

Development of a Career Awareness Program for Students in Grades Eleven and Twelve

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This paper describes the background and process of developing a Career Awareness Program for high school students in grades eleven and twelve. It discusses not only the need for the program but some of the findings concerning the age at which students apparently become able to focus on a career decision. The paper describes a multi phase career awareness program with a specific script for a student presentation to be given by any construction professional.

Key words: Career Awareness, High School, Career Decisions

Introduction

Construction is one of the worlds oldest and largest industries, then why is it that there is not an abundance of persons choosing construction as a career. While the reason may be multi faceted and complex one reason is that there is a lack of current information available for those choosing careers to review. Not only must this information be available but also it must be available at the proper time to be valuable.

This project will involve the development of a Construction Industry Career Awareness program. This program will be initially targeted at students in grades eleven and twelve. The project has been composed of the following six phases.

Program Development

Phase One: Development of list of source organizations

The first phase of this project involved the development of a detailed list of potential source organizations that have readily available educational material that will be appropriate to include in any career awareness program. A detailed compilation of organization names, addresses, phone numbers and contact persons has been developed. These organizations are listed in Appendix I:

Phase Two: Organization Inquiries

The second phase of this project involves the mass mailing of requests for information to all of those listed in the previous phase. A form letter was developed to request any career awareness information the organization might already have.

Phase Three: Receipt and cataloging of the information

The third phase of this work involved the receipt, review and cataloging of the information received from our request mailed out in Phase Two. Appendix II is a listing of the information received.

Phase Four: Development of the preliminary career awareness program

This phase involved the development of the preliminary draft of the career awareness program that the program developer was able to test in the next phase.

Program Testing

Phase Five: Preliminary testing of the program

During the course of the work stipulated in the grant the program developer saw an opportunity to broaden the scope and enhance the work product by testing the preliminary career awareness presentation. The program developer pursued and was given the opportunity to host a meeting of 100 career guidance counselors from the Dade County Public School system at F.I.U. At this meeting the program developer presented a lot of the material the program developer had developed during the course of this project as a pilot to determine its effectiveness. After the meeting the program developer received numerous comments and feedback on the presentation which the program developer incorporated into the final presentation.

In addition, as a result of this presentation, the program developer was invited to give a personal Career Awareness presentations to the students at several Dade County High Schools. The program developer was able to give 18 career awareness presentations to a total of over 400 senior high school students. The experience gained through these presentations was invaluable in the refinement of this Career Awareness program.

Program Observations

The experienced gained in the presentation of the prototype Career Awareness Presentation to over four hundred high school students in 18 classes has lead this investigator to the following observations.

1. The Florida School system is divided into three grade-grouping components. The first component is the elementary school comprised of students in grades one through five,

these students range in age from 6 to 11. The second component is the Middle School that groups grades six, seven and eight. Students in middle school generally range in age from 12 to 14. The third component is the High School with the grouping of grades nine, ten eleven, and twelve. Students in high school range in age from 15 to 18.

The concept of seriously considering a career is something that must be accompanied by the students' general maturity. Didn't many of us, at one time or another, want to be cowboys, astronauts or models. As we matured each of us a different rate, we at some point in time began to seriously examine career possibilities. Being a cowboy was most of the time no longer a consideration. The intent of this research project was to develop a career awareness program for students in grades seven through twelve. As previously stated the program developer have made presentations to many students within the nine to twelfth grade range and have found a vast difference in the maturity level of students between the ninth and twelfth grades. The ninth and tenth grade students are often still in the honeymoon stage of career consideration. While no longer really considering being a cowboy it still seems the only careers which excite them are careers like a fighter pilot, navy seal, secret agent etc. The program developer found the tenth, eleventh and twelfth graders to be substantially more mature when it comes to career consideration. They listen attentively and tend to ask more relevant questions.

Because of the disparity in the maturity of students in the ninth and tenth grades and those in the eleventh and twelfth grades which ultimately affects their ability to receive and understand the message the program developer have concluded that any Career Awareness Presentation of this nature be focused at students in the eleventh and twelfth grades. A much more superficial awareness presentation could be developed at a later date to expose younger students in the lower grades.

2. While these types of career awareness presentations are helpful, most high school students have an inherently short span of attention. They also tend to have rather short memories when it comes to things such as information presented to them such as this. The experiences the program developer have had lead me to believe that the best and most effective way of disseminating the information about construction as a career choice to the students may not be by presentations directly to the students but through both the guidance counselors and the general school faculty.

Many high schools have career awareness presentations, meetings or demonstrations which are held for faculty and guidance counselors only. In as much as the guidance counselors and general faculty have the most interaction with and trust of the students it is only logical to attempt to educate these individuals about the advantages of a career in construction and let them carry the banner to the students.

3. In addition to the career awareness presentation that can be personally given to the high school faculty or guidance counselors, a self-contained self-explanatory construction career information package can be distributed to the guidance counselors at each school.

Career Awareness Day Presentation to Students in Grades Eleven and Twelve

There appears to be two distinct types of High School career awareness day presentations. The first and least common is the formal 30-minute to 60-minute presentation given in an auditorium, meeting room or specially prepared classroom. In this presentation the presenter has at his or her disposal all of the equipment required to complete the presentation including TV and video tape player, overhead projector and screen, black or white board etc. The presenter is generally alone i.e., a singular subject presentation or perhaps with one or two other presenters from different careers. One of the key elements of this type of presentation is that the presenters remain in the same space while the audience changes, as students file in and out during breaks between presentations. This is the preferable method of presentation because of the following advantages:

1. The presentation space remains constant, giving the presenter an additional comfort level with the acoustics and lines of sight.
2. The equipment is available and positioned as required by the presenter to facilitate a smooth presentation. The resulting smoothness of presentation allows the presenter to retain the attention of the audience throughout the presentation.
3. There is no additional time lost for set up and take down between presentations.

The second and most common type of presentation is when the students remain in their classes and the presentation is asked to travel from class to class to make the presentation. These presentations generally last from 5 to 10 minutes. Disadvantages to this type of presentation include the following:

1. The presenter does not always have the required equipment since all classrooms are equipped differently. This can be extremely detrimental to a multi media based presentation.
 2. There is significant time lost and effort expended in the setting up and taking down of presentation materials.
 3. In general this type of presentation results in a less polished appearing presentation than the longer type of presentation.
 4. Students are bombarded with 5 to 6 presentations per hour over a two to three hour period. Student fatigue generally sets in after the first three or four presentations. This fatigue ultimately results in the students' loss of concentration on the material presented.
- Appendix III is prototype outlines of the two types of Career Awareness Day Presentations.

Budget for the further development of these Career Awareness Information Packages. The following, Table 1, is a budget for the printing of these Career Awareness packages.

Recommendations

The following are recommendations for future work in the career awareness area.

Table 1

Printing Budget

Item	Price
1. Career Information Packages for Career Guidance Counselors - 2000 copies	
printed cover 8.5X11 Brochure folder glossy one color	\$1900.00
printed cover 8.5X11 Brochure folder glossy two color	\$2071.00
2. Four tier information inserts - 2000 copies	
Four tier (4 sheet) insert on heavy weight paper B/W	\$85.00
Four tier (4 sheet) insert on heavy weight paper one color	\$103.00
3. Four tier information inserts - 2000 copies	
Four tier (4 sheet) insert on card stock B/W	\$91.00
Four tier (4 sheet) insert on card stock one color	\$111.00
4. Brochure handout to students - 10,000 copies	
8.5X11 trifold brochure with 4 photos on flat card stock B/W	\$1267.00
8.5X11 trifold brochure with 4 photos on flat card stock one color	\$1327.00
5. Brochure handout to students - 10,000 copies	
8.5X11 trifold brochure with 4 photos on glossy card stock B/W	\$3372.00
8.5X11 trifold brochure with 4 photos on glossy card stock one color	\$3878.00
6. Overhead projector slides (transparencies) - 200 copies	
(24 originals) 8.5X11 Overhead Projector Slides B/W	\$2400.00
(24 originals) 8.5X11 Overhead Projector Slides one color	\$4800.00
(24 originals) 8.5X11 Overhead Projector Slides two color	\$4800.00
7. Overhead projector slides (opaque copies) - 2000 copies	
(24 originals) 8.5X11 Brochure inserts 20lb bond B/W	\$1785.00
(24 originals) 8.5X11 Brochure inserts 20lb bond one color	\$2031.00
(24 originals) 8.5X11 Brochure inserts 20lb bond two color	\$2591.00
8. Overhead projector slides (opaque copies) - 2000 copies	
(24 originals) 8.5X11 Brochure inserts glossy B/W	\$6336.00
(24 originals) 8.5X11 Brochure inserts glossy one color	\$6850.00
(24 originals) 8.5X11 Brochure inserts glossy two color	\$8127.00
9. Youth Fair Presentation Boards - 200 copies (2 boards each)	
30X42 mounted on foamcore	\$4000.00

1. Production

- a. Production of the prototype career awareness packages developed in this work. The next step in this process should be to select the style i.e. paper, color etc. of the final presentation format and begin production.

2. Distribution

- a. The second step would be the development of a distribution matrix that would define exactly which individuals across the state would receive copies of the career awareness package.
- b. This list would probable include, at a minimum, all high school career guidance counselors across the state.
- c. The final career awareness package would then be distributed to those defined on the list.

3. Career Awareness Training

- a. A further phase of this work would involve the development of a career awareness training session which would be given throughout the state to prepare

persons to go into the high schools and make comprehensive, exciting career awareness presentations.

4. Development of a Multi-Media computer presentation.
 - a. A final phase of this career awareness package would be the development of a self contained Multi-Media Career Awareness Presentation which would be contained on a CD ROM. This CD would be a totally self contained presentation incorporating overhead projector type slides, photos, text, video and sound. It would be distributed to those on the distribution matrix for use in either the career guidance counselor's office of the school library. It could also be distributed to community colleges and universities.

Appendix I

Air Conditioning And Refrigeration Institute
1815 North Fort Myer Drive
Arlington , Virginia 22209

Air Conditioning Contractors of America
1513 16th. St., N.W.
Washington , DC 20036

American Building Contractors Assoc.
12123 Woodruff Ave.
Downey , CA 90241

American Iron And Steel Institute
1000 16th. Street NW
Washington, DC 20036

American Plywood Association
P.O. Box 11700
Tacoma, Washington 98411

American Society for Concrete Construction
1902 Techny Ct.
Northbrook, IL 60062

American Society for Testing and Materials
1916 Race St.
Philadelphia, PA 19103-1187

American Subcontractors Association
1004 Duke St.
Alexandria, VA 22314

American Wood Council
1250 Connecticut Ave. N.W., #200
Washington, DC 20036

ASHRAE
1791 Tullie Circle N.W.
Atlanta, GA 30329

Asphalt Roofing Manufacturers Association
6000 Executive Blvd., Suite 201
Rockville , MD 20852

Associated Builders Contractors
1300 N. 17th St., 8th Floor
Rosslyn, VA 22209

National Association of Home Builders
1201 15th St., N.W.
Washington, DC 20005

National Association of Minority Contractors, Inc.
806 15th St., Suite 340
Washington, DC 20005

National Association of Plumbing-Heating-Cooling
Contractors
180 S. Washington St., P.O. Box 6808
Falls Church, VA 22040

National Association of Tile Contractors
626 Lakeland East Drive
Jackson, MS 39208

National Association of Women in Construction
327 S. Adams St.
Fort Worth, TX 76104

National Concrete Masonry Association
P.O. Box 781, 2302 Horsepen Road
Herndon, VA 22070

National Electrical Contractors Association
7315 Wisconsin Ave.
Washington, DC 20014

National Fire Protection Association
P.O. Box 9101
Quincy, MA 02269

National Frame Builders Association
4840 W. 15th. St. 1000
Lawrence, KS 66049-3876

National Hardwood Lumber Association
P.O. Box 34518
Memphis, TN 38184-1818

National Institute of Building Sciences
1201 L St., N.W., Suite 400
Washington, DC 20005

National Mechanical Contractors Assoc.
c/o Tom Obert Associated Builders and Contractors.
1300 N., 17th. St.
Rosslyn, VA 22209

Associated General Contractors of America
1957 E St., N.W.
Washington, DC 20006

National Roofing Contractors Association
O'Hare International Center
10255 W. Higgins Rd., Suite 600
Rosemont, IL 60018

Associated Sheet Metal Contractors, Inc.
3000 W. Hallandale Beach Blvd.
Hallandale, FL 33009

National Spa and Pool Institute
2111 Eisenhower Avenue
Alexandria, VA 22314

Bruce Engineering Company
2000 Tucker Industrial Rd.
Tucker, GA 30084

National Wood Window and Door Manufacturers
Association
1400 East Touhy Avenue, Suite g-54
Des Plaines, IL 60018

Cast Iron Soil Pipe Institute
5959 Shallowford Rd., Suite 419
Chattanooga, TN 37421

Plumbing, Heating, Cooling Information Bureau
3 Illinois Center
Chicago, IL 60601

Ceiling and Interior Systems Construction Association
5700 Old Orchard Rd., 1st Floor
Skokie, IL 60077

Portland Cement Association
5420 Old Orchard Rd.
Skokie, IL 60077

Ceramic Tile Institute of America
700 N. Virgil Avenue
Los Angeles, CA 90029

Prestressed Concrete Institute
20 N. Wacker Drive
Chicago, Illinois 60606

Drywall, Lath, and Plaster Bureau c/o W.F. Pruter
Associates
3127 Los Feliz Blvd.
Los Angeles, CA 90039

Professional Women in Construction
342 Madison Ave. Rm. 451
New York, NY 10173

Electrical Contractors Council c/o Tom Obert Associated Sheet Metal and Air Conditioning Contractors' National
Builders and Contractors
1300 N., 17th. St.
Rosslyn, VA 22209

Association
4201 Lafayette Center Drive
Chantilly, VA 22021

Flat Glass Marketing Association
3310 S.W. Harrison St.
Topeka, KS 66611-2279

Small Homes Council-Building Research Council
1E St., Mary's Rd.
Champaign, IL 61820

Gypsum Association
810 1st St., N.E., Suite 510
Washington, DC 20002

Standard Building Code/Southern Building Code
Congress International
900 Montclair Rd.
Birmingham, AL 35213

Hardwood Manufacturers Association
400 Penn Center Blvd., Suite 530
Pittsburgh, PA 15235

Steel Joist Institute
12405 48th St. N., Suite A
Myrtle Beach, SC 29577

Hardwood Plywood & Veneer Assoc.
1825 Michael Farraday Drive P.O. Box 2789
Reston, VA 22090

Tile Contractors Association of America
112 N. Alfred St.
Alexandria, VA 22314

International Association of Plumbing and Mechanical
Officials
20001 Walnut Dr. S.
Walnut, CA 91789

Truss Plate Institute
583 D'Onofrio Drive
Madison, WI 53719

International Conference of Building Officials
5360 W. Workman Mill Rd.
Whittier, CA 90601

Urethane Foam Contractors Association
4302 Airport Blvd.
Austin, TX 78722

International Council of Employers of Bricklayers and
Allied Craftsmen
Mason Contractors Association of America
1550 Spring Rd., Ste. 320
Oak Brook, IL 60521

US Chamber of Commerce Construction , Housing, and
Community Development
1615 H St. N.W.
Washington, DC 20062

International Institute for Lath and Plaster c/o W.F. Pruter
Associates
3127 Los Feliz Blvd.
Los Angeles, CA 90039

U.S. Department of Commerce
14th St. and Constitution Ave., N.W.
Washington, DC 20230

Kitchen Cabinet Manufacturers Association
1899 Preston White Drive
Falls Church, VA 22091

U.S. Government Printing Office Superintendent of
Documents
N. Capitol and H Streets, N.W.
Washington, DC 20405

Masonry Contractors Association of America
17 W. 14th St.
Oak Brook Terrace, IL 60181

Western Lath, Plaster, Drywall Contractors Association
8635 Navajo Rd.
San Diego, CA 92119

Mechanical Contractors Association of America
1385 Piccard Drive
Rockville, MD 20850

Western Wood Products Association
Yeon Building 522 S.W. 5th Ave.
Portland, OR 97204

Metal Building Manufacturers Association c/o Thomas
Associates, Inc.
1300 Summer Ave.
Cleveland, OH 44115

Wood Truss Council of America
5937 Meadowood Drive, Suite 14
Madison, WI 53711

Metal Construction Association
1133 15th St., N.W., Suite 1000
Washington, DC 20005

Appendix II

American Institute Of Steel Construction
One East Wacker Drive, Suite 3100
Chicago, IL 60601-2001
Brochures: "Steel career opportunities."

American Society for Heating, Refrigerating and Air Conditioning Engineers
1791 Tullie Circle, N.E.
Atlanta, GA 30329
Brochures: "Engineering and you." National Society of Professional Engineers
Brochures: "Careers in heating, ventilating, air conditioning and refrigeration."
Brochures: "Your future in air-conditioning, heating and refrigeration industry."
Brochures: "Career profiles in ventilating, air conditioning and refrigeration."

Associated General Contractors of America
1957 E Street, N.W.
Washington, D.C. 20006
Brochure describing career opportunities for men and women in the construction industry.

Glass Association of North America
3310 S.W. Harrison St.
Topeka, KS 66611-227
Brochure: "Glass industry's most used manuals available through; Glass Association of America."
Brochure: Publications price list.

International Congress of Building Officials
5360 Workman Mill Road,
Whittier, CA 90601-2298
Brochure: "Modern building inspection; a dynamic rewarding career"

International Association of Plumbing and Mechanical Officials
20001 Walnut Drive South
Walnut, CA 91789-2825
Letter suggesting that we contact the "National Association of Plumbing Heating and Cooling Contractors."
At: 1-800-533-7694.

Metal Building Manufacturers Association
1300 Summer Avenue
Cleveland, OH 44115
Video: "Metal building systems: images of the future."

National Association of Home Builders
1201 15th. Street, N.W.
New York, NY 10005-3902
Brochure: "Home Builders Institute: trained and real"
Brochure: "Skills; job corps, train for your future."
Brochure: "Student chapters; building the future."
Brochure: "Home Builders Institute; the educational arm of the National Association of Home Builders."
Letter: information about "Miami Job Corps center."

National Association of Plumbing, Heating, Cooling Contractors & Mechanical Contractors Of America
180 S. Washington St.
Falls Church, VA 22046
Brochures: "Your pipeline to hot careers and cold cash Careers in the plumbing & HVAC industry."
Brochure: "Management & engineering careers in mechanical contracting. Take your career to the max."

Form to order the booklet "Your pipeline".
Form to order video & brochure "Take your career to the max."
Video: "Your pipeline to hot careers and cold cash; careers in the plumbing and HVAC industry." Rt: 9:39

National Association of Tile Contractors
626 Lakeland East Drive
Jackson, MS East 39208
Brochure: "Career craftsmanship." By the Lighthouse Group Address 901 Montgomery Highway,
Birmingham, Al 35216

National Electrical Contractors Association
16201 Trade Zone Ave., Suite 105
Upper Marlboro, MD 20772
Brochure: "Electrical apprenticeship." By the National Joint Apprenticeship and Training Committee

National Fire Protection Association
1 Batterymarch Park,
Quincy, MA 02269-9101
Brochure: "Fire protection engineering."
Brochure: "National Fire Academy: open learning fire service program."
Brochure: Fire protection information and career opportunities.
Article: "National fire academy issues higher education challenge." Fire Engineering, March 1994.
Article: "FPE educators on international programs." NFPA Journal January/February 1993
Educating the fire protection engineer." Fire Journal, September/October 1989
Article: "Protective service occupations and compliance inspectors." Reprinted from the Occupational
Outlook Handbook, 1994-1995 edition
Article: "Fire fighters and inspectors." Chronicle Guidance Publications, J January 1995.
Career summary: "Firefighter", Careers inc. January 1995.

National Frame Builders Association
4840 West 15th. Street, Suite 1000
Lawrence, KS 66049-3876
Brochure: "Why NFBA?, What is NFBA?: The only trade association representing the post-frame
industry."
NFBA membership application

National Roofing Contractors Association
10255 W. Higgins Road, Suite 600
Rosemont, IL 60018-5607
Roofing career video
Study guide for roofing career video
Guide of NRCA affiliate organizations

Portland Cement Association
5420 Old Orchard Road,
Skokie, IL 60077-1083
Brochure: "Portland cement & concrete: a brief guide to the industry, its products, & resources."

Society for Women Engineers
120 Wall Street-11th. Floor
New York, NY 10005-3902
Brochure concerning women in the engineering field

Standards for Materials, Products, Systems & Services
100 Barr Harbor Drive
West Conshohocken, PA 19428-2959

Magazine: "Standardization news", vol. March 1996
Brochure: "What is ASTM?"
Brochure: "Advantage; the ASTM advantage: credibility, quality and market acceptance."
Catalog: "1995 ASTM publications catalog."

U.S. Government Printing Office
Superintendent of Documents
Washington, DC 20402

Occupational Outlook Handbook: Information for sale from the U.S. Government Printing Office.
Special ordering information for State and Local Institutions.
United States Government Information order form.

Western Wood Products Association
Yeon Bldg., 522 S.W. Fifth Ave
Portland, OR 97204-2122

Brochure: "W.W.P.A serving lumber producers"
Brochure: "Rec. Lumber terminology & invoice procedures."
Brochure: "Wood frame design."
Brochure: "Common framing errors."
Brochure: "Picture perfect framing."
Brochure: "From forest to grade stamp."
Brochure: "Environmental information directory."
Brochure: "Product information literature list."

Wood Truss Council of America
5937 Meadowood Dr., Ste. 14
Madison, WI 53711-4125

Brochure: "Framing the American art; a demonstration of the art of framing."
Brochure: "Partition separation: prevention and solutions."
Brochure: "Quiet, capable performance from southern pine floor trusses."
Brochure: "Standard responsibilities in the design process involving metal plate connected wood trusses. WTCA 1-1995."

Miscellaneous information concerning:

- ?? Truss educational programs.
- ?? Order form for publications and services.
- ?? WTCA order form for TPI publications.
- ?? Framing the American art: video/report information.
- ?? Framing the American art: summary of framing facts.
- ?? Building with floor trusses. Order form for publications
- ?? Bracing and erecting wood trusses. Order form for video.
- ?? Partition separation brochure. Order form for brochure.
- ?? Woodwords publication subscription form.
- ?? Metal plate connected wood truss handbook. Order form.
- ?? Letter referring to the recent undertaking of 12 educational slide programs.
 - Storage, handling, installing and bracing of metal plate connected wood trusses.
 - Connectors and tie down's for residential and light commercial construction.
 - Standard responsibilities in the design process involving metal plate connected wood trusses". WTCA 1-1995 engineered wood products.
 - Fire performance of metal plate connected wood trusses.
 - Inspection of installed wood girder trusses
 - Truss history, inspection of installed wood trusses, lumber growth, harvest, transportation, processing and grading.
 - Truss design and truss field repair

Appendix III

CAREER AWARENESS PROGRAM: COMPONENT ONE

Career Awareness Day Presentation One to Students in Grades, Eleven and Twelve

Approximate length: 30 minutes

Overhead projector slides: 25

1. Greeting and Introduction

Overhead projector slide one: Title

A. The presenter should start each presentation with a greeting, i.e. "Good Morning or Good Afternoon". He or she should also thank the host for inviting him or her to make this presentation.

B. The presenter should then introduce his or her self and give a little background about themselves or the organization they represent.

C. The presenter should thank the host for inviting him or her to make this presentation.

Example:

Good morning, my name is Joe Constructor, I am a licensed contractor and member of the local contractors association. I want to thank Mr. Wilson for inviting me to make this presentation on the opportunities and potential of a career in construction.

2. History

Overhead projector slide two: History

A. The presenter should briefly discuss the history of the industry as one of the world's oldest industries.

Example:

One of man's first and still most important requirements is the need for shelter. It was through the creation of man's first shelter that the concept of construction was born. At first it was every man for himself. Then in an effort to build bigger and better dwellings teams of people would be formed to undertake the building. It couldn't have been very long before one person, through assisting several other persons in the creation of their dwellings, became more knowledgeable about the process than those around him. Thus was born the first construction specialist.

3. Definitions

Overhead projector slide three: Typical Owner Contractor Relationship

A. The presenter should briefly introduce and define some of the major players in the industry and their relationship to one another. These should include the following.

- a. Owner
- b. General or Prime Contractor
- c. Sub Contractor
- d. Architect
- e. Engineer
- f. Material Supplier

Example:

The construction of any given building is a fairly complex intertwined process consisting of many different people working together towards a common goal. Before I continue let me introduce some of the prime persons responsible for the construction process.

First we have the OWNER without whom the project would not exist. After recognizing the need for the project one of the first steps the owner takes is the hiring of an architect. The ARCHITECT is responsible for the design of the building. His responsibility includes the development of a set of construction drawings and specifications the contractor will use to construct the building. Assisting the architect are several consulting engineers. These ENGINEERS are responsible for the detailed design of the structural, mechanical, plumbing and electrical system of the building.

Upon completion of his or her work the architect and owners release the drawings and specifications called the construction documents to one or more contractors to bid on the project. Once selected the CONTRACTOR is responsible for the entire construction process. In addition to being responsible for the quality of the construction, the contractor is responsible for making sure the project is progressing on schedule and for the agreed upon cost.

Working for the contractors are several subcontractors. These SUB CONTRACTORS are generally specialty contractors responsible for entire sub parts of the building such as the electrical, plumbing and mechanical systems of the building to name a few.

The people who supply the materials for the project are called material suppliers. The material suppliers supply both the general contractor and the sub contractors.

Overhead projector slide four: Typical Construction Management Relationship

A. The presenter should briefly introduce the concept of the construction manager and describe his or her relationship to others in the industry.

Example

As both the industry and the requirements of Owners become more specialized and complex the need for a new construction professional has developed. This professional is called the Construction Manager. The responsibilities of the construction manager may vary from project to project but in all cases the construction manager acts as the owner's representative during the construction process. In fact in some cases the construction manager actively participates from the inception of the project giving input on the selection of the design professional.

4. Categories of Construction

Overhead projector slide five: Categories of Construction

A. Using the prepared overhead projector slides with attached commentary, the presenter should explain the four major categories of construction.

- a. General Building Construction
- b. Highway Construction
- c. Heavy Industrial Construction
- d. Utilities Construction

Example

The construction industry is a complex network of many types of projects. These projects can be roughly divided into the following our major categories.

General Building construction is the single largest category of construction. It accounts for approximately 60% of the entire industry. Included within the category of general building construction is the construction of all office buildings, schools, apartments, churches, shopping centers, government buildings and almost every other type of shelter need.

The second category of construction is highway construction. Highway construction consists of all highway and roadway construction including the roads themselves, drainage, bridges and landscaping.

The third category of construction is called heavy industrial construction. This category consists of the construction of all heavy industrial uses including but not limited to airports, tunnels, dams, refineries, railroad projects and nuclear power plants.

The fourth category of construction is referred to as utilities construction. It consists of pipeline installations, sanitary sewer facilities, waste water treatment plants and all other utility and service needs.

5. Current Trends

Overhead projector slide six through fourteen

- a. Using the prepared overhead projector slides with attached commentary, the presenter should explain the various segments of the industry and their current trends including but not limited to the following:

Value of Construction

Overhead projector slide Six: Total Value of Construction

Example

The total value of construction in the United States has cycled like most other aspects of the economy, but has generally risen. The current volume of construction in the United States is over 500 billion dollars. Comprising 6% of the country's gross domestic product Construction is one of the United States largest industries.

- b. Office Construction

Overhead projector slide Seven: Total Value of Office Construction

Example

1996 was the busiest year in office construction in five years. With a total current volume of 26 billion dollars, office construction is one of the largest segments of the construction industry.

- c. Retail Construction

Overhead projector slide Eight: Total Value of Retail Construction

Example

The retail construction segments has showed a steady growth since 1992 and is currently estimated at an annual volume of 40 billion dollars.

- d. Single Family Construction

Overhead projector slide Nine: Total Value of Single Family Construction

Example

While dipping slightly in 1997 the single family residential market is still viewed as a strong component of the construction industry. It is currently estimated at 146 billion dollars per year.

- e. Multi Family Construction

Overhead projector slide Ten: Total Value of Multi Family Construction

Example

The volume of multi family construction has steadily risen since 1993 to its current volume of 20 billion dollars.

- f. Educational Construction

Overhead projector slide Eleven: Total Value of Educational Construction

Example

The Educational Construction market has continued to increase over the past 8 years with a current volume of 40.4 billion dollars. In addition the National Education Association predicts a need for 250 billion dollars to repair existing schools.

- g. Hotel Construction

Overhead projector slide Twelve: Total Value of Hotel Construction

Example

After a dip in the early 90's the hotel construction market has increased approximately 1 billion dollars per year to a current volume of 8.7 billion dollars.

- h. Highway Construction

Overhead projector slide Thirteen: Total Value of Highway Construction

Example

Highway construction has continued to increase with a current volume of 45 billion dollars. Because of the general decay of many of the country's highways it is estimated that it will take approximately 150 billion dollars to facilitate the required repairs.

- i. Industrial Construction
Overhead projector slide Fourteen: Total Value of Industrial Construction
Example
The volume of industrial construction has shown a steady increase over the past 5 years to a current volume of 35 billion dollars.
- j. Infrastructure Construction
Overhead projector slide Fifteen: Value of Infrastructure Construction
Example
The volume of construction involving the country's infrastructure including municipal sewer and water facilities has steadily increased to its current volume of 111 billion dollars.

6. Sources of Employment

Overhead projector slide Sixteen, Seventeen and Eighteen: Sources of Employment

A. The presenter should discuss the potential sources of employment i.e. employers including but not limited to the following:

- a. Construction Management Firms
- b. General Contracting Firms
- c. Sub Contracting Firms
- d. Electrical Contractors
- e. Mechanical Contractors
- f. Plumbing Contractors
- g. Governmental Organizations
- h. School Boards
- i. Airport
- j. Port Authority
- k. Building Departments
- l. State Dept. of Transportation
- m. Federal Agencies
- n. Architecture Firms
- o. Engineering Firms
- p. Interior Design Firms

7. Positions

Overhead projector slides Nineteen & Twenty: Positions

A. The presenter, using the attached position descriptions, should discuss the possible positions within the industry, which are available to interested individuals including the following.

- a. Construction Manager
- b. General Contractor
- c. Estimator
- d. Scheduler
- e. Project Manager
- f. General Superintendent
- g. Job Superintendent
- h. Foreman
- i. Journeyman
- j. Construction Engineer
- k. Safety Engineer
- l. Expediter
- m. Clerk of the Works
- n. Building Inspector

Example

- a. Construction Manager: The Construction Manager as previously mentioned acts as the Owner's representative during the entire construction process. He or she will be responsible for reviewing the work

of all parties involved to protect the Owner's interests. The Construction Manager might be brought into the process early enough to give input on the selection of the design professional.

- b. **General Contractor:** The General Contractor as discussed before is often a company owner. He or she must be both a business person and a construction specialist. The General Contractor is responsible for all construction activities dealing with all key individuals on a project including the architect, the owner, the subcontractors and company personnel.
- c. **Estimator:** The Estimator prepares basic data concerning a proposed construction project (usually from plans and specifications-- including quantities of materials, man-hours to perform items of work, methods to be used, equipment required, and with the assistance of other members of the office staff, computes the cost of construction which represents the contractor's competitive bid or the job.
- d. **Scheduler:** The Scheduler is responsible for the preparation of the construction schedule. He or she might also be responsible for reviewing the project schedule as the project progresses.
- e. **Project Manager:** The Project Manager directs all construction functions on the project for the General Contractor. He or She establishes and develops methods, procedures, schedules, and policies for the work. The PM is responsible for coordinating the work of all units and divisions within his company and performs such administrative duties as are required for proper completion of the project.
- f. **General Superintendent:** The General Superintendent directs all on site construction functions for the project. According to established schedules, specifications, methods and procedures the General Superintendent supervises the job superintendents which work under him or her.
- g. **Job Superintendent:** The Job Superintendent directs all construction functions on small or medium size projects or on specific phases of large projects. He or she is responsible for establishing and maintaining proper work schedules, cost control procedures, and quality control methods.
- h. **Foreman:** The Foreman supervises all journeymen of a particular trade working on a project. He or she is responsible for planning the work, maintains schedules, and ensuring proper procedures s directed by the superintendent.
- i. **Journeyman:** The journeyman can be a carpenter, mason, operating engineer, or any member of one of the building trades who performs the work of a particular craft as directed by the foreman.
- j. **Construction Engineer:** The Construction Engineer is responsible for technical aspects of a project including the design, testing and analysis of specifications and materials, planning, surveying, research and other critical factors in the building process. Though referred to as an engineer this individual is often not a registered engineer.
- k. **Safety Engineer:** The Safety Engineer is responsible for setting up job site safety operations, ensuring safety consciousness of employees, ensuring that activities are conducted in accordance with federal and state safety and health regulations and procedures, and providing professional advice on the safety of various construction activities. Again though referred to as an engineer this person is seldom actually a registered engineer.
- l. **Expediter:** The Expediter is generally an entry level position. The responsibilities vary from company to company but he or she is generally responsible for reviewing deliveries, scheduling arrival of materials and men at job sites, establishing work priorities, and obtaining necessary clearances.
- m. **Clerk of the Works:** The Clerk of the Works is also an entry level position. This person is generally located at the jobsite and is responsible for managing and coordination all of the paperwork and submittals for the project.

8. Rewards

Overhead projector slide 20: Rewards

A. The presenter should discuss the rewards of a career in construction. He or she should touch upon both the intangible rewards as well as the tangible rewards.

Example

There are many personal rewards which can be derived from a career in construction. The first is the satisfaction of creating, which is one of the most rewarding feelings a person can experience. The second is seeing the fruits of your labor in permanent form. Buildings often outlive their creators and being able to see your work day after day in permanent form can be extremely rewarding. A third reward is in knowing that you through your creation are helping others.

In addition to these intangible rewards a career in construction can also offer substantial tangible rewards. The current nationwide average salary for non supervisory personnel in construction is \$15.00 per hour. Supervisory personnel have the opportunity to make considerably more.

9. Pathways to success

Overhead projector slides Twenty One: Pathways to Success

A. The presenter should discuss the three primary pathways to success in the construction industry.

Example

While there are in fact many ways to enter and gain success in the industry, there are three commonly used pathways to success. These differ according to the amount of training and formal education the individual has.

a. Directly from high school through an apprenticeship program or similar organized training program.

For those who want to enter the construction industry through the trades, apprentice training programs have been established to prepare young people for a career as journeymen. These programs, set up by cooperative management and labor organizations or by management groups alone, are 2-4 years in duration and combine on-the-job training with classroom instruction on the use of tools and procedures of the trade. Apprentices, whether union or open shop, receive regular hourly wages which are a percentage of the journeyman's rate and this percentage increases every six months throughout the duration of the training program until journeyman status is reached.

b. Through successful completion of a two year technical school or community college program after high school.

There are many two year programs available to people wishing to enter the industry at the company level. These programs provide a general background in construction practices and procedures and include such courses as surveying, plans and specifications, preparation and interpretation of documents, basic construction computations, estimating, drafting construction materials and management techniques.

c. Through the successful completion of a four year college degree program in construction or construction management after high school.

When all other things are equal, the people who progress the fastest and advance the farthest are those with the most complete preparation. Construction is no exception and for men and women interested in management positions, the best path to follow begins with four or five years of study in a college level construction engineering or construction management curriculum.

In any case the construction industry offers each person an almost unrestricted opportunity for advancement. An individual's progress within the industry is generally dependent upon three factors. The first of course are the requirements of the employer. The next two factors are how well the individual has prepared his or herself for advancement and the second is how well that person carries out their current responsibilities. Just remember STAY IN SCHOOL and complete your high school education.

CAREER AWARENESS PROGRAM: COMPONENT TWO

Career Awareness Day Presentation Two to Career Guidance Counselors and General Faculty
Approximate duration: 30 minutes
Overhead projector slides: 25

This presentation is virtually the same as the student presentation except for some of the focus of the wording. It has been omitted from this paper for brevity.

CAREER AWARENESS PROGRAM: COMPONENT THREE

Career Information Packages for Career Guidance Counselors

A third component of this career awareness program is the career awareness package for the career guidance counselors. This package can be given as a part of the formal presentation or can be used as a stand alone information package when no presentation is given. This package will consist of the following:

- A. Printed two-fold brochure cover with two pockets.
- B. Four part stepped information insert covering the following topics
 - 1. History
 - 2. Current Trends
 - 3. Employment Opportunities
 - 4. Pathways to success
- C. Package of typical job descriptions found in the construction industry
- D. Hard copies of the presentation overhead projector slides
- E. Copies of the tri-fold brochure

CAREER AWARENESS PROGRAM: COMPONENT FOUR

Career Awareness Brochure for Career Guidance Counselors, Classroom Teachers and Students

This career awareness brochure is a stand-alone tri-fold out brochure intended to briefly give the student an overview of the industry while outlining many of the opportunities for success. It will also have organizations which they might contact for additional information. The following topics will be covered.

- A. The Industry
 - 1. Construction Values
 - 2. Employment
- B. Categories of Construction
- C. Sources of Employment
 - 1. Employment
 - 2. Positions
- D. Pathways to Success

CAREER AWARENESS PROGRAM: COMPONENT FIVE

Career Awareness Poster for presentation at County Fairs and High School Career Fairs

This will involve the creation of a two-panel poster board presentation consisting of two 30" X 42" presentation boards. These boards would basically duplicate the tri-fold brochure developed earlier.