistic approach to the project development was adopted. Information on purpose, significance of the project, describing the job and the technician, preparation for employment, current educational opportunities, meeting the SCANS 2000 objectives, and

availability of grants and funding were discussed in detail. Each item was supported through documentation.

Developing an academy will:

1. Circumvent several years of field experiences.
2. Benefit the economy by providing a competent workforce to an understaffed industry.
3. Provide living wage employment opportunities to an impoverished section of our population.
4. Improve self-esteem for the underpaid irrigation worker.
5. Radiate positive attitudes to the student's friends and family.
6. Fulfill dream for workers presently denied access to an appropriate education.
7. Consumers will enjoy quality landscaping at more reasonable costs, since reliable and qualified technicians will be more plentiful.

Funding is required to bring this project to fruition. Methods for acquiring crucial vocational endowment follows the format presented in the "Grantsmanship" book, and the Department of Labor's Grant Application (Cortez, 1991; U. S. Department of Labor, 2000). Additional format alterations were adopted as required to tailor the results to best fit the situation.

CHAPTER THREE

Methodology

Introduction

The methodology used to develop the project is presented in Chapter Three. Each step of the proposal development process is identified and synopsized. Steps are presented in a typical order for proposal development. The order could be changed to conform to individual preferences. The development process can be independent of the presentation format.

Proposal Content Validation

Granting organizations want to verify the allocation of their money represents a valid purpose and cause. Proposal authors must justify their intent and substantiate their desires to the funding organization. Validation is a multiphase process that encompasses two general funding concerns. First, how profound the project is. Second, how wisely the money will be distributed. Cortez (1991) approaches these concerns through a series of detailed development steps:

1. Need Statement.
2. Literature Review.
3. Goals and Objectives.

4. Plan of Action.
5. Evaluation Plan.
6. Management Plan.
7. Budget.
8. Appendix.
9. Abstract.
10. Contents.
11. Reviewer's Guide.
12. Table of Contents.
13. Application Cover Letter.
14. Population Served (Cortez, 1991).

Need Statement

This provides the granting organization with a clear and well-defined objective. It is a vital component of the proposal. The granting agency must feel the need is relevant or significant enough to warrant funding. It is important this section provide adequate provocation.

Literature Review

The literature review, written in third person, provides the reader with supportive arguments that validate the Need Statement. References are included to give credence to the need.

Goals and Objectives

Goals provide operational guidelines, whereas Objectives define expected measurable outcomes. Combined, they place readers into the right mindset for reviewing the proposal. They define the motivation for the proposal.

Plan of Action

The Plan of Action is also known as the Scope or Procedure. It is often the lengthiest portion of the proposal, ranging from five to fifty pages. It explains exactly how the writer is planning to accomplish the objectives. A great deal of thought needs to be dedicated to this section.

Evaluation Plan

This is the checks and balance portion of the proposal. How, by whom, what, why, and when, the vocational program evaluation is discussed. No formal model exists. Whatever method works best for the author is recommended. Building a method development system into a program is essential to ensure accomplishment of goals and to adjust the approach if necessary to achieve the success.

Management Plan

This defines "Who will do what?" for the proposal review board. It is based on well prepared plans of action

that highlight the ultimate responsibility of each person involved. The review board does not require exact details, merely assurance their money is being invested intelligently. The management plan also reflects the writer's organizational rationale and abilities. It is important to reassure the funding agency the author is responsible and knowledgeable.

Budget

The budget is a major concern. It may be presented in a variety of ways, including fixed and variable expenses, value of donated items vs. actual expenses, or major expenses vs. minor expenses. Sometimes funding agencies, such as government-sponsored institutions, will dictate the presentation format. It is common practice to include a Budget Rationale section, justifying the expenditures. It offers the opportunity to submit the affects on the local demographics. Most budget sections provide readers with quick expense summaries and a rationale. The appendix includes a detailed expense itemization. The Budget is a recommended starting point for proposal writers experiencing writers-block. It immediately focuses the writer on analyzing the related issues.

Appendix

This part of the document provides additional reference information not included in the body of the proposal. Examples include:

1. Itemized expenses.
2. Professional references.
3. Résumés.

Abstract

The Abstract is the last thing to be written, but the first thing read. It is what the initial proposal assessment is based on. Abstracts should be decisive and informative. Normally, the abstract is limited to 250 words. It is recommended that abstracts never exceed two double-spaced type written pages. Some granting agencies provide a form for the abstract. The abstract might be used in other applications. Educational Resource Information Center (ERIC) uses abstracts as an overview for researchers. Press releases and reports do the same. The abstract could be used to qualify or support decisions in corporate boardrooms. The following is a synopsis of what good abstracts include (Cortez, 1991):

1. The title of the project. The title should be a description of the project and be limited to fifteen words. Keep the title professional. Avoid

playing word games, for example, "Designing An All Inclusive Preparatory Vocational Educational Academy For Entry Level Irrigation Technicians" would be more appropriate than "Making it Happen for the New Technician."

2. The name of the project director.
3. The name of the organization, if there is one.
4. The starting and ending dates of the project.
5. A brief and realistic statement of the objectives.
6. A general outline of the plan of action (limit it to two paragraphs).
7. A statement on how the project relates to other projects or disciplines. Include the significance of the project beyond its original scope and intent.
8. Available resources and personnel. This will be a good place to include personal biographies or résumés.

Contents

The proposal contents will reflect a great deal of thought. It should be rational, appropriate, and defendable. There are a series of evaluative questions that should be considered when developing the contents. They are:

1. What is the problem to be solved (the problem/need statement)?
2. Is it really important?
3. How important?
4. What is the supporting evidence?
5. How can you solve this problem, or a part thereof (a chance to brainstorm)?
6. Will the project meet the needs described?
7. How will the needs be met?
8. How will you be able to tell the needs have been met?
9. Does your solution meet the grant criteria?
10. Is your project original, or an original approach to a problem? (This is very important to funding organizations.)
11. Can you qualify the need by addressing "who will be served," "how many will be served," "what geographical area will be served," etc.
12. Who is actually going to be involved in the project?
13. What process of consultant involvement has been established?
14. Can the gap be defined?
15. Can the gap be filled?

16. Why isn't a program like yours already in place?
17. How can your project be generalized to other projects or locations?
18. Can you substantiate the competence of the project director and staff?
19. Are there others sponsoring your project (e.g. institutions or individuals)?
20. Why should you or your organization engage in this project?
21. How can your project be evaluated?
22. What is the exact character of the project research component?
23. Are the evaluation techniques appropriate?
24. How long will it take to bring the project to maturity?
25. What impact will the project have on your personal time?
26. What impact will the time frame have on your project?
27. How much will the project cost?
28. What are the limitations and constraints of your project?
29. What happens when the project is completed?

30. How much of a difference will the project make overall?

Reviewer's Guide

This is a quick and simple reference guide. It affords the reader a method for locating information with little or no effort. The easier the information is to pull from the proposal, the less the reviewer will scrutinize it.

Table of Contents

For proposals in excess of 10 pages, it is customary to include a table of contents. It is important that text can be easily located. Titles and subtitles are strongly recommended. Looking for the reason behind a financial decision will be much easier if the topic is listed as "Budget Rationale" in the table of contents, than it would be if listed as "My Views." The table of contents should be professional looking and easy to read. Do not embellish it with fancy formatting. The purpose of the table of contents is to give the reader a quick reference guide.

Application Cover Letter

The cover letter, also referred to as a "Letter of Transmittal," is the document that introduces the financier to the project. It is a synopsis of who, why, how much, and how. This is the "hook" used to generate the readers interest. By reading the cover letter, the reader should

have a general understanding of what their money is going to produce. It is also an advertisement for the proposal. Cover Letters let funding agencies know what to expect. They are short, clear, and interesting. It is the writer's first opportunity to secure the proposal review board's interest and support. Grant writers should not waste this opportunity on unnecessary information or trains of thought. Make the first impression a good one. It is considered a professional courtesy to send a copy of the Cover Letter and the Abstract to the people who helped develop the proposal.

Not every granting organization requires a Cover Letter. Federal government grants rarely require them, but corporations, foundations, and state and local government grants do. If unsure, include a Cover Letter.

The Cover Letter should be addressed to an individual or a particular division within the funding organization. It should be authored by one person, normally the program or academy director. This personalizes the Cover Letter. It should be professional in appearance and on professional writing stock. This is a personal plea for money. Professionalism breeds an atmosphere of responsibility.

Population Served

The proposal will benefit a particular group of people. This needs to be identified in the proposal. It should be well defined.

Follow-Up Suggestions

Cortez (1991) provided a series of follow-up suggestions. By following these suggestions, the grant writer will be able to improve the proposal quality. These are:

1. Proposal Development.
2. Writing tips.
3. Proposal Planning Checklist.

Proposal Development

Dr. Cortez's 1991 Grantsmanship book recommended paying special attention to some very specific restrictions when writing the grant. These restrictions include:

1. The purpose for the funding has to be completely legal.
2. Ensure that there is a need for the project.
3. The objectives must be clear, obtainable, and measurable.
4. Specify the target group and others who might be involved, explaining to what extent and how.

5. Be sure objectives and methodology are closely tied to each other, and to a reasonable budget. Typically, conforming to a 10% budget constraint is a good maximum. Scientific research applications might require more.
6. Be realistic in how much money will be required. Make sure it is reflected by the amount requested.
7. Establish a plan for continuing the program once proposal money is exhausted.
8. Establish commitment by describing time, material, facility, and personnel management information.

Writing tips

Dr. Cortez (1991) also provides this list of writing tips:

1. The proposal innovator should be the only person writing the proposal. Help can be obtained from other sources, but the work should reflect the efforts of the innovator.
2. Imagine who the reader is going to be, then target the proposal to that one individual.
3. For the sake of "Bragging Rights," write the proposal in third person. It is easier to brag about others than yourself.

4. Keep the title suitable to build interest. Don't be cute. Stay professional.
5. A table of contents is required for proposals over 10 pages in length.
6. Don't crowd the proposal. Use subheadings and underlines to make the proposal easier to read and digest. Emphasize important elements.
7. Try to maintain a 15 word per sentence limit.
8. Avoid using more than two commas per sentence. This focuses the sentence.
9. Allow only one thought per paragraph. The paragraph should be as short as possible.
10. Write like you talk. Use a personal style. Use of contractions is recommended.
11. Sell your proposal with the use of quick, grabbing openers. Then hold the readers' attention.
12. Be up front with your proposal. Start with the most important points first.
13. Focus on positive aspects. Be an optimistic problem solver.
14. Be solid in your convictions.
15. Don't belittle the reader with overkill.
16. Keep the words simple, but not so simple that you insult the reader.

17. Avoid professional jargon, abbreviations, and vague references.
18. Problem starts can usually be overcome by starting with the budget.
19. Don't try to be sly. They know you're asking for money. Be bold. Make the sale.
20. Apply the "KISS" method. Keep it short and simple!
21. Don't get trapped by rules for writing. Let your writing represent you. Be sure you are understood. Be yourself when you write.
22. Include a time schedule, and maintain it (Cortez, 1991).

Proposal Planning Checklist:

The "Proposal Planning Checklist" is designed to ensure the proposal writer covers specific and critical issues prior to submission. This should be a guide during proposal development and a final checklist upon completion. The "Proposal Planning Checklist can be referred to as insurance. It will only take a few minutes, but can save the proposal.

1. Is the need for the project identified?
2. Is the need validated?
3. Is the project realistic?

4. Are the potential benefits of the project identified?
5. How, if at all, will the project affect other agencies, or institutions?
6. Can it be funded?

Summary

The primary objective of grant writing is to establish a source of funding. It is important that grant writers validate expenses. An effective grant proposal accomplishes this through a series of development phases. The combined phases associate significance with funding, and demonstrate the money will be spent judiciously.

CHAPTER FOUR

Conclusions and Recommendations

Introduction

Chapter Four presents the conclusions gleaned as a result of completing this project. Recommendations extracted from this project are also presented. This chapter concludes with a summary.

Conclusions

The conclusions extracted from this project follow:

1. Writing proposals for funding requires high-level writing competency. A well-written application will convey a sense of professionalism and reliability to the person reviewing the proposal.
2. Multiple proofreaders provide valuable insight. Something written and reviewed by the same person may include subtle inconsistencies and misrepresent the intent. When subjected to another's prospective, anomalies may surface. This is important because inconsistencies and misrepresentations could cause the proposal to fail.
3. Limit readers to one or two. What is important to one reader may not be to another. Attempts to

satisfy too many readers will result in unnecessary corrections and rewrites. Involving a limited number of high quality readers reduces this problem.

4. When a proposal represents one person's objective, it could impact others. They need to be consulted. Otherwise the project may not develop smoothly.

Recommendations

The recommendations resulting from this project follow:

1. This project should be submitted to multiple funding organizations. A concerted effort should be made to research, correct, and resubmit any viable funding rejections. This process should continue until financing is acquired. Re-submittals are particularly important because they demonstrate the author's dedication to the proposed project.
2. Additional research should be put into aligning the Irrigation Technician Academy with the current academic educational objectives. Nearly every phase of this academy will directly advance the students' academic educational abilities. Minor alterations in the completed curricula could

qualify an articulation agreement for credit at other institutions.

3. Lessons learned from this project should be used to write future grant proposals for vocational irrigation programs.

Summary

This thesis clarifies the need to improve vocational training for irrigation technicians. The demand for technicians is not being met. The demand could be satisfied by a group of people presently overlooked by industry. Adequate funding could make this training a reality. This thesis project could bring career opportunities to an overlooked workforce, by securing necessary funding.

APPENDIX

Preparatory Vocational Education Grant Proposal

Introduction

This project is a sample grant proposal. The primary format is based on the U. S. Department of Labor, Employment and Training Administration's Application for Federal Assistance (2000). If money is awarded it will be used to develop a Preparatory Vocational Irrigation Technician Academy. The target audience would be lower socioeconomic irrigation workers with poor academic prospects. Graduates would help supply a journeymen shortage in the irrigation industry.

Financial and technical provisions are similar to the Department of Labor's Application Checklist specifications (U. S. Department of Labor, 2000). Information was supported and cited in a Literature Review. Operational explanations, and checks and balances are revealed. Goals are identified and methods for measuring progress are explained.

Influences outside of this project have censored its content. The right to privacy was applied where appropriate. Some supplemental information was unavoidably incomplete. Otherwise this proposal draft is valid.

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LIST OF FIGURES

Mission Statement

Furnish a disadvantaged workforce with the body of knowledge and skills necessary to effectively compete in the Irrigation Technician employment arena.

Organizational Goals

1. Develop a system of training that utilizes the most effective learning applications.
2. Develop a learner focused and performance based training academy.
3. Develop an academy that will instill a sense of professional integrity in the student.
4. Develop an ongoing method for updating and improving the academy.

The Need

Southern California has a critical shortage of Irrigation Technicians. Failing career advancement opportunities are partly responsible. Training in this field is predominately available through colleges or college level programs. Available prospective technicians are low socioeconomic adults with poor academic backgrounds. They are unable to take advantage of existing curricula. Funding for a Preparatory Vocational Academy would provide academically challenged students with marketable skills at living wages, and supplying a crucial demand.

Literature Review

Money from this grant will be used to train low-income workers to qualify as entry-level Irrigation Technician positions in the Southern California Landscape industry. The landscape industry is a major market at home and abroad (U. S. Department of labor, 1998; Association Generales des Producteurs de mais, 1999). Irrigation Technicians are an essential part of this industry (Shank, 1998).

San Bernardino County, in Southern California, is the largest County in the State. Between 1993 and 1997 the Landscape and Horticultural services industries (Standard Industrial Classification code 0780) employee population expanded 130%. Average payroll expanded 145%. In 1997, it was the third largest employment industry in the United States. This trend is reflected throughout the Country. Indications suggest that the industry will continue to prosper (U. S. Census Bureau, 2000). In 1998, the Irrigation Association surveyed the top 100 landscape irrigation contractors in the country. Their number one industry concern was better trained job applicants (1998a). Landscape Irrigation Technicians are a crucial component of the landscape irrigation business (Shank, 1998). There is a genuine need for properly trained landscape Irrigation Technicians in this growing industry.

The Target Audience

On March 28, 2000, National Public Radio announced that an estimated 88% of American adults living below the poverty line were employed (KVCR 91.9 FM San Bernardino Ca.). These represent hard working citizens who lack the skills to advance in today's economy. These adults living in Southern California, who possess low academic prospects, are the target audience for this academy. Some will already be employed in the irrigation industry, but a present, they are only qualified to earn poverty wages. Research suggests opportunities to develop the required skills for career advancement in the irrigation trade are not available for this disadvantaged workforce.

Significance of the Technician

Arguably, the single most important ingredient in landscaping is irrigation. Plants must have water or they die. Available water supplies are dwindling (Association Generales des Producteurs de mais, 1999; Thurston, 1999). What is available, must be used efficiently. Water conservation is the primary concern of the Irrigation Technician (Basanese, 1998). Irrigation Technicians have to apply a multitude of skills derived from several different trades (Corona/Norco Unified School District, 1999). These include a working knowledge of:

1. Electricity.
2. Hydraulics.
3. Computer programming.
4. Ornamental plants.
5. Soil/water/plant relationships.
6. Heavy equipment.
7. Power equipment (Corona/Norco Unified School District, 1999; Mitchell, 1998).

Technicians must problem solve using higher cognitive domains (Mitchell, 1998; Namba, 1999). Almost all problems encountered by technicians, start at Bloom's Taxonomy "Evaluation" level (Bloom, 1969; Gronlund, 1993).

Describing the Job, and the Technician

Irrigation Technicians are responsible for solving most technical problems in landscape irrigation (Mitchell, 1998). Technicians have to be skilled in basic sprinkler design concepts, basic horticultural, and a wide range of construction techniques. They must stay current on developing technology (Barnes, 1999; Irrigation Association, 1999; Shank, 1998). Examples include:

1. Applied use of soil sensors (control or report on the moisture needs of the soil).
2. Fertigation Techniques (applying fertilizer through the irrigation system).

3. Global Positioning Systems (GPS).

4. Global Information Systems (GIS).

5. Fault finders (Wire and broken wire locating devices).

6. Computer networked satellite systems (Barnes, 1999; Burt, 1999; Corona/Norco Unified School district, 1999; Dyer, 1999; Irrigation Association, 1998b; Shank, 1998; Walter, 1999).

Southern California's Landscape irrigation industry is fast passed. Technological advances in landscape irrigation are an ongoing process. Irrigation Technicians must stay abreast of changes in industry technology (Barnes, 1999; Burt, 1999; Dyer, 1999; Irrigation Association, 1998b; Shank, 1998; Walter, 1999).

Irrigation Technicians differ from other irrigation employees. They have the ability to problem solve, and work on problem systems in uncomfortable situations (Mitchell, 1998; Namba, 1999). Dedication and complex problem solving skills are the basis of their great demand (Namba, 1999).

Current Educational Opportunities

Most Technicians start by working in the field, then proceeded to either a trade school or a college. Trade schools and colleges have academic minimums. Irrigation Technicians must be able to read, write, and perform

mathematical calculations prior formal instruction (Winter Catalog, 1999-2000).

Colleges and Universities

Several colleges offer irrigation courses. California State Polytechnic Universities in Pomona and San Louis Obisbo offer formal irrigation technology curricula. California State Polytechnic University in Pomona offers a Landscape Irrigation Systems major (Winter Catalog, 1999-2000). Most curricula are offered under the School of Engineering.

Kansas State University offers an Irrigation Association based course. It is operated under the Department of Horticulture, Forestry, and Recreation Resources (Reaves, 1999). These classes are designed to bring college students to the level of Golf Course Irrigation Technicians.

Internet

Internet sites offering simple design lessons. Jess Stryker simplified the content of Pomona's California State Polytechnic University Landscape Agricultural Engineering Irrigation Classes developed by Professor Yo Tsi Hung Ph.D. It was published on the Internet (Stryker, 1999). Many facts and figures are based on manufacturer's laboratory tests, which do not always match field conditions. Such limitations

are not validated to the reader. No solutions are offered for anomalous situations.

Retailers

Books and pamphlets available through venders are intended for retail use. Landscapers use them as well (Home Base, 1999; Orbit, 1999; Rain Bird, 1999; Toro, 1995). Over simplified contents limits effectiveness. Crucial design aspects such as imperfect spacing situations, performance limitations, proper selection of related materials, hydraulic limitations, and geographic considerations, are omitted.

Manufacturers

Technical tips for irrigation contractors are available through Hunter Industries. They are published monthly. A full volume of their technical information is available on Compact Disk (Hunter Headlines, 1999). This information is limited to basic technical applications and does not include lessons.

Technical Manuals

Available Technical Manuals generally require high cognitive levels of understanding. An example is the Hunter Industries Technical Manual (Hunter, 1996). It uses several irrigation and landscape irrigation formulas that require prior knowledge of applied algebra.

Industry Seminars

Occasionally, irrigation product manufacturers offer design seminars. These are limited to basic design applications. Students have to be able to read and use math prior to attending (Toro University, Beginning Irrigation Design School, Intermediate Irrigation Design School). These seminars are used as advertisements. Formulas or techniques may be altered to prejudice the student to their product.

Certification

The Irrigation Association is presumably the world irrigation leader. It offers a variety of irrigation certificates. These certificates are not easy to obtain. They require high level reading comprehension, demonstrated by the college level textbooks that are often required (Pair, et al., 1983). An Irrigation Association panel reviews applicants prior to acceptance. Irrigation Association Certificate Programs normally coincide with the major irrigation and landscape trade shows (Irrigation Association, 1999). To complete enough certificates to become a qualified technician typically requires years.

Suppliers

Most suppliers use employees with minimal knowledge to educate blue-collar workers. Some use staff experts. These experts are normally former contractors or designers who

failed in their own business ventures. Few are actually qualified. Even fewer have a formal understanding of instructional techniques and teaching skills (Irrigation Association, 1998a).

Usually, a specific product manufacturer carefully prepares instructional material. Information will pilot the learner into depending on a specific product. Lessons are given to the supplier's employees, who present it to the customer. In essence, persons with limited backgrounds are teaching carefully censored material, to an unknowing audience. The existing system is seriously flawed.

Education Summary

A thorough review of available information suggests that an All-Inclusive Irrigation Academy for disadvantaged workers does not exist. Either several years of their lives must be dedicated to on-the-job-training or the technician has to gain entry into a college or university. The majority of training is done as piece-work at the parts supplier level (Irrigation Association, 1998a).

Summary

This grant will fund an All-Inclusive Irrigation Technician Academy for the disadvantaged lower socioeconomic workforce.

Scope of Development

The Scope of Development encompasses the creation and implementation of the funded project.

Description and Rationale

This project will be divided into four phases, all of which would be interwoven to generate a fifth phase: (1) Analysis; (2) Design; (3) Development; (4) Implementation; and (5) Control, the link common to all the phases. All of the data collected will be evaluated and approved for use prior to advancing to the next phase. Each phase requires a different avenue to be traversed prior to completion. The workload will be divided amongst the development staff, which includes paid staff members, volunteers, consultants, and an Academy Development Advisory Professor.

Analysis Phase

The Analysis phase produces four pieces of information:

1. Defines the need for training.
2. Defines the target audience.
3. Describes the tasks of the target audience.
4. Defines the expected outcomes of training.

Design Phase

The Design phase will produce four pieces of information: (1) Development of the Performance Objectives;

(2) Organize the Performance Objectives into meaningful units and into a meaningful sequence; (3) Select the most appropriate instructional methods; and (4) choose the most effective media for presenting instruction.

Development Phase

The Development phase will produce three pieces of information: (1) The creation of lesson plans; (2) lesson materials for the instructor; and (3) lesson material for the students. This will be followed by a test to assess the instructional viability of the training materials.

Implementation Phase

The implementation phase, outside of sample audiences for evaluative purposes, is limited to an incomplete portion of this segment. The grant being sought will not include monies for the implementation of the Academy. The Implementation Phase will concentrate on three areas: (1) Developing an instructional agenda draft; (2) Establishing criteria for the learning environment; and (3) Soliciting funds for the physical implementation of the academy.

Control Phase

The Control Phase will place structural guidelines on all the other phases of development. These guidelines will enforce high-level accountability and force the academy to stay on task. This will be accomplished by determining the

evaluation standards for each goal. Immediately after each goal is defined, an evaluation standard will be conceived. Figure 3 crudely defines interrelationship between Analysis, Design, Development, Implementation, and Control/Evaluation:

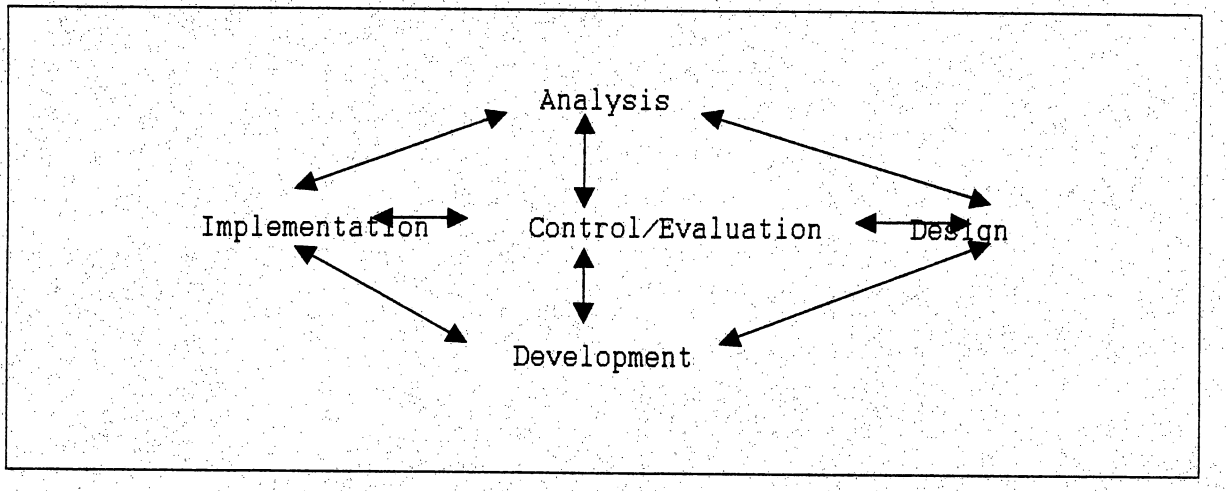

Figure 1. The ADDIC/ADDIE Model

(Source: Bullard, et al., 1994; Hutton, J. [Included in a Southern Illinois University at Carbondale's satellite campus in Moreno Valley, California, Workforce Development and Education class] 1997).

Describing the Staff

Job requirements will be defined. The following is a preliminary outline. Actual job descriptions will be solidified through interaction with the Advisory Professor and some Industry Subject Matter Experts.

Academy Development Director

This will be a full-time position. The Director is responsible for:

1. Overseeing the development of the entire academy.
2. Consulting with the Advisory Professor.
3. Most of the initial foundation work.
4. Most of the cognitive developmental decisions.
5. Setting up a reliable and legal system for management and disbursement of funds.

Secretary

This would be a full-time staff member. The secretary's responsibilities include:

1. Organizing and maintaining the flow of paperwork.
2. Making and confirming appointments.
3. Maintaining staff schedules and time reports.
4. Maintaining financial records.
5. Maintaining capital-related documents and reports.
6. Preparing and dispensing monies.
7. Proof-reading reports and writing letters.
8. Assisting with presentations.
9. Following up on contacts, appointments, and surveys.
10. General housekeeping in the office.

11. Responsible for the overall operation of the office functions.

Part-Time Employees

The primary source of part-time help should come from the local colleges and universities. Students working on major projects, theses, or internships can take advantage of the academy development process to help fulfill their scholastic requirements. They would be limited to 20 paid hours of work per week. These persons would be responsible for:

1. Data collection and reporting.
2. Research.
3. Overseeing simple assignments.
4. Evaluating processes and procedures.
5. Making presentations and attending meetings.
6. Designing performance objectives.
7. Organizing instructional presentations.

Consultants and Subject Matter Experts

These parties would be a combination of paid consultants and volunteers. Individual expertise would determine their actual job functions. Some of the areas the consultant's services would be used are:

1. Business.
2. Computer Technologies.

3. Legal.

4. Educational.

5. Electrical.

Advisory Professor

This person's responsibilities would include:

1. Formulating articles of operation.

2. Guiding the Academy development process.

3. Attending review and progress meetings.

4. Overseeing large expenditures.

Instructional Goals

Goals of this academy are broad based. This is necessary to encompass the variety of topics and competencies that comprise a well-rounded educational experience. The academy goals are presented alphabetically by type or category (e.g. electrical, hydraulics, soils, etc.).

Business Concepts Goal:

Students will understand established and proven business practices.

Computer Applications Goal:

Students will understand computer applications as applied to the irrigation trade.

Designing Goal:

Students will know how to design and evaluate simple residential, commercial, and municipal sprinkler irrigation systems.

Drafting Goal:

Students will know how to produce and evaluate simple but professional irrigation designs in blueprint form.

Electrical Goal:

Students will understand electrical concepts that pertain to the field of irrigation.

Employment Preparation Goal:

Students will know how to prepare for job interviews as Irrigation Technicians.

Future Trends and Issues Goal:

Students will understand the importance of following industry trends and issues.

Hand Tools Goal:

Students will know how to effectively use hand tools in the irrigation trade.

Hydraulics Goal:

Students will understand how to apply hydraulic engineering concepts to solve problems, and design sprinkler systems.

Identification of Parts Goal:

Students will know how to reference and use common irrigation parts.

Mathematics Goal:

Students will understand how to apply mathematical concepts to the irrigation trade.

Mechanized Labor Goal:

Students will know the safe and effective operational techniques for mechanized labor.

Miscellaneous Goal:

Students will acquire a working knowledge of the less vital aspects of the Irrigation Technician trade.

Participation Goal:

Students will understand the advantages of teamwork and peer tutoring.

Power Tools Goal:

Students will know how to safely and effectively use and care for power tools.

Product Reviews and Testing Procedures Goal:

Students will develop viable product evaluation procedures.

Repair Techniques Goal:

Students will understand practical repair procedures and associated evaluative techniques.

Report Writing Goal:

Students will know how to produce readable, usable, accurate, and timely irrigation related reports.

Resource List Goal:

Student will understand the importance of resource lists.

Setting Irrigation Controllers Goal:

Students will know how to program typical residential and small to medium commercial irrigation controllers.

Soft-skills Goal:

Students will understand how to apply soft-skills.

Soils Goal:

Students will understand soil-water-plant relationships as they pertained to designing, scheduling, troubleshooting, and installing simple landscape irrigation systems.

Spatial/Abstract Thought Applications Goal:

Non-spatial and non-abstract intelligence students will understand the body of knowledge and skills necessary to function well as an Irrigation Technician.

Survey Fundamentals Goal:

Students will know how to apply simple surveying techniques.

Transposing Blueprints Goal:

Students will understand how to transpose design information from the blueprint to the job site.

Troubleshooting Goal:

Students will know how to resolve irrigation problems in the field.

Updating Information Goal:

Students will know about industry product changes and developing technologies.

Itemized Expense Work Sheets

FIXED EXPENSE ITEMS	FREQUECY	AMOUNT	TOTAL
Personnel			
• Director's salary	Monthly	3,800	45,600
• Est. Benefits and Taxes (15%)	Monthly	570	6,840
• Secretary's salary	Monthly	1,920	23,040
• Est. Benefits and Taxes (15%)	Monthly	288	3,456
• Part Time Employee x 2	Monthly	1,120	13,440
• Est. Taxes (11%)	Monthly	123	1,476
	Sec. Total		93,852

Equipment			
• PC w/ multimedia production capabilities.	Initial	2,000	2,000
• PC for secretary	Initial	500	500
• Lap Top w/ multimedia presentation capabilities.	Initial	1,500	1,500
• Printer/Fax/Copier	Initial	650	650
FIXED EXPENSE ITEMS	**FREQUECY**	**AMOUNT**	**TOTAL**
• Desktop Printer with multimedia quality output.	Initial	1,200	1,200
• Used office desk.	Initial	200	200
• Used Secretaries desk.	Initial	200	200
• Office Chairs x 3.	Initial	70	280
• Used conference table.	Initial	300	300
• Conference chairs x 6	Initial	40	240
• PowerPoint Projector & Screen.	Initial	5,000	5,000
• TV/VCR Combination.	Initial	300	300
• Digital Camera.	Initial	500	500
• County Licensing fees	Initial	29	29
• Fictitious Business Name Statement(newspaper).	Initial	50	50
• 10% miscellaneous expenses	One time	1,287	1,295
	Sec. Total		14,244

• Office space.	Monthly	1,000	12,000
• Insurance.	Monthly	120	1,440
• Utilities and maintenance fee.	Monthly	175	2,100
	Sec. Total		15,540
VARIABLE EXPENSE ITEMS	**FREQUECY**	**AMOUNT**	**TOTAL**
• Academy Development Advisory Professor (est. 10 hours/month).	Monthly	1,500	18,000
• Other consultants (est. 10 hours/month).	Monthly	650	7,800
• Telephone expenses.	Monthly	150	1,800
• Travel Expenses (est. includes gas, lodging, and food).	Monthly	600	7,200
• Air Travel (est. included airfare and rental car for one trip/month).	Monthly	800	9,600
• Office supplies (est. included outsourcing major printing jobs).	Monthly	300	3,600
• 10% oversight expense.	Preliminary	4,800	4,800
	Sec. Total		52,800
		Grand Total	176,436

Figure 2. The Itemized Budget Worksheets

Proposal Planning Checklist

1. Was the need for the project identified?

   Yes. Reference the Need section. There is a very real demand for Irrigation Technicians in the Southwestern United States Landscape industry.

2. Was the need validated?

   Yes. Reference the Literature Review Need section. More than 30 references were cited in support of the need.

3. Was the project realistic?

   Yes. Supporting documentation is found in the Literature Review.

4. Were the potential benefits of the project identified?

   Yes. Reference the Need section. By obtaining proper funding an all-inclusive preparatory vocational education instructional academy could be realized.

5. How, if at all, would the project affect other agencies?

   It would rely on commitments from at least one school, since using an existing classroom is the intent. Supportive agencies such as rental yards and industry suppliers would be tapped for time

and materials. Industry manufacturers would be called upon to assist with presentations and funding, either directly or through donations of materials.

6. Could it be funded?

   Yes. The need is far too great and the availability of such programs is rare.

Summary

This proposal holistically justified the need for project funding. Mission statements and objectives provided insight into the nature of the Irrigation Academy. The literature review corroborated the need by addressing important considerations. The scope of development was outlined in detail. Instructional concerns were categorically identified, and goals developed. A final review used a proposal-planning checklist. It reconfirmed the validity of this project. The proposal is ready to implement.

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