Exploring Training Needs and Development of Construction Language Courses for American Supervisors and Hispanic Craft Workers

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Abstract: This study explores the training needs of American supervisors and Hispanic construction craft workers and describes the development, delivery, and evaluation of construction-focused training courses intended to facilitate accommodation for American supervisors and assimilation of Hispanic craft workers to the United States (U.S.) industry. A survey was conducted to better understand the adaptation issues between American supervisors and their Hispanic craft workers. As a result of the survey, two unique construction language courses were developed: English as a second language (ESL) and Spanish as a second language (SSL) for construction. Evaluation feedback from initial course offerings suggest that they were useful in terms of increased confidence and improved ability to communicate. It is anticipated that the courses developed and the training provided will improve the communication channels between American supervisors and Hispanic workers, as well as strengthen the supervisor-worker relationship as the American supervisor grows aware of the existent communication differences. A model for transferring these research findings to other cultural groups and a technology-based approach for delivering these courses to the construction site are also discussed.

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Introduction

Hispanics are considered the largest minority in the U.S. and are projected to make up about 25% of the workforce by 2050. In Iowa alone, the Hispanic population increased by 153% from 1990 to 2000 (U.S. Census Bureau 2004a,b,c). Mexico has been the traditional source of Hispanic immigrant labor in the United States. However, in the past decade, trends started to change with immigrants coming from Central America and, more recently, from countries such as Ecuador, Argentina, Colombia, and Peru due to the deterioration of South American economies. Population trends indicate that the number of Hispanic workers in construction will continue to grow, creating the need to develop strategies to blend cultures in the workplace. In some states such as California, New Mexico, and Texas, Hispanics are already the majority of the construction workforce (Goodrum and Dai 2005). To effectively blend Hispanic workers into the U.S. construction workforce, it will be necessary to develop an understanding of the communication process and the role of language barriers to communication, and to identify the consequences of communication failures between the Hispanic worker and the American supervisor.

This paper explores the unique training needs for American supervisors and Hispanic construction craft workers and describes the development, delivery, and evaluation of construction-focused training courses that can facilitate communication among these two groups. Furthermore, the paper presents a recommended strategy that can help define the procedure for Hispanic workers to assimilate into the American workforce.

The development of the cross-cultural training program needed to accomplish two primary objectives:

1. Be responsive to the needs of industry while recognizing the resource constraints extent in any construction project setting; and
2. Be responsive to the cultural preferences of the participants.

Objective 1 was accomplished through a needs analysis survey of industry, conducted among a small sample of U.S. construction companies to identify the most pressing needs for training multicultural construction crews. Objective 2 was accomplished largely through a review of the literature and participant evaluation surveys after the pilot offering of the training program. The initial step in this process was to review the academic literature on cross-cultural management to identify an appropriate framework for developing the training program. As a follow up to the aca-

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demic literature review, a broader search of trade publications and government reports was conducted to identify current training programs available for Hispanic construction workers.

Through the literature review, the research team was attempting to identify cultural factors that would be useful in answering questions regarding the size of the classes, the formality of the program, the appropriate level of interaction between the supervisor, participants, and instructor, the organization of training sessions and materials, etc.

The results of the needs analysis were combined with appropriate cultural models identified in the literature to design, develop, and deliver two basic training courses, ESL and SSL for construction. After initial field tests of the training courses, the program was evaluated by the participants to determine effectiveness. Finally, a model for transferring these research findings to other cultural groups is described.

Literature Review

Cross-Cultural Studies

The approaches used in cross-cultural management research are almost as varied as the cultures under study (Earley 2006). A full discussion of the issues involved in comparative culture studies far exceeds the scope of this paper. Interested readers are referred to a recent article by Soares et al. (2007) for an excellent review of the different approaches to cultural identity and measurement in research studies. In general, the authors state that there are four approaches to cultural identity and measurement, and that all four approaches have inherent weaknesses. Two of the approaches to cultural identity and measurement (direct values inference and indirect values inference) pertain specifically to work values and cross-cultural management and are germane to the development of training programs for multicultural audiences such as the one described in this manuscript. The other two approaches have roots in anthropology and social psychology and are less applicable to the development of cross-cultural management training programs, and are not discussed here.

The direct values inference approach involves measuring the values of individuals from within a given culture, and inferring general cultural characteristics by aggregating the individual values. Aggregated individual values are then analyzed statistically across multiple cultures to identify commonalities and differences along universal dimensions upon which cultures vary. This approach typifies the work of Hofstede (1984, 1991, 2003) and Schwartz (1992, 1994). The Schwartz model of universal values holds promise for future research (Steenkamp 2001), but Hofstede's study of cultural values has been replicated by a number of researchers and is a widely accepted framework of cultural values. For instance, Shao and Webber (2006) found that Hofstede's four cultural dimensions helped explain differences in effective leadership styles in Chinese and North American organizations. Hofstede's model of cultural variations can also be applied to issues of linguistics and intercultural communication (Manning 2004). Additionally, Rowlinson (2001) studied organizations in a construction context and found that Hofstede's dimensions of power distance and individualism explained differences in organizational commitment between cultures.

There has been some criticism of Hofstede's work, particularly when Hofstede's work is used for indirect values inference or benchmarking. In this approach, secondary data are used to assign characteristics of cultures without directly measuring members of the group. When researchers use the national cultural scores from Hofstede's study as variables in a statistical analysis, there is potential for measurement error (Soares et al. 2007). In short, cultural value inference is valid for describing differences between cultures on important, universal value dimensions, but caution should be used when attempting to quantify these differences for use in hypothesis testing.

Culture can be a difficult concept to define and evaluate in a research context. Work by Phua and Rowlinson (2004) suggests that the relationships between culture and individual behaviors are more complicated than can be captured in broad cultural generalizations. These authors call for future research on defining and measuring culture in construction management research. Chan and Tse (2004) also state that to date there has been a lack of robust empirical studies testing the effects of culture on construction operations.

The criticisms of cultural inference frameworks, such as Hofstede's, may be valid. However, even critics of such frameworks acknowledge a paucity of alternative constructs available for researchers interested in examining cultural factors in construction labor and personnel issues. Since the focus of our study was on developing a training program for the Hispanic assimilation of American culture and American accommodation to the Hispanic culture on jobsites, and not on hypothesis testing requiring quantitative measurement of cultural dimensions, and since Hofstede's cultural values descriptions have been widely replicated and utilized in cross-cultural management research, the decision was made to use Hofstede's cultural value dimensions as the guiding framework for the development of the training program for Hispanic/American construction crews.

Hofstede's terminology for describing national cultures consists of five different criteria, which he called "dimensions" because they occur in combinations and are largely independent of each other. These five criteria are: individualism versus collectivism, large or small power distance, strong or weak uncertainty avoidance, masculinity versus femininity, and time orientation (Hofstede 1991).

Individualism versus collectivism involves the relationship between an individual and his or her fellow workers. There are two categories: (1) societies in which ties between individuals are very loose, that is, everybody looks after his or her own self-interests (individualistic); and (2) societies in which the ties between individuals are very tight, that is, everybody looks after his or her group's interests (collectivistic). Hispanic societies fall in the second category, where friendships prevail over tasks, and loyalty is very valuable among group members and between bosses and subordinates. In a collectivist culture, an employer hires a person that belongs to an "in-group." The individual will act according to the interest of the "in-group," which may not always coincide with his or her individual interest. The relationship between employer and employee is seen in moral terms as it resembles a relationship of mutual obligations of protection in exchange of loyalty. On the other hand, management in individual societies prefers to move workers around individually. If incentives and bonuses are given, these are linked to an individual's performance; opposite to the management of groups found in collectivist societies. Management techniques related to training exist almost exclusively to individualist countries and these are based on cultural assumptions, which may not hold for the Hispanic collectivist worker.

Power distance refers to the way society deals with people's inequality. On the jobsite, the level of power is related to the degree of centralization of authority and the degree of autocratic

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leadership. The Hispanic culture, in general, is characterized by a large power distance and in this situation superiors are considered to be existentially unequal. These workers are accustomed to organizations that use centralization of power and subordinates are expected to be told what to do. The ideal boss, from the large power distance worker perspective, is a benevolent autocrat or as Hofstede calls it "good father." This type of worker may ideologically reject the boss's authority, after some experiences with a "bad father."

Uncertainty avoidance, which is not the same as risk avoidance, indicates to what extent a culture can program a member to sense or feel about changing, unknown, or surprising situations. The two ends of this dimension are related to how strong or weak the members accept or avoid uncertainties. Groups with weak uncertainty avoidance tend to accept the fact that the future is unknown and, therefore, accept each day as it comes. On the other hand, other societies tend to reduce uncertainty in the future by creating security and avoiding risk. In this dimension, there exists a clear correlation between power distance and uncertainty avoidance (Hofstede 1984). Laws and rules help society in preventing uncertainties in the behavior of people. According to Hofstede this is very noticeable in the workplace.

In uncertainty avoiding societies such as the United States, there are many formal and informal rules controlling the rights and duties of employers and employees as well as controlling the work process. For Hofstede, individuals in these societies have been programmed since early childhood to feel comfortable in structured environments; the need for rules in a society of this sort is an emotional matter. In contrast, countries such as Mexico, Colombia, and Guatemala, with very weak uncertainty avoidance rather seem to be emotionally distraught about formal rules. Rules are only established in case of absolute necessity. In strong uncertainty avoidance societies, individuals like to be busy. Life is hurried, and time means money. In weak uncertainty avoidance societies, individuals are quite able to work hard if there is a need for it, but they are not driven to an urge towards constant activity.

Masculinity versus femininity is related to the division and clear definition of roles between the sexes in society. Human societies have associated certain roles to men only or to women only. This is part of a socialization process, rather than a biological one. Latin countries such as Venezuela and Mexico are considered to be quite masculine. However, Hofstede shows that the United States has relatively high masculinity compared to most western European countries and other Latin American countries such as Chile and Guatemala. In general, countries with high masculinity tend to have sympathy for the strong—men are supposed to be ambitious and tough, and dominant values in society are material success and progress. This is a dimension in which Hispanic workers share more similarities with the American culture.

The time dimension of culture is related to the way people value the usage of time, how they set goals and objectives, and how important and firm are the deadlines and time commitments. In the long-term dimension, values are oriented towards the future, like saving and persistence. Businesses in long-term oriented cultures such as the United States are accustomed to working toward building up strong positions in their markets without the expectation of short-term results. In the short-term dimension, on the other hand, values are oriented towards the past and present, like respect for tradition and fulfilling social obligations. Hispanic workers typically lean towards the short-term aspect of this dimension as they view deadlines as more flexible than their American counterparts (Hofstede 2003).

Hofstede established some relationship among these five dimensions, such as power distance and collectivism (Hofstede 1984). Collectivist countries always show large power distances, but individualist countries do not always show small power distance. Poor countries tend to be collectivist with larger power distances, and many Hispanic construction workers are from these poorer countries.

Hofstede's findings shaped the research team's thinking regarding development of the delivery method for the training program and helped the researchers understand the cultural preferences of Hispanic workers and American supervisors. For instance, from Hofstede's analysis, the research team determined that the program should probably be delivered in a group setting. The development of the course content, as opposed to delivery, was driven more by industry-specific research and a review of existing programs, as discussed in the following section.

Current Hispanic Construction Worker Training Programs

Most training programs for Hispanic construction workers are mainly concerned with health and safety aspects (O'Connor 2003). For instance, the Occupational Safety and Health Administration (OSHA) has special concerns for non-English speaking workers. According to the OSHA (2002) Trade News Release, more than $2.2 million in new funding was allocated for outreach to Spanish and other non-English-speaking workers during the 2004 fiscal year. This is the first time OSHA's budget included additional funding for Hispanic outreach (Canales 2005). Moreover, OSHA is forming alliances with Hispanic leadership and community-based organizations and offering an ever-increasing number of publications and fact sheets in Spanish. OSHA will continue to expand ongoing Hispanic outreach projects such as the community-based efforts to disseminate safety and health information among immigrants in New York and New Jersey (OSHA 2002).

In addition, a new website written in Spanish is helping OSHA reach out to non-English speaking workers and employers. The web page features basic documents related to worker and employer rights and responsibilities, resource materials, and other information of special interest to Spanish-speaking audiences. Moreover, OSHA's new program, Alliances, enables organizations committed to workplace safety and health to collaborate with OSHA to prevent injuries and illnesses of Hispanics in the workplace (Canales 2005).

Additionally, the Construction Accident Reduction Emphasis (CARE) program in Florida, an alliance with a Latino community group in Georgia, encourages workers to report hazards. Moreover, it offers safety and health courses as well as small business training taught in Spanish in the Southwest, and bilingual compliance assistance specialists and inspectors available to assist Spanish-speaking workers and employers in several local offices (Canales 2005).

The Georgia Tech Research Institute (GTRI) believes that education in the construction industry is a matter of life and death and has shown great concern in the lack of job experience of Hispanics that is causing high mortality rates in Georgia. GTRI has created material to make federally mandated training more effective for Hispanic construction workers. GTRI's areas of study are divided into five categories: fall protection, scaffolding, trenching and excavation, electrical hazards, and materials handling. This material has been prepared for computer presentation for job orientations and has been distributed through building

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associations, statewide and regional OSHA offices, and the Hispanic Chamber of Commerce ("Hispanic Worker Safety" 2004).

Furthermore, the National Institute for Occupational Safety and Health (NIOSH) conducts a wide range of research, training, and technical assistance programs to identify and reduce hazardous working conditions. NIOSH in Spanish, another source of available material, includes Spanish-language versions of several NIOSH workplace safety and health documents relevant to industries and occupations in which large numbers of Spanish-speaking workers are employed. It also describes in Spanish how workers and employers can contact NIOSH and access basic services such as health hazard evaluations (Canales 2005).

The state of Massachusetts has also given priority to this type of training programs for Hispanic construction workers. The Department of Work Environment, Univ. of Massachusetts-Lowell senses there is the need for linguistically and culturally appropriate occupational and health resources targeted to Spanish speaking workers (Brunette 2005). This entity has developed safety and health educational materials for Hispanic construction workers that have been federally funded to be implemented in Lawrence, Mass.; a city with a Hispanic population majority. The structure of the training includes 13 modules of 1 h duration each where six are mandatory and seven are elective (Brunette 2005). On the other hand, the AGC of Massachusetts has formed an alliance agreement with OSHA with intentions of reducing and preventing the Hispanic worker exposure to health and safety hazards (Gordon and Petrucelli 2005). The news release of this alliance was made on Apr. 19, 2005 and officially partners OSHA and AGC of Massachusetts to provide expertise to develop training and educational programs for Hispanic construction workers (Fitzgerald 2005).

California's Working Immigrant Safety and Health Coalition (WISH) with funding from the Institute for Labor and Employment is sharing strategies to protect the health and safety of the Hispanic immigrant worker. WISH has begun developing a network of organizations to provide training and support for Hispanic immigrants working in construction (Teran 2002).

In the private construction industry, the nominal and human cost of losing a worker due to injury or death on the job is increasing by the day. In 2000, the state of Texas reported 81 Hispanic construction worker fatalities. The Dallas/Forth Worth Airport (DFWA) expansion project put in place a training program aimed at minimizing injuries among Hispanic workers by breaking down barriers of language, literacy, and culture with Hispanic workers. The DFWA project may have one of the best construction training programs in the US due to its leadership in training Hispanic workers in health and safety (Nash 2004). Nearly 13,000 workers have taken the 40 h course developed by BEST Institute, which is offered in Spanish as well as in English. This course teaches the basic vocabulary and phrases used in everyday work situations, especially the vocabulary and phrases correlated to safety and health procedures.

A private company in Wyoming called Construction Communication Corp. has created a Commercial Construction Communication book and a Construction Spanish-English Dictionary that could serve contractors and Hispanic-training developers as guidance in the architecture of the training in construction language (Construction Spanish 2002).

To conclude with the review of public and scholarly efforts to increase training practices for Hispanic construction workers, it is important to recognize Paul Goodrum's work from the University of Kentucky on possible factors explaining high mortality rates for Hispanic construction workers related to other races and cultures (Goodrum and Dai 2005). Michael Schulman from North Carolina State Univ. and Tom O'Connor at the National Academy of Science have also made contributions in health and safety training for Spanish speaking construction workers (O'Connor et al. 2005; Schulman 2005).

Needs Analysis

The needs analysis involved surveying Hispanic craft workers and American Supervisors who work together on the jobsite to achieve common goals. Two questionnaires were designed: one for Hispanic craft workers and another for American supervisors. The goal of the questionnaires was to provide data necessary to bridge the gap between American supervisors and Hispanic construction workers by identifying the problems created by blending the two cultures into the workplace. The questionnaire for Hispanic workers was arranged in four parts related to the worker's: (1) English speaking capabilities; (2) management training background; (3) safety awareness; and (4) personal background information. The questionnaire for the American supervisors was arranged in the following four categories: (1) Spanish speaking capabilities; (2) Hispanic cultural awareness; (3) safety aspects; and (4) personal background information.

Data collection for the Hispanic workers utilized face-to-face interviews with construction workers on the jobsites using a sample of convenience. All interviewers were bilingual. It was necessary to obtain enough data to draw and evaluate significant conclusions and generate recommendations for course content. Several construction companies in Iowa were willing to collaborate and 10 of them were contacted prior to conducting the interviews. Most of the construction projects chosen as data sources were located in the Des Moines area, Ames, Burlington, Council Bluffs, and other cities in which the presence of Hispanic workers was sufficient to conduct the survey. The desired sample size was calculated to be approximately 100 and was based on the number of Hispanic workers involved in the construction industry in Iowa, obtained from statistics provided by the Bureau of Labor Statistics (BLS) and U.S. Census Bureau. A total of 97 responses were obtained.

Data collection for the American supervisors was carried out in the form of face-to-face interviews and mailed-in questionnaires. The companies targeted were those that had American supervisors in charge of a significant number of Hispanic employees within their organization. A total of 38 surveys were obtained from 15 construction companies in Iowa. Seventeen supervisors were interviewed personally.

Results of the Needs Analysis for Hispanic Workers

Personal Information

- Eighty percent of Hispanic construction workers have lived in the U.S. from 1–15 years and 67% of all the respondents plan to permanently stay in the U.S.
- Fifty-one percent of Hispanic workers had less than 1 year or no experience in construction prior to living in the U.S.

Communication Skills and Interests

- Sixty-two percent of the Hispanic respondents said that they were not satisfied with their ability to communicate at the jobsite.
- Sixty-eight percent of the workers said they had not taken

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courses to help them learn the language while 92% of the workers would like to take an English course.
- Seventy-nine percent of Hispanic workers expressed the desire to be trained in both English and Spanish.
- Fifty-five percent of the Hispanic workers identified "*lack of communication*" as their major problem on the jobsite. Eighty percent of Hispanic workers said that it was very important to improve communication with supervisors and coworkers.
- Eighty-nine percent of Hispanic workers are interested in taking a technical training course; 55% of Hispanic worker respondents prefer instruction in areas of carpentry and equipment while 78% of the workers currently have tasks involving concrete and carpentry.
- Ninety-six percent of Hispanic workers responded that they are very interested in learning to operate heavy equipment. More than fifty percent of them said that a "*forklift*" and a "*backhoe*" are the most preferred machines to operate.
- Twenty-three percent of Hispanic workers experienced a construction-related accident.
- When workers were asked whether they would like to take a course to be promoted to supervisor, 86% of them answered positively. Within the context of this research, a supervisory position is understood as a leadership position such as foreman, crew leader, or supervisor, depending upon the company's needs and the worker's capabilities.

Results from the Hispanic survey provided fundamental considerations for developing an ESL course for Hispanic craft workers. In addition, a construction craft worker who will become a supervisor is expected to be fluent in English, since this is one of the initial requirements for advancement opportunities within an American construction company.

Results of Needs Analysis for American Supervisors

Out of the 38 American supervisor respondents, 16% work in 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. About 60% of the interviewed American supervisors have a total of seven or more Hispanics in their crew. Other key findings from the American supervisor survey are as follows:
- Eighty-two percent of the respondents stated that "*communication*" and "*language*" barriers are the most common problems encountered in the jobsite by American supervisors.
- Seventy-eight percent of the American supervisors communicated with Hispanic workers in their crew using the English language.
- Approximately 84% of American supervisors are dissatisfied with their ability to communicate in Spanish and 92% expressed that it is important to improve their communication with Hispanic workers in their crew.
- Sixty percent of the American supervisors interviewed have taken some sort of Spanish course in high school or college. It should be noted that their previous education is not enough to communicate clearly with the Hispanic crew members and many indicated that they had forgotten the majority of the previously learned material.
- Of the respondents who have not taken a Spanish course, 81% were interested in taking a course to learn Spanish.
- When asked about proposed solutions to overcome the language barrier, 15% proposed taking SSL courses and 46% proposed a combination of ESL and SSL courses for both the American supervisor and the Hispanic worker.
- Seventy-five percent of American supervisors have a link person (facilitator) who helps in communicating with the Hispanics in a crew. This confirms that many American supervisors are not capable of communicating directly with their Hispanic crew members because of language differences. However, a significant concern arises when the link person does not show up to work. Potentially, these situations will 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 instructions to Hispanic workers.
- Other problems encountered by the American supervisor were "*nonpunctuality*," "*collective protest*," "*lack of attention*," and "*leader development*" on the part of the Hispanic worker. For instance, "collective protest" is when a worker is suspended from the job temporarily (for any reason) and the rest of the crew does not show up to work the next day as a form of protest and support to the fellow worker. "Lack of attention" refers to subordinates that do not show interest and/or attention when tasks are assigned by a supervisor. Some supervisors find it difficult to assign a leader whom they believe has the appropriate capabilities to indirectly lead the crew and this problem is labeled as "leader development." Many Hispanics believe in "seniority," and in many cases the assigned crew leader may not correspond with who 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.

Overall, American supervisors recognize that training in communication skills is necessary to bridge the existing language gap between themselves 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. Hispanic workers have a lower probability of grasping the information provided in an ESL training course, because this population may not have the literacy skills necessary to receive and use the information efficiently.

Training Course Development, Description, and Content

Course Development

The courses included in this paper—ESL and SSL construction courses—intend to address a combination of issues identified among survey findings from Hispanic craft workers and American supervisors in Iowa. Specifically, these courses intend to help improve direct language communication and cultural awareness on the jobsite. In addition, these courses intend to provide instructional material and content that could facilitate language communication between the Hispanic workers with their American supervisor by improving his or her English and Spanish skills related to construction.

The most influential survey finding in developing these courses is the need to improve communications on the jobsite. The majority of Hispanic craft workers were not satisfied with their ability to communicate with their supervisor in English. Moreover, American supervisors have identified that most of the

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issues on the jobsite involve miscommunications due to the language barrier. The need to increase productive language communication on the jobsite shaped the development of construction focused language courses.

A systematic approach to diversity training is necessary for the development of the proposed courses. Goldstein (1993) recommends that training developers consider why training is needed, what should be covered in training, and how training outcomes should be measured. 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 the process of training individuals: (1) awareness; (2) skill building; and (3) action planning. The development of the two courses incorporates some of the Outreach Training Program Guidelines from OSHA's training materials.

Description of ESL and SSL Construction Courses

In the ESL and SSL construction courses, participants are provided with a booklet containing all the material, and a presentation is given by the instructor following the booklet. The presentation has four parts: (1) meaning in English; (2) meaning in Spanish; (3) pronunciation of the word in English (for ESL) and Spanish (for SSL); and (4) a photo of the word. Every word included in the booklet is presented to participants in these four ways. The teaching process has the following sequence: (1) the word is shown and read to participants by the instructor in English and Spanish; (2) participants repeat the word several times; (3) participants write the pronunciation of the word (phonetic sound); and (4) comments are discussed.

The intent of the SSL and ESL construction courses is to be highly interactive, provide basic material on only the necessary information, including construction-related vocabulary, names of tools and equipment, and simple direct language phrases to facilitate basic communication. These courses target American supervisors and Hispanic workers with a low level of second language knowledge in Spanish or English, respectively. The survey findings led researchers 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. In addition to providing "survival words," the course includes "survival phrases," which will facilitate communication between the Hispanic worker and the American supervisor.

Examples of the material used during the course are provided in Figs. 1 and 2. After several trial runs of the ESL and SSL construction courses, a final version was implemented. A word is supposed 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 should repeat the word after the instructor has clearly pronounced it to the trainees. This process may be repeated several times until trainees feel comfortable with the pronunciation and meanings of the word. Flashcards are used to facilitate learning, pronunciation, and knowledge retention. This course is designed to be taught in one 8 h session.

Instructors also discuss aspects of cultural dimensions or cultural differences. This explanation of cultural differences will help increase the awareness of substantial and fundamental differences between both groups. By discussing the cultural dimensions as described by Hofstede (1984), participants get sensitized to the fact that cultural diversity exists and that behaviors have a strong cultural influence. An example of this is the dimension of power distance, in which the Hispanic worker believes that his boss is an all-powerful person that he should not really speak to. In such a setting, communication basically does not exist. The use of Hofstede's cultural comparison framework was helpful in communicating some of the nonlanguage barriers that exist on the workplace.

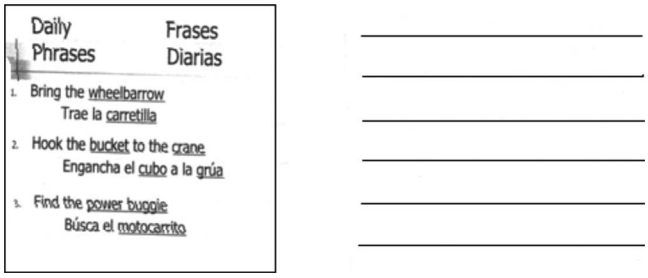

Fig. 1. Pocket size booklet

Training Course Effectiveness

ESL Course Evaluation

The ESL course was delivered four times with 24 participants involved in the training. Two evaluations were provided by the participants: one immediately following the course and another two or more months after the course was delivered. Both evaluations measured three important aspects of the course: (1) contents; (2) usefulness; and (3) instructor. For both evaluations, two similar questionnaires were developed and used to determine the participant's perceptions, in particular, to the usefulness of the course as it relates to the benefits they obtained.

The results of the initial course evaluation (immediately following the course presentation) show that course contents were described as very basic by 69% of the participants and normal by 31%. With regard to the usefulness of the information they received, 50% said that all of it has been useful and the other 50% said that most of it will be useful in the future. Ninety-one percent of the workers said that the course was definitely what they expected; 95% of workers said that it was worth the time

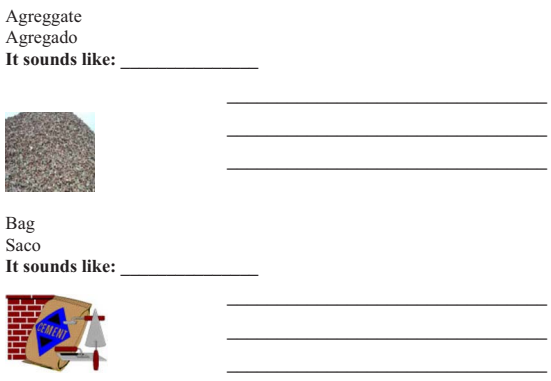

Fig. 2. Portion of SSL construction course

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Table 1. Paired T-Test, Evaluation of ESL for Construction

Questions	Subjects	Mean (1–7) (1=least favorable, 7=most favorable) Course evaluation	Follow-up	Probability $>t$	Observations
Has the ESL construction course been useful?	19	6.842	5.842	0.001 0	2
The course was just what I was expecting to get.	19	6.947	6.474	0.003 4	2
The course was worth the time I invested in it.	19	7	6.737	0.056 2	1
I feel that my confidence has improved since taking the course.	19	6.842	6.211	0.023 9	2
I would recommend the course to others.	19	7	6.895	0.162 8	1
I think the workbook was appropriate to improve my speaking capabilities.	19	6.842	6.526	0.230 1	1
I think the class activities were useful.	19	6.834	6.556	0.287 8	1

attending the course. Eighty-seven percent said their confidence increased, and 100% of workers would recommend the course to others. With regard to the workbooks, 95% said they were excellent and 100% said they were specific enough (construction focused). The activities during the course were excellent according to 96% of the workers, including the use of flash cards. These initial course evaluations strongly indicate that the course will be useful and will help the worker to better overcome the communication barrier.

The follow-up evaluation was performed on 20 out of 24 ESL participants two or more months after the course was delivered. The general objective of the follow-up questionnaire was to determine the effectiveness of the ESL construction course and how it compares to the results of the earlier course evaluation. The follow-up questionnaire was similar to the first one except that it was oriented toward what happened since the course offering. It consisted of 20 questions, the last seven of which were used to generate personal and background information. It also contained two open-ended questions. Seven questions could be compared directly (to the course evaluation), and this was done using a paired t-test.

Analyses of the answers provided by the participants of the ESL construction course strongly suggest that the course has been useful. After Hispanic workers that took the course were asked to explain why they think the course had been useful, participants gave different responses. Ten of them said it was useful because it was construction focused, 15 said they have improved communication, 11 said they have improved their confidence, and eight said they have lost their fear of speaking in another language. When asked about the most useful information/lessons taught, 11 participants said *information about tools* was useful, 10 said *survival phrases* were useful, four said *everything* was useful, five said *information about equipment* was useful, and three said *information about materials* was useful. When asked about what has been the least useful information/lessons taught, 14 said everything was useful, four said information about equipment was the least useful, and one said information about materials was the least useful.

The questions that can be analyzed using the paired t-test are shown in Table 1. It can be observed that out of the seven questions, four had statistically insignificant mean differences at the 95% confidence level. It is reasonable to assume that participant perceptions regarding likelihood to recommend the course to others, worth of time they invested in it, appropriateness of workbook to improve their speaking capabilities, and also usefulness of class activities remains unchanged two or more months after completion of the training course. Of the three questions that have $p<0.05$, the postcourse mean values fall in the upper part of the answer scale from 1 to 7 (1=least favorable, 7=most favorable). This means that participants continue to regard the course as having been useful, since they improved their confidence in speaking and believe the course is just what they were expecting.

The results of both questionnaires suggest that the ESL construction course is an appropriate tool for improving the capabilities of the Hispanic workers to communicate better on the jobsite with their American supervisors.

SSL Course Evaluation

The SSL course was delivered twice successfully with the help of the AGC of Iowa and Iowa DOT officials, either as an 8-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. 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 assistants were 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, seven course evaluations were collected. Table 2 summarizes these results.

The questions illustrated in Table 2 rate to some extent the content of the course, the instructor and assistant, the overall quality of the training received, and the effectiveness of the training material (workbooks). In general, the results show that the SSL course for construction was successful in providing these American supervisors with a tool to help 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 seemed to meet the expectations of usefulness for the intended audience. Still, many difficulties were encountered

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Table 2. SSL Course Evaluation Results

Course content		Too basic	About right	Too difficult		
	How was the overall class content?		100%			
		Yes	No			
	Was the order of the topics easy to follow?	100%				
		All	Most	About 50%	Some	None
	How much of the information presented will be useful to you in your job?		100%			
Instructor and assistant		Deficient	Fair	Good	Excellent (%)	
	Knowledge of subject				100	
	Communicated clearly				100	
	Effective presentation tools				100	
	Responded well to questions				100	
		No interest	Impartial	With interest	Very interested	
	How would you rate the trainers' interests in your training?				100%	
Overall training		Not at all	Neutral	Somewhat	Almost (%)	Definitely
	Was the class what you expected?				100	
	Was the class a worthwhile investment?				50	50
	Has your confidence in speaking Spanish improved?		50%	50%		
		No	Maybe	Probably	Definitely	
	Would you recommend this course to others?				100%	
Training workbooks		Poor	Average (%)	Excellent (%)		
	How would you rate the training books?			100		
	Were they complete?		50	50		
	Were they accurate?		50	50		
	Were the activities useful?			100		
	How would you rate the classroom and equipment?		50	50		

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 (8 h) seems to be a limiting factor for American supervisors and construction companies involved in this training, since there was a very low sign-up and attendance rate for the SSL construction course. Therefore, the type of training provided through the SSL construction course may not be regarded as a priority among American supervisors or within a construction company's organizational culture.

Transferability of the Model to Other Groups

Transferability is a term used in qualitative research to establish the degree to which aspects of research findings can apply to contexts other than the study from which the findings emerge. This has led to the development of a model that can be potentially applied to various cultural groups that currently or in the future pose similar assimilation problems in construction as do Hispanic workers now. This is useful when other populations are represented with a high percentage of workers within the construction industry.

Throughout the data collection, researchers noticed a moderate presence of Bosnian laborers who, according to a few supervisors, faced cultural and language barriers similar to those of Hispanics. The last Bosnian immigration wave to the U.S. began in 1992 as a result of political instability in their country, and a great majority of the displaced citizens moved to the U.S. as refugees (Malcolm 1996). Although no original data were collected, it is found that the demographic dynamics of Bosnians are different than those of Hispanics by nature because the population increase rate is decreasing over the years as stability returns to those countries. Regardless of these natural differences, we argue there is the potential to transfer the research model for Hispanic workers to cultural groups such as Bosnian construction workers. In addition to this, the issue of Bosnian workers was brought up several times in meetings and conversations with AGC of Iowa officials. Fig. 3 depicts the flow of major actions to be undertaken in order to successfully transfer the research model and obtain the benefits that were discovered for Hispanic workers. It is important to note that the final objective to keep in mind is that cultural and language adaptation and assimilation between the workers and the American supervisors needs to be achieved. Note that the model for other cultural groups follows the same procedures as the one described in this manuscript: (1) understanding unique characteristics of the cultural group by performing a literature search and needs assessment, (2) developing course material suited for the cultural group, (3) delivering the course content, and (4) evaluating training effectiveness.

Conclusions

This paper has investigated the development of two training courses for construction contractors as a result of the growing Hispanic population in the U.S. The research methodology included a literature review, needs analysis (survey development, data collection and analysis), development and delivery of ESL and SSL courses, and an evaluation of their effectiveness.

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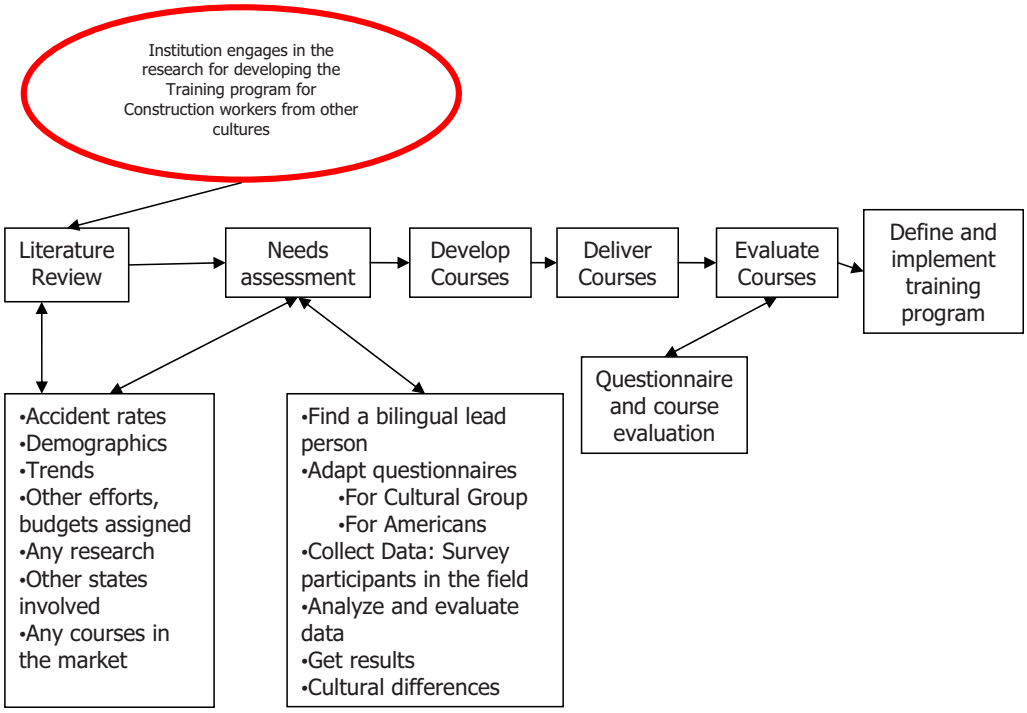

Fig. 3. Transferability model for construction workers of other cultural groups

The survey clearly revealed that communication and cultural awareness are the main problems on the jobsite and there is a lack of adequate training. The two evaluations collected from the Hispanic workers and American supervisors that received the training show that the information presented in these courses has been beneficial. These courses have increased confidence among American supervisors and Hispanic workers when speaking their non-native language. The follow-up survey for this course also showed that the information presented has been retained for the most part and has continued to be useful.

The present body of literature on the subject of developing training material that allows Hispanics to adjust to the American construction industry is reasonably large. Various private and public groups have progressed in the development of language-based training courses. The courses reported in this transcript are similar to those described in the literature. However, the major contribution of this research project is the actual delivery of the training material, its evaluation, and the emphasis put into non-language barriers such as cultural differences. The Hoftede model of culture was useful in explaining general behavioral differences between Hispanics and American construction workers. The simplicity of the Hofstede model is attractive for training a group of people who only need to understand the basic cultural differences in their group of workers.

Contractors and society as a whole will benefit from implementing a training program suited for their Hispanic construction workers and American supervisors. Some of the potential benefits of this training program are a reduction of accident rates, increased productivity, better quality of work, as well as other intangible factors such as fewer conflicts, increased morale, and higher retention rates. Due to the contractor's responsibility to schedule the work activities and resources, the training program should be contractor-driven for its adoption and implementation.

Recommendations

The results of this research project are most relevant for construction companies that employ a relatively high percentage of Hispanic workers per crew. Furthermore, it is recommended that the ESL and SSL courses be delivered by individuals who possess multicultural experience in the construction industry, specifically Hispanic and American culture, and who are fluent in both languages in order to provide the greatest benefits. This will provide the students an understanding of the differences between the two cultures and encourage interaction in the classroom through real experiences. The courses must also fit the contractor's work schedule or season. Contractors should be the driving force behind the implementation of these training programs, since upper management involvement and support plays a key role in the success of the program.

Further research can be performed to develop more innovative and effective ways of delivering training to American and Hispanic construction workers. Moving from *assimilation* and *adaptation* to an *integration* approach of training is a topic worth exploring in future research. Incentives to obtain the contractors' commitment can be explored. Determining the best approach to deliver the training material could help identify resource constraints, such as amount of time that could be devoted to training, the best time of year to offer the program, etc.

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