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7. Author Edna Vanessa Vázquez		**8. Performing Organization Report No.**	
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16. Abstract

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.

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.

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 *Spanish as a Second Language (SSL) Survival Course*. A series of technical training courses were also developed, titled *Concrete Pavement Construction Basics* (CPCB), 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.

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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.

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.

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

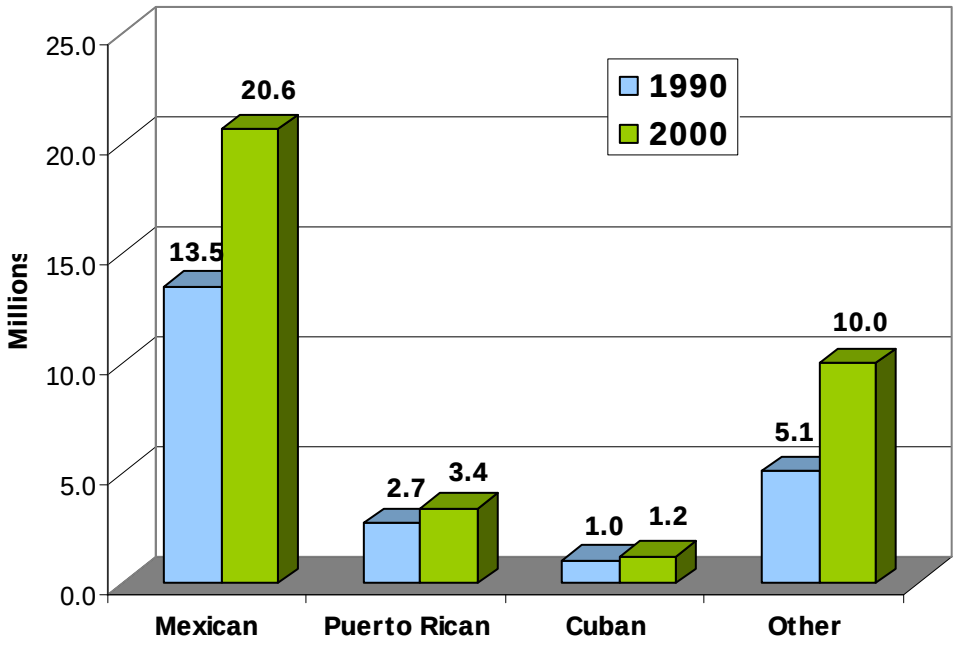

Figure 2.2. Growth of Hispanic Population by Origin: 1990-2000 (U.S. Census Bureau 2001)

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.

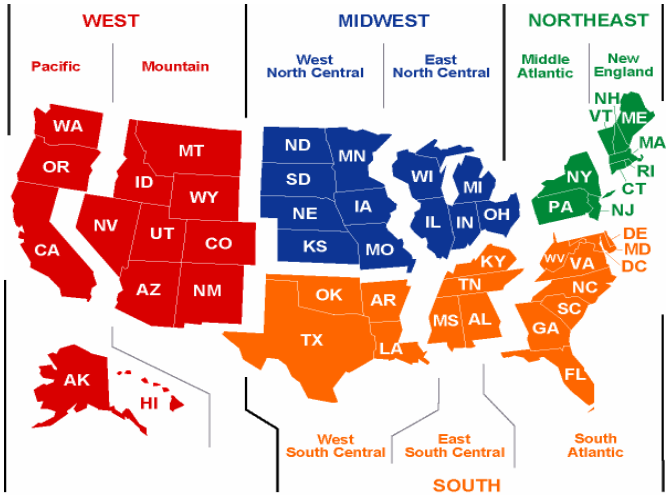

Figure 2.3. 2000 U.S. Census Regions and Divisions (EIA 2005)

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

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.

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 Familiar						Very Unfamiliar
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