

DEVELOPING AN EFFECTIVE CONSTRUCTION TRAINING PROGRAM FOR AMERICAN SUPERVISORS WITH HISPANIC CRAFT WORKERS

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16. Abstract <p>In the construction industry, Hispanics have the highest rate of fatal work injuries among the racial/ethnic groups, and productivity in the field is limited by the language barrier between Hispanic workers and their supervisors and the level of education of many Hispanic craft workers. This research developed a training program designed to facilitate the integration process between American supervisors and Hispanic craft workers in a practical and cost-effective way, thus improving productivity and lowering fatality rates.</p> <p>The Iowa State University research team conducted a survey of 38 American supervisors, representing 14 Iowa construction companies. Survey results confirm that communication is the main problem experienced by American supervisors in the jobsite. Many American supervisors also use or depend on a link-person (an individual who interprets tasks to the rest of the Hispanic crew) to communicate to the Hispanic crewmembers. Research findings show that language differences affect productivity and workplace safety in the construction industry. Additionally, the educational levels of Hispanic workers indicate that they may not have the literacy skills necessary to understand training materials.</p> <p>This research developed two training courses designed to expand the Spanish communication skills of American supervisors. The research team modified the English-as-a-second-language course developed in Phase I into the <i>Spanish as a Second Language (SSL) Survival Course</i>. A series of technical training courses were also developed, titled <i>Concrete Pavement Construction Basics (CPCB)</i>, that cover general practices in concrete pavement construction. They are much shorter and more specialized than the SSL course. The CPCB courses provide American supervisors simple and practical communication tools on a variety of topics to choose from according to their specific needs.</p>			
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This report constitutes Phase II of the Hispanic Workforce Research Project, which continues the work begun in Phase I, “Developing an Effective Training Program for Hispanic Supervisors and Craft Workers.” The author would like to thank the Iowa Department of Transportation for sponsoring this research.

EXECUTIVE SUMMARY

The rapidly growing Hispanic population in the United States is having a major effect on the labor force, such as in the construction industry's experience of productivity and safety issues. Labor shortages and continued economic growth contribute to the diversification of the workforce, since many industries have had to turn to immigrant workers for labor.

By 2004, Hispanics made up 21.4% of the construction industry workforce, according to U.S. Census Bureau reports. However, fatalities among Hispanic workers since 2000 continue to be significantly high, and Hispanics hold the highest rate of fatal work injuries among racial/ethnic groups, as reported in 2003 by the Bureau of Labor Statistics. Moreover, the construction industry continues to have the highest number of work-related fatalities among industries and within occupations. Productivity in the field is limited by the language barrier and the educational levels of many Hispanic craft workers. Therefore, a training approach needs to be implemented that can address the issue of not only a different language, but a different culture and different education levels as well.

This research develops a training program designed to fit the needs of the construction industry's American supervisors and address the issues of productivity and safety as they relate to the growing Hispanic labor force within the construction industry in Iowa. The objective is to facilitate the integration process between American supervisors and Hispanic craft workers in a practical and cost-effective way.

In order to perform a thorough assessment of the needs and interests of American supervisors in charge of Hispanic craft workers among their crews, as well as the challenges the supervisors face, the Iowa State University research team conducted a survey of 38 American supervisors, who represent 14 Iowa construction companies. Sixty-six percent of the survey participants worked in the areas of heavy/highway construction and the remaining 34% of participants worked in areas related to general commercial construction. Survey results confirm that communication is the main problem experienced by American supervisors at the jobsite. Many American supervisors also use or depend on a link-person (an individual who interprets tasks to the rest of the Hispanic crew) to communicate to the Hispanic crewmembers.

Research findings show that language differences affect productivity and workplace safety in the construction industry. Additionally, the educational levels of Hispanic workers indicate that they may not have the literacy skills necessary to understand training materials fully. To address these problems, this research project developed two training courses designed to expand the Spanish communication skills of American supervisors. The research team modified the ESL course developed in Phase I completely into the *Spanish as a Second Language (SSL) Survival Course*. This course focuses on developing the ability of American supervisors to communicate in Spanish, thus diminishing the need of a link-person to assign daily tasks to Hispanic workers.

Taking into account uncovered survey results and feedback obtained from the *SSL Survival Course*, a series of technical training courses were also developed, titled *Concrete Pavement Construction Basics* (CPCB). The courses are divided into 12 subtopics that cover general practices in concrete pavement construction. They follow a similar structure to that of the SSL course, but are much shorter and more specialized. The CPCB courses offer American supervisors simple and practical communication tools with a variety of topics to choose from according to their specific needs.

These courses will improve communication channels between American supervisors and Hispanic workers and strengthen the supervisor-worker relationship, resulting in increased work productivity and quality and a reduction of fatalities and injuries among Hispanics in the workplace.

1. INTRODUCTION

1.1. Background

Every industry in the United States is facing new challenges of growing numbers of minorities and immigrants speaking their native languages with limited or no knowledge of English. As the U.S. economy continues to expand and the baby boom generation retires over the next 30 years, the need for immigrant workers will increase significantly, creating new challenges that target the U.S. labor force (CNN.com 2001). Numerous industries have already had to contract bilingual employees to communicate to workers, who come from numerous backgrounds (Black, Asian, Hispanic, etc.). Notably, the Hispanic population has increased at a record-breaking rate over the past decade, becoming the largest minority population, according to 2003 U.S. Census Bureau population estimates (U.S. Census Bureau 2004b).

Many studies have been done regarding the causes for this sudden boom in the Hispanic population. Among the top reasons for this growth are lawful migration increases, higher fertility rates, economic/social problems in many Central and South American countries, and higher than average wages and growing employment opportunities in the U.S. These factors are so prevalent today that by 2012 the Bureau of Labor Statistics (BLS) forecasts the Hispanic labor force to reach 23.8 million workers; about 15% of the projected total civilian labor force for 2012 (BLS 2004b).

While the nation's Hispanic population increased by 57% from 1990 to 2000, Iowa's Hispanic population increased an outstanding 153% during that same period (U.S. Census Bureau 2001). Due to continued economic growth and labor shortages experienced in Iowa and many other states, organizations have turned to immigrants as a source of labor, in particular the growing Hispanic population.

Along with the population increase, Hispanic workers continue to have the highest rate of fatal work injuries (4.5/100,000 Hispanic workers) among racial/ethnic groups, as reported by the BLS in the "National Census of Fatal Occupational Injuries in 2003." Furthermore, the construction sector carried the highest number (1,126) of fatal occupational injuries in 2003, especially among construction laborers (BLS 2003a).

The increase in the Hispanic population and the high rate of work-related fatalities in the construction sector may be associated. A clearer association may probably be established between work-related fatalities and the Latin American immigrants specifically, who made up 41% (14.5 million people) of the 2000 Hispanic population in the U.S (U.S. Census Bureau 2001). The Mexican immigrant population entering the United States had a median educational level of 8th grade in 2000, meaning that many of them do not have the literacy skills necessary to communicate effectively in English or even in Spanish (Schmidley 2001). This may be one of the reasons behind the high fatality rates among Hispanics: their inability to communicate effectively with their American supervisors. Many Hispanics, especially

foreign-born, are drawn to the construction sector because of the growing labor demand, low-skill and literacy requirements, and ease of entry (Arbelaez 2003). Most construction workers are either skilled craft workers or laborers (BLS 2004a). In addition, most Hispanic workers in the construction industry, specifically in Iowa, are laborers, as found in previous studies (Arbelaez 2003). Education in and awareness of safety and preventive practices needs to be encouraged among the supervisors of the growing numbers of Hispanic workers. The language barrier and culture shock this group confronts also needs to be taken into account in a proactive way to strengthen awareness.

The Occupational Safety and Health Administration (OSHA) and other associations are pushing for a strong safety awareness movement in the construction industry to reduce the number of work-related fatalities in the U.S. Although the numbers have decreased significantly since 1994, fatalities among Hispanic workers continue to be high; this fact should concern the individuals who share the workplace with Hispanics, such as American coworkers and supervisors (BLS 2003a).

Much effort has been devoted to this matter, with increasing English as a Second Language (ESL) courses offered among Iowa communities and the translation of documents into Spanish. But the reality is that most of the Hispanic population that enters the construction labor force has less than a high school education (Arbelaez 2003). Therefore, a different approach needs to be developed that not only addresses the issue of a different language, but a different culture and different education levels as well.

As with the majority of immigrants, many Hispanics come to Iowa fleeing economic instability in their countries and in search of better life opportunities. Mexicans compose more than half (58%) of the Hispanic population in the U.S., followed by Puerto Ricans (10%), Cubans (4%), and the rising Central and South American populations (28%) (U.S. Census Bureau 2001). These populations will continue to increase within the construction sector in Iowa as employment projections indicate a 15.1% increase in the nation's construction industry over the 2002–2012 period (BLS 2004b).

The Iowa Department of Transportation (Iowa DOT), along with Iowa State University's Civil, Construction, and Environmental Engineering Department, Associated General Contractors (AGC), and other organizations, are taking action to face these new challenges. With the research and data collected, various courses have been developed that focus on the needs of the heavy/highway sector of the construction industry with regards to the Hispanic workers in Iowa. Until now, an ESL course and the *Stepping-Up to Supervisor* (SUTS) course focused on construction have been developed and delivered successfully to Hispanic workers. However, in order to facilitate the integration process of this increasing workforce, the responsibility cannot fall only on the workers. American supervisors in charge of Hispanic workers within their crews also need to take responsibility. Of course, there are mixed opinions about the communication effectiveness and language used in the field. Nonetheless, the involvement of American supervisors is crucial to the success of the integration process. The supervisors can be involved directly by participating in Spanish as a

Second Language (SSL) courses or indirectly by having their workers participate in ESL courses.

The Hispanic Workforce (HWF) Research Project was initiated to investigate labor productivity issues and safety incidents within the construction industry as they relate to Hispanic craft workers. The main objective of the investigation is to develop effective training approaches that address language issues in a quick and cost-effective way. Phase I of the HWF Research Project focuses on investigating the training needs of Hispanic construction craft workers and developing an effective training program for construction companies that employ Hispanic workers.

Iowa State University's research team conducted a survey of 97 Hispanic craft workers from 10 construction companies across Iowa to determine the workers' current conditions. The survey results confirmed that language differences is a major contributing factor in the communication problems between American supervisors and Hispanic workers involved in construction projects. In response to the survey findings, Phase I of the HWF Research Project developed two training courses designed to help both American construction companies and their Hispanic labor force overcome the challenges that keep them from performing tasks safely and productively. One of the training courses is titled *English as a Second Language Survival Course*. It is designed to facilitate basic communication needs between Hispanic workers and their American supervisors, focusing only on construction terminology. The other training course is the *SUTS Course for Hispanic Construction Workers*, which serves as an effective training tool to help companies promote those Hispanic craft workers whose willingness and skills meet the requirements for advancing to a supervisory position in an American construction company. Both courses were delivered during 2004, wherein important feedback was obtained from participants as part of the course evaluation. The training courses also received excellent ratings and much interest from the Hispanic workers who participated. Further information relating to Phase I may be found in the following:

- Developing an Effective Construction Training Program for Hispanic Supervisors and Craft Workers (Arbelaez et al. 2004)
- Development of an effective supervisory training course for Hispanic construction craft workers (Arbelaez 2003)
- Developing Effective Integration between American Supervisors and Hispanic Craft Workers in Construction (Canales 2004)

This research effort discusses Phase II of the HWF Research Project, which focuses on providing American supervisors the tools necessary to eliminate the language barrier as much as possible with their Hispanic crew, in order to achieve higher productivity and performance levels. Among the training tools designed, a *Spanish as a Second Language Survival* course was created to provide American supervisors enough terminology to communicate daily tasks to Hispanic workers. In addition, a series of short technical courses called *Concrete Pavement Construction Basics* was created to address the specific needs

uncovered during the research process. These courses will improve the communication channels between American supervisors and Hispanic workers and strengthen the supervisor-worker relationship, as American supervisors will have a better understanding of Hispanic culture. Raising awareness of the increasingly diversified workforce within construction companies' organizational cultures will facilitate the integration process, which will in turn benefit the construction industry in Iowa. Once American supervisors participate in this integration effort, the construction industry will see results in terms of increases in work quality and productivity and a reduction of fatalities and injuries among Hispanics in the workplace.

1.2. Problem Statement

Fatalities among Hispanic workers since 2000 continue to be significantly high, and Hispanics have the highest rate of fatal work injuries among racial/ethnic groups (BLS 2003a). Moreover, the construction industry continues to have the highest number of work-related fatalities among industries and within occupations (BLS 2003a). Productivity in the field is also limited by the language barrier and the level of education of the Hispanic workers. The awareness of workforce diversity needs to increase among American supervisors in order to face these new challenges effectively. But crucial limitations to this diversity awareness are the time, availability, and willingness of American supervisors to share the responsibilities and participate in the integration effort. In short, a communication gap exists between Hispanic workers and American supervisors that affects the construction industry. Thanks to the Iowa DOT and Iowa State University's CCEE Department, research programs have been developed to address these issues before any further consequences arise.

1.3. Research Objectives

This study will offer American supervisors a tool for creating more effective and direct lines of communication to the increasing Hispanic labor force within the construction industry in Iowa. To reach this goal, a thorough assessment of the needs and interests of American supervisors has to take place. This assessment will include the degree of Hispanic cultural awareness among supervisors, which is a critical factor that influences one ethnic group's perception of another. Some American supervisors embrace the new immigrant culture and others simply reject the new culture unless the immigrants adapt to American culture. The fact is that the U.S. economy is expected to expand, creating more and more jobs, but the supply of workers in the country is not enough to keep up with the growth rate (CNN.com 2001). The need for immigrant workers will thus grow substantially, especially Hispanic workers. Construction companies should be aware of these facts: that it's not a matter of selecting a labor force, but rather needing the immigrant labor force to keep up with the construction industry's work demands as the economy expands. The training tools developed in this research will give American supervisors the opportunity to be proactive and participate in the assimilation of the two cultures (Hispanic and American) in the workplace.

Survey questionnaires present a way through which information can be collected to develop an appropriate response to the current problems facing the construction industry. The observations and data gathered from the American supervisors' survey questionnaires were analyzed and compared to the survey results from Phase I as well. This approach contributed to the production of valuable and practical training courses. These courses link the needs of the supervisors and those of the construction industry to provide Hispanic workers a safer and more interactive workplace.

1.4. Research Approach

The following list describes in detail the research approach proposed to achieve the objectives for Phase II of the HWF Research Project:

- Develop an understanding of the training requirements for the Hispanic construction workforce in Iowa from the contractor's perspective. This involves interviewing American supervisors using a survey approach and performing office and jobsite visits. The research team will investigate the diversity efforts by the AGC of Iowa, specifically the guidelines that have been translated into Spanish and a comprehensive Spanish-English Construction Dictionary. The most suitable course delivery models will be identified as a result of the needs assessment (e.g., Saturday-only classes or training during the workweek at night). Social aspects will be considered in this part of the research.
- Review current training material available for American supervisors, if any, to evaluate whether the requirements of the contractors with respect to their Hispanic labor force are being taken into account and addressed appropriately.
- Modify the ESL course into an SSL course and deliver it to the American supervisors so they can use it as a working tool that will enable them to better communicate with Hispanic workers. This will provide valuable feedback to the research team and help them better understand the requirements of the Hispanic workforce, as well as better understand the needs from the contractor's perspective. Develop and deliver a technical course to American supervisors. Course evaluations following each course will be analyzed and evaluated to determine the effectiveness of the training course.
- Develop a process that can be used to train workers from other cultures (e.g., Bosnians).
- Summarize findings, make recommendations, and provide a final report for the entire research project (including Phases I and II).

1.5. Report Organization

Chapter 1 introduces the subject matter, identifies the problems and challenges that the construction industry is facing, discusses the objectives of this project, and defines the goals of this research project.

Chapter 2 presents the literature review, starting with the general overview about how Hispanics influence the U.S. population before continuing with more detailed information about the Hispanics workforce's impact on the nation's construction industry. This chapter concludes with a summary of available training material for American supervisors.

Chapter 3 describes the methodology used for gathering the necessary data and analyzing the results. The observations and results gathered will suggest the necessary steps required to generate reliable tools that will serve as a solution to the stated problems and challenges.

Chapter 4 provides the procedure, systematic approach, and cultural aspects considered in the development of the training courses for American supervisors. The chapter also discusses the analysis and survey results used to develop the courses for American supervisors, which are the *Spanish as a Second Language Survival Course* and *Concrete Pavement Construction Basics*. The *SSL Survival Course* content is described briefly, consisting of four main parts: (1) general, (2) resources, (3) safety, and (4) various. It also includes the results of the surveys to determine the effectiveness of the courses. The *Concrete Pavement Construction Basics* course consists of a series of technical courses based on concrete pavement construction practices, such as site preparation, slip-form paving operations, jointing, safety, and many others. At the end of each course, trainees receive an evaluation form for the course.

Chapter 5 presents all of the subtopics that constitute *Concrete Pavement Construction Basics* and the general course structure, as well as materials provided. Chapter 6 introduces a model which can be used to transfer and/or adapt the HWF Research Project to other cultures. And, finally, conclusions and recommendations are discussed in Chapter 7.

2. LITERATURE REVIEW

2.1. Introduction

Along with the population increase in the United States, the workplace is also diversifying more and more. Managerial and supervisory positions need to raise awareness of the changing workforce demographics, increase sensitivity to different ethnicities and cultures, minimize discrimination in the workplace, and modify the culture and leadership practices of the organization (Romero 2004). Due to the rapid growth of the Hispanic population in the United States during the past decade and the increasing population projections, this culture calls for recognition and an understanding of their influence over time in American society.

The most current information was obtained from numerous data sources, such as the U.S. Census Bureau, the Bureau of Labor Statistics, and other governmental organizations and research papers, to analyze a range of factors distinctive to the Hispanic culture that influences the U.S. workforce today. In particular, this study focuses on trends in the construction industry labor force and how they affect Iowa's construction workforce.

2.2. Hispanic Population Trends in the United States

2.2.1. Origins and Demographic Information

The United States came to be what it is today because of the desire of early settlers and immigrants for better life opportunities. As early as European contact with the Americas in the 15th century, countless immigrants (English, Irish, Welsh, Western Europeans, etc.) have settled in the United States, the land of opportunity, in search for a better life. Now, the United States is experiencing an immigration increase from Latin American countries, evident in the significant Hispanic population increase. Most Latin American immigrants are fleeing from unstable economic conditions in their homeland. They are coming to the United States in search of better economic and social opportunities, just like the early immigrants and settlers.

To understand a culture, it is critical to identify its origins, in this case the Hispanic culture. For years, the three major Hispanic groups relocating to the continental United States from Latin American countries and territories have been Mexicans, Puerto Ricans, and Cubans. This is so because, apart from the neighboring location of these countries, these places have also had defining historical events and strong political and socioeconomic ties with the United States over time.

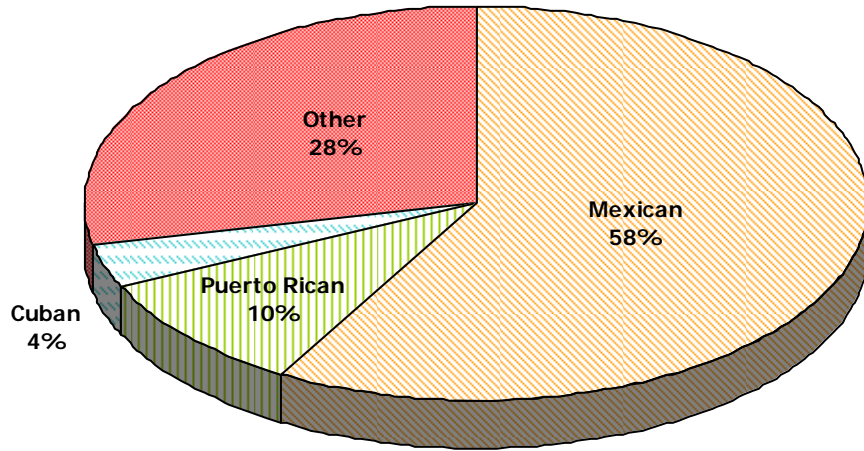


Figure 2.1. Hispanic Population by Origin in 2000 (U.S. Census Bureau 2001)

Mexicans made up more than half (58%) of the 35.3 million Hispanics in the nation for the year 2000, as shown in Figure 2.1. Puerto Ricans made up 10% of the 2000 Hispanic population and Cubans made up 4%. Notably, a few other groups have grown significantly, such as immigrants from Central and South America, represented in part by the category identified as “Other”. Even though this category represents numerous nationalities, together it comprises 28% of the total Hispanics registered in the United States for the year 2000 (U.S. Census Bureau 2001).

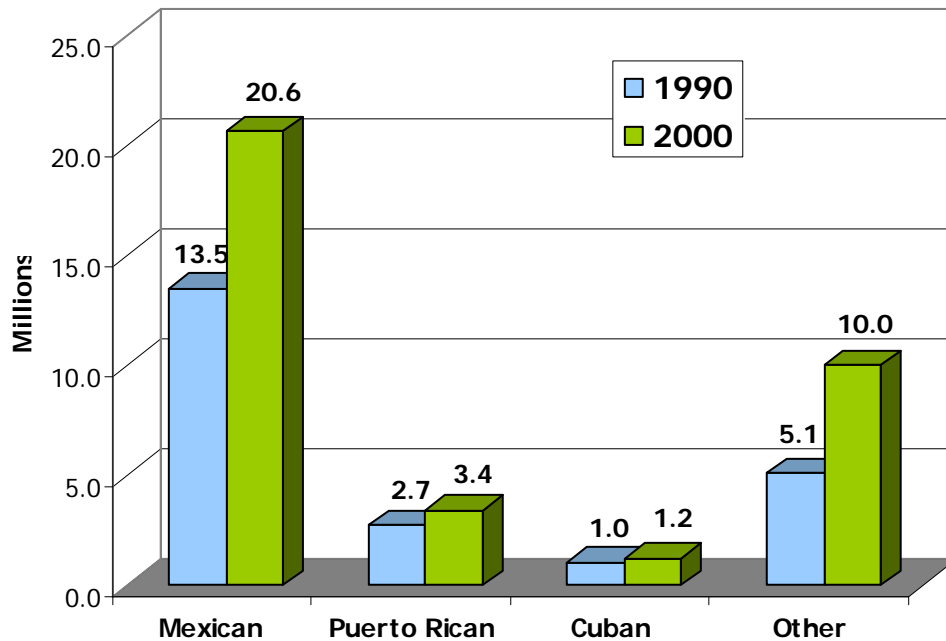


Figure 2.2. Growth of Hispanic Population by Origin: 1990-2000 (U.S. Census Bureau 2001)

Over the past decade, two groups have grown significantly. The Mexican population increased to 52.9% compared to 13.5 million from the 1990 Census. The Hispanics under the “Other” category have practically doubled in size, increasing to 10 million; that is a 96.9% increase (from 4.9 million) as shown in Figure 2.2. The “Other” category includes, for the most part, people from Central and South America (excluding Mexico), the Dominican Republic, and Spain.

These numbers suggest that three out of every five Hispanics in the United States are of Mexican origin. For this reason, most of the Hispanics in the nation’s workforce are composed of Mexicans, followed by the category of other Hispanic groups, which continues to increase in population. The number of Puerto Ricans and Cubans continues to grow, but at a much lower rate. Hence, attention needs to be shifted towards the growing “Mexican” and “Other” groups.

Construction is being affected as a result of the rising numbers of Hispanics entering the industry workforce. Ease of entrance and high wages make construction a very attractive industry for many immigrants coming from Central and South America.

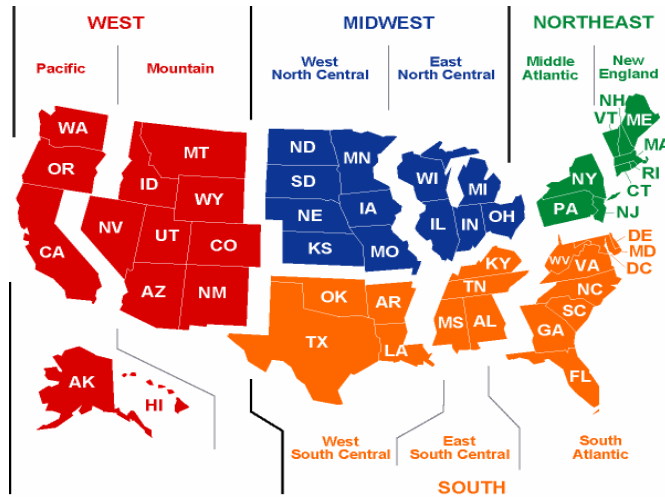


Figure 2.3. 2000 U.S. Census Regions and Divisions (EIA 2005)

Among the four Regions of the United States shown in Figure 2.3, as defined by the U.S. Census Bureau in 2000, the South and the West contain the greatest concentration (76.3% together) of Hispanics in the nation, 11.6 and 15.3 million, respectively. Moreover, Hispanics make up almost 25% of the total Western population, as shown in Table 2.1. Mexicans make up the majority of Hispanics within these two regions in part because many of the southwestern states, from California to Texas, used to belong to Mexico until the mid 1800s. In the Midwest, Hispanics only make up 4.9% of the region’s population, even though the Midwest is the second largest U.S. population region. Still, Mexicans continue to make up the bulk (71%) of the Hispanics in the Midwest, suggesting that they are starting to move inland from the border states.

Table 2.1. 2000 Distribution of Hispanic Population by Region (U.S. Census Bureau 2001)

U.S. Region	Population (millions)	Hispanics (millions)					
		Population	% of Region Population	Mexican	Puerto Rican	Cuban	Other
South	100.2	11.6	11.6	6.5	0.8	0.9	3.4
Midwest	64.4	3.1	4.9	2.2	0.3	0.0	0.6
West	63.2	15.3	24.3	11.4	0.2	0.1	3.6
Northeast	53.6	5.3	9.8	0.5	2.1	0.2	2.5
Total	281.4	35.3	12.5	20.6	3.4	1.2	10.0

In 2000, Iowa and five other states had minority populations of less than 10% (Stoops 2002). Of the 2.9 million Iowans, 7% (216,000) identified themselves as belonging to a minority group. Out of these 216,000, Hispanics make up 82,400 (38%), constituting the largest minority group, followed by Blacks (28%) and Asian/Pacific Islanders (17%). These numbers suggest that as the years pass, Iowa’s population will continue to diversify at a much faster rate, according to population trends. It is important to strengthen awareness and diversity education in order to adjust to these changes and benefit from them.

2.2.2 Population Trends

The United States has been among the top 10 most populous countries over the period 1950-2000 (Stoops 2002). Figure 2.4 shows the fluctuations of the U.S. population growth rate. The variability of the population increase percent change can be linked to the major events of that particular decade, such as the Great Depression of the 1930s and the post-World War eras.

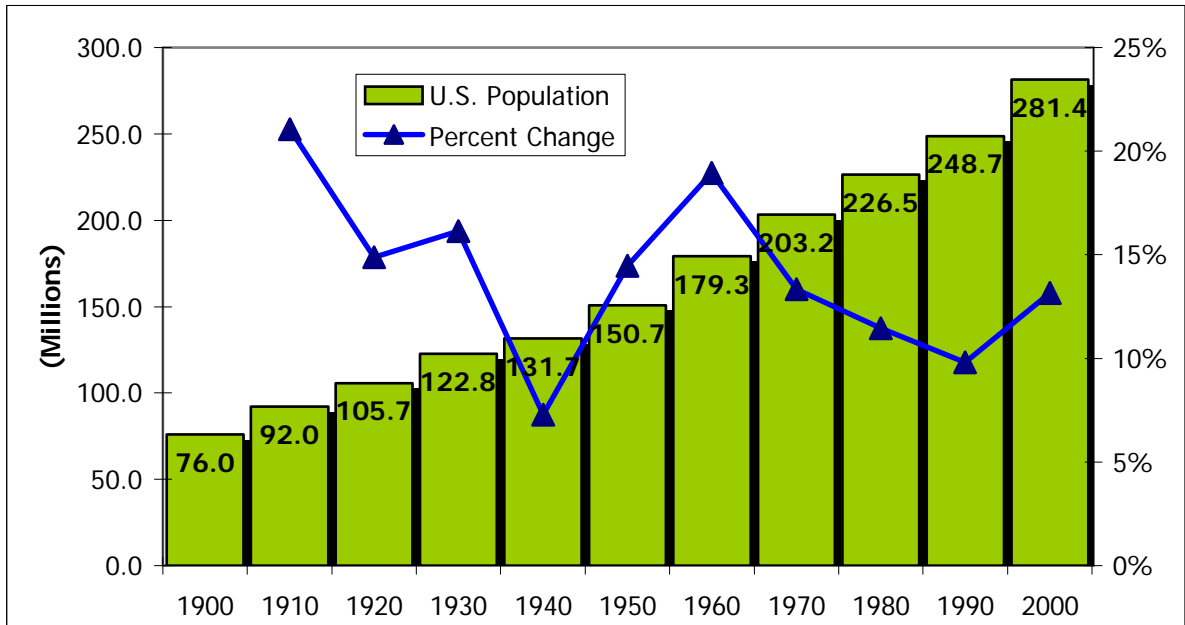


Figure 2.4. Total U.S. Population and Percent Increase

Source: U.S. Census Bureau 2004b

In the 1990-2000 decade, the United States experienced the largest population increase (32.7 million) of this century. The population growth percentage change finally underwent a 13.2% increase after a 30-year period decline. Among the factors responsible for this growth is the minority population growth. The total minority population increased from 24.4% (60.6

million) of the total U.S. population in the 1990s to 30.9% (86.9 million) in 2000. Every decade since the 1940s the white population has decreased in numbers, in the last decade dropping from 80.3% of the nation's population to 71.5% (Stoops 2002). Meanwhile, other racial groups (Blacks, American Indian, Asian, etc.) have been increasing to the point where individuals belong to more than one race or minority group. Of all the minority groups, Hispanics experienced the largest percent increase (57.9%) for the 1990-2000 decade. The most recent U.S. Census Bureau estimates show that Hispanics are the largest minority group in the United States today: July 1, 2003 population estimates show 37.1 million Blacks superseded by 39.9 million Hispanics.

Immigrants have also contributed significantly to the population growth. In the year 2000, 28.4 million U.S. civilians were foreign-born. The Latin American immigrants accounted for more than half (14.5 million) of the foreign-born U.S. population, increasing 72.6% from the 8.4 million of the 1990 Census. Foreign-born Mexicans increased 82.4% over the 1992-2000 decade to amount to 7.8 million. "Of the foreign born population age 25 and older (5.6 million) from Mexico, 66.2% (3.7 million) had less than a high school education" (Schmidley 2001). This information suggests that most Mexican-born immigrants in the United States can only enter a job market that does not require a high school diploma. The manufacturing and construction industries offer this type of market and ease of entry.

By the year 2025, the U.S. population is expected to reach 419.9 million and Hispanics are projected to make up about a quarter (24.4%) of that total (U.S. Census Bureau 2004a). Hispanics are projected to grow at a much higher rate than any other ethnic group because they can belong to any particular race (White, Black, Asian, etc.).

Iowa's population change from 1990 to 2000 ranked 43rd among the 50 states and the District of Columbia with a 5.4% change, an increase of 149,569 people over the period (U.S. Census Bureau 2001). However, Iowa experienced a substantial population increase of Hispanics with a 153% population change over the last decade, from 32,600 in 1990 to 82,500 in 2000. Of the 2.7 million Iowans five years of age and older, 79,500 speak Spanish or Spanish Creole at home, suggesting that 96% of Hispanics in Iowa speak Spanish as a first language. In addition, almost half of the Spanish speaking population speaks English "less than very well." Mexicans alone make up 74.2% of Iowa Hispanics in 2000, followed by Puerto Ricans (3.3%) and Salvadorans (1.8%). Hispanics in Iowa have already surpassed 1990 U.S. Census projections of 54,000 for 2000, and their growth in the years to come is going to influence the state in an even greater capacity.

2.3. The Hispanic Labor Force and the U.S. Construction Industry

The workplace is diversifying more every year; however, the diversification seems to be leaning towards the Hispanic ethnic group "due to faster population growth resulting from a younger population, higher fertility rates, and increased immigration levels," evident in the current population statistics and labor force projections (Toossi 2004). Companies are now facing the challenges and opportunities of a more diverse workforce with numerous

dimensions, such as gender, age, race, ethnicity, educational background, personality, religion, etc. In the past, individuals who were considered “different” were willing to assimilate in order to succeed in the workplace. In today’s society, individualism is highly valued to some extent and distinct differences are celebrated (Roosevelt Thomas, Jr. 2001). For example, Hispanics in the entertainment business are more popular than ever, gaining momentum in TV, movies, music, and professional sports (Herrera 2001). As a result, U.S. industries are faced with a workforce that is less willing than ever to assimilate. In some cases, the Hispanics’ strong cultural ties are presenting productivity and safety issues related somewhat to language and cultural differences.

But why are so many Hispanics drawn to the construction industry? The construction industry offers numerous opportunities for job placement to individuals of different talents and educational backgrounds. Construction earnings are significantly higher (\$18.51) than the average of all the industries (\$14.95). In addition, most of the occupations within construction require more strength and stamina than occupations in other industries due to the physically demanding tasks such as bending, stooping, and lifting of heavy objects. Construction workers may be exposed to weather and potentially dangerous conditions as in the case of work at great heights or exposure to harmful materials, fumes, and loud noises (BLS 2004a). Work within construction requires a certain degree of willingness to perform many different tasks in this type of environment, which may not be as attractive for potential workers that prefer more comfortable working conditions. For instance, construction laborers perform many of the tasks mentioned above in conditions involving building and highway construction, tunnel and shaft excavation, hazardous waste removal, environmental remediation, and demolition (BLS 2004c). These characteristics may well be one of the reasons behind the shortage of labor in the construction industry nationwide. Therefore, many Hispanics, especially immigrants (legal and illegal), have become a very popular source of labor because they are willing and available to enter the construction industry job market, filling the excess number of vacant positions.

The following table summarizes the significant facts of both the construction industry and the Hispanic workforce.

Table 2.2. Summary of current facts

	Construction	Hispanics
Employment and Labor Force (BLS 2004b, 2004d)	<ul style="list-style-type: none"> ▪ Construction employment projected to increase 15.1% over 2002-2012 decade. ▪ Construction is the only goods-producing industry (including mining and manufacturing; excluding agriculture) division where employment is projected to increase. ▪ Construction employs 7.7% (10.8 million) of the total employed workforce in the United States 	<ul style="list-style-type: none"> ▪ The Hispanic civilian labor force is projected to increase 32.6% over the ten-year period reaching 23.8 million in 2012. ▪ Hispanics are the largest source of labor among minority groups in 8 out of 13 industry divisions in the Nation. ▪ The construction industry has the highest proportion of Hispanics (21.4%) among all U.S. industries.
Occupations (BLS 2004d)	<ul style="list-style-type: none"> ▪ Construction laborer is the second largest occupation within the industry (15% workforce; 1.234 million). 	<ul style="list-style-type: none"> ▪ More than a third of construction laborers are Hispanic (470,000); the highest number of any construction occupation.
National Census of Fatal Occupational Injuries in 2003 (BLS 2003a)	<ul style="list-style-type: none"> ▪ The construction industry accounted for the highest number of fatalities among all industry sectors (1,126 fatal occupational injuries; 20%). ▪ Construction laborers had the highest number of fatalities (270; 24%) in the private construction industry sector. ▪ "Falls to lower level" was the most frequent workplace fatality for construction laborers in 2003. 	<ul style="list-style-type: none"> ▪ Hispanics accounted for the highest number of fatalities among the racial/ethnic groups (791 fatal occupational injuries; 50%). ▪ The most frequent fatal work injuries among Hispanics were "Falls" (16%) followed by "Struck by an object" (13%). ▪ Foreign born Hispanics have a greater proportion of workplace fatalities through the years than the native-born Hispanics.

Table 2.2 shows how Hispanics are already influencing the industry. They have accounted for a disproportionate number of workplace fatalities, more noticeable at the beginning of this new millennium with an average of 14.6% (836 fatalities) over the 2000–2003 period compared with their average employment proportion, which is 11.6% (15.799 million) of the total of employed U.S. workers for those four years (BLS 2003a). Moreover, nonfatal injuries among Hispanics occur more frequently in construction than in any other industry (Vazquez and Stalnaker 2004). Language places Hispanic construction workers at higher risk of injury or fatality in the workplace. In the years to come, the growing Hispanic population will shape the construction industry’s labor force, and failing to recognize these changes may

have serious consequences for the profitability of contractors and increases in insurance premiums.

2.3.1. Possible Reasons of High Injury and Fatality Rates

Recently, organizations are becoming aware of the current statistics and fatality rates among Hispanics. In the case of organizations within the construction industry, these rates can significantly increase costs and reduce productivity. There is a concern as to the best approach for addressing this issue, which involves an utterly different culture. The source or possible sources of these outcomes must be identified and understood in order to find the most adequate approach.

Foreign-born Blacks, Asians, and Hispanics were more likely to be in the labor force than their native-born counterparts. About 48% (10 million) of the foreign-born labor force in 2003 was Hispanic, compared with only about 7% of the native-born labor force (BLS 2003b). The fatality statistics seem to indicate that Hispanics are disproportionately employed in the more dangerous and labor intensive industries. For instance, construction, agriculture and related industries, and manufacturing contain 55.3% of the Hispanic workforce combined (see Table 2.2).

“Recent immigrants are drawn to industries that will have quick cash turnover and require very little documentation. For the most part these are industries in which they have family and friends already working. Contractors also turn to immigrant labor to fill jobs that American English-speaking workers won’t take...” (Silva 2004)

In 2000, it was estimated that a total of seven million undocumented immigrants entered the United States and almost 70% of them are Mexican foreign-born (U.S. Census 2004b). For the estimated number of foreign-born Mexicans who illegally entered the United States, the median educational level was about 8th grade (Schmidley 2001).

Obviously, the level of education among Hispanic immigrants plays a big role in the job market. The vast majority of Hispanic immigrants (legal and illegal) are limited to jobs that do not require a high school diploma. Their native-born language, Spanish, also narrows the employment opportunities available, since they are not able to communicate effectively in the English language. The language barrier is one of the major factors behind the death rate among Hispanic workers. For instance, in regards to traditional safety training, the transmission method is used to deliver it. Generally, in this method the trainer attempts to transmit the information to the student where the student is expected to receive, understand, and use the information. Also, the transmission method presumes a level of education in the recipient that may not be the case for Hispanics. Transmission breaks down when there exists a language barrier and, in cases where the training is provided in Spanish, the information may not be clearly understood due to low literacy skills among Hispanics. The inability to communicate effectively can place the Hispanic workers and their English-speaking coworkers in unsafe situations that can be prevented with the appropriate training.

Advancement opportunities or capabilities are also missed, since there exists a communication gap between the employer and the Hispanic employee (Vazquez and Stalnaker 2004).

Another factor that contributes to higher fatality rates among Hispanics is the fact the illegal immigrants are willing to work for less pay and work in the most dangerous industries, as long as they do not lose their jobs (Crockett 2004).

Of course, the culture factor cannot be ignored. The Hispanic culture is often characterized as collectivist, with tendencies of being high in uncertainty avoidance and power distance (Romero 2004). Collectivist culture refers to individuals that prefer to engage in group activities. For instance, Hispanics are oriented towards the family group context rather than work-related groups. They tend to be loyal subordinates and look after the group's interests rather than individual interests (Canales 2004). High power distance refers to cultures in which a clear difference exists between the powerful and the powerless, where leaders are expected to delegate and use teams infrequently. Leaders are seen as authority figures who are accorded exceptional respect. Also, Hispanic followers rarely disagree or challenge positions of authority because of their desire to avoid uncertainty. Hispanics would rather remain silent to keep their job than report potential workplace hazards or incidents that would provoke an unfavorable opinion (whistleblower) from their employer, a characteristic that increases the risk hazard among Hispanics (Vazquez and Stalnaker 2004).

Organizational factors as well are responsible for the risks that Hispanic construction workers face today. Some of these factors are described below:

- Fatality and injury is underreported because of illegal immigrant involvement (Vazquez and Stalnaker 2004)
- Hispanics may not receive any safety training at all
- Safety information is often not provided in Spanish
- Hispanics are not educated about their right to a safe workplace
- Hispanics often do not complain because of fear of being fired and/or deported
- Inadequate enforcement by OSHA (LIUNA 2005)

2.3.2. What Actions Are Organizations Taking?

On February 27, 2002, John L. Henshaw, Assistant Secretary of Labor for OSHA, delivered a statement before the U.S. Senate Committee on Health, Education, Labor, and Pensions, the Subcommittee on Employment, Safety, and Training, regarding the efforts to protect immigrant workers. This statement, summarized in the following initiatives, discussed in detail OSHA's commitment to helping employers reduce fatality and injury rates among Hispanic workers:

- Establishing a Hispanic Workers Task Force to pursue creative solutions to improve the agency's outreach to and prevent fatalities among Hispanic workers

- Using OSHA's toll-free telephone number at (800) 321-OSHA for emergency reporting by Spanish-speaking individuals
- Initiating a national clearinghouse for training programs in Spanish that includes videos, written publications, and other training materials
- Creating a Spanish-language website for employees and employers
- Compiling a list of fluent Spanish-speaking employees that includes 119 in Federal OSHA, 38 in states and territories with OSHA-approved safety and health plans, and 22 in onsite consultation agencies
- Strengthening the OSHA offices' contacts with police and emergency responders to ensure that OSHA receives referrals when an injury is work-related (OSHA 2002).

Along the way, OSHA has encountered a series of difficulties with respect to immigrant workers. In some cases, it seems that employers do not report workplace fatalities to OSHA because of fear of possible legal repercussions from hiring undocumented workers. OSHA's objective is to enforce safety standards, but their efforts are sometimes mistaken for those of Immigration and Naturalization Services (INS). On the worker side, immigrants are afraid to speak out about hazardous conditions for fear of being fired or deported. OSHA states that it only issues citations to employers that fail to report a death and they also pledge informant identity confidentiality. In addition, the whistleblower protection provisions under section 11(c) forbid employers from discriminating against or discharging workers for making safety/health complaints under the OSHA Act (Henshaw 2002).

Outreach efforts to the Hispanic community are not only extended at the national level, but also at the regional level. For example, OSHA has worked closely with churches and community organizations representing immigrants (Region II); provided a 10-hour course on construction safety conducted in Spanish (Fort Worth); and provided safety and health training grants to non-profit organizations and professional organizations, colleges, universities, and community colleges, enabling them to establish programs to train employees and small business employers (Henshaw 2002).

A number of organizations are already collaborating in efforts to reduce the fatality rates of Hispanic workers. For instance, in response to the current statistics and fatality rates, the Laborers' International Union of North America (LIUNA), which represents more than 840,000 workers, mostly in the construction industry, established a national labor-management health and safety fund. The fund helps members and contractors provide a safer workplace and improve the health and safety of members both on and off the job. Among the actions that the LIUNA is taking as a result are as follows:

- Helping Hispanic workers organize
- Establishment of the Laborers-AGC Training and Education Fund, which teaches many classes in Spanish, Polish, and other languages
- Translation of safety materials into Spanish
- Informing workers of their rights to a safer environment

- Working with Latino worker/day laborer organizations on safety issues (LIUNA 2004).

Although efforts in the past couple of years have decreased the Hispanic work-related deaths from 895 in 2001 to 791 in 2003, Hispanic workers still hold the largest fatality rates among all ethnic groups. Some organizations suggest that OSHA needs to adapt a more vigorous enforcement program, targeting smaller jobsites where dangers may be the greatest. These organizations also propose that OSHA should staff themselves with more bilingual inspectors and provide stronger protection for whistleblowers and immigrant workers so they may work free of fear (LIUNA 2005). However, culture also plays a big role in the work experiences of Hispanic laborers. Initially, when Hispanic immigrant workers (legal and illegal) enter the United States, they face the process of acculturation. Individuals who acculturate accept or modify certain aspects of the new culture (American) and that of their original culture (Hispanic) (Romero 2004). The process of acculturation can be facilitated by understanding the Hispanic culture and effectively integrating Hispanics into an organization's culture. They may not even have the literacy skills necessary to understand the safety information provided nor the resources and willingness to obtain this kind of information, which is crucial for the daily activities at the jobsite.

It seems that most organizations are focusing their efforts on the Hispanic workers alone, translating material in Spanish and conducting safety training in Spanish. This approach may not be the most appropriate one, since these workers' ability to receive, understand, and use the information is very much constrained by their educational level. For example, Darrin Drollinger, vice president of technical safety programs for the Equipment Manufacturers' Institute (EMI) in Chicago, IL, reports that his organization has translated more than half of its written materials into Spanish only to see them sit on the shelf. He speculates that a source of the problem might be that some Spanish-speaking workers have low literacy in their own language. Also, the president of VISTA Training Inc. in Burlington, WI, Rick Longstaff, reported that over the four years of the Spanish-language materials' availability, the company has sold, at most, 20 copies. The price tag was lowered to equal that of the English versions, only to see the demand stay flat (Grenoble O'Malley 2001).

It appears that their American supervisors need to get involved and participate as well in the efforts to ensure that the Hispanic crews understand the training provided. Perhaps a quicker and better approach is to shift the attention to the supervisors of Hispanic workers. Generally, supervisors of Hispanic crews are less in numbers and have higher educational levels.

2.4. Materials Available for American Supervisors

Generally, American supervisors with Hispanic crews have a "link" person who is supposed to translate into Spanish the daily tasks required for a particular construction project. But how sure can the American supervisor be that the designated "link" person is transmitting the correct message when the supervisor cannot verify the accuracy of the translation? Even worse, what if the link-person fails to show up to the site on a particular day? These types of

situations can slow down productivity and create potentially unsafe environments due to the inability of the American supervisors and the Hispanic workers to communicate effectively.

Plenty of material exists describing different supervisory approaches and the best ways to manage a crew or a team. Therefore, an internet search was performed to explore the materials available, targeting the specific management skills necessary to be effective with Hispanic employees, especially immigrants. Of the organizations and resources searched, such as the Center to Protect Workers Rights (CPWR) (<http://www.cpwr.com>) and the Electronic Library of Construction Occupational Safety and Health (<http://www.elcosh.org>), very little material for American supervisors was found. Still, some information was found regarding the funding of research, grants, and training programs, for instance, the *Workplace Safety and Health of Hispanic Construction Workers* research project conducted by the CPWR with funding from the National Institute for Occupational Safety and Health (NIOSH). Also, a number of journals were searched, such as the *Hispanic Journal* and those published by the American Society of Civil Engineers (ASCE). However, the search often resulted in articles about diversity or teaching the Spanish language, such as “A Deeper Look at “Diversity,” “Best Practices In Managing Diversity,” “FLAME—Foreign Language Alternative Mastery Example: Another Approach to FLES Models in Use,” and “Teaching Spanish as a Foreign Language in Belgrade Yugoslavia: A Need to Overcome the Old Ways.”

On a general search, very few of websites were found that addressed the issues of workplace diversity or the language barrier and its consequences, specifically for the construction industry, which experiences high fatality rates every year.

With the recent demographic trends, many companies offer consulting services for cross-cultural training involving managerial positions with Hispanic employees, but these services are from a business administration standpoint. For example, the company *Consulting Groups of the Americas, LLC* (<http://www.cgamericas.com>) offers training classes for English-speaking managers. They offer companies “Customized Cross-Cultural Training Classes” that will help the particular company do the following:

- Understand the culture and business customs of the company’s Spanish speaking employees
- Reduce cross-cultural conflict
- Avoid costly employee errors
- Cut training costs
- Increase worker productivity and morale
- Decrease employee turnover
- Teach supervisors how to manage the company’s Spanish-speaking workforce
- Educate Spanish-speaking employees about U.S. business practices

Among the classes offered, one is targeted to English-speaking managers, in which they will learn about Hispanic culture and customs, how to overcome communication barriers and

build trust with the Hispanic employees, and how to understand the importance of the Spanish language, among other skills.

Bella International, Inc. (<http://www.bellaii.com>) is another company that has a website offering organization and business development for multicultural organizations and international ventures, specializing in Hispanic cultures. The company also offers numerous consulting services targeting a company's needs in regards to its Hispanic workforce. In addition, Bella International provides publications that include information regarding "Building Teams Among Hispanic Workers" and "How To Be a Good 'Patrón' (Boss) With Your Hispanic Employees." The latter focuses on essential management skills necessary to be effective with Hispanic employees. The following are some of the topics discussed:

- Cross-cultural management training
- Changes versus tradition
- What being a good boss, "jefe," or "patrón," means
- Effective incentives
- Customized, bilingual courses onsite that assure results

Some information found discusses training approaches or materials that may work as a solution to the language barrier. One construction company uses a "blue hardhat program." Bilingual employees wear a blue hardhat for easy identification in the field. They translate or enable communication between Spanish- and English-speaking employees, which facilitates safe job performance and minimizes misunderstandings. In this program, employees enter a bilingual testing program, which allows them to demonstrate the ability to communicate effectively in their non-native language. An independent company administers the tests and, generally, the employer provides a monetary incentive to those in the program (Vazquez and Stalnaker 2004).

According to the Texas Workers Compensation Commission Reports, 572 workplace deaths were recorded in Texas for the year 2000 and up to 468 were recorded in 1999. Hispanic workers make up nearly half of the construction industry's workforce in Texas, according to the Commission. VerbaCom, a national executive development company with offices in Dallas and Houston, Texas, in collaboration with the AGC Chapter in Houston, has developed and been teaching Spanish 101 for Construction Industry Personnel to company project managers, supervisory foremen, and other construction industry personnel. The course teaches the basic Spanish-language skills necessary to be able to communicate and understand directives, instructions, and personnel issues specific to the construction industry. Their goal is to increase efficiency and production, to minimize misunderstandings and to help prevent accidents on the job site through better communication. The VerbaCom approach teaches the basics of the Hispanic culture along with the language. From 1999 to 2001, more than 600 construction personnel have taken the basic course in Houston and nearly 250 in North Texas since April 2000 (Hispanic Journal 2002).

The \$2.6 billion Dallas/Fort Worth Airport (DFWA) expansion project, also called the DFWA's Capital Development Program in Texas, developed a unique 40-hour training course that appears to be breaking down language barriers and seriously improving safety. The project, which began in September 2002, has had no fatalities and lower injury and illness rates than the national average for heavy construction projects, saving additional money on its project-controlled insurance program. The safety program was developed by BEST Institute, Inc. of Garland, Texas, in conjunction with the two primary contractors at the airport project: Austin Commercial and Hensel Phelps. So far, nearly 13,000 students have taken the course; roughly half took it in Spanish. Some of the individuals involved with the program say that the following characteristics are responsible for the program's success:

- Speaking the workers' language
- Addressing cultural differences
- Not skimping on training
- Verifying learning
- Follow-ups (Nash 2004)

Construction Spanish, the Instant Jobsite Translator has become a popular product among contractors and organizations, with over 220,000 copies in use. This pocket-sized book translates over 1,400 words and terms commonly used on construction projects. The book was developed by *Investment Group Services, Ltd.* (<http://www.constructionspanish.com>), which also offers other products such as *Construction Communication*, which includes eleven chapters on communication, safety, understanding of language barriers, and lists of thousands of construction-related words and phrases in English and Spanish.

2.5. Concluding Remarks

“The effective utilization of Hispanics in the United States depends on a higher-level understanding of Hispanic culture” (Romero 2004). Diversity in the workforce is inevitable due to the increasing minority populations, especially the growing Hispanic population that is projected to reach a quarter of the U.S. population by the year 2050.

Construction organizations need to recognize that training programs need to be implemented successfully to overcome the issues of productivity and safety that the Hispanic workforce brings to the construction industry. American supervisors must take action and get involved in the efforts to ensure Hispanic workers go home safely to their families every night.

A number of training efforts and programs have emerged to address the issues that the construction industry is facing today with respect to the growing Hispanic workforce. Nonetheless, a quick and cost-effective solution that fits the industry has not been found or recognized nationwide.

This research develops a training program designed to meet the needs of the construction industry from the American supervisors' perspective and improve productivity, safety, and

effective communication. The objective is to facilitate the integration process between American supervisors and Hispanic craft workers in a practical and cost-effective way.

3. RESEARCH METHODOLOGY

3.1. Introduction

This research attempts to perform a thorough assessment of the needs and interests of American supervisors in charge of Hispanic craft workers in order to develop an effective tool that will alleviate the current communication gap. American supervisors face many challenges daily at the jobsite, such as time constraints, weather, and many other unforeseen events and factors. Thus, understanding most of these challenges as they relate to Hispanic workers, without ignoring the fact that culture plays a big role, is a key part of this research.

The research follows the same concept of Phase I, “Developing an Effective Construction Training Program for Hispanic Supervisors and Craft Workers,” with the focus shifted towards the American supervisor side. As with any research program, it is critical to examine and understand every possible dimension of the problem to achieve the objectives established. In this case, the objective is to facilitate the integration process between the growing Hispanic workforce and American supervisors. The research at hand focuses on American supervisors with Hispanic crews working for construction companies in Iowa.

This section describes the methodology, shown in Figure 3.2, used to collect and analyze the data obtained. The methodology consists of four parts: (1) a literature review on the construction industry, the training available for American supervisors, the Hispanic population in the state of Iowa, and the factors behind the industry setbacks (discussed in Chapter II); (2) questionnaire development, data collection, and data analysis and results; (3) development of two training courses: *Spanish as a Second Language Survival Course* and *Concrete Pavement Construction Basics*; and (4) conclusions and recommendations.

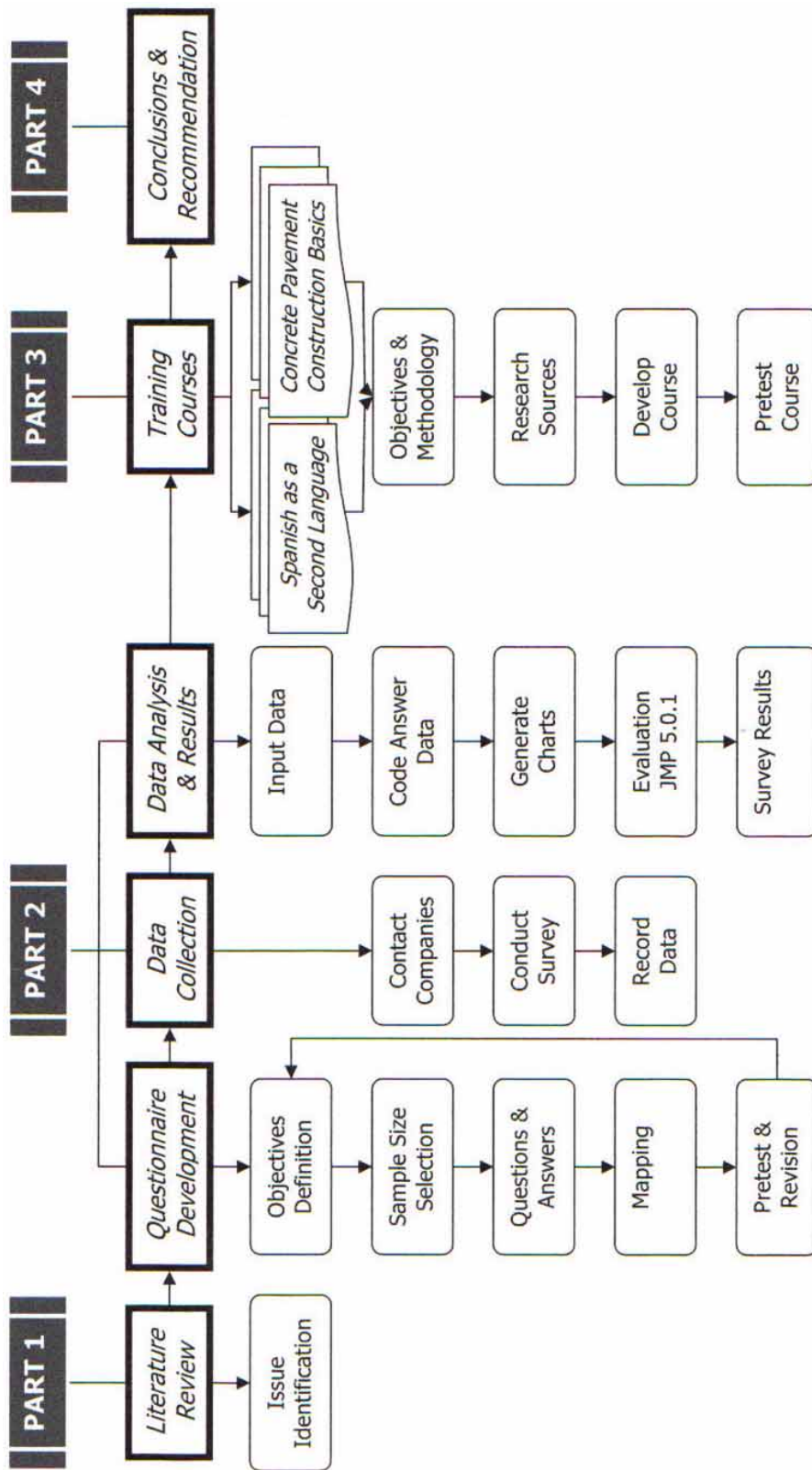


Figure 3.1. Research methodology

3.2. Questionnaire Development and Sample Population

This research is part of a project funded by the Iowa DOT and conducted through its research management agreement with the Center for Transportation Research and Education at Iowa State University. Therefore, all individuals and organizations that participated throughout this research project were part of Iowa's construction industry.

The investigation began with a review of all relevant material (professional journals, internet information, publications, textbooks, and previous research papers) related to the Hispanic population, its influence on the construction industry, mainly in Iowa, and the degree of cultural awareness among American supervisors who must adjust to the growing Hispanic workforce. The intention of the literature review was to establish the objectives and structure of the survey questionnaire to obtain the necessary data to bridge the gap between American supervisors and Hispanic construction workers. Among the objectives, the essential design was (1) to identify the problems created when the two cultures meet in the workplace and (2) to assess the needs and interests of the American supervisors in order to produce effective and suitable construction training courses. These courses will bring about a better understanding of the Hispanic culture and more efficient communication between American supervisors and Hispanic workers, which will result in the successful accomplishment of daily tasks and a safer workplace environment; this is what every construction company should strive for.

The following fifteen objectives were defined for the design of the questionnaire given to American supervisors:

1. Determine the types of training programs currently offered by construction companies to American supervisors.
2. Determine the adequacy of American supervisors' training for working with the Hispanic workforce.
3. Identify the value of training programs to American supervisors.
4. Identify Hispanic and American cultural differences and their implications for the workplace.
5. Determine patterns of needs, interests, and areas of opportunity for American supervisors to develop their relationships with Hispanic workers.
6. Prioritize those areas of improvement for implementing ESL/SSL and technical training courses for Hispanic construction workers and American supervisors.
7. Determine the factors and problems (e.g., language barrier, lack of experience) that adversely affect the performance, quality, and safety conditions of Hispanic construction workers.
8. Determine the level of interest expressed by American supervisors in having Hispanic workers learn to operate construction equipment.
9. Prioritize the type of equipment American supervisors would prefer Hispanic workers learn to operate.
10. Determine the level of satisfaction expressed by American supervisors when

dealing with Hispanic workers as it relates to the workers' willingness to learn new skills, comply with safety rules and regulations, and do the tasks they are asked to do.

11. Establish, through documenting, the need to have key employees on the job site to overcome the language barrier.
12. Determine accident rates and types of accidents incurred by Hispanics in construction.
13. Gather background, personal, and demographic information on American supervisors.
14. Obtain turnover rates of American supervisors.
15. Identify the personal expectations and goals of American supervisors related to maintaining and developing their relationships with Hispanic workers.

This research was designed to explore the factors that influence how American supervisors in Iowa's construction industry interact in the workplace with the Hispanic crews. A key issue that affected the sampling approach selected for this research was the availability and willingness of project supervisors to participate. Therefore, a "convenience sample" was decided upon, since the "people who are willing to complete the survey are also available when you need them" (Fink 1998). Even though the results of the research cannot be used to make clear inferences, the research can be considered of high practical value to industry practitioners and construction companies.

A sample size of at least 30 survey respondents was determined to be necessary for obtaining enough data to draw and evaluate significant conclusions and generate recommendations. This sample size was determined using statistics on the number of American supervisors and Hispanics involved in the construction industry in Iowa, provided by the BLS and U.S. Census Bureau.

According to the specific objectives established for the survey, quantitative and qualitative measurement techniques were determined, as well as the questionnaire order and survey length. Initially, the questionnaire consisted of nine questions that would provide the necessary information. After a pretest of two respondents, the questionnaire was reviewed, corrected and modified by several experts, including the Survey Director and Associate of the Center for Survey Statistics and Methodology at Iowa State University and other faculty.

In the end, the survey consisted of 35 questions divided into the following four categories: (1) type of training offered, (2) Hispanic cultural awareness, (3) safety aspects, and (4) personal information and preferences. Appendix A contains the questionnaire in its final format.

3.3. Data Collection, Analysis and Evaluation

The data collection stage of Part 2 (see Figure 3.1) was carried out in the form of face-to-face interviews, on the jobsite or elsewhere, and mailed-in questionnaires to construction companies in Iowa willing to collaborate. The companies targeted were those that would have a significant number of Hispanic employees within the organization. Of the 30 surveys initially planned, 38 were actually obtained among 15 construction companies in Iowa. Seventeen supervisors were interviewed personally and the rest of the questionnaires were filled out by supervisors on their own. American supervisors did not report any difficulty filling out the questionnaire.

As a last stage of Part 2, data analysis and evaluation were completed and used for the selection and development of two effective and unique training courses, discussed in Chapter IV. In this part, factors such as the length of the questionnaire, the number of completed surveys, and the data analysis software to be used had to be considered. Each objective in the questionnaire was achieved by asking the appropriate question. Appendix A contains a complete map of objectives for the corresponding questions.

Microsoft Excel was used to store respondents' information. Thus, survey responses were input, coded, and kept confidential in a customized database. Totals and respective percentages were calculated, and bar charts were generated for each of the 35 questions. Through the bar charts, the general distribution and the inclination of the data collected were identified.

Data analysis continued with the evaluation of the generated charts. Once all the data were gathered, it was exported to the statistical software JMP 5.0.1 to perform further variability and similarity analyses for every question. The analysis results, in turn, led to significant conclusions for research project recommendations. In light of both bar charts and statistical results, questions were selected according to the research objectives.

4. TRAINING COURSE DEVELOPMENT

4.1. Introduction

Hispanics are becoming a source of labor for many low-wage, low-skill, and physically demanding jobs in the United States. As their numbers grow, organizations must adopt new management training programs that take into consideration workplace diversity, which will in turn increase awareness and sensitivity towards Hispanic culture.

Studies show that Hispanics are strongly attached to their culture, despite being exposed to American culture (Romero 2004). Consequently, their identity in the workplace will be evident as well, introducing a new language and culture to the organization. This new language and culture can create issues within an organization if not approached properly. The construction industry is thus currently experiencing a communication gap between the American supervisors and Hispanic craft workers, which in turn may affect production costs and workplace safety. However, directing all training efforts towards the Hispanic workers may not be enough to achieve a construction company's production goals and safety commitments, given that many Hispanics do not have the educational level and literacy skills necessary to receive and understand the information provided.

Providing an adequate and continuous learning environment for all employees, both supervisors and workers, is one of the best methods for ensuring that both cultures (American and Hispanic) share common values and organizational goals to obtain more effective results.

Based on available data, results, and recommendations obtained from surveys conducted from May 2003 through March 2004, the research team developed two training courses for Phase II of the Hispanic Workforce Research Project. One course modifies the ESL course developed in Phase I into an SSL course, and the other offers more technical training based on the needs discovered. These courses are designed for American supervisors who need to develop basic Spanish-speaking skills in order to guarantee better and more direct communication with the Hispanic workforce and improve its interaction with leadership. The objective of these courses is to facilitate the integration process of both cultures by providing American supervisors the option to participate and take responsibility through the training programs developed.

Phase II adapts many course design guidelines used from Phase I, "Developing an Effective Construction Training Program for Hispanic Supervisors and Craft Workers." Section 4.2 discusses the work of Arbelaez (Phase I) and Canales (Phase I and II), which incorporates some of the Outreach Training Program Guidelines from OSHA's outreach training program into the design of these courses.

4.2. Systematic Approach for Training Course Development

Arbelaez (2003) found that a systematic approach to diversity training is necessary for the development of the proposed courses. Goldstein (1993) forces training developers to consider why training is needed, what should be covered in training, and how training outcomes should be measured. This approach was adapted and simplified for this research, as shown in Figure 4.1.

Stage one (see Figure 4.1) was described in Chapters II and III of this report. The two courses included in this report, the *SSL Survival Course* and *Concrete Pavement Construction Basics*, address a combination of current Hispanic workforce issues and more specific issues for American supervisors that are characteristic of Iowa construction companies, as identified in survey findings. Therefore, the intent of these courses is to provide instructional material and content based on research findings. These courses will facilitate the integration process between Hispanic workers and American supervisors by improving, in a practical manner, the supervisors' Spanish-speaking skills related to the construction jobsite, more specifically on concrete pavement road projects.

Figure 4.1 indicates that once the needs assessment is complete, training course development can begin. For this process, the courses were structured around three main steps that play a critical role in training individuals: (1) awareness, (2) skill building, and (3) action planning (Arbelaez 2003). Having structured the content, the process of fully understanding every step is supplemental to each of the two courses.

The *SSL Survival Course* follows the same framework as the *ESL Survival Course* developed in Phase I of the Hispanic Workforce Research Project. The instructor provides the participant a workbook containing all the material discussed throughout the presentation. The content of the presentation is approached in four segments: (1) meaning in Spanish, (2) meaning in English, (3) pronunciation of the word in Spanish, and (4) a picture of the word as a visual aid. Every word included in the workbook is presented to participants in these four ways. The teaching process has the following sequence: (1) the word is shown to participants and read to them by the instructor in Spanish; (2) participants repeat the word several times; (3) participants write the pronunciation of the word (phonetic sound); and (4) comments are discussed. Each of these sequential steps is related somehow to the structural components (awareness, skill building, and action planning), but the goal is to follow an effective, combined path (Canales 2004).

For the first structural component, *awareness*, a brief introduction to participants of industry and organizational facts, risks, and accident rates, as well as projected demographic changes and workplace diversity, is highly recommended to begin the bicultural training process. This should lead to increased participant motivation, interest, and attention.

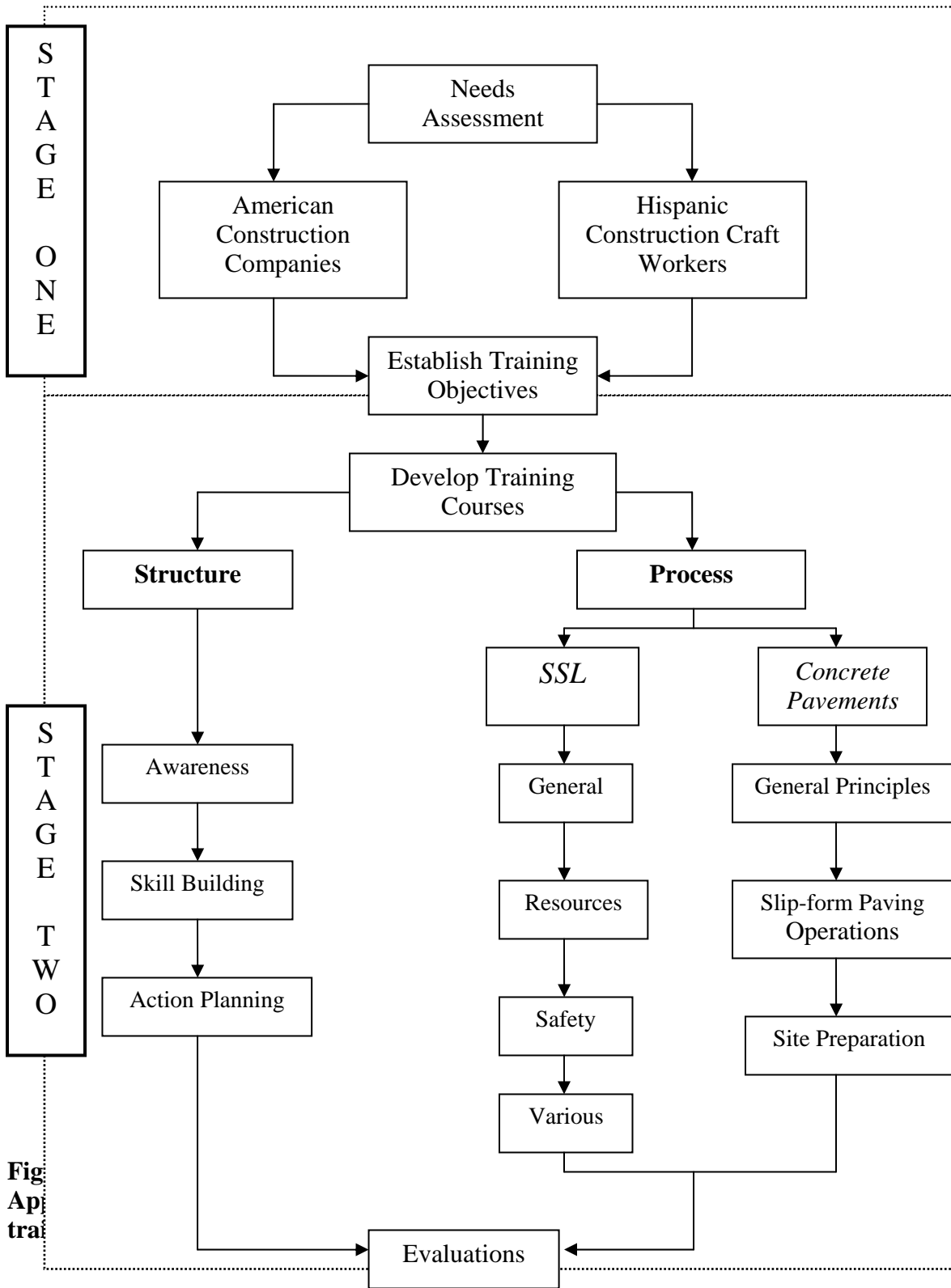


Fig. 1
 Ap. tra

Once the participant becomes aware of the actual working environment and potential changes, the attainment of knowledge and *skill building* for new adjustments, challenges, and

behaviors can begin (Kraiger 2002). It is very important to stress the differences in cultural norms, attitudes, and values between American and Hispanic cultures.

Since diversity is the focus of these courses, development and delivery of the courses should not only be done by a qualified trainer, but the individual must also be fluent in both English and Spanish. More importantly, the trainer must share and understand both American and Hispanic cultures to transmit the message and associate with the participants.

During the *skill building* component, participants should also have the opportunity to observe both appropriate and inappropriate behaviors, experience working with cultural issues and conflicts, and finally receive encouraging criticism to make the necessary adjustments. For example, simulations of workplace situations are useful at this stage. Anecdotes and group discussions can be used where issues can be identified and improved upon. Real scenarios provide American supervisors a way to associate past experiences with the issues present in the construction industry, such as the communication gap and cultural differences with Hispanic workers. The supervisors need to understand why and how those situations may be encountered on the jobsite. The main goal is to encourage communication in the jobsite, which will lead to the integration of the two cultures. The two parties can become one team working together towards the achievement of a common goal, communicating at a basic level in either or both languages and using construction-related terminology.

The third and last structural component is *action planning*. It concludes the preceding *skill building* and *awareness* stages. Without it, the training approach would be unsatisfactory. This stage is the result of the training process; therefore, trainers are to make sure that it has been successfully completed. During this stage, problem solving and process improvement activities are discussed and should be developed when delivering the training course.

The contents of these courses were chosen according to the information American supervisors need to know about communicating with their Hispanic crew in a practical and effective way within an American construction company. More specifically, these contents were given a heavy/highway construction emphasis because the majority of the survey findings were obtained from this area of the construction sector.

The *Concrete Pavement Construction Basics* course takes a slightly different training approach, but with the same structural components as the *SSL Survival Course*. The course was designed fulfill the specific technical and contextual needs of American supervisors within an appropriate timeframe. Survey results show preferences to be in the area of concrete pavement construction practices. Therefore, a series of independent courses related to concrete pavement procedures was developed for American supervisors to allow them to choose any or all of the subtopics that fit their job and training requirements. Some of the subtopics developed are concrete placement, finishing, and curing, among many others. These courses not only train for the technical aspect of the job, but include the added value of the language dimension to allow supervisors to communicate with their Hispanic crews without the constant need for a link-person. The link-person is a crewmember who acts as an interpreter between the American supervisor and the Hispanic crewmembers (Canales 2004).

4.3. Criteria for Developing Training Courses

4.3.1. Spanish as a Second Language Survival Course

American supervisors play a very important role in the execution phase of a construction project. They act as a link between the project management team and the craft workers. The project management team communicates to the supervisors the schedule and activities necessary for the completion of a project. The supervisor then delegates to the craft workers the tasks necessary for the execution of an activity. Work experience, leadership skills, and good communication skills are crucial for transmitting tasks to the craft workers successfully. However, crew demographics are changing as the labor force becomes more diverse. Therefore, when a crew exhibits strong cultural differences from the supervisor, such as a different native language (i.e., Spanish), supervisor-worker communication may break down and the tasks and activities may not be transmitted appropriately.

A total of 38 surveys were collected from the American supervisors willing and available to complete the questionnaire. Some were conducted as face-to-face interviews and others were submitted by mail or fax. Fourteen Iowa construction companies were represented in this investigation. Sixty-six percent of the survey participants worked in the areas of heavy/highway construction, among which five individuals specialized in bridge construction and two specialized in earthwork and heavy equipment construction. The remaining 34% of participants worked in areas related to general commercial construction. Table 4.1 summarizes the job titles of the survey participants.

Table 4.1. Survey participant job titles

Job title	Total	Percentage
Supervisor	13	33%
Superintendent	12	31%
Project manager	4	11%
Assistant project manager	1	3%
Foreman	1	3%
Safety director	1	3%
Unidentified	6	16%

The survey captures the opinions of American supervisors with regard to their Hispanic crewmembers. Appendix B contains graphical representations of all survey question results. The following figures illustrate the survey results that justify, from an exploratory angle, the need for a construction-focused SSL training course designed for American supervisors. The statistical software JMP 5.1 was used to illustrate the selected survey results in the form of a histogram, a mosaic plot, a box plot, and a scatter plot. Survey results from Phase I were also used to compare the attitudes of Hispanic workers with those of American supervisors.

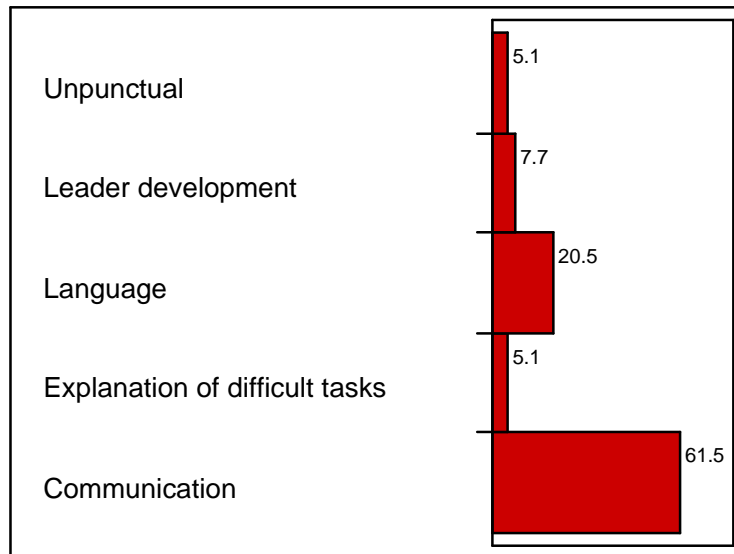


Figure 4.2. Most common problems encountered in the jobsite by American supervisors (%)

The survey captures the types of problems American supervisors face as they relate to Hispanic crewmembers. The most common problems are illustrated in Figure 4.2. Apparently, language seems to impact the effectiveness of communication and productivity on the jobsite, since most of the recorded problems that American supervisors faced were classified under either “Communication” or “Language”. Another problem encountered related to language is captured under “Explanation of difficult tasks.” Results show that little or no knowledge of Spanish considerably reduces the ability of American supervisors to communicate to the Hispanic crews, especially in the case of “difficult tasks,” where a great deal of unnecessary effort and time may be spent trying to explain these tasks. Other problems encountered by American supervisors were “Unpunctuality,” “Collective protest,” “Lack of attention,” and “Leader development” on the part of the Hispanic workers. “Collective protest” describes, for example, when a worker is suspended from the job for the following day, and the rest of the crew does not attend the jobsite on the following day to support the suspended worker and protest the suspension. “Lack of attention” refers to subordinates that do not show attention when tasks are assigned by a supervisor. Some supervisors find it difficult to assign a leader whom they believe has the appropriate capabilities (leader development). Many Hispanics believe in “seniority,” and in many cases the assigned crew leader may not correspond with whom the crew believes the leader should be. As a result, the assigned leader and/or the crew may not perform according to expectations. These problems arise mostly because American supervisors are unfamiliar with the differences between Hispanic and American cultures.

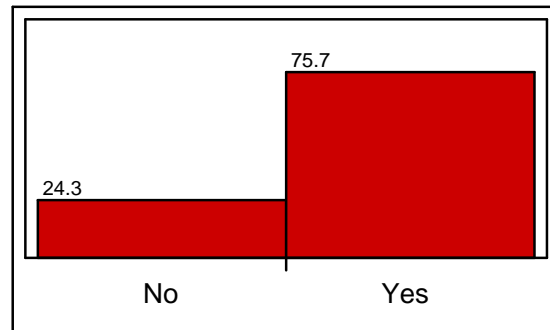


Figure 4.3. Do you have a link-person (facilitator) to help you communicate with the Hispanic workers in your crew? (%)

Many other factors illustrated in the survey results may reinforce the challenges American supervisors are facing in the construction industry today with regard to the more diverse Iowa workforce. Over 75% of American supervisors have a link-person (facilitator) who helps them communicate with the Hispanics in their crew, as shown in Figure 4.3. This confirms that many American supervisors are not capable of communicating directly with the Hispanic crewmembers because of language differences. However, what happens when the link-person does not show up to the worksite? How will the tasks be transmitted effectively to the Hispanic crewmembers without proper knowledge of the Spanish language? These situations may decrease the productivity of construction activities on any given day or even compromise the safety of coworkers because of the improper transmission of tasks and safety issues to Hispanic workers.

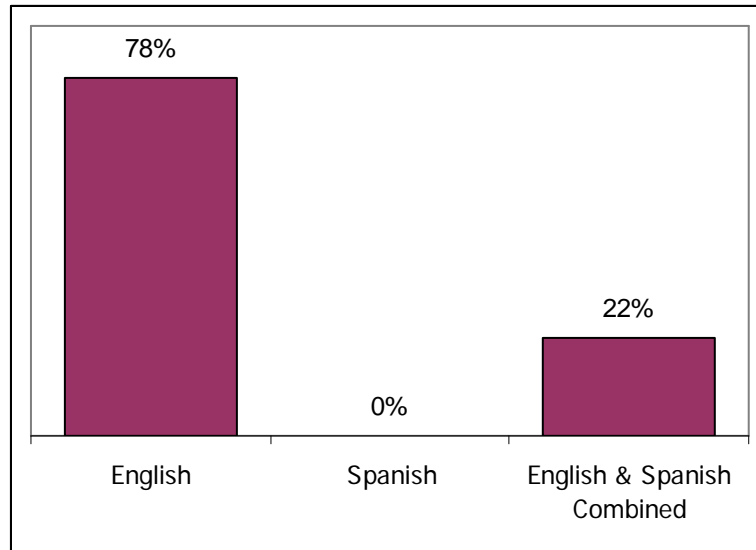


Figure 4.4. What language do you use to speak to the Hispanic workers in your crew?

Figure 4.4 shows that 78% of the American supervisors interviewed communicated with Hispanic workers in their crew using the English language. The remaining 22% combined the English and the Spanish language to speak with the Hispanic crewmembers. Taking into account the results from Phase I, 67% of Hispanic craft workers in Iowa have not even taken a course to learn English. Therefore, the use of the English language is not sufficient to communicate with Hispanics, since many of them do not understand the English language fully.

Approximately 84% of American supervisors are dissatisfied with their ability to communicate in Spanish and 91.6% expressed that it is important to them to improve their communication with the Hispanic workers in their crew, as illustrated in the survey results illustrated in Appendix B, questions 19d and 22b. More than half (59.5%) of the American supervisors interviewed have taken some sort of Spanish course in high school or college (see Appendix B, question 1a), but survey results show that their previous education is not enough to communicate clearly with the Hispanic crewmembers, and many indicated that they have forgotten a majority of what they learned. Of the 40.5% who have not taken a Spanish course, 81.3% were interested in taking a course to learn Spanish (see Appendix B, question 1c). When asked what solution they would propose to overcome the language barrier with the Hispanic workers (see Appendix B, question 33), 15% proposed taking SSL courses and 46% proposed a combination of ESL and SSL courses for both the American supervisors and the Hispanic workers. Evidently, American supervisors recognize that some kind of training in communication skills is necessary to bridge the existing language gap between the supervisors and the Hispanic craft workers.

In terms of effort, survey results suggest that it would be easier to teach American supervisors basic construction terminology in Spanish because there are fewer supervisors and they have higher educational levels than Hispanic workers. Figure 4.5 shows that

Hispanic crew sizes vary from “1–3” to “more than 10.” About 60% of the interviewed American supervisors have a total of 7 or more Hispanics in their crew.

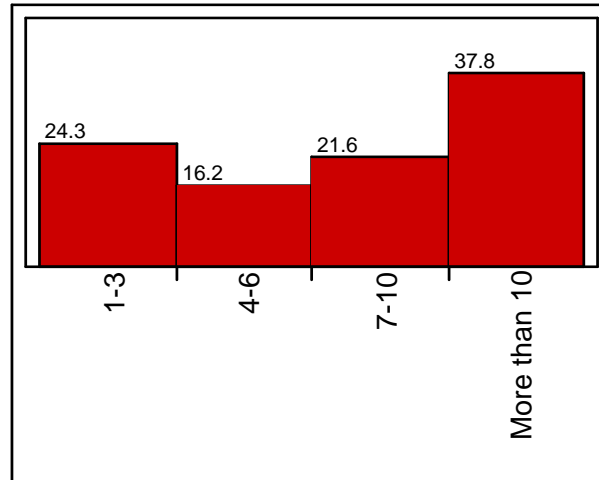


Figure 4.5. How many Hispanic workers do you have in your crews? (%)

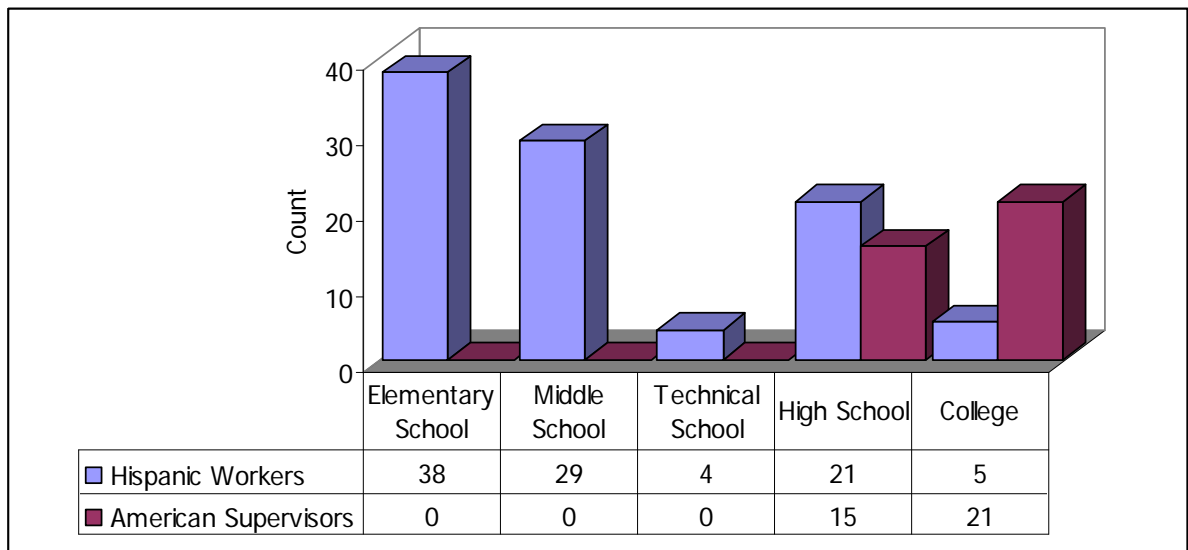


Figure 4.6. What is the highest level of education you have completed?

In addition, the educational level of American supervisors was compared with that of Hispanic workers using survey results from Phase I, as illustrated in Figure 4.6. According to the data points on the graph, all American supervisors had completed a “High School” or “College” education. On the other hand, Hispanic workers had educational levels that ranged from “Elementary School” to “College.” The 95% confidence intervals of the two samples (American Supervisors: 4.41 to 4.75; Hispanic Workers: 1.97 to 2.50) representing the

diamonds shown in the graph do not overlap at all. Thus, there is convincing evidence that the mean educational levels of the two samples are different. Also, the distribution for both samples was not normal; therefore, a rank-sum test was needed to compare the mean educational levels of both samples. A rank-sum test, otherwise known as the Wilcoxon test, is a nonparametric statistical tool that can be used to compare two independent samples in order to avoid making any distributional assumptions (Ramsey and Schafer 2002). There is strong evidence that the mean educational level of American supervisors is higher than that of the Hispanic workers (two-sided $(\text{Prob} > |Z|)$ p-value < 0.0001 , from the rank-sum test). As a result, American supervisors are better suited to receive a second language training course because of their educational levels. Hispanic workers have a lower probability of grasping the information provided in an ESL training course, because they may not have the literacy skills necessary to receive and use the information.

The data collected through this survey and the literature review from Chapter II indicate that an SSL training course focused on construction terminology, which addresses issues regarding Hispanic craft workers, is necessary for American supervisors in the Iowa construction industry. It is important to note that both samples collected (from American supervisors and Hispanic workers) were selected as convenience samples. Therefore, the data collected was restricted to those Iowa construction companies that volunteered their resources during the research surveying period. In the case of the Hispanic participants, some were each others' brothers, cousins, or in-laws. Motivation may have influenced the survey results as well. For instance, some American supervisors were disrupted at the jobsite during regular working hours to complete the surveys.

Once again, the survey confirms that communication poses a crucial problem at the jobsite. Many American supervisors have taken Spanish courses in the past, but they communicate mostly in English and use a link-person to transmit tasks to the Hispanic crew. This research shows that language differences affect workplace productivity and safety in the construction industry. In addition, the educational levels of the Hispanic workers suggest that they may not have the literacy skills necessary to understand training materials fully. Construction companies thus need a quick and cost-effective training tool that will expand the Spanish communication skills of American supervisors. As a result, construction-focused vocabulary words were implemented into the courses developed to meet the needs of the industry. Key phrases were also incorporated into the course as a means of encouraging communication between American supervisors and Hispanic workers. These courses significantly reduce the need for a link-person on the jobsite, since American supervisors will be able to communicate and interact with Hispanic crewmembers.

Overall, the research results can be considered representative of the construction industry in Iowa for practical purposes, and, as a result, the *Spanish as a Second Language Survival Course* was created.

4.3.1.1 Brief Description and Course Content

The following section is taken directly from the research work performed by Augusto Canales. Canales (2004) was a key member of the research team for this project and participated in the design of the SSL training course. His dissertation, *Developing Effective Integration between American Supervisors and Hispanic Craft Workers in Construction*, provides an accurate and precise description of the courses in general. The focus of these courses is on simplicity. They are not college courses, but instead are highly interactive, basic courses on only the necessary information, including construction-related vocabulary, tool names, equipment, and simple, direct language phrases to facilitate basic communication.

The development of the *SSL Survival Courses* was based on basic construction vocabulary. The level of these courses, as the name indicates, is for American supervisors with a low level of second language knowledge in Spanish. The survey findings related to SSL courses led developers to structure the course such that it contains two types of instructional materials: a booklet and a visual presentation. The booklet provided to trainees consists of a list of words sorted alphabetically and organized by categories. These categories include general vocabulary (alphabet, vowels, numbers, and hand tools), resources (materials, workforce, and equipment), safety (safety equipment and safety signs), and other information (productivity, quality, and survival phrases). The visual presentation contains pictures of the words and their meanings in English and Spanish. Table 4.2 summarizes the contents of the courses by topic and subtopic.


Table 4.2. *SSL Survival Course* content

General	Resources	Safety	Various
➤ Alphabet	➤ Materials	➤ Safety equipment	➤ Productivity
➤ Vowels	➤ Work force	➤ Safety signs	➤ Quality
➤ Numbers	➤ Equipment		➤ Miscellaneous
➤ Hand tools			

Examples of the material used during the course are provided in Figure 4.7. The full version of the *SSL Survival Course* is available from the Iowa State University Department of Civil, Construction and Environmental Engineering. The course contains real work situations in which the American supervisor can learn to instruct his or her workers.

Aggregate/
Agregado

It sounds like: _____



Bag/
Saco

It sounds like: _____




Figure 4.7. Examples from the *SSL Survival Course*

After several trial runs of the *SSL Survival Course*, the most effective approach was implemented. A word is to be read by the trainees after they have visualized the picture symbolizing the word's meaning. Once this word has been visualized and read, trainees are to repeat the word after the instructor has clearly pronounced it to them. This process may be repeated several times until trainees feel comfortable with the pronunciation and meaning of the word. Flashcards are used to facilitate learning and retain knowledge and pronunciation of the word. This course is designed to be taught in one eight-hour session.

Instructors should also discuss cultural dimensions or cultural differences, which will give Hispanic workers and American supervisors a sense of confidence in the instruction that goes beyond simply pronouncing the word correctly. By discussing the cultural dimensions as described by Hofstede (1983), participants become sensitized to the fact that people are all different, that cultural diversity exists, and that people are somehow located in, belong to, or behave in one or more of Hofstede's dimensions. For example, in the dimension of power distance, workers from cultures with high power distance believe that the boss is an all-powerful person to whom workers cannot even dare to speak; in such a situation, communication basically does not exist. In addition to providing "survival words," the course includes "survival phrases" that facilitate communication between Hispanic workers and American supervisors.

4.3.1.2. Course Delivery and Evaluation

Once the *SSL Survival Course* was completely modified from the ESL course created in Phase I, the next step was to deliver the course and test its effectiveness. The course has been delivered successfully several times with the help of the Associated General Contractors of Iowa, either as an eight-hour session on a Saturday or as shorter sessions scheduled during weekdays to fit the needs of the construction organization.

A course evaluation sheet consisting of 22 questions was given to the participants at the end of the session (see Appendix C). The objective of the course evaluation was to determine the adequacy of the course content and the course’s usefulness to the American supervisors. The instructor and assistant are also evaluated on their training skills. Through the course evaluation, effectiveness can be measured and improvements can be incorporated into the courses in the future. At the time the course was delivered, two course evaluations were collected. Though these may not be sufficient to determine the effectiveness of the course, Table 4.3 summarizes the results obtained.

Table 4.3. SSL course evaluation results

		Too Basic	About Right	Too Difficult		
Course Content	1 How was the overall class content?		100%			
		Yes	No			
	2 Was the order of the topics easy to follow?	100%				
		All	Most	About 50%	Some	None
	3 How much of the information presented will be useful to you in your job?		100%			
Instructor & Assistant		Deficient	Fair	Good	Excellent	
	6 Knowledge of subject				100%	
	7 Communicated clearly				100%	
	8 Effective presentation tools				100%	
	9 Responded well to questions				100%	
			No Interest	Impartial	With Interest	Very Interested
	10 How would you rate the trainers' interests in you training?				100%	
Overall Training		Not At All	Neutral	Somewhat	Almost	Definitely
	11 Was the class what you expected?				100%	
	12 Was the class a worthwhile investment?				50%	50%
	13 Has your confidence in speaking Spanish improved?		50%	50%		
			No	Maybe	Probably	Definitely
	14 Would you recommend this course to others?				100%	
Training Workbooks		Poor	Average	Excellent		
	15 How would you rate the training books?			100%		
	16 Were they complete?		50%	50%		
	17 Were they accurate?		50%	50%		
	18 Were they activities useful?			100%		
	19 How would you rate the classroom and equipment?		50%	50%		

The 17 questions illustrated in Table 4.3 rate to some extent the content of the course, the instructor and assistant, the overall training, and the training material (workbooks). In general, the results show that the *SSL Survival Course* was successful in providing these two American supervisors a tool to overcome the communication barrier with Hispanic craft workers in their crews. The SSL course content was regarded as “About right;” and “Most” of the course content was determined useful by the participating American supervisors. The construction focus integrated into the course seems to meet the expectations of usefulness for the intended audience of American supervisors.

Still, many difficulties were encountered throughout the scheduling process of the course. There is interest and need for the courses, as discussed in previous sections, but time seems to be a major constraint. The length of the course (eight hours) seems to be a limiting factor for American supervisors and construction companies in Iowa, since there was a very low sign-up and attendance rate for the SSL course. Apparently, many American supervisors may not be aware of the fatality rates among Hispanics and the benefits that an SSL course would bring to them in terms of communication with and the productivity of Hispanic crewmembers. Therefore, the type of training provided through the *SSL Survival Course* may not be regarded as a priority among American supervisors or within a construction company’s organizational culture.

4.3.2. Concrete Pavement Construction Basics Course

The integration process of the American and Hispanic cultures in the construction industry will take a lot of effort and dedication from both parties, including involvement at the organizational level, in order to increase workplace diversity awareness. To make the effort as smooth as possible, a series of technical courses have been developed to accommodate the needs of American supervisors. The objective of the technical courses is not to teach a new language, but to offer American supervisors the means by which to improve their language skills and encourage proper communication within a crew for a specific field of work.

American supervisors are key players in the activities and processes that take place during a construction project. Hence, their preferences must be taken into account in order to meet their needs and job limitations, such as time. Figure 4.8 shows that 71.4% of American supervisors who answered this survey question preferred a technical course focused on “Concrete/Finishing” work-related activities. Another 14.3% selected either “Carpentry/Formwork” or “Equipment Operation.” The remaining 14.3% of American supervisors replied that “All” of the technical topics would be equally beneficial to them to improve their communication skills with their Hispanic crewmembers.

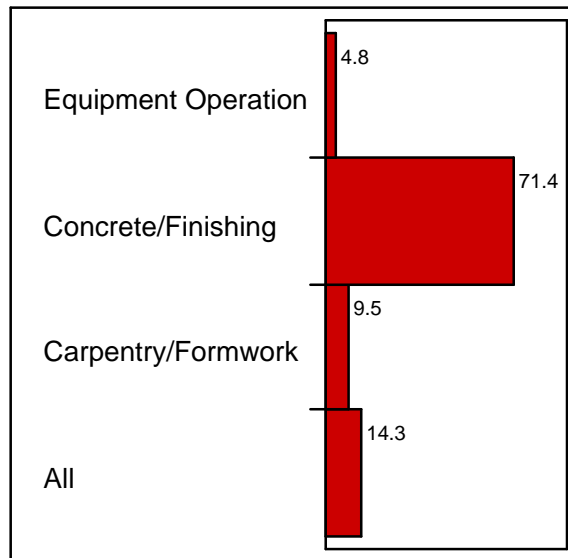


Figure 4.8. What technical course would you prefer to take that will benefit the communication between you and your Hispanic crewmembers? (%)

A “Concrete/Finishing” technical course appears to be the most demanded among American supervisors in Iowa. Therefore, a number of publications were considered and reviewed to determine the most appropriate path and technical terminology to help American supervisors attain the minimum Spanish language skills related to concrete construction. With this in mind, the technical curriculum of the Center for Portland Cement Concrete Pavement Technology, housed and administered at the Center for Transportation Research and Education at Iowa State University, offered a complete range of publications based on concrete pavement construction practices.

Another observation regarding technical courses is worth noting. In Phase I, Hispanic workers were asked to state which technical course related to their trade they would prefer to take. In the present research, American supervisors were asked to state which technical course related to their trade they would prefer their Hispanic crews to take. All the answers were recorded, and Figure 4.9 illustrates both parties’ range of preferences. It is noted that American supervisors have a significant interest in concrete-related technical courses, especially for their Hispanic workers. On the other hand, Hispanic workers had more interest in equipment-related technical courses. This discrepancy could be because the types of jobs related to equipment operation seem more enjoyable and pay more. The second and third most common preferences for Hispanic workers were “Carpentry” and “Concrete.” In many cases, their interest in “Carpentry” was related to formwork. Therefore, concrete-related work seems to be a very popular interest among American supervisors as well as Hispanic workers.

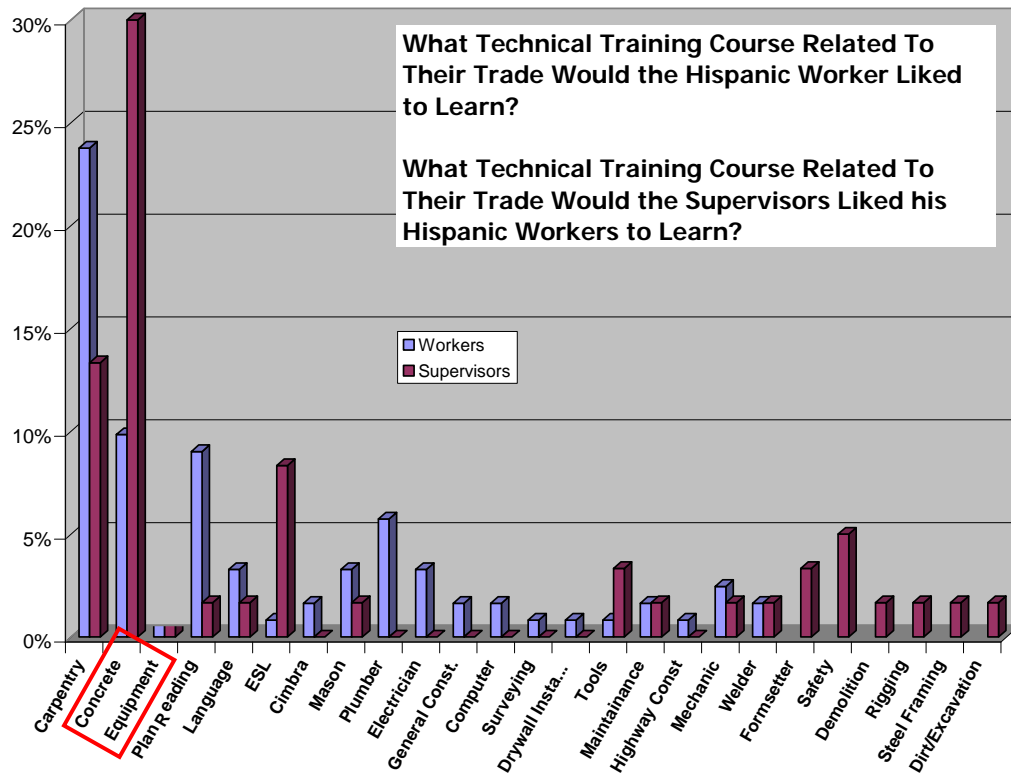


Figure 4.9. Technical course preference

Hence, the course was titled the *Concrete Pavement Construction Basics* course (CPCB course). It is divided into 12 subtopics, lasting approximately 3 hours each, that best describe the major concrete pavement construction practices: site preparation, slip-form paving operations, jointing, special weather considerations, and safety (Brink, Grove, and Hanson 2004). Each subtopic is structured in the same teach-learn manner as the *SSL Survival Course*. A visual presentation and a workbook is provided to American supervisors as course material to get them acquainted with the common terminology of each subtopic. The *CPCB* course is discussed in more detail in Chapter V.

4.3.2.1. Course Delivery and Evaluation

The *CPCB Course* was successfully delivered in April 2005. A total of five people described as “foremen” and one “field supervisor” attended the training session. The subtopic selected by the construction organization for this session was *Safety*, and it lasted approximately two and one-half hours, followed by the course evaluation questionnaire.

Through the course evaluation results, effectiveness can be measured and improvements can be incorporated into the courses in the future. This questionnaire follows the same format as that previously discussed for the *SSL Survival Course* (see Section 4.3.1.2 and Appendix C).

Table 4.4 provides a summary of the results obtained from the six participants with respect to the content of the course, the instructor and assistant, the overall training, and the training material (workbooks). The results show that the course content was considered appropriate and easy to follow by all the participants. Most, if not all, of the information presented during the course was useful to 66% of the participants.

Table 4.4. CPCB course evaluation results

Course Content	1	How was the overall class content?	Too Basic	About Right	Too Difficult		
			Yes	No			
	2	Was the order of the topics easy to follow?	100%				
Course Content			All	Most	About 50%	Some	None
	3	How much of the information presented will be useful to you in your job?	50%	17%	33%		
			Deficient	Fair	Good	Excellent	
Instructor & Assistant	6	Knowledge of subject			17%	83%	
	7	Communicated clearly			17%	83%	
	8	Effective presentation tools			17%	83%	
	9	Responded well to questions			17%	83%	
			No Interest	Impartial	With Interest	Very Interested	
	10	How would you rate the trainers' interests in you training?				100%	
Overall Training			Not At All	Neutral	Somewhat	Almost	Definitely
	11	Was the class what you expected?			17%	50%	33%
	12	Was the class a worthwhile investment?				33%	67%
	13	Has your confidence in speaking Spanish improved?		25%	25%		50%
			No	Maybe	Probably	Definitely	
14	Would you recommend this course to others?		17%		83%		
Training Workbooks			Poor	Average	Excellent		
	15	How would you rate the training books?		33%	67%		
	16	Were they complete?		33%	67%		
	17	Were they accurate?		50%	50%		
	18	Were they activities useful?		33%	67%		
19	How would you rate the classroom and equipment?		33%	67%			

For the training session in general, more than half of the participants regarded the course a worthwhile investment. In some cases, their confidence in speaking Spanish improved, since they repeat the vocabulary terms several times and practiced the correct pronunciation. Almost all of the participants would definitely recommend this course to others. The course material had ratings that ranged from “Average” (33%) to “Excellent” (67%). When asked what information they considered to be the most useful, they answered “survival phrases,” “learning the correct pronunciation” and “all of the vocabulary.” The following are some of the comments shared by the participants:

- “It will be useful and helps to understand areas that I was unsure of.”
- “It is a good start to levy to communicate with Hispanic employees.”

- “Better communication leads to better understanding of the job...leading to safer, productive worksites.”

In general, the results show that the SSL survival course was successful in providing the two American supervisors a tool to overcome the communication barrier with Hispanic craft workers in their crews. The SSL course content was regarded as “About right;” and “Most” of the course content was determined useful by the participating American supervisors. The construction focus implemented into the course seems to meet the expectations and usefulness of the intended audience (American supervisors).

Questionnaire results show that the *CPCB Course* was successful in providing American supervisors a tool to encourage direct communication with Hispanic craft workers in their crews.

4.4. Concluding Remarks

Clearly, the survey results discussed in this chapter and the extensive literature review discussed in Chapter II prove from a practical standpoint the necessity of second language training material that focuses on work-related activities for American supervisors with Hispanic crews. The majority of Hispanic construction workers in Iowa are of Mexican origin and their average educational level found from Phase I survey results was “Middle School.” This limits their ability to understand training material and apply it to their work activities.

It is thus critical for American supervisors to participate in the integration efforts to diminish the language barrier. The research data from Hispanic construction craft workers and American supervisors can be considered reliable. Thus, developing the *SSL Survival Course* and *Concrete Pavement Construction Basics* was necessary to offer American supervisors the basic Spanish-speaking skills to facilitate the integration process.

5. CONCRETE PAVEMENT CONSTRUCTION BASICS

5.1. Course Objective

The *Concrete Pavement Construction Basics* course is designed to meet the technical communication needs of American supervisors with Hispanic crewmembers. The course follows the same structure as the *SSL Survival Course*, but the general approach is modified to address the time limitations that American supervisors exhibit and appeal to the individual interests in work activities for particular road construction projects. This course intends to increase the awareness of the growing Hispanic workforce in Iowa's construction industry, which will in turn decrease fatality rates among Hispanic workers and improve workplace safety and productivity.

5.2. Course Content

The course is divided into 12 subtopics related to concrete pavement construction practices. Three subtopics were initially designed during the early stages of Phase II of the Hispanic Workforce Research Project to determine the most adequate approach to these technical courses. These subtopics are as follows:

- Materials
- Jointing
- Joint Sawing and Sealing

All three courses contain extensive information and images describing design details and proper procedures for each of the three subtopics. Figure 5.1 shows a few slides displaying the contents of each topic. The entire course outlines for these subtopics are provided in “Developing an Effective Construction Training Program for American Supervisors with Hispanic Craft Workers: Spanish as a Second Language Survival Course and Concrete Paving Construction Basics Course.”



Figure 5.1. Sample slides for three initial subtopics

After a pre-test during the early stages of Phase II, these courses were determined to be too detailed, considering the language limitations of the concrete pavement construction practices for American supervisors. As a result, the remaining nine courses were modified to address simple terminology common on the jobsite. The nine subtopics are as follows:

- Curing
- Equipment
- Finishing
- Grading
- Hand Tools
- Placing Concrete
- Safety
- Stringline and Dowel Bars
- Transporting Concrete

Each subtopic (4 through 12) is estimated to last a total of three hours is divided into two sessions, a vocabulary session and a survival phrase session. All have an average of 20 vocabulary words and approximately 24 survival phrases characteristic of each subtopic. Furthermore, all subtopics have a set of “Basic Survival Phrases” to encourage communication between both parties and a set of “Emergency Phrases” that American supervisors can use for emergency situations. These phrases are repeated in every course because their sole function is to help American supervisors communicate and understand their Hispanic crewmembers.

Following the “Basic Survival Phrases” and “Emergency Phrases” are the “Daily Phrases.” These phrases consist of the most common activities that American supervisors may need to assign on a daily basis for the specific subtopic. They are short, to the point, and describe mostly assigned actions (verbs) with a corresponding vocabulary term. A feature of these phrases is that the vocabulary terms are underlined so that the American supervisors who wish to take the learning experience a step further can substitute vocabulary words within a corresponding phrase. This is another trait of the *CPCB Course* that encourages communication and integration between the American supervisors and Hispanic crewmembers. Figure 5.2 shows a few of the phrases used throughout the subtopics. For example, one can substitute “wheelbarrow” in phrase 1 with “power buggie” from phrase 3 and the phrase in Spanish will look like this: *Tráe el motocarrito*.

Daily Phrases	Frases Diarias
1. Bring the <u>wheelbarrow</u> Tráe la <u>carretilla</u>	
2. Hook the <u>bucket</u> to the <u>crane</u> Engancha el <u>cubo</u> a la <u>grúa</u>	
3. Find the <u>power buggie</u> Búsca el <u>motocarrito</u>	

Figure 5.2. Phrases out of the “Placing Concrete” course

In addition, the course material is also offered in a pocket-sized version. This product gives the American supervisor the opportunity to take the learned material to the jobsite to practice and make any additional notes or comments. The actual size of the booklet is approximately the size of a wallet. The booklet was designed for convenience and it is a great tool that facilitates the learning process. The size and material make the item portable and durable at the same time.



Figure 5.3. Inside look at pocket-sized booklet

The content of the entire CPCB Course is provided in “Developing an Effective Construction Training Program for American Supervisors with Hispanic Craft Workers: Spanish as a Second Language Survival Course and Concrete Paving Construction Basics Course.”

6. ADAPTING THE RESEARCH TO OTHER CULTURES / ETHNIC GROUPS

Phase II also includes the development of a process that can be used to train workers from cultures other than Hispanic ones. Canales (2004) developed a “Model for Bosnian Construction Workers” in his dissertation as a means to transfer the research model for Hispanic workers to groups like Bosnian construction workers. He selected this ethnic group as an example for model transferability because, during the period when the interviews were conducted, it was evident that Bosnian workers had an important presence at Iowa jobsites. Additionally, officials from AGC of Iowa brought up the issue of Bosnian workers several times during previous meetings and conversations.

In Canales’ (2004) dissertation, the term transferability, commonly used in qualitative research, describes the degree to which aspects of research findings can apply to contexts other than that from which the findings emerged. Accordingly, when other populations represent a high percentage of the construction workforce, a model can be developed that suits any ethnic group that poses similar integration issues in the construction industry as Hispanics workers are currently posing.

Figure 6.1 illustrates the model developed by Canales (2004), which depicts the flow of major activities that must take place to transfer the research findings successfully and obtain the same benefits as those obtained for Hispanic workers. Canales (2004) noted that it is very important to keep in mind that the final objective is to achieve integration between the workers and the American supervisors.

Model for Bosnian Construction workers

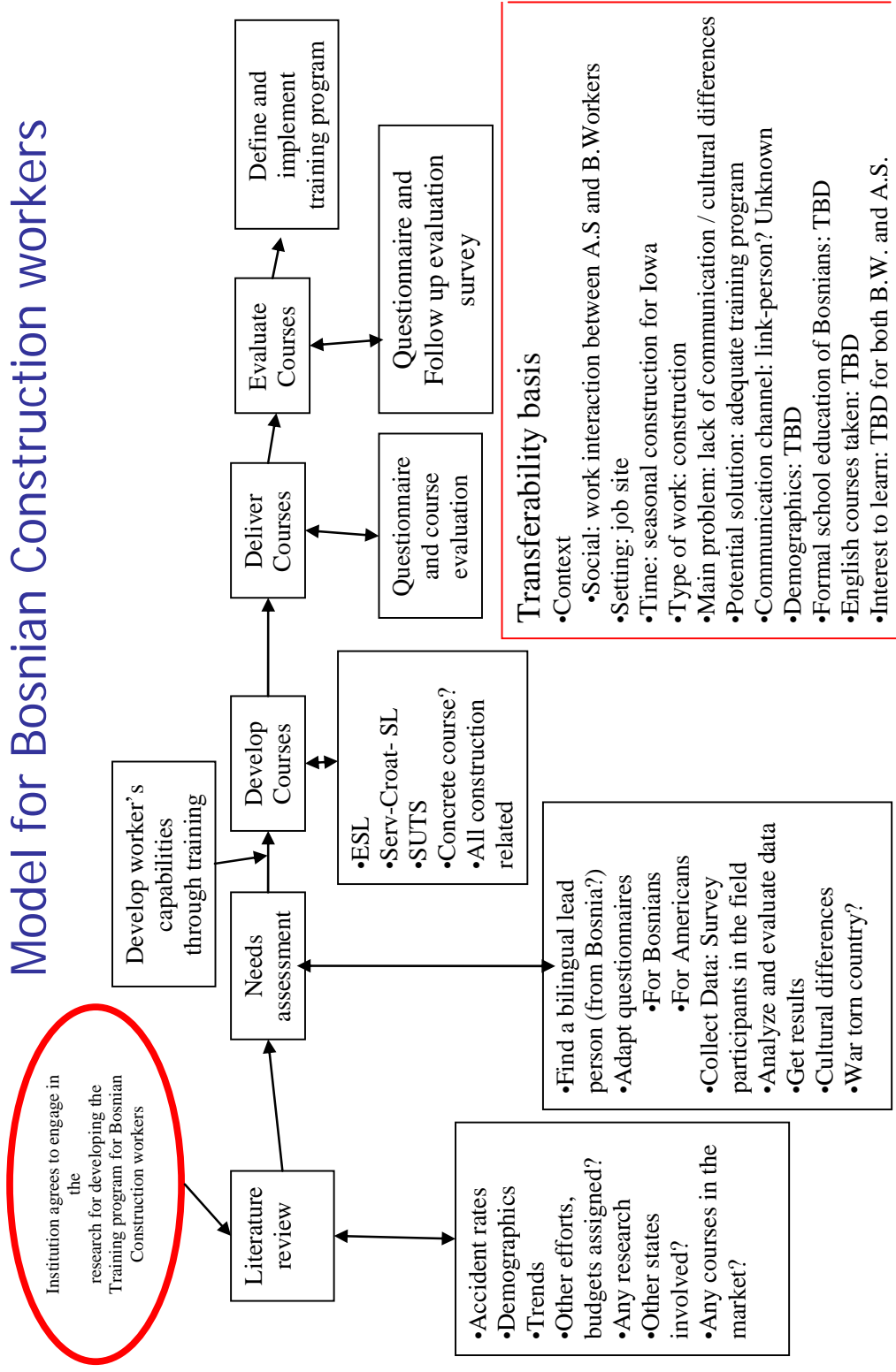


Figure 6.1. Transferability model (Canales 2004)

Research activities can begin with the literature review, which determines the demographics, trends, and accident rates of the population researched. The literature review also details the efforts placed on research and training material. Then follows the needs assessment activity, in which a questionnaire is developed to determine the specific details and needs of the population investigated. A series of courses is then developed based on the findings of the literature review and the needs assessment activities. Finally, the courses are delivered to the appropriate audience and evaluated to determine their effectiveness. Once these activities have taken place, the course is then defined and implemented into a training program for use by construction companies. The model transferability bases are the following:

- Social context: work interaction between American supervisors and Bosnian workers
- Setting: job site
- Time: seasonal construction for Iowa
- Type of work: construction
- Main problem: lack of communication/cultural differences
- Potential solution: adequate training program
- Communication channel: link-person? Otherwise unknown
- Demographics: to be determined
- Formal education of Bosnians: to be determined
- English courses taken: to be determined
- Interest to learn: to be determined for both Bosnian workers and American supervisors

Canales (2004) also observed that when transferring the model, it is very important in the literature review stage to determine the demographics and the trends of the target population. For example, the actual number of workers and the growth trends of the Bosnian population are very different from the Hispanic population. The Hispanic population is expected to reach a quarter of the U.S. population by the year 2050, according to projections, whereas the Bosnian population is not likely to grow as rapidly because of different circumstances.

At the onset of the effort is the need to have an institution that will financially sponsor the research project and an entity (i.e., a university) that will be willing and capable to undertake the transfer process. The Bosnian population in Iowa's construction industry currently appears to present a need for integration.

A key element of the success and transferability of this model is that, as part of the research team, at least one individual must understand American culture as well as the culture being researched (e.g., Hispanic, Bosnian); the individual must be fluent in both languages and be somewhat familiar with the construction industry. The model or training courses can also be adapted to fulfill the specific needs (technical, safety, ethics, etc.) of the contractors of different trades that recognize the need for integration.

7. SUMMARY OF FINDINGS

The rapidly growing Hispanic population in the United States is having a major effect on the labor force, causing the construction industry to experience productivity and safety issues. Hispanics have become the largest minority group in the nation, and by the year 2025 they are expected to make up almost a quarter of the projected 419.9 million people living in the United States. The nationalities most commonly found in the Hispanic population are Mexicans, Puerto Ricans, and Cubans. The group of Hispanics from the remaining countries in Central and South American nations has roughly doubled in size over the 1990-2000 decade, totaling 10 million people. In Iowa alone, the Hispanic population has increased by 153% over the previous decade (1990-2002), becoming the largest minority group within the state.

It is also important to note that the majority of the U.S. Hispanic population is of Mexican origin, and of the estimated 7 million undocumented immigrants entering the United States for 2000, almost 70% are Mexican foreign-born, as indicated in the population report from the Statistical Abstract of the United States for 2004–2005, published by the U.S. Census Bureau (2004b). Obviously, the workforce is changing, becoming more diverse as society evolves. Labor shortages and continued economic growth contribute to the diversification of the workforce, since many industries have had to look to immigrant workers as a source of labor.

In 2004, Hispanics made up 21.4 % of the construction industry workforce. They also accounted for the highest rate of fatal work injuries (4.5/100,000 Hispanic workers) among the racial/ethnic groups. This data corroborates the fact that construction companies have not given enough effort to address diversity in the workplace. Construction companies must provide new training programs that accommodate the changing workforce demographics to maximize the contributions of all employees. Organizations need to examine the population trends and demographics, their competitive environment, and the nature of their business with respect to the current human resources available. If these changes are not recognized and integrated into the organizational culture of a company, undesirable outcomes such as low productivity, higher insurance premiums, and workplace fatalities may result from improper training approaches.

The research described in this report focuses on the objectives set forth for Phase II of the Hispanic Workforce Research Project. It takes into account the challenges that American supervisors are facing with respect to their Hispanic crews, more specifically, the language barrier and cultural differences. The research methodology follows the same steps as that in Phase I, but instead targets American supervisors with Hispanic crews in Iowa's construction industry. Surveys were conducted with either face-to-face interviews or mailed-in survey questionnaires from contractors who volunteered to participate. Survey findings were recorded, analyzed, and evaluated, and results clearly show that there is a need for training courses that effectively bridge the communication gap between American supervisors and Hispanic craft workers.

One of the research objectives was to modify the ESL course developed in Phase I into an SSL course for American supervisors. The research team modified the ESL course completely into the *SSL Survival Course*. This course focuses on developing the ability of American supervisors

to communicate in Spanish, thus diminishing the need of a link-person to assign daily tasks to Hispanic workers. The course was delivered once during the investigation period and several times thereafter. Some minor difficulties were encountered, such as the problems of encouraging individuals to sign up for the courses and securing commitment in scheduling courses from contractors. In one case, the course had excellent ratings but the attendance was very low, probably because the period during which the course was offered did not fit the contractors' schedules. This suggests that many American supervisors and their respective construction companies may be aware of the current population trends and fatality rates of the Hispanic population, but are highly limited by their working season.

It was also found that many American supervisors do not realize the serious consequences that can come about from an improperly trained individual. Besides the decreased productivity due to the language barrier, Hispanic employees who are not trained according to their needs may become a threat to themselves and to their coworkers on the construction site.

Taking into account the survey results and the experience from the SSL course, a series of training courses were developed titled *Concrete Pavement Construction Basics*. The courses are divided into 12 subtopics that cover general practices of concrete pavement construction. They follow a similar structure to that of the SSL course, though the courses are much shorter and more specialized. It is understandable that American supervisors are very restrained by time, and cost is a major factor for construction companies that implement new training methods. With this in mind, the *Concrete Pavement Construction Basics* course offers American supervisors a simple and practical communication tool with a variety of topics to choose from according to the supervisors' specific needs. The objective of the course is not to teach a whole new language, but to encourage communication between the two parties and facilitate the integration process through the basic phrases and common terminology of pavement construction practices.

8. CONCLUSIONS AND RECOMMENDATIONS

As part of the analysis and evaluation of the survey results, the data from the Hispanic workers in Phase I were taken into consideration. The survey results suggest that the following conclusions are a practical representation of the American supervisors' attitude toward the Hispanic workforce in Iowa's construction industry:

- Communication poses a crucial problem on the jobsite.
- A link-person is commonly used as means of communication.
- The language that American supervisors mostly use to communicate is English.
- Many supervisors are unsatisfied with their ability to communicate to Hispanic crews.
- Many supervisors are interested in taking a course to learn basic Spanish.
- Most supervisors propose both ESL and SSL courses to solve the language barrier.
- The mean educational level of American supervisors is clearly higher than that of the Hispanic workers
- Most American supervisors prefer a "Concrete/Finishing" technical course to help them better communicate with Hispanic crewmembers.

In conclusion, it would be quicker, more cost-effective, and easier to train American supervisors in Spanish because they are fewer in number and have higher educational levels, guaranteeing that most of the information transmitted in a course will at least be received. More importantly, they are leaders of the crews that perform the actual work needed to complete a construction project. The supervisors need to communicate effectively to increase efficiency and productivity and minimize misunderstandings. Their active involvement in the integration effort will present tangible results and bridge the communication gap.

For the success of these courses, it is recommended that the course be delivered by individuals who possess multicultural experience in the construction industry, specifically Hispanic and American culture, and who are fluent in both languages. This will provide the students a good understanding of the differences between the two cultures and encourage interaction in the classroom through real experiences. The courses must also fit the contractors' work schedules or seasons. For example, training programs in Iowa are best scheduled before the spring season.

These courses are mostly suited for those construction companies that employ a large percentage of Hispanic workers and work mostly in concrete pavement construction. Those American supervisors who have Hispanic crews should take at least four, if not all, of the *Concrete Pavement Construction Basics* course that best fit their needs. Contracting companies should be the driving force behind the implementation of these training programs, since upper-management involvement and support plays a big role in the success of the program.

The research methodology used for the Hispanic Workforce Research Project can also be applied to other cultures to obtain similar integration results. When other populations represent a high percentage of the workforce within the construction sector, the model can be applied and adapted to the particular ethnic group.

Further research can be performed to develop more innovative and effective ways of integrating American and Hispanic cultures so that the two perform as a team, rather than two separate cultural entities. Incentives to obtain the contractors' commitment can be explored. Determining the best approach to deliver the training material can also be investigated by placing American supervisors and Hispanic workers into separate groups or unifying them in a classroom.

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APPENDIX A. QUESTIONNAIRE FOR AMERICAN SUPERVISORS

Questionnaire for American Construction Supervisors who deal with the Hispanic Workforce

Conducted by: Iowa State University

Date: _____

Department of Civil, Construction, and Environmental Engineering

Anonymity: Your answers to the following questions will be completely anonymous and the results will be held strictly confidential and will be used for statistical purposes only and not linked to the respondent.

General Objective

The general objective of this survey is to bridge the gap between American supervisors and Hispanic construction workers, by defining the fundamental needs created by blending the cultures in the workplace. The assessment of the needs and interests will help develop suitable and effective SSL (Spanish as a Second Language) and other training courses that will encourage American construction supervisors to learn and use this important communication tool that will enable them to be active and productively engaged participants in the workforce in accordance with the trends that are currently affecting the construction industry. This will in turn help them accomplish their construction companies' goals under a safe environment.

Specific Objectives

1. To determine the types of training programs currently offered by construction companies to American supervisors.
2. To determine the level of adequacy of American supervisor's training as it relates to working with the Hispanic workforce.
3. To identify the value of training programs to American supervisors.
4. To identify Hispanic and American cultural differences and their implications for the workplace.
5. To determine patterns of needs, interests, and areas of opportunity for American supervisors to develop their relationship with Hispanic workers.
6. To prioritize those areas of improvement for the implementation of ESL and technical training courses for Hispanic construction workers as expressed by American supervisors.
7. To determine the factors and problems (e.g. language barrier, lack of experience) that adversely affect the performance, quality, and safety conditions of Hispanic construction workers.
8. To determine the level of interest as expressed by American Supervisors in having Hispanic workers learn to operate construction equipment.
9. To prioritize the type of equipment American supervisors would prefer Hispanic workers learn to operate.
10. To determine the level of satisfaction as expressed by American Supervisors when dealing with Hispanic workers as it relates to: a) their willingness to learn new skills, b) their willingness to comply with safety rules and regulations, and c) their willingness to do the type of tasks they are asked to do.
11. To establish by documenting the need to have key employees on the job site to overcome the language barrier.
12. To determine accident rates and types of accidents undergone by Hispanics in construction as expressed by American supervisors.
13. To gather background, personal, and demographic information on American supervisors.
14. To obtain turnover rates of American supervisors.
15. To identify personal expectations and goals of American supervisors as it relates to maintaining and developing their relationship with Hispanic workers.

Note: This questionnaire will take 15-20 minutes to complete.

Please circle one response for each question

Questions 1 thru 6 are related to Spanish language training.

1. a. Have you ever taken a course to help you learn Spanish?

1 = Yes 2 = No

- b. If YES, how many total hours of training have you had? _____

- c. If NO, would you like to take one?

1 = Yes 2 = No

(If you have never taken a class in Spanish, SKIP TO QUESTION.7)

2. Was this Spanish course related to construction?

1 = Yes 2 = No

3. How would you rate the following aspects of your Spanish course?

	<u>Good</u>	<u>Very poor</u>	Very					
a. Contents to use in your job	1	2	3	4	5	6	7	
b. Contents to use in your every day life	1	2	3	4	5	6	7	
c. Instructor				1	2	3	4	5
	6	7						
d. Other: _____								

4. How would you rate the degree of difficulty?
- | | | | |
|---|------|------------------|-------------|
| | Very | Very | <u>easy</u> |
| | | <u>difficult</u> | |
| | | | 1 2 |
| 3 | 4 | 5 | 6 7 |

5. How would you rate the
- | | | |
|--|------|------|
| | Very | Very |
|--|------|------|

duration of the course? Short

Long

3 4 5 6 7 1 2

6. How well did your Spanish course(s) meet your needs Not at All

Completely or expectations? 1 2

3 4 5 6 7

Questions 7 thru 14 ask you about future technical training needs.

7. Would you be interested in having your Hispanic crews take a technical training course related to their trade?

1 = Yes 2 = No → IF NO, SKIP TO QUESTION 15

8. If YES, what would you like them to learn? (name the trade)

9. Is this related to your direct area of responsibility at work?

1 = Yes 2 = No

10. If your Hispanic crews were to take technical training courses in the near future, what degree of importance to the course contents would you give to the following aspects:

	Very	Not							
	<u>Important</u>	<u>Important</u>							
a. On-the-job vocabulary?	1	2	3	4	5	6	7	N/A	
b. Equipment operation?	1	2	3	4	5	6	7	N/A	
c. Construction safety?	1	2	3	4	5	6	7	N/A	
d. Plan Reading?		1	2	3	4	5	6	7	N/A
e. Tools?			1	2	3	4	5	6	7
N/A									
f. Measurements ?	1	2	3	4	5	6	7	N/A	
g. Other: _____	1	2	3	4	5	6	7	N/A	

11. Would you like them to learn to operate heavy equipment?

1 = Yes 2 = No → IF NO, SKIP TO QUESTION 13

12. Which of the following would you prefer them to learn to operate? (circle all you want)

1 = Forklift 3 = Motorgrader 5 = Dump truck
2 = Backhoe 4 = Bulldozer 6 = Other _____

13. In which language do you think they should be taught when taking these technical courses?

1 = English 2 = Spanish 3 = English and Spanish combined

14. Where do you think would be most convenient for these courses to take place?

1 = Job site 2 = Classroom 3 = Both 4 = Either one

Questions 15 thru 24 relate to your overall job site conditions

15. How many Hispanic workers do you have in your crews?

1= 1-3 2= 4-6 3= 7-10 4= more than 10

16. How long have you supervised Hispanic workers?

1= 1-3 yrs 2= 4-6 yrs 3= 7-10yrs 4= more than 10 yrs

17. Do you have a link-person (facilitator) to help you communicate with people in your crew?

1 = yes 2 = No

18. How familiar do you think you are about Hispanics with regard to the following:

	Very							
	<u>Familiar</u>			<u>Unfamiliar</u>				
a. Culture differences	1	2	3	4	5	6	7	
b. Manners			1	2	3	4	5	6
	7							
c. Work Ethic		1	2	3	4	5	6	7
d. Other:_____	1	2	3	4	5	6	7	

19. How satisfied are you with each of the following?

	Very					Very		
						<u>Dissatisfied</u>		
	<u>Satisfied</u>							
a. Dealing with Hispanic workers, ...their overall performance	1	2	3	4	5	6	7	
b. The Hispanic worker job safety awareness	1	2	3	4	5	6	7	
c. The response of Hispanic workers to the type of tasks you ask them to do	1	2	3	4	5	6	7	
d. Your ability to communicate in Spanish		1	2	3	4	5	6	7

20. How often do you need a translator to communicate with people in your crew?

1 = Never 3 = Sometimes 5 = Always
 2 = Seldom 4 = Often

21. What language do you use when you speak to Hispanic workers in your crew?

1 = English 2 = Spanish 3 = English and Spanish combined

22. How important would it be to you to ...

	Very					Not		
						<u>Important</u>		
	<u>Important</u>							
a. Improve your communication with your link-person (facilitator)?		1	2	3	4	5	6	7
b. Improve your communication with all the Hispanic workers in your crew?	1	2	3	4	5	6	7	
c. Receive SSL training emphasizing only in construction?	1	2	3	4	5	6	7	
d. Have more Hispanic workers in your crew?	1	2	3	4	5	6	7	

23. Have you had any construction related accidents in your Hispanic crews?

1 = Yes

2 = No

24. What are the most common types of accidents you have seen or undergone in relation with your Hispanic workers, if any?

Question 25 thru 35 relate to your background and some personal information

25. How long have you been a construction supervisor (Superintendent, foreman)?

___ years ___ months

26. How much construction experience did you have prior to supervising Hispanic workers?

___ years ___ months Trade: _____

27. How long have you been involved in construction and in what trade?

___ years ___ months Trade: _____
___ years ___ months Trade: _____

28. How long have you been employed by the company you are currently working for?

___ years ___ months

29. How many other construction companies have you worked for? _____

30. How old are you? _____ years old

31. What is the highest level of education you have completed?

1 = Elementary school No of years _____ 4 = High school No of years _____

2 = Middle school No of years _____ 5 = College No of years _____

3 = Technical school No of years _____

32. What do you consider to be your main problem(s) on the job site as they relate to Hispanic workers?

33. What solution(s) do you propose to solve the language barrier with Hispanic workers?

34. Would you like to send any or all of your Hispanic workers to a course designed to help them step up to supervisor?

1 = Yes

2 = No

3 = maybe

35. What technical course would you prefer to take that will benefit the communication between you and your crew?

1. Concrete Finishing

3. Carpentry

2. Equipment Operation

4. Other _____

Your collaboration is greatly appreciated.....

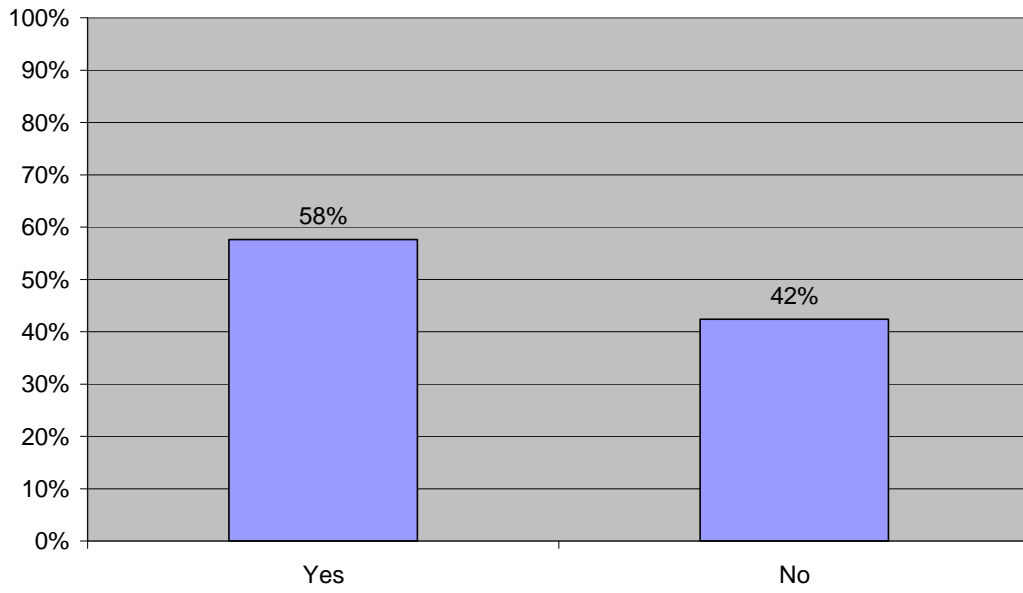
THANK YOU!

Mapping of Objectives

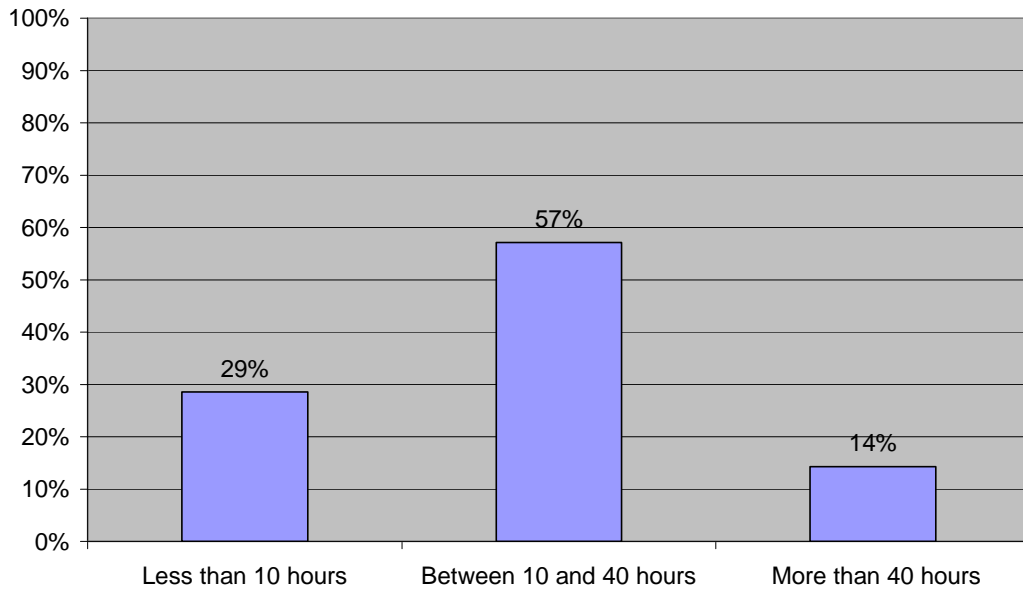
Objective No.	Question No.
1	2,3c,19c
2	1a,1b,4,5
3	3a,3b,6
4	15,16a,b,c
5	1c,5,7,8,9,13,14,19d
6	10a,b,c,d,e,f,33
7	17d,23a,b,24a,b,33
8	11
9	12
10	17a,b,c
11	18,19a,b
12	20,21
13	22,25,26,27,28,29,34
14	30,31
15	32, 35

APPENDIX B. SURVEY RESULTS FOR AMERICAN SUPERVISORS

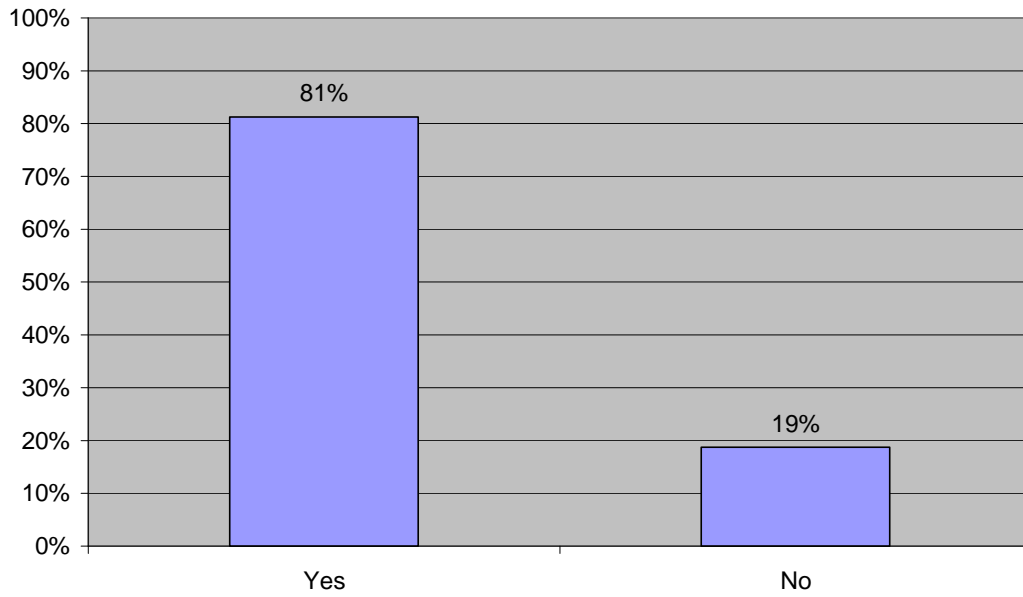
1a. Have you ever taken a course to help you learn Spanish?



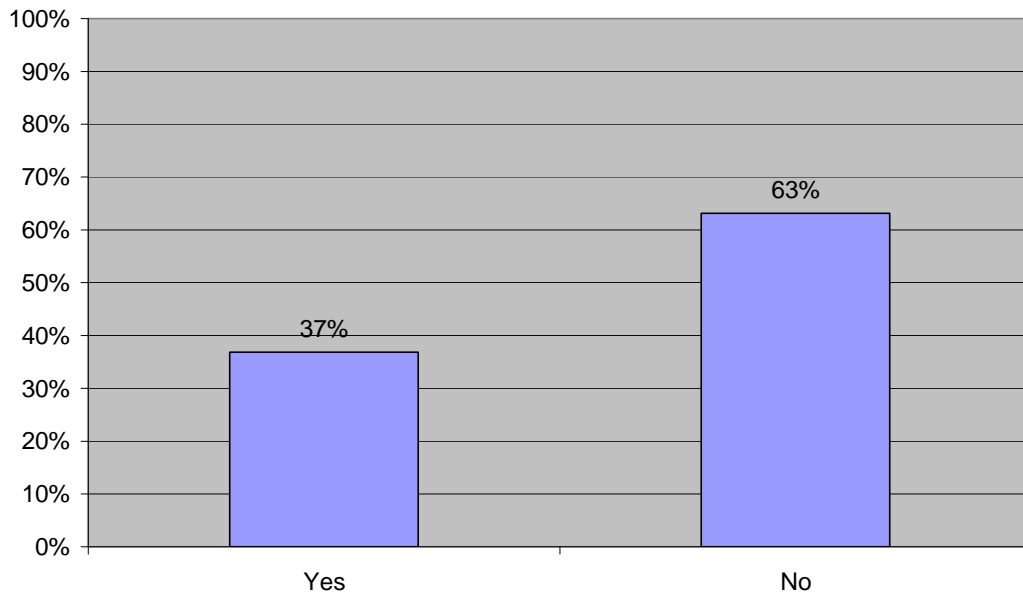
1b. How many total hours of training have you taken?



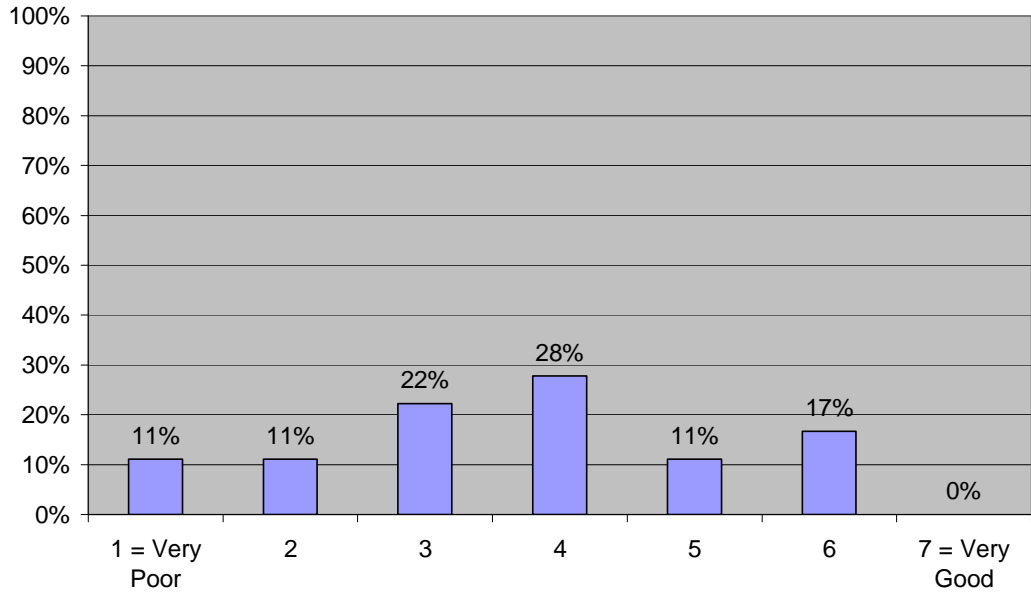
1c. Would you like to take a course to learn Spanish?



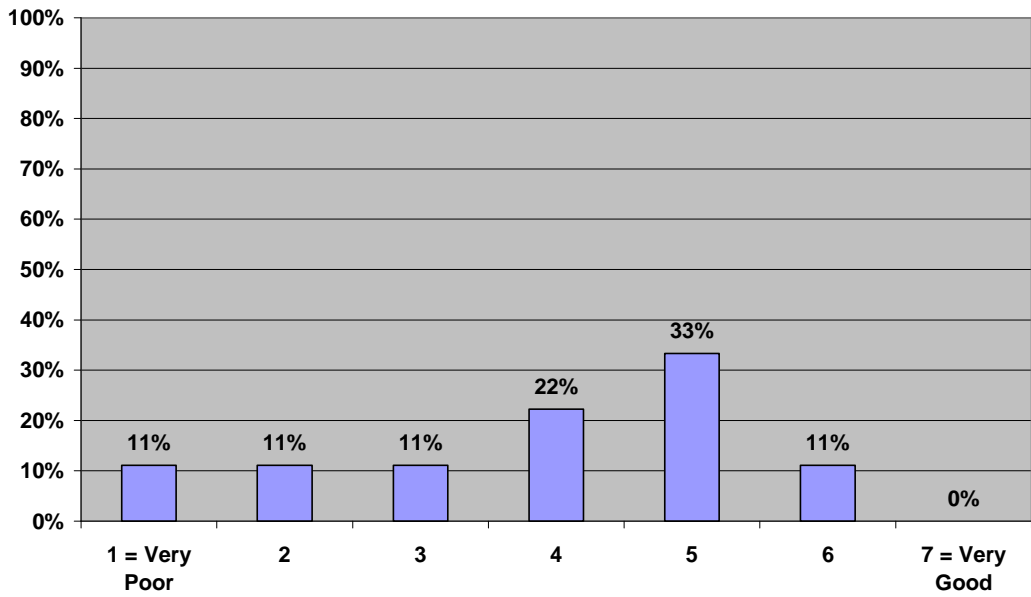
2. Was this Spanish course related to construction?



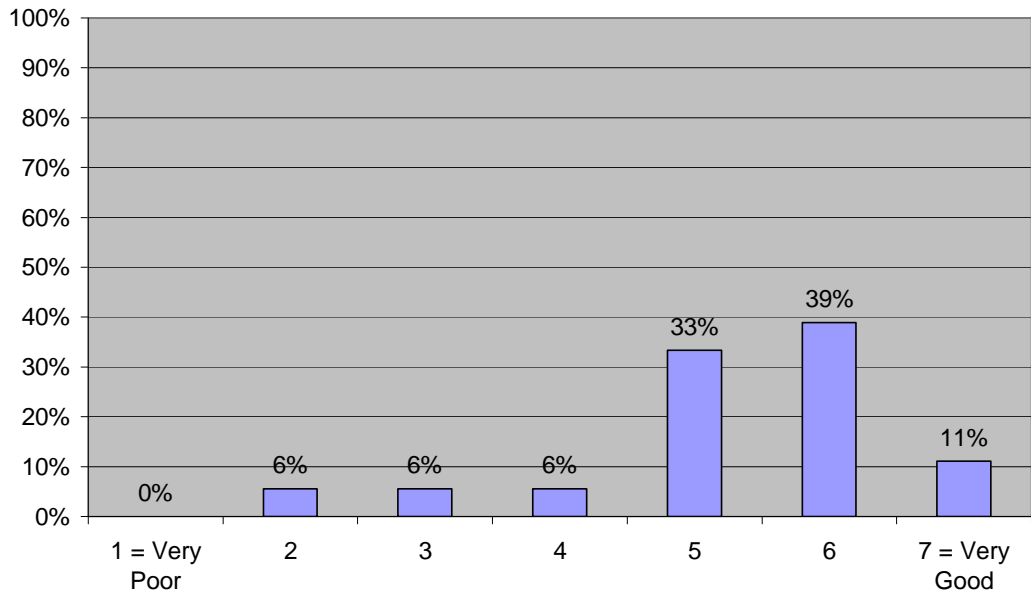
3a. How would you rate the contents for use on the job?



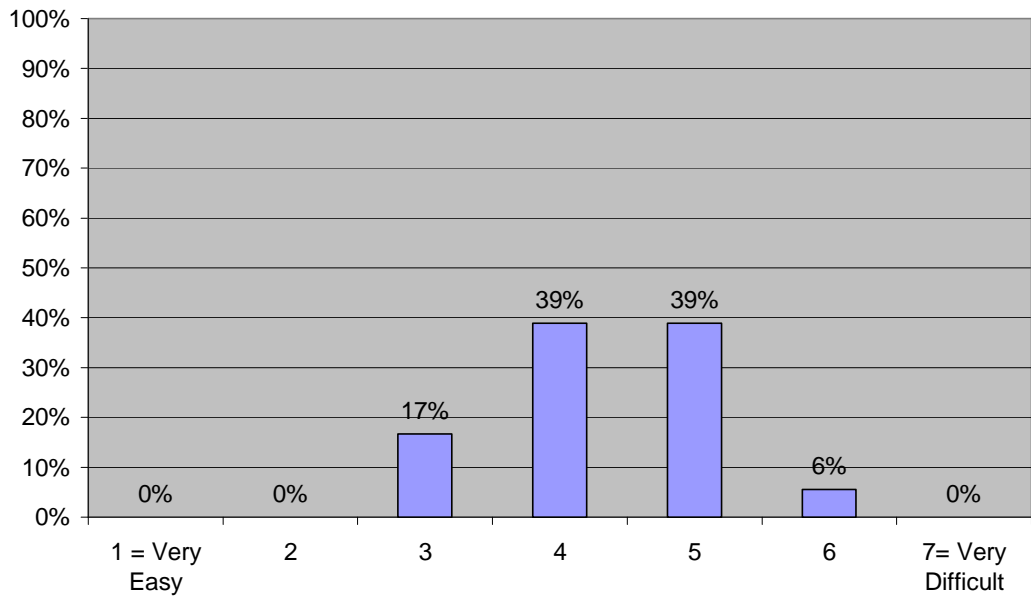
3b. How would you rate the contents for use in everyday life?



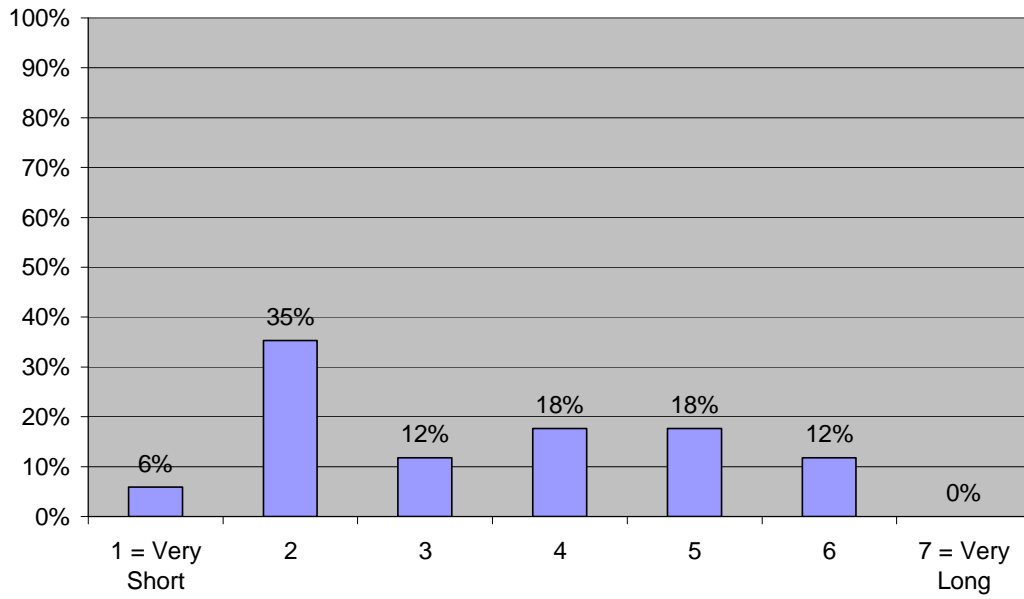
3c. How would you rate the instructor?



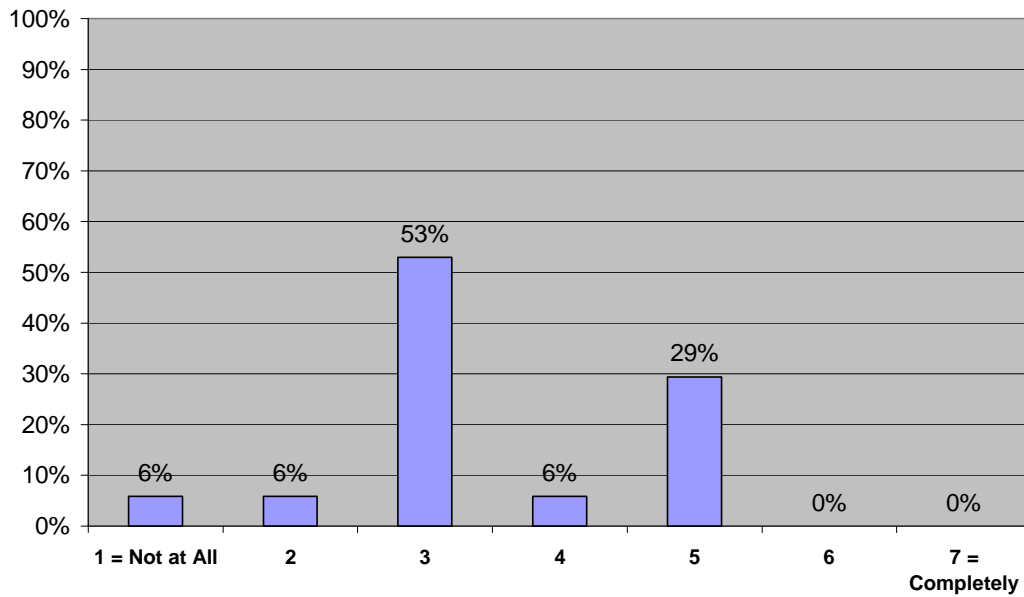
4. How would you rate the degree of difficulty?



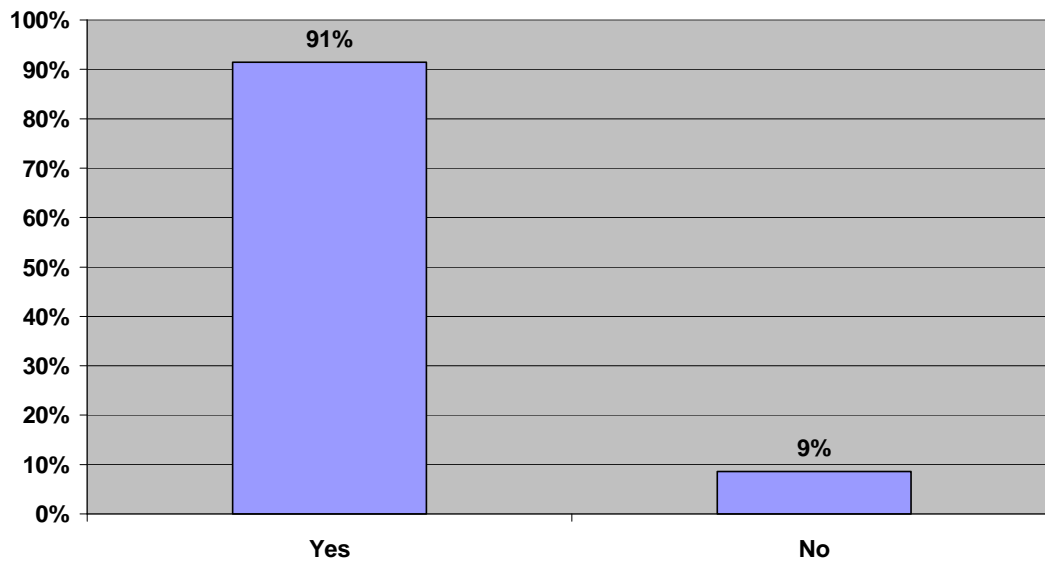
5. How would you rate the length of the course?



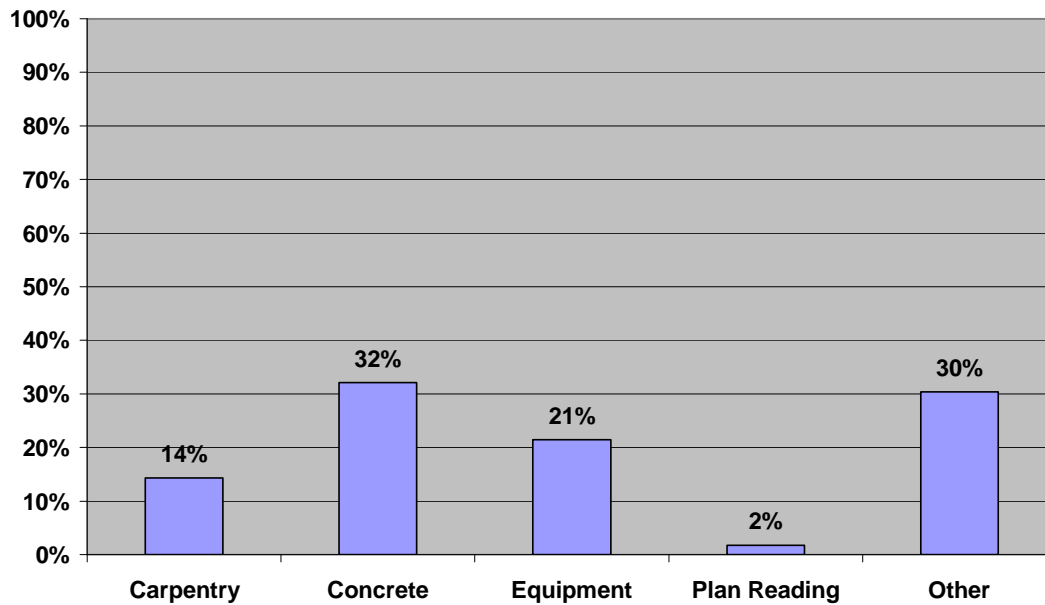
6. How well did your Spanish courses meet your needs and expectations?



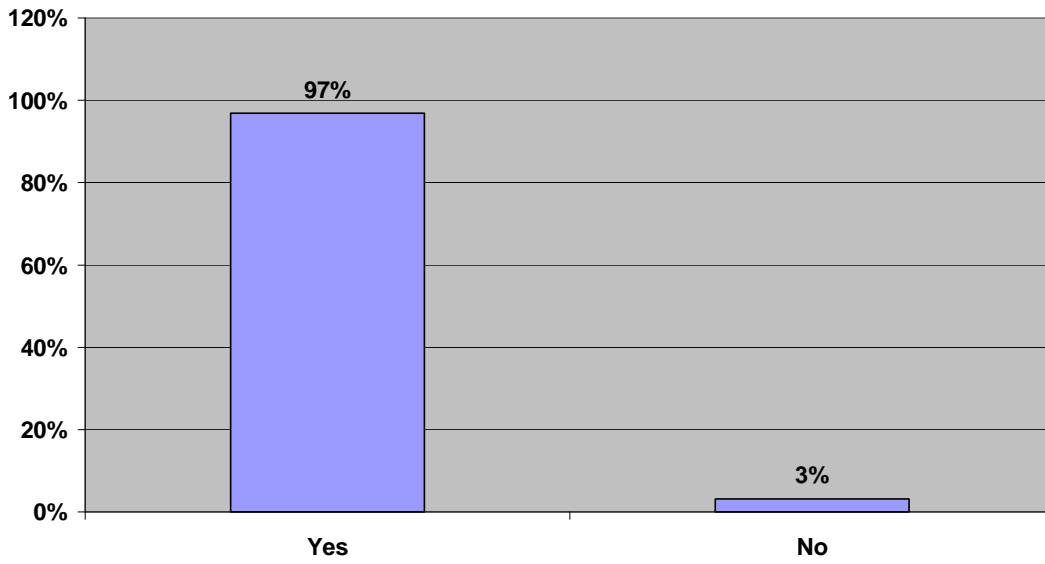
7. Would you be interested in having your Hispanic crew take a technical training course related to their trade?



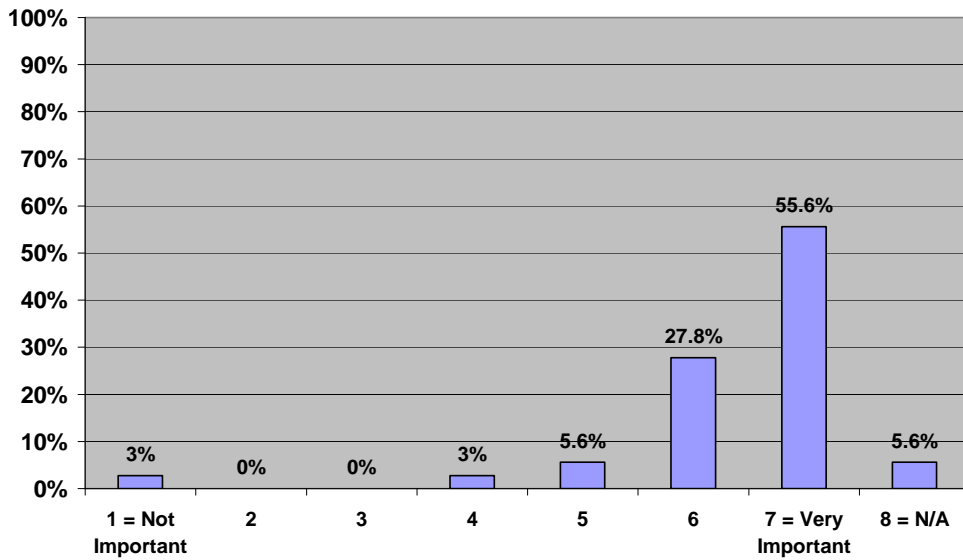
8. What would you like them to learn?



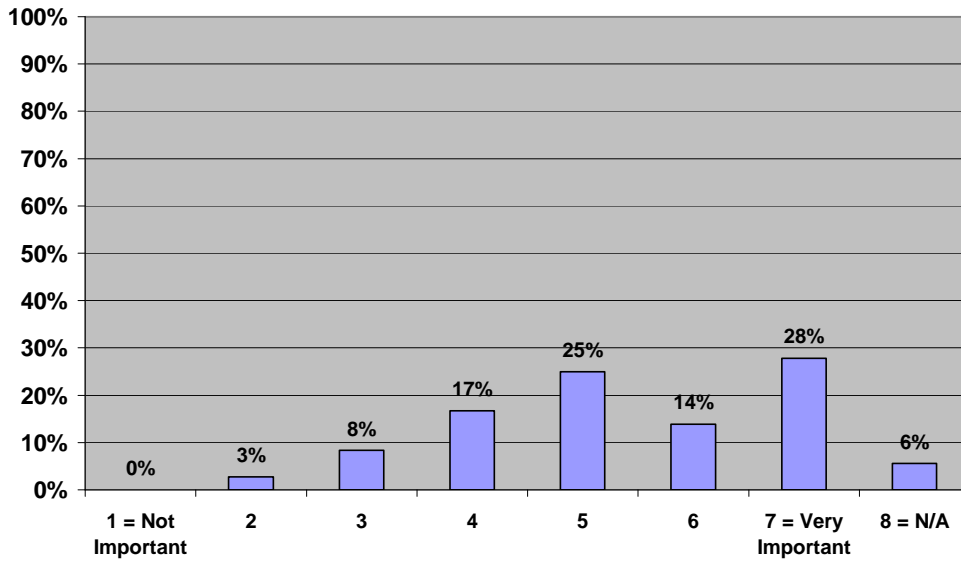
9. Is this related to your occupation? (Trade)



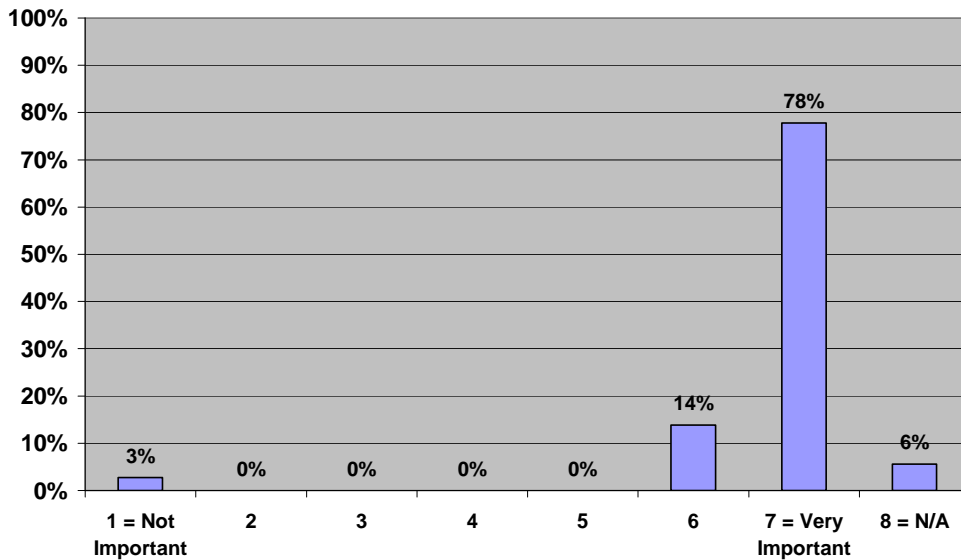
10a. In future technical training courses for your Hispanic crew, what degree of importance would you give to On-the-job vocabulary?



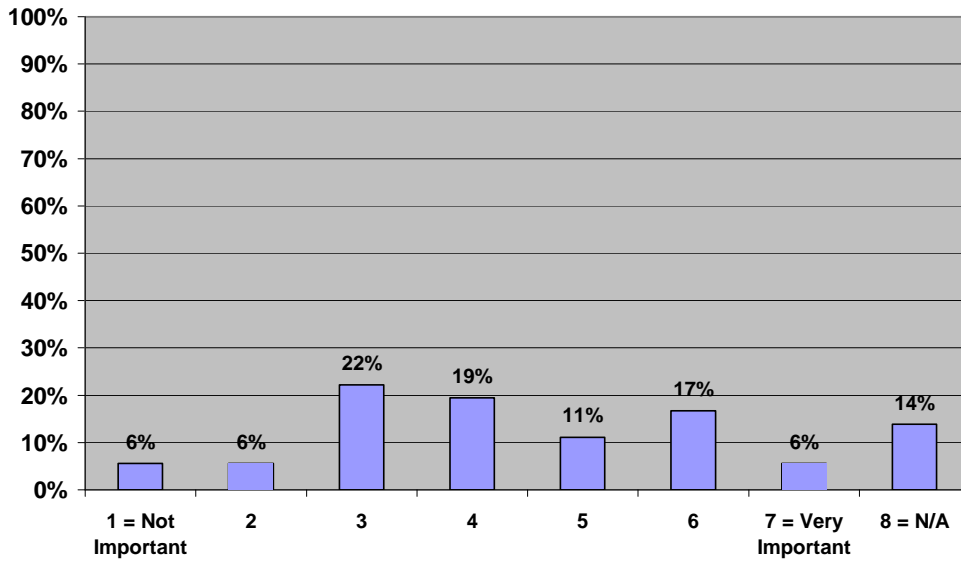
10b. In future technical training courses for your Hispanic crew, what degree of importance would you give to Equipment operation?



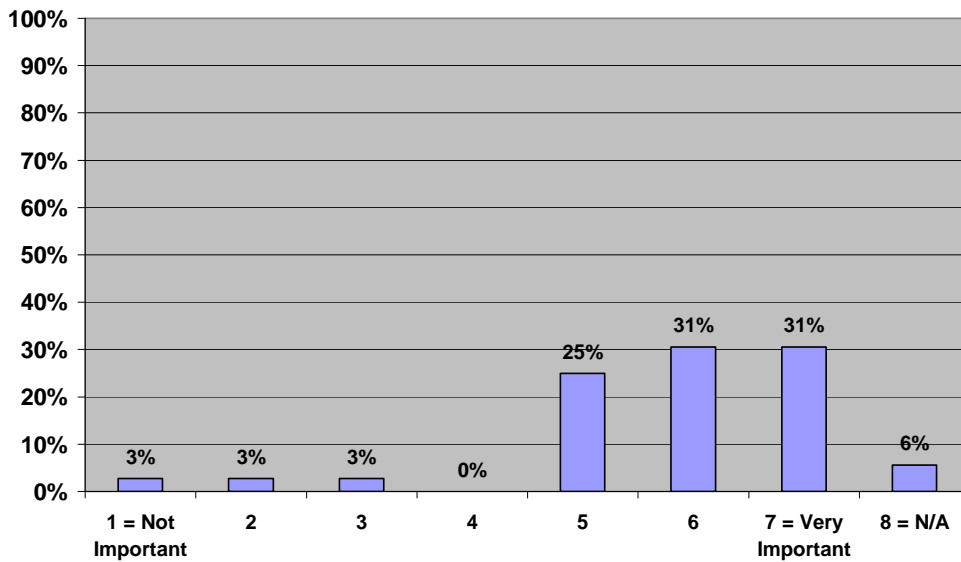
10c. In future technical training courses for your Hispanic crew, what degree of importance would you give to Construction Safety?



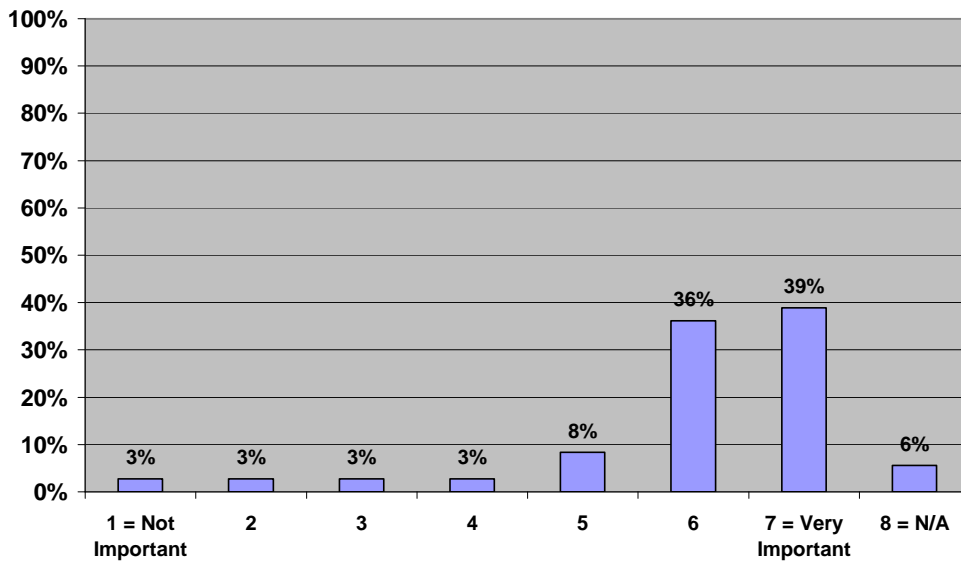
10d. In future technical training courses for your Hispanic crew, what degree of importance would you give to Plan Reading?



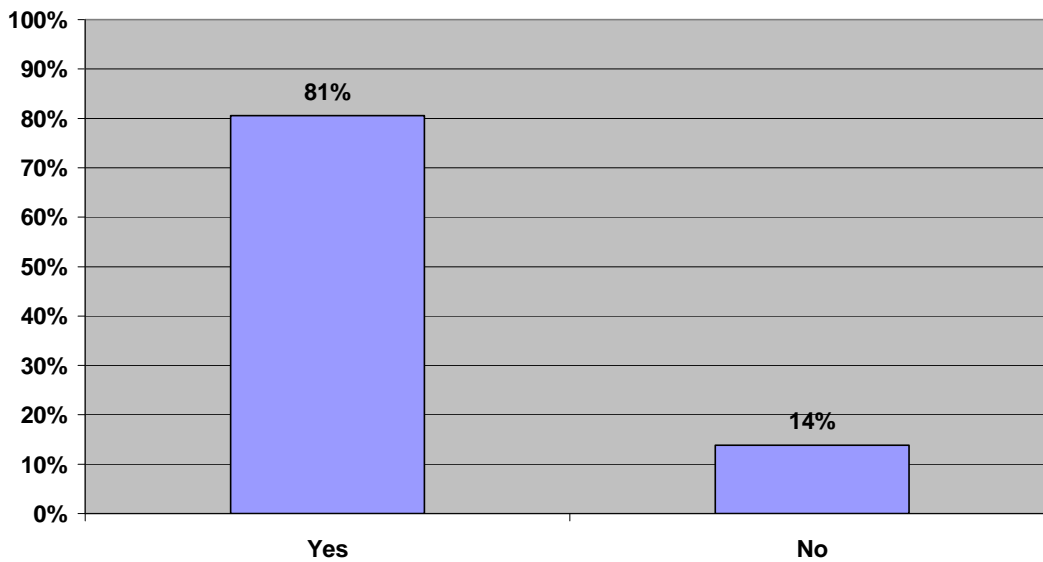
10e. In future technical training courses for your Hispanic crew, what degree of importance would you give to Tools?



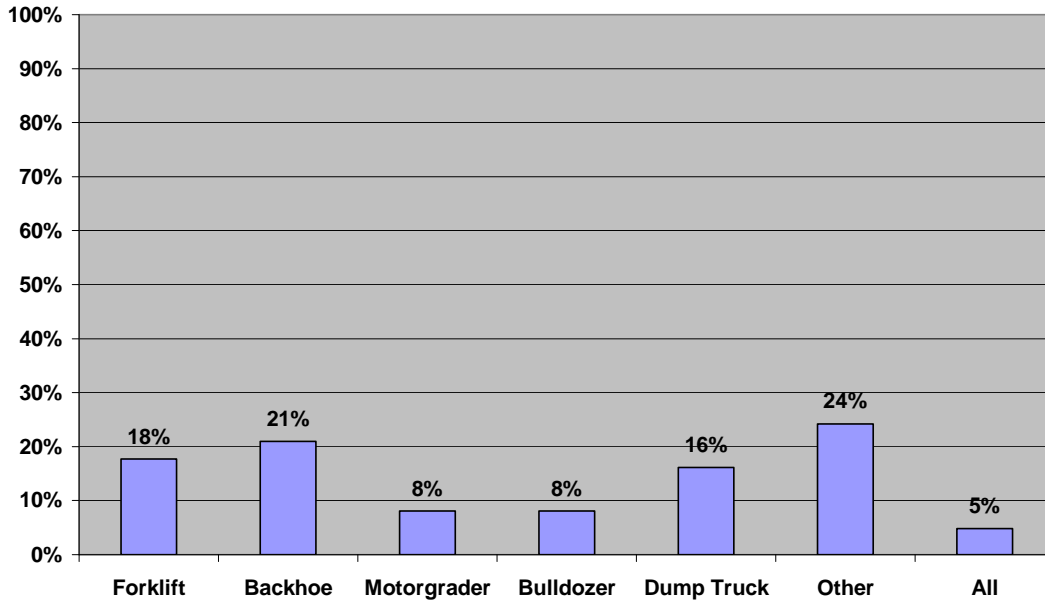
10f. In future technical training courses for your Hispanic crew, what degree of importance would you give to Measurements?



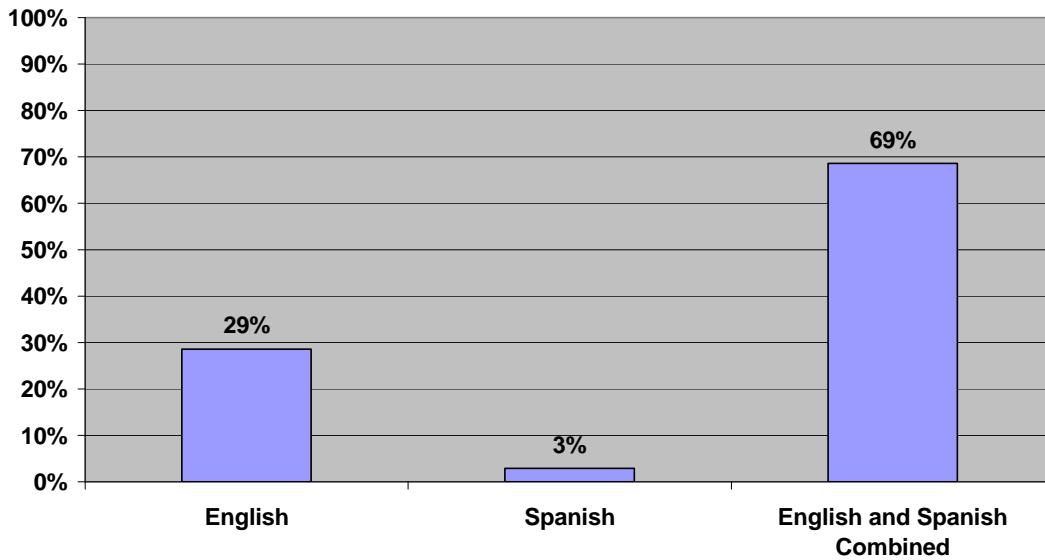
11. Would you like them to learn to operate heavy equipment?



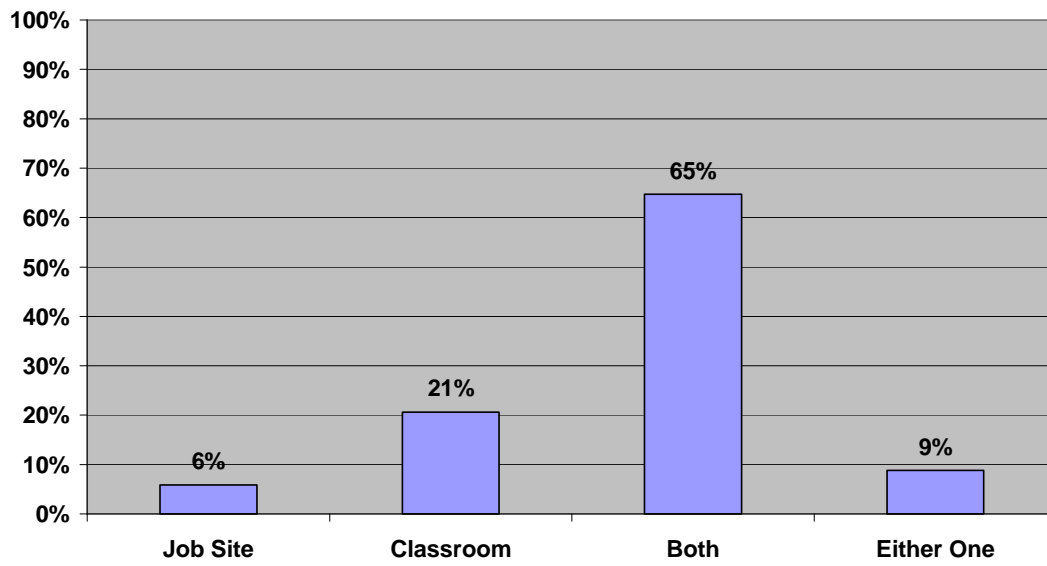
12. What kind of equipment would you prefer them to learn to operate?



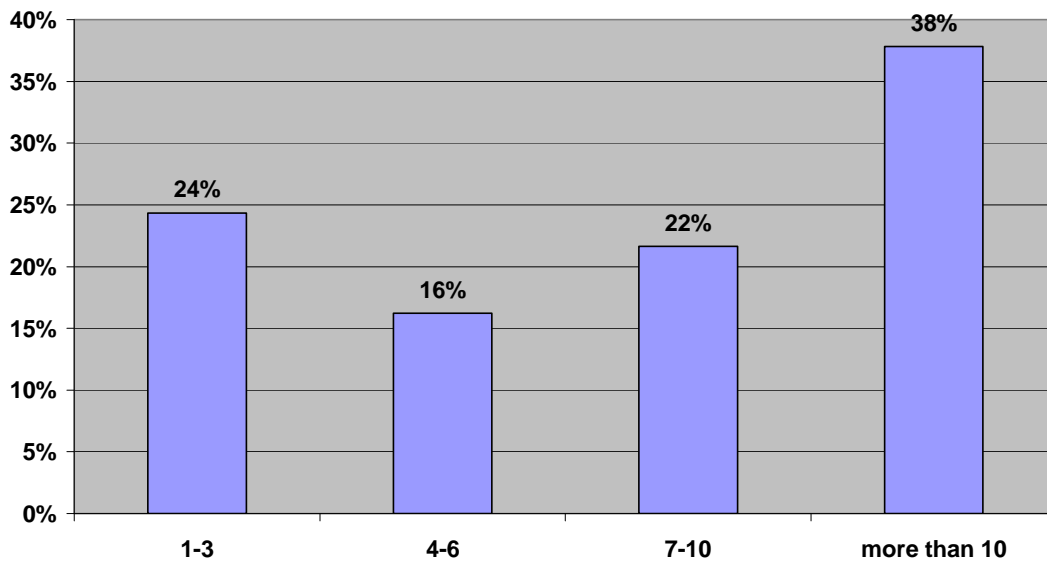
13. In which language do you think they should be taught when taking these technical courses?



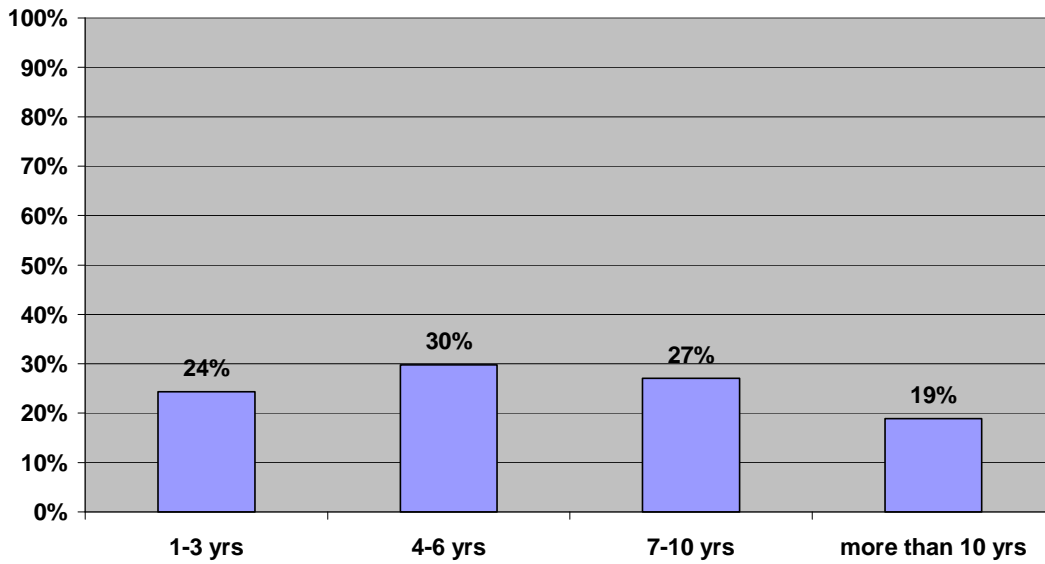
14. Where would you like these courses to take place?



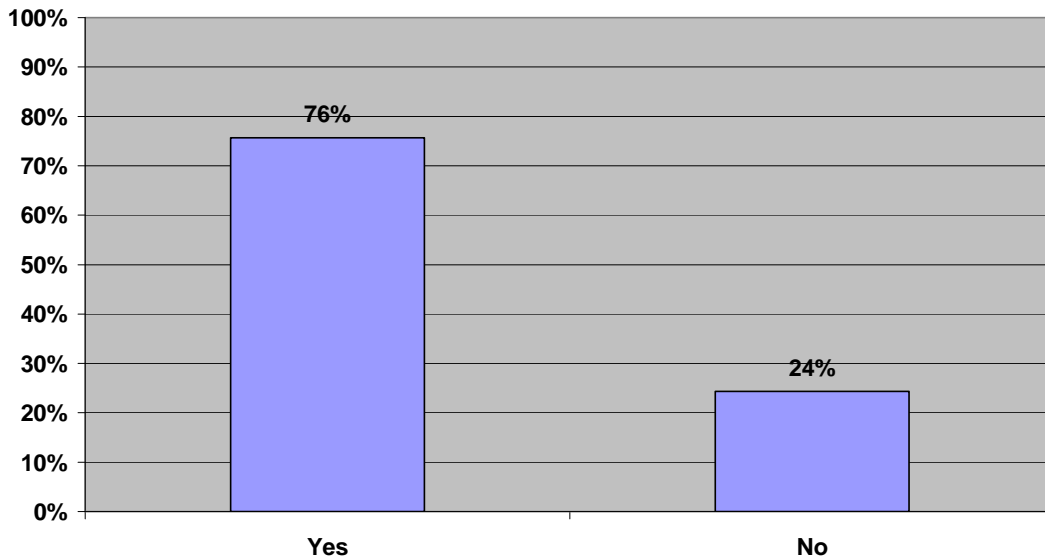
15. General Hispanic crew sizes?



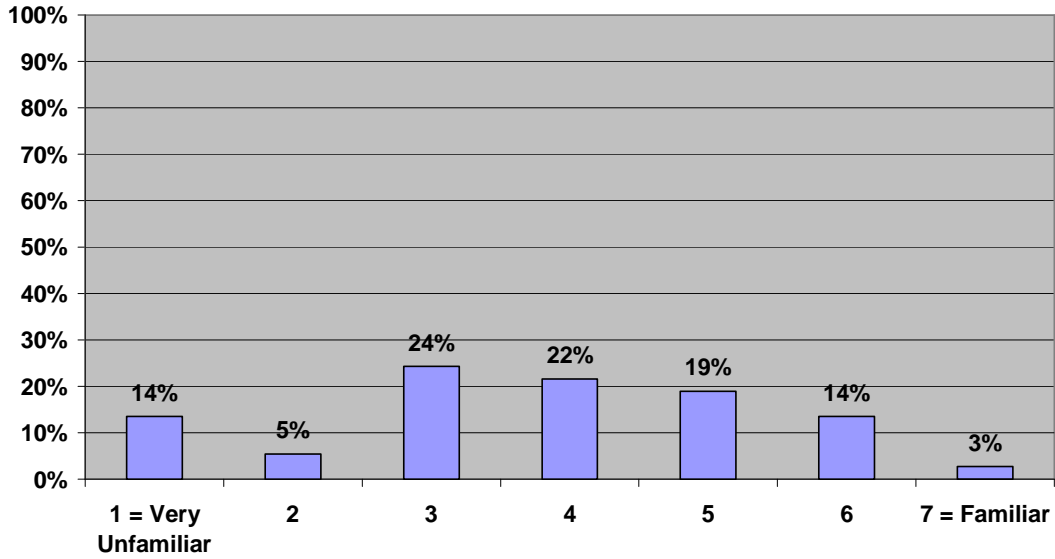
16. How long have you supervised Hispanic workers?



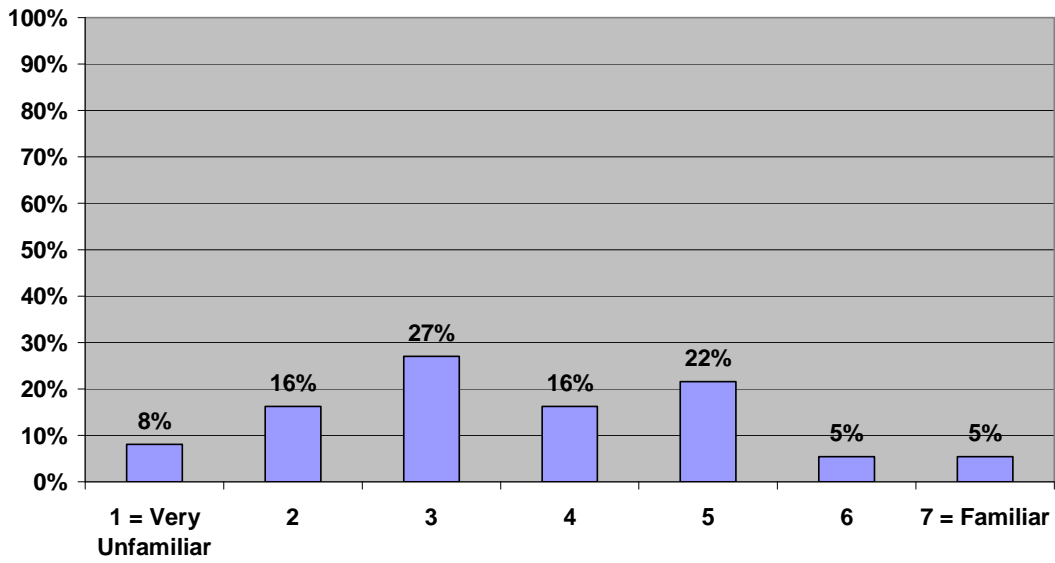
17. Do you have a link person(facilitator) that helps you communicate with the Hispanics in your crew?



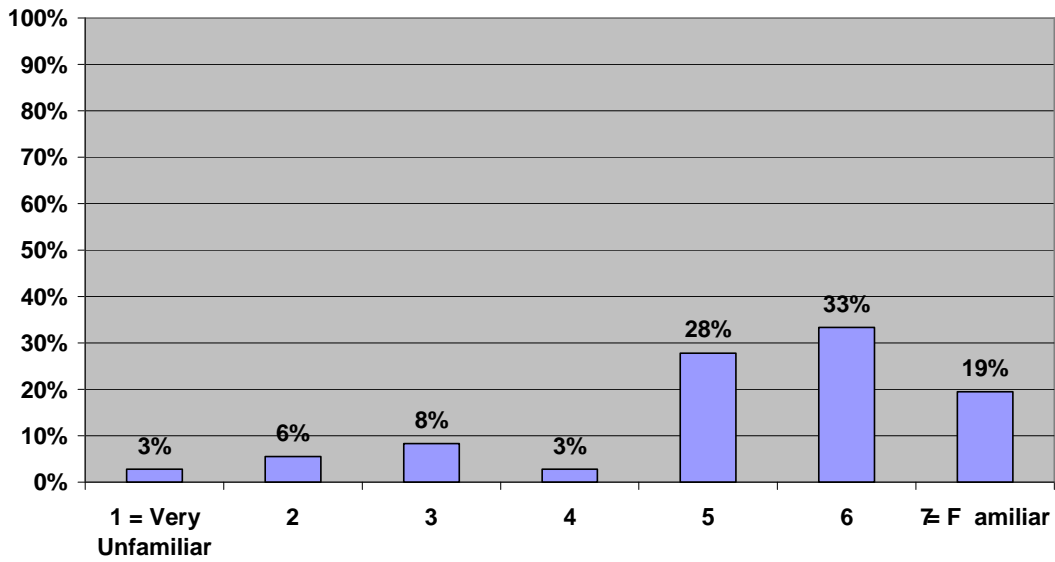
18a. How familiar are you with regard to Hispanic culture differences?



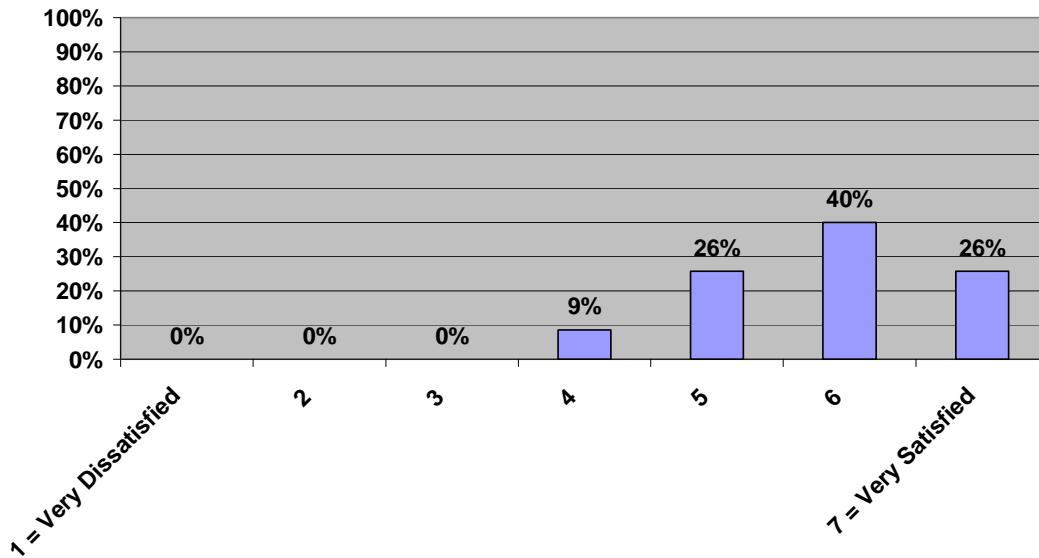
18b. How familiar are you with regard to Hispanic's manners?



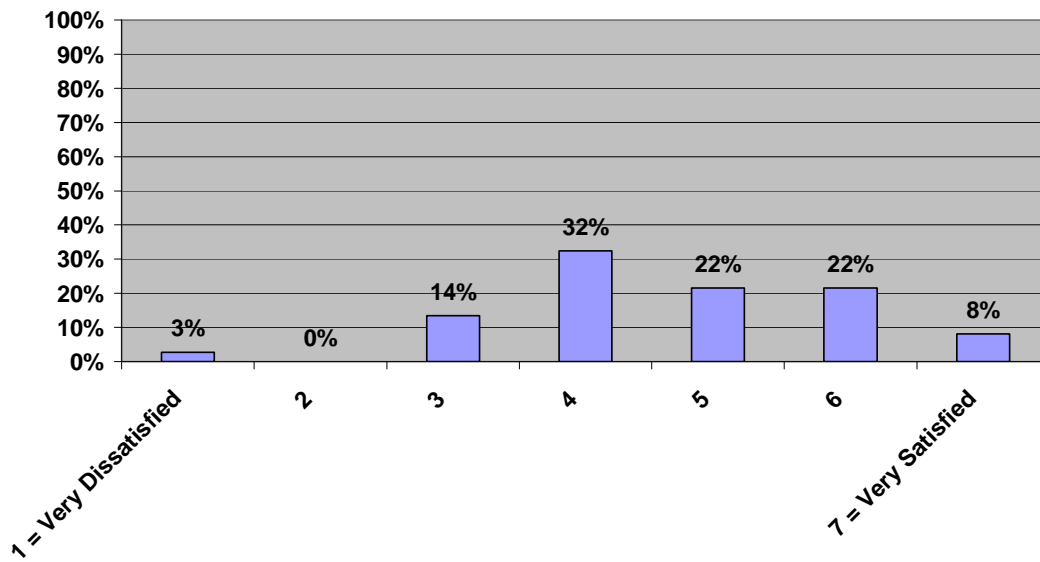
18c. How familiar are you with regard to Hispanic's work ethics?



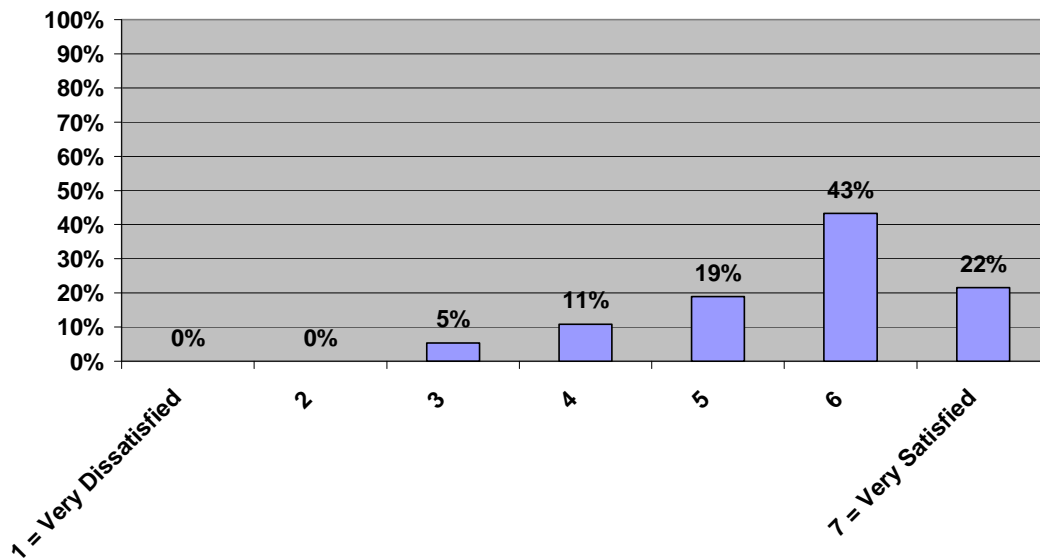
19a. How satisfied are you with the overall performance of Hispanic workers?



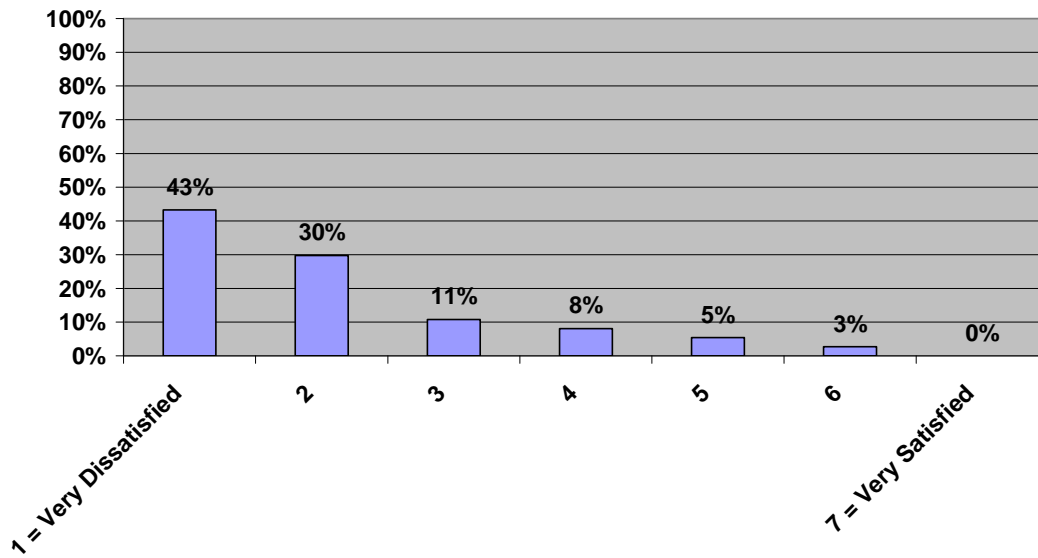
19b. How satisfied are you with the job safety awareness of Hispanics?



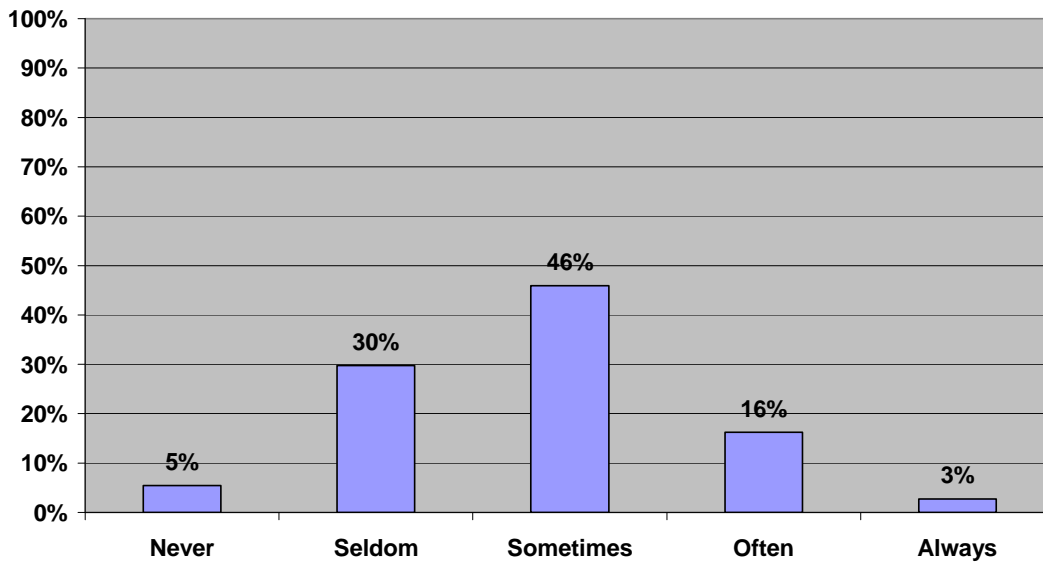
19c. How satisfied are you with Hispanics' response to the type of task assigned?



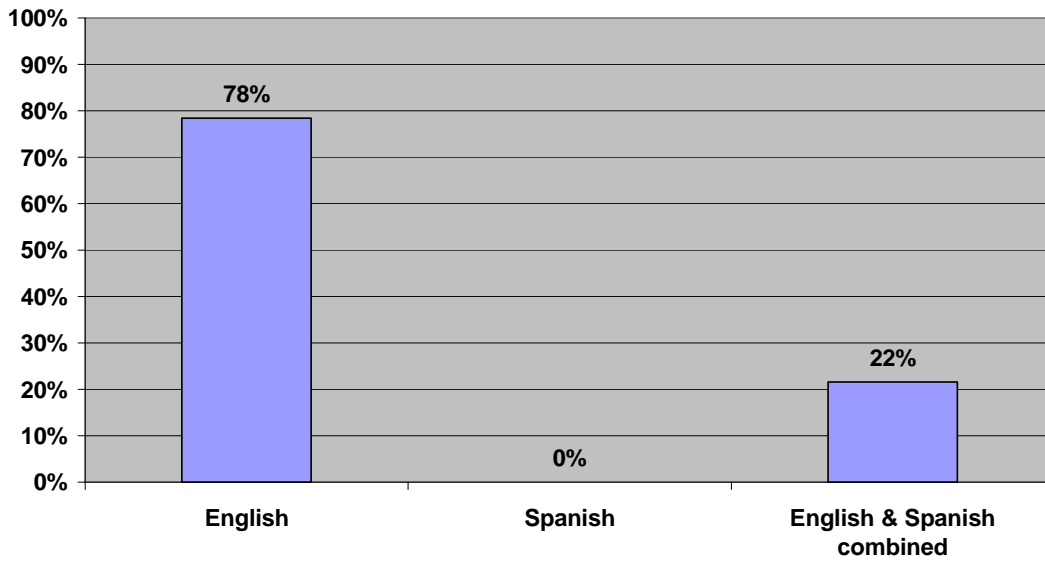
19d. How satisfied are you with your ability to communicate in Spanish?



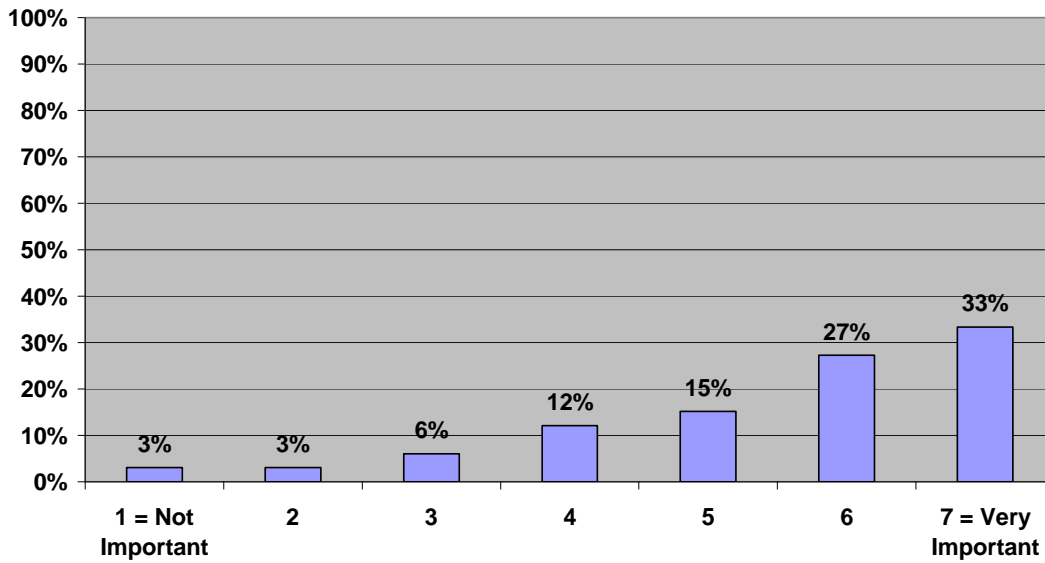
20. How often do you need a translator to communicate with the Hispanics in your crew?



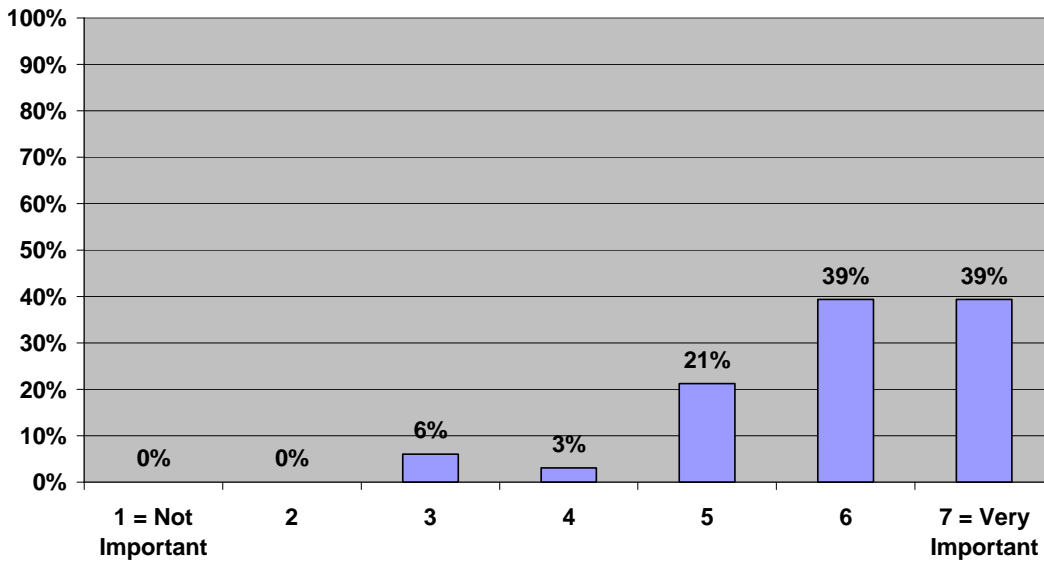
**21. What language do you use to speak to the Hispanic workers in your crew?
in your crew?**



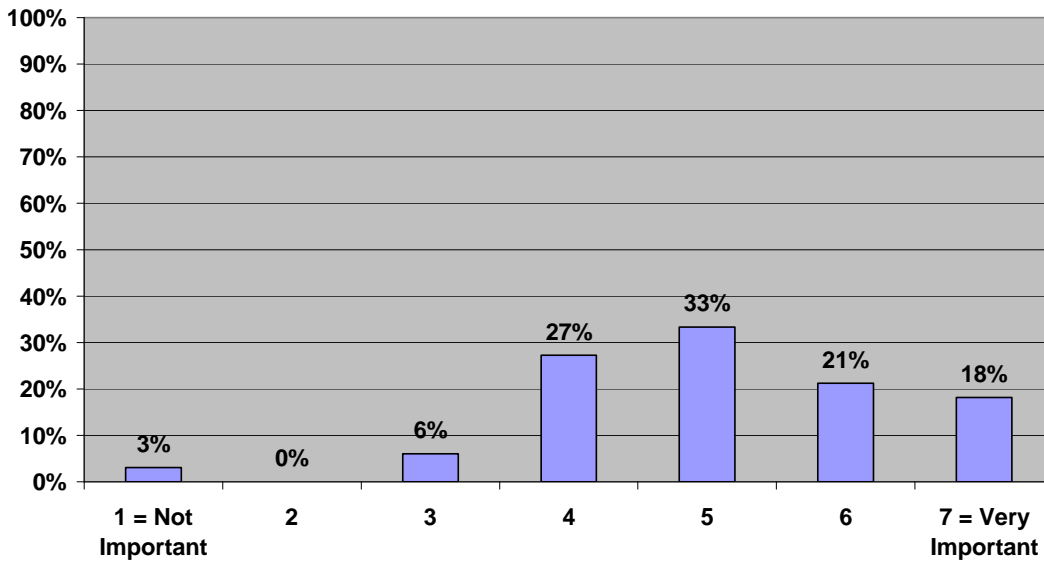
22a. How important would it be to you to improve your communication with your link-person(facilitator)?



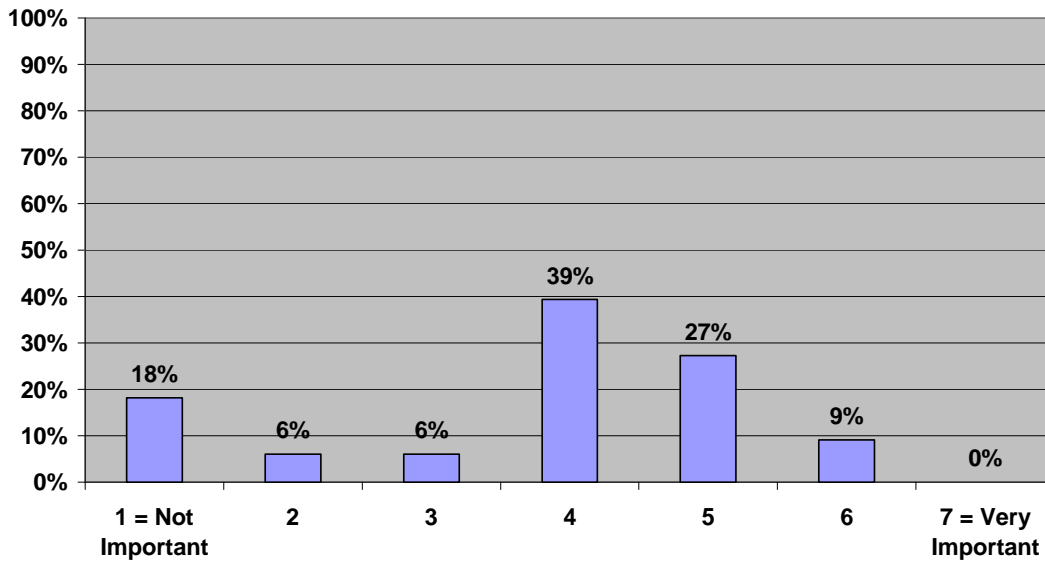
22b. How important would it be to you to improve your communication with the Hispanic workers in your crew?



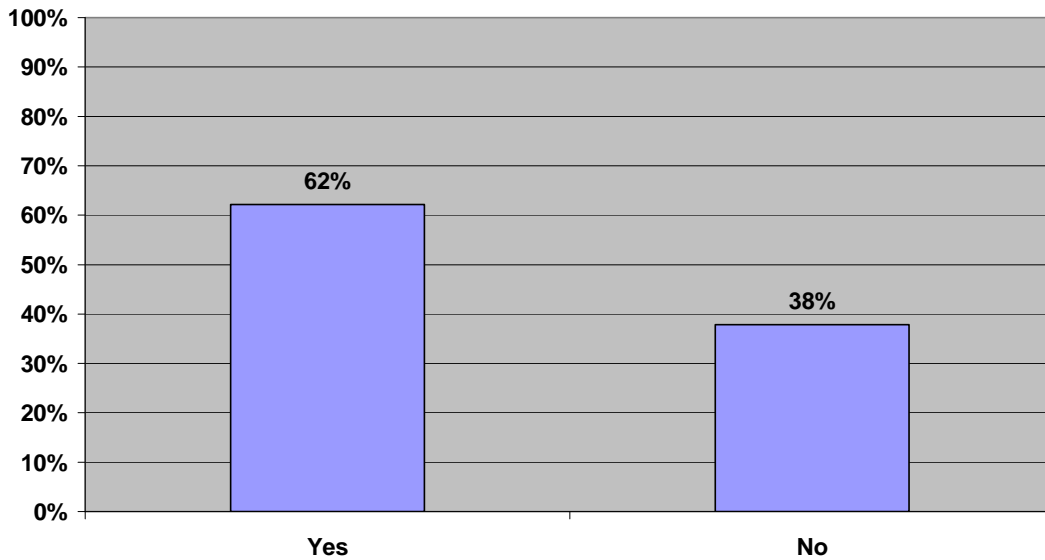
22c. How important would it be to you to receive SSL training specialized in construction?



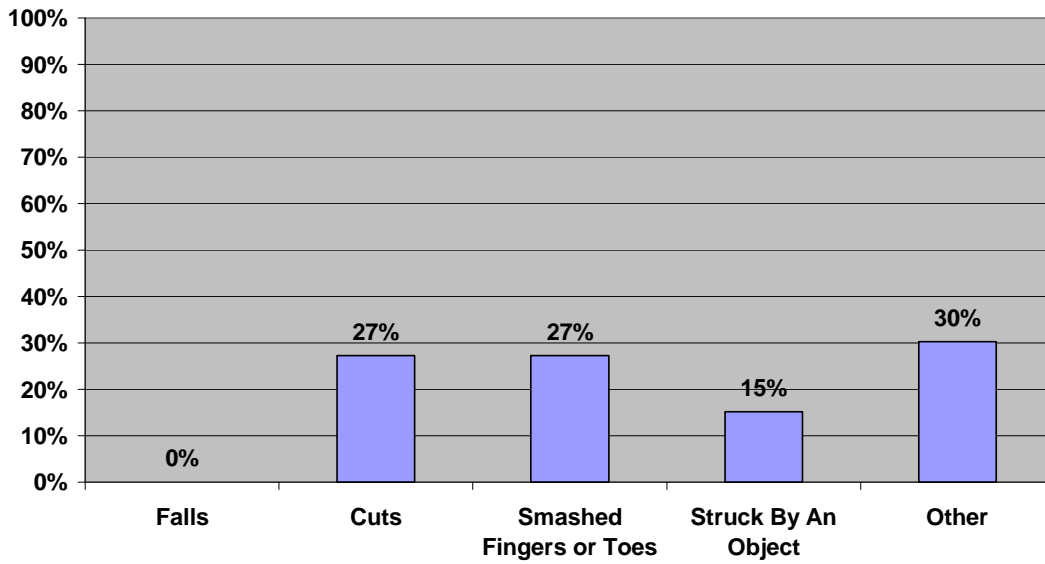
22d. How important would it be to you to have more Hispanic workers in your crew?



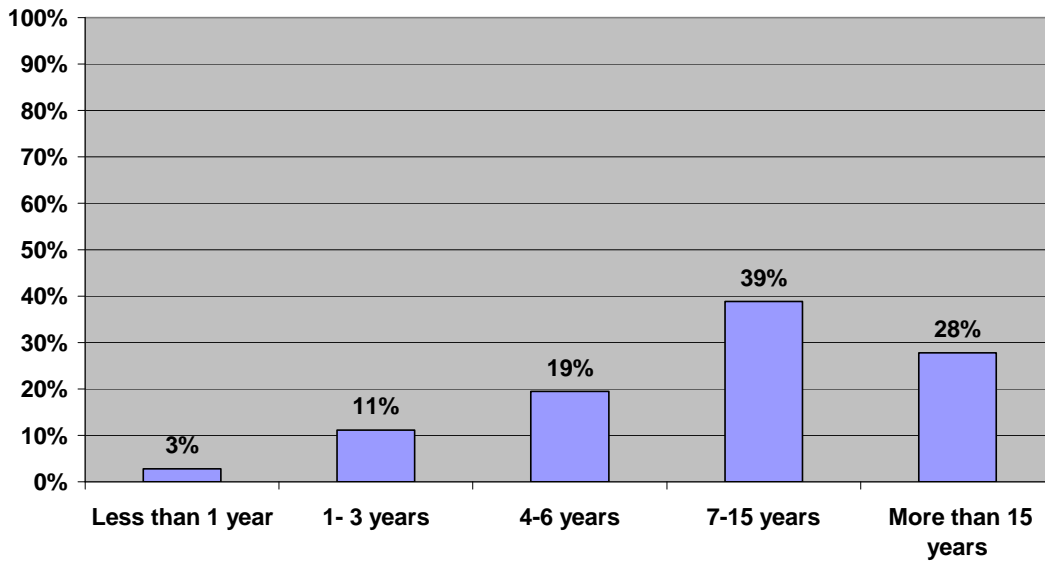
23. Have you had any construction related accidents within your Hispanic crew?



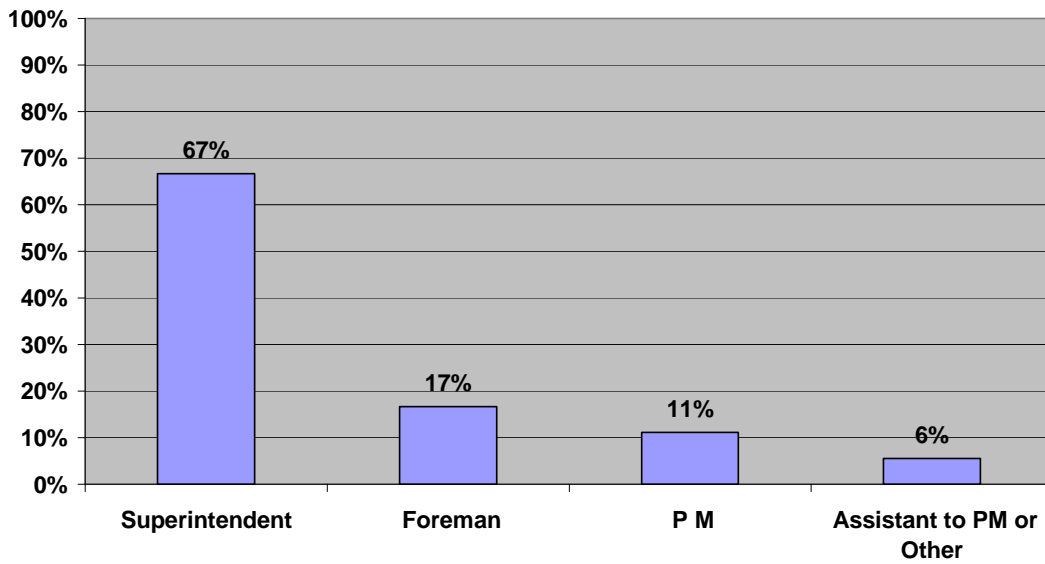
24. What are the most common types of accident you have seen or undergone in relation with the Hispanic workers, if any?



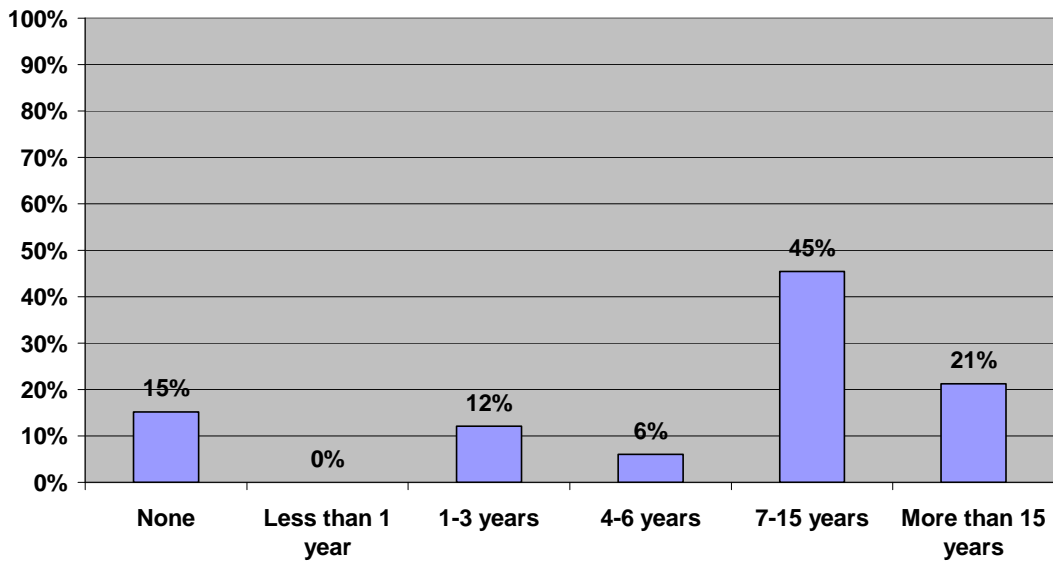
25a. How long have you been a construction supervisor?



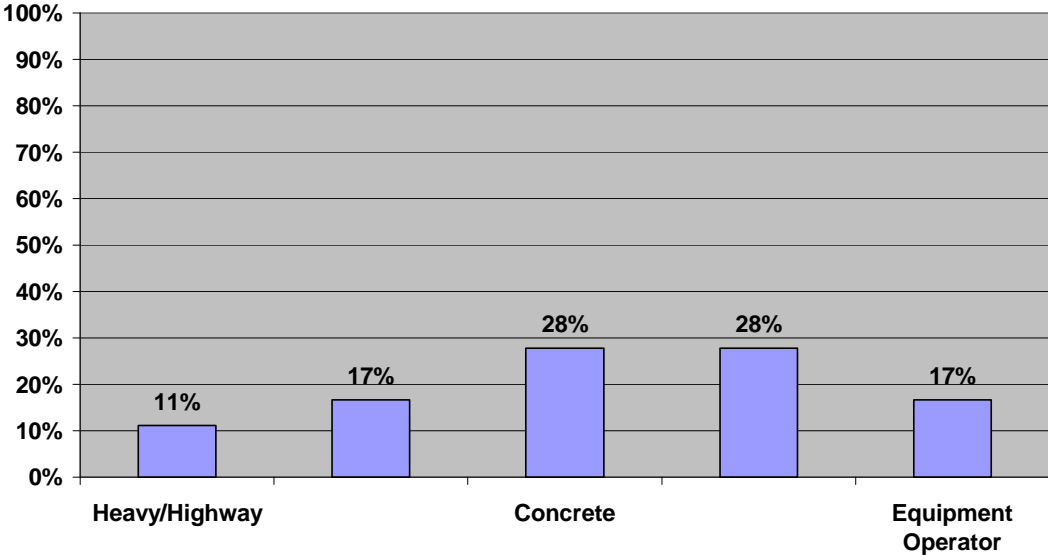
25b. What is your field title?



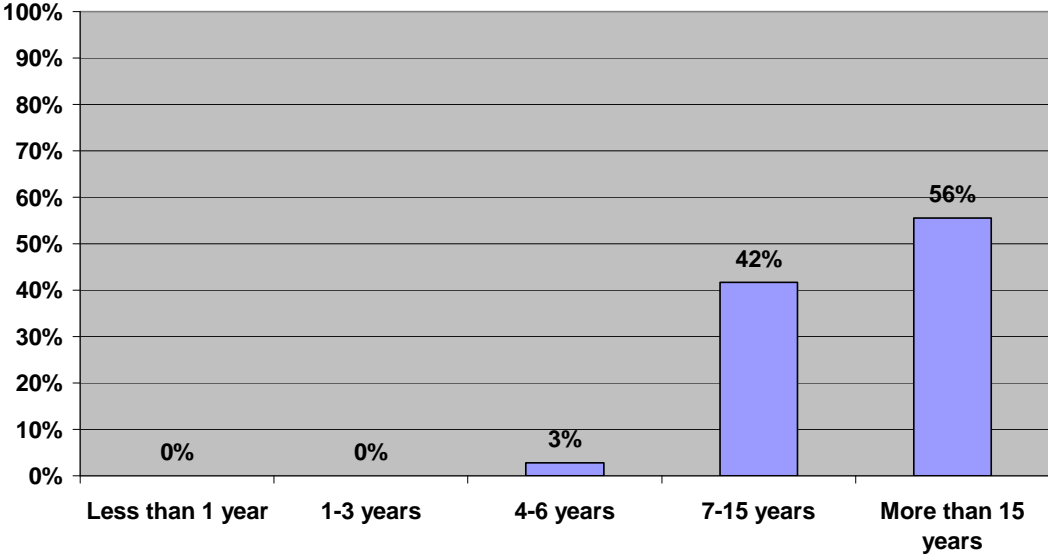
26a. How much experience in construction did you have prior to supervising Hispanics?



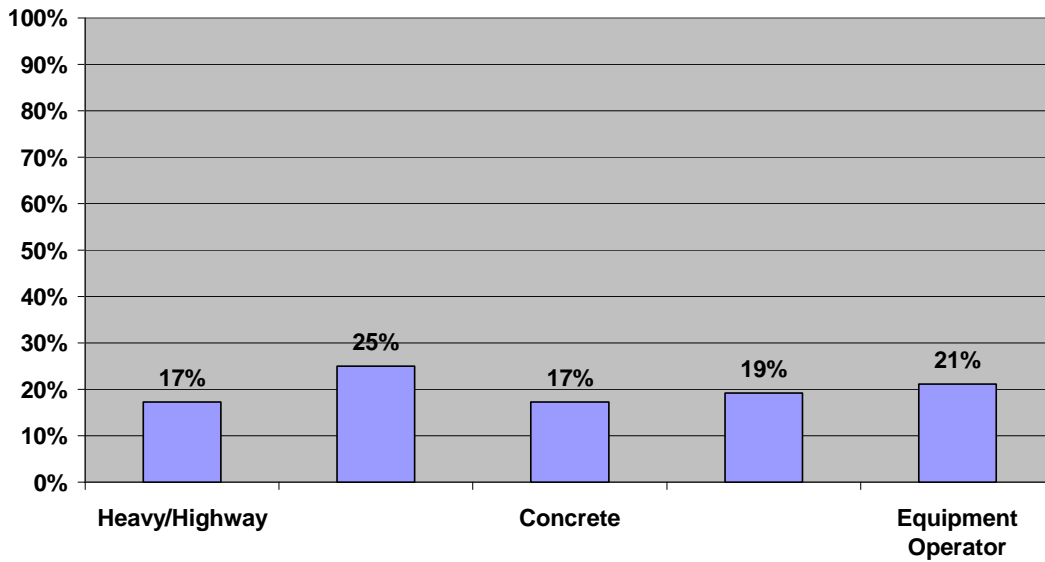
26b. In which trades did you get construction experience prior to supervising Hispanics?



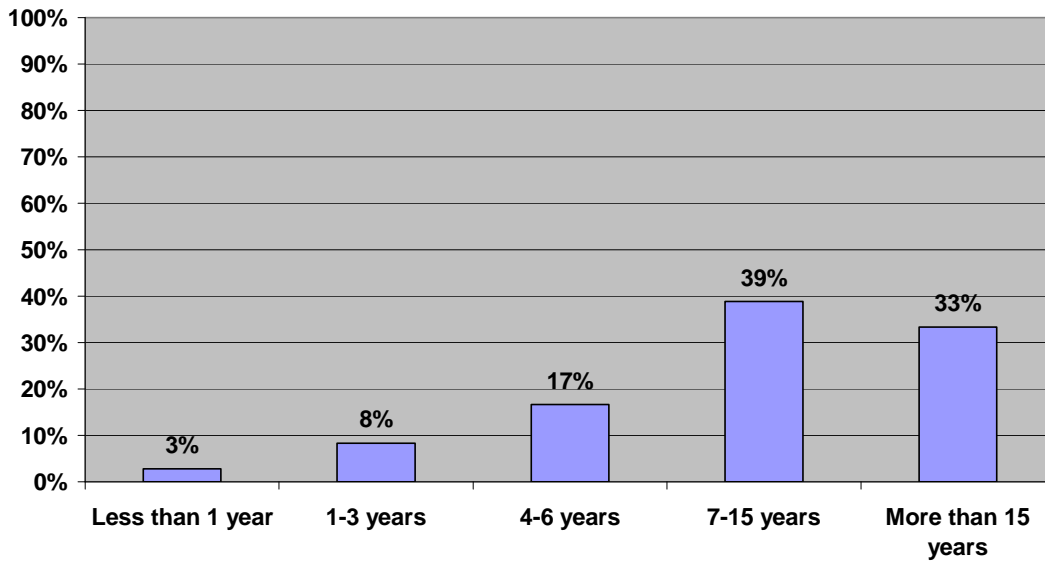
27a. How long have you been involved in construction?



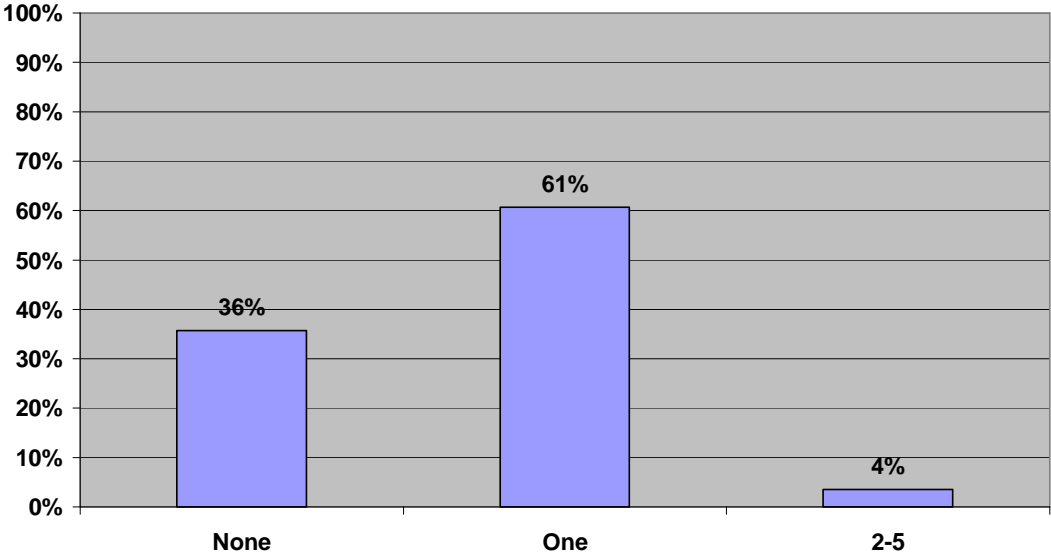
27b. In what trade/trades have you been involved in construction?



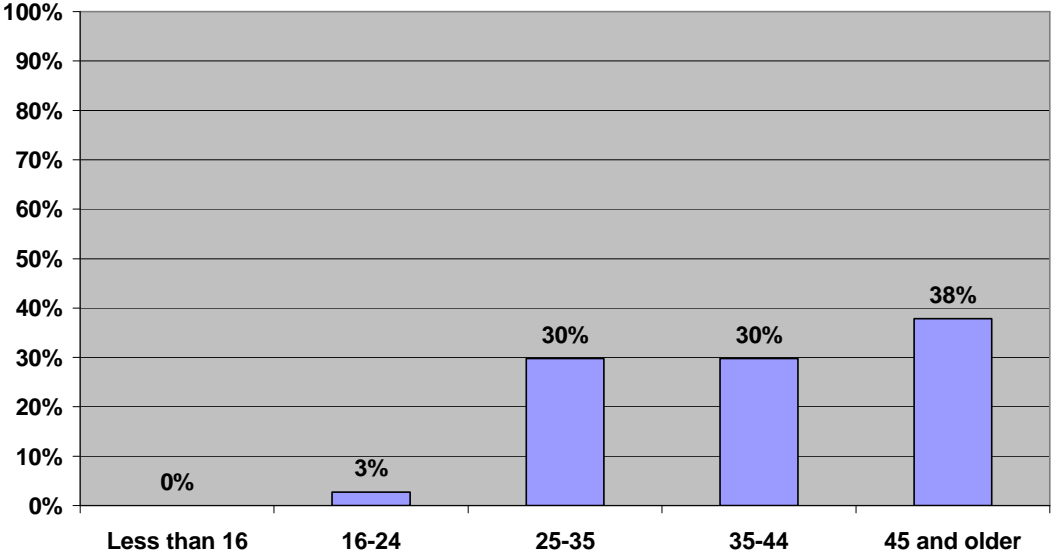
28. How long have you been employed by the company you are currently working for?



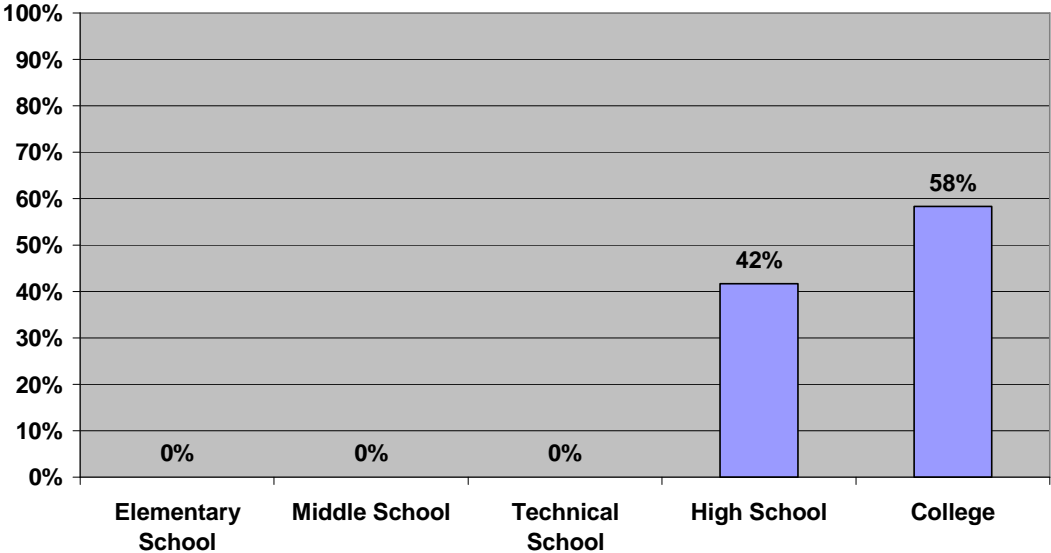
29. How many other construction companies have you worked for?



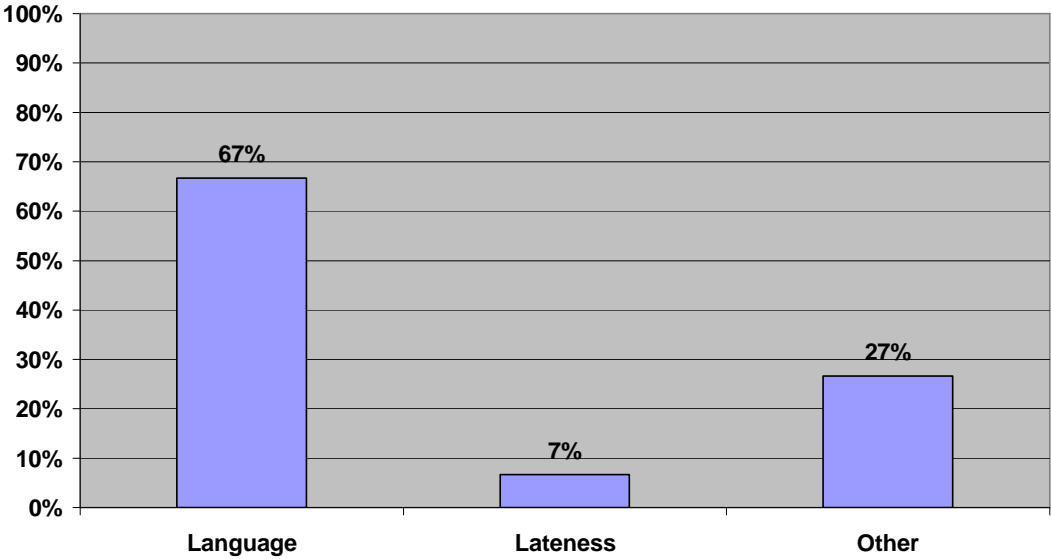
30. How old are you?



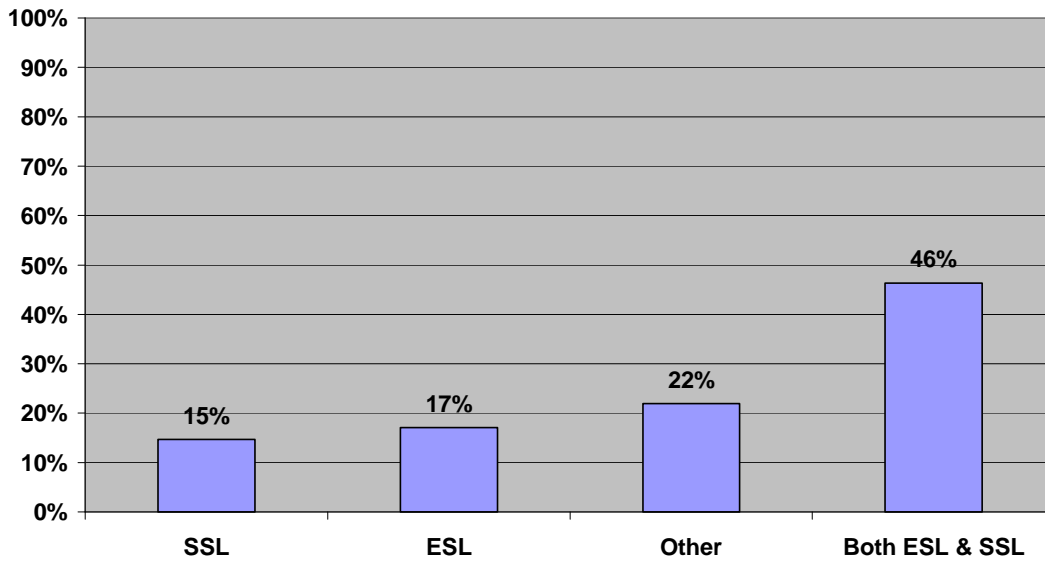
31. What is the highest level of education you have completed?



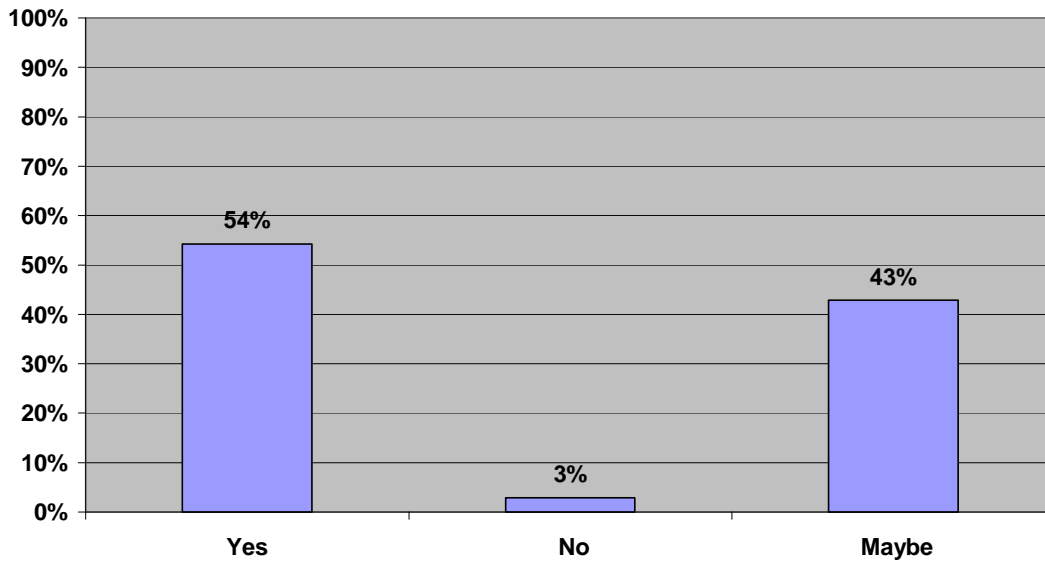
32. What do you consider to be your main problem(s) in the job site as they relate to Hispanic workers?



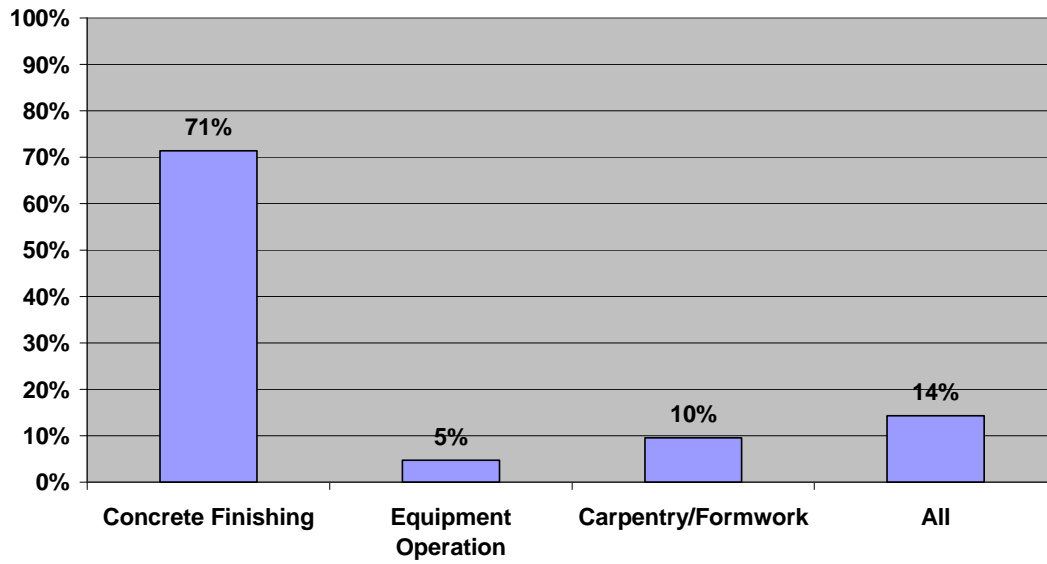
33. What solution(s) do you propose to solve the language barrier with Hispanic workers?



34. Would you like to send any of your Hispanic workers to a course designed to help them step up to supervisor?



35. What technical course would you prefer to take that will benefit the communication between you and your Hispanic crew members?



QUESTIONNAIRE FOR AMERICAN SUPERVISORS

CODING MANUAL

Question No.	Code	Column
1a.	Have you ever taken a course to help you learn Spanish?	<u>1</u>
	1 = Yes 2 = No	
1b.	If YES, how many total hours of training have you had?	<u>2</u>
	1 = Less than 10 hours 2 = Between 10 and 40 hours 3 = More than 40 hours	
1c.	If NO, would you like to take one?	<u>3</u>
	1 = Yes 2 = No	
2.	Was this Spanish course related to construction?	<u>4</u>
	1 = Yes 2 = No	
3.	How would you rate the following aspects of your Spanish course?	-
	1 = Very Poor 2 = 3 = 4 = Neutral 5 = 6 = 7 = Very Good	
3a.	Contents for use on the job	<u>5</u>
3b.	Contents for use in everyday life	<u>6</u>
3c.	Instructor	<u>7</u>

4. How would you rate the degree of difficulty? 8

- 1 = Very Easy
- 2 =
- 3 =
- 4 = Normal
- 5 =
- 6 =
- 7 = Very Difficult

5. How would you rate the length of the course? 9

- 1 = Very Short
- 2 =
- 3 =
- 4 = Normal
- 5 =
- 6 =
- 7 = Very Long

6. How well did your Spanish courses meet your needs and expectations? 10

- 1 = Not at all
- 2 =
- 3 =
- 4 = Neutral
- 5 =
- 6 =
- 7 = Completely

7. Would you be interested in having your Hispanic crews take a technical training course related to their trade? 11

- 1 = Yes
- 2 = No

8. If YES, what would you like them to learn? -

1 = Checked

- 8-1 Carpentry 12
- 8-2 Concrete 13
- 8-3 Equipment 14
- 8-4 Plan reading 15
- 8-5 Other 16

9.	Is this related to your occupation? (Trade)	<u>17</u>
	1 = Yes	
	2 = No	
10.	If your Hispanic crews were to take technical training courses in the near future, what degree of importance to the course contents would you give to the following aspects:	
	1 = Not Important	
	2 =	
	3 =	
	4 = Neutral	
	5 =	
	6 =	
	7 = Very Important	
	8 = N/A (Not Applicable)	
10a.	On-the-job vocabulary?	<u>18</u>
10b.	Equipment operation?	<u>19</u>
10c.	Construction safety?	<u>20</u>
10d.	Plan Reading?	<u>21</u>
10e.	Tools?	<u>22</u>
10f.	Measurements?	<u>23</u>
11.	Would you like them to learn to operate heavy equipment?	<u>24</u>
	1 = Yes	
	2 = No	
12.	Which of the following would you prefer them to learn to operate? (circle all you want)	-
12-1	1 = Forklift	<u>25</u>
12-2	2 = Backhoe	<u>26</u>
12-3	3 = Motorgrader	<u>27</u>
12-4	4 = Bulldozer	<u>28</u>
12-5	5 = Dump truck	<u>29</u>
12-6	6 = Other	<u>30</u>
12-7	7 = All of the above	<u>31</u>
13.	In which language do you think they should be taught when taking these technical courses?	<u>32</u>
	1 = Spanish	
	2 = Spanish	
	3 = Spanish and Spanish combined	
14.	Where do you think would be most convenient for these courses to take place?	<u>33</u>
	1 = Job site	

- 2 = Classroom
- 3 = Both
- 4 = Either one

15. How many Hispanic workers do you have in your crews? 34

- 1 = 1-3
- 2 = 4-6
- 3 = 7-10
- 4 = more than 10

16. How long have you supervised Hispanic workers? 35

- 1 = 1-3 yrs
- 2 = 4-6 yrs
- 3 = 7-10 yrs
- 4 = more than 10 yrs

17. Do you have a link-person (facilitator) to help you communicate with people in your crew? 36

- 1 = Yes
- 2 = No

18. How familiar do you think you are about Hispanics with regard to the following: -

- 1 = Very Unfamiliar
- 2 =
- 3 =
- 4 = Neutral
- 5 =
- 6 =
- 7 = Very Familiar

18a. Culture differences 37

18b. Manners 38

18c. Work Ethic 39

19. How satisfied are you with each of the following?

- 1 = Very Dissatisfied
- 2 =
- 3 =
- 4 = Neutral
- 5 =
- 6 =
- 7 = Very Satisfied

19a. Dealing with Hispanic workers, ...their overall performance	<u>40</u>
19b. The Hispanic worker job safety awareness	<u>41</u>
19c. The response of Hispanic workers to the type of tasks you ask them to do	<u>42</u>
19d. Your ability to communicate in Spanish	<u>43</u>

20. How often do you need a translator to communicate with people in your crew? 44

- 1 = Never
- 2 = Seldom
- 3 = Sometimes
- 4 = Often
- 5 = Always

21. What language do you use when you speak to Hispanic workers in your crew? 45

- 1 = Spanish
- 2 = Spanish
- 3 = Spanish and Spanish combined

22. How important would it be to you to ...

- 1 = Not Important
- 2 =
- 3 =
- 4 = Neutral
- 5 =
- 6 =
- 7 = Very Important

22a. Improve your communication with your link-person (facilitator)?	<u>46</u>
22b. Improve your communication with all the Hispanic workers in your crew?	<u>47</u>
22c. Receive SSL training emphasizing only in construction?	<u>48</u>
22d. Have more Hispanic workers in your crew?	<u>49</u>

23. Have you had any construction related accidents? 50

- 1 = Yes
- 2 = No

24. What are the most common types of accidents you have seen or undergone in construction, if any?

24-1	Falls	<u>51</u>
24-2	Cuts	<u>52</u>
24-3	Smashed fingers or toes	<u>53</u>
24-4	Struck by	<u>54</u>
24-5	Other	<u>55</u>

25a. How long have you been a construction supervisor? 56

- 1 = Less than one year
- 2 = Between one and three years
- 3 = Between four and six years
- 4 = Between seven and fifteen years
- 5 = More than fifteen years

25b. Superintendent or foreman? 57

- 1 = Superintendent
- 2 = Foreman
- 3 = Project Manager
- 4 = Assistant PM

26a. How much construction experience did you have prior to supervising Hispanic workers? 58

- 0 = None
- 1 = Less than one year
- 2 = Between one and three years
- 3 = Between four and six years
- 4 = Between seven and fifteen years
- 5 = More than fifteen years

26b. What trade?

1 = Heavy/Highway	<u>59</u>
2 = Masonry/Laborer	<u>60</u>
3 = Concrete	<u>61</u>
4 = Carpentry	<u>62</u>
5 = Equipment related	<u>63</u>

27a. How long have you been involved in construction and in what trade? 64

- 0 = None
- 1 = Less than one year
- 2 = Between one and three years
- 3 = Between four and six years
- 4 = Between seven and fifteen years
- 5 = More than fifteen years

27b. What trade?	<u>65</u>
1 = Heavy/Highway	<u>66</u>
2 = Masonry/Laborer	<u>67</u>
3 = Concrete	<u>68</u>
4 = Carpentry	<u>69</u>
5 = Equipment related	<u>70</u>

28. How long have you been employed by the company you are currently working for?	<u>71</u>
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- 1 = Less than one year
- 2 = Between one and three years
- 3 = Between four and six years
- 4 = Between seven and fifteen years
- 5 = More than fifteen years

29. How many other construction companies have you worked for in the U.S.? ____	<u>72</u>
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- 0 = None
- 1 = One
- 2 = Between two and five
- 3 = More than five

30. How old are you? _____ years old	<u>73</u>
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- 1 = Less than 16
- 2 = Between 16 and 24
- 3 = Between 25 and 34
- 4 = Between 35 and 44
- 5 = 45 and Older

31. What is the highest level of education you have completed?	<u>74</u>
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- 1 = Elementary school
- 2 = Middle school
- 3 = Technical school
- 4 = High school
- 5 = College

32. What do you consider to be your main problem(s) on the job site as they relate to Hispanic workers?	-
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32-1 Communication	<u>75</u>
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32-2	Lateness	<u>76</u>
32-3	Other	<u>77</u>

33. What solution(s) do you propose to solve the language barrier with Hispanic workers?

33-1	SSL	<u>78</u>
33-2	ESL	<u>79</u>
33-3	Other	<u>80</u>

34. Would you like to send any or all of your Hispanic workers to a course designed to help them step up to supervisor? 81

- 1 = Yes
- 2 = No
- 3 = Maybe

35. What technical course would you prefer to take that will benefit the communication between you and your crew?

1 = Concrete Finishing	<u>82</u>
2 = Equipment Operation	<u>83</u>
3 = Carpentry/Formwork	<u>84</u>
4 = Other	<u>85</u>

APPENDIX C. SSL COURSE EVALUATION QUESTIONNAIRE

SSL: Survival Course
EVALUATION

Personal	Company name: _____	Phone #: _____
	Your name: _____	Date: _____
	Occupation: _____	

Course Contents	How was the overall class content? <input type="checkbox"/> Too basic <input type="checkbox"/> About right <input type="checkbox"/> Too difficult
	Was the order of the topics easy to follow? <input type="checkbox"/> Yes <input type="checkbox"/> No
	How much of the information presented will be useful to you in your job? <input type="checkbox"/> All <input type="checkbox"/> Most <input type="checkbox"/> About 50% <input type="checkbox"/> Some <input type="checkbox"/> None
	What is the most useful information you received? _____ _____
	What is the least useful information you received? _____ _____

Instructor & Assistant Trainer	Trainer Name (1): _____	Assistant Trainer Name (2): _____				
			<u>Deficient</u>	<u>Fair</u>	<u>Good</u>	<u>Excellent</u>
			(1) (2)	(1) (2)	(1) (2)	(1) (2)
	Knowledge of subject		— —	— —	— —	— —
	Communicated clearly		— —	— —	— —	— —
	Effective presentation tools		— —	— —	— —	— —
Responded well to questions		— —	— —	— —	— —	
	How would you rate the trainers' interests in you training?					
	<input type="checkbox"/> Without interest	<input type="checkbox"/> Impartial	<input type="checkbox"/> With interest	<input type="checkbox"/> Very interested		

Overall Training		<u>Not at all</u>						
	<u>Definitely</u>							
	Was the class what you expected?	1	2	3	4	5	6	7
	Comments: _____							
	Was the class a worthwhile investment?	1	2	3	4	5	6	7
Comments: _____								
Has your confidence in speaking English improved?	1	2	3	4	5	6	7	
Comments: _____								
	Would you recommend this course to others?							
	<input type="checkbox"/> No	<input type="checkbox"/> Maybe	<input type="checkbox"/> Probably	<input type="checkbox"/> Definitely				

Training Workbooks	How would you rate the training books?	__Poor	__Average	__Excellent
	Were they complete?	__Poor	__Average	__Excellent
	Were they accurate	__Poor	__Average	__Excellent
	Were they activities useful?	__Poor	__Average	__Excellent
	<i>Comments:</i> _____			
	How would you rate?	__Poor	__Average	__Excellent
	<i>Comments:</i> _____			

The following information will be used to improve this training course in all the aspects previously evaluated for future opportunities.

I would tell someone considering this course...

This course could be better if...

What can you say to others who think they don't need training? Why should someone consider taking this training course?
