

**THE NECESSITY OF SPANISH SPEAKING EDUCATION IN TEXAS A&M
UNIVERSITY'S DEPARTMENT OF CONSTRUCTION SCIENCE**

A Thesis

by

DAVID ALLEN HUDSON

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

May 2010

Major Subject: Construction Management

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Approved by:

Chair of Committee,	Nancy Holland
Committee Members,	Ivan Mutis
	Anne Nichols
Head of Department,	Joe Horlen

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ABSTRACT

The Necessity of Spanish Speaking Education in Texas A&M University's

Department of Construction Science. (May 2010)

David Allen Hudson, B.A., Texas A&M University

Chair of Advisory Committee: Dr. Nancy Holland

This study investigates the importance the Spanish language has on the construction industry. Due to its highly concentrated Spanish populations, Texas construction sites are filled with Spanish speakers. This creates a need to overcome the language barrier and bridge the gap between the workers and the management, who generally speaks little or no Spanish.

Two surveys provided the qualitative data for this study. The first survey gathers views of current students in the Department of Construction Science at Texas A&M University. The other survey gathers opinions from current professionals in the construction industry. The results of these surveys indicate a clear, strong importance of Spanish in the construction industry. In addition, they also point out a definite interest in this subject matter by current students in the program.

Two universities that are currently attempting to overcome this problem are the University of Texas at San Antonio and Colorado State University. Colorado State University provides their students with the opportunity to take a class focused specifically on the Spanish language and culture that affects the construction industry.

The syllabus for this class serves as a formwork for other similar classes that may follow in the years to come.

ACKNOWLEDGEMENTS

I would like to thank my committee chair, Dr. Nancy Holland, and my committee members, Dr. Ivan Mutis, and Dr. Anne Nichols, for their guidance and support throughout the course of this research.

Thanks also go to my friends and colleagues and the department faculty and staff for making my time at Texas A&M University a great experience. I also want to extend my gratitude to the students and company representatives who were willing to participate in the study.

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1. INTRODUCTION, BACKGROUND, AND MOTIVATION

Communication skills are fundamental to success in virtually all professional careers. Construction management is no exception to the rule. Many tools are required to develop effective communication skills, and the most basic of these tools is the knowledge of a common language. Although the United States of America does not technically have an official national language, approximately 82% of the American population speaks English as a native language (Wikimedia Foundation, Inc., 2010). According to the Pew Hispanic Center, in 2007 approximately 26% (2,935,600 out of 11,457,566) of the construction workers in the United States were Hispanic (Pew Hispanic Center, 2009). In addition, the U.S. Census Bureau reveals that 48% of the Hispanic-origin population in the U.S. lives in either California or Texas (Family Education Network, 2007). Another source states that Texas alone has a Spanish-speaking population of approximately 3.4 million (www.spanishlanguageguide.com, 2010). These facts establish the prominence of Spanish-speaking laborers not only in the construction industry in general, but more specifically within the construction industry in Texas. Future construction managers at Texas A&M University are educated in many areas of the industry; however there is no Spanish culture or language requirement to graduate with a degree in Construction Science.

This thesis follows the style of the *Journal of Engineering Education*.

Literature review

In 2001 Ruth Ruttenburg and Maria Lazo conducted various interviews with Spanish-speaking construction workers who received training from the Center to Protect Workers Rights (CPWR) and published their findings in an article entitled “*Spanish-Speaking Construction Workers Discuss Their Safety Needs and Experiences*” (Ruttenburg & Lazo, 2004). Ruttenburg and Lazo asked open-ended questions to all individuals with Spanish surnames and completed evaluation surveys on their construction safety and health training from the CPWR in 2001. They found that most of those interviewed admitted they had faced substantial challenges when trying to understand much of the training they had received in English. The vastly growing number of Hispanic construction workers along with the results of Ruttenburg and Lazo’s interviews indicate an enormous value in Spanish language safety and health training for construction workers who understand limited English. One means to overcome the language barrier, is equipping construction students with a basic working vocabulary that would be useful when dealing with Spanish-speaking employees. This study examines the need to overcome the language barrier on the construction site. Ruttenburg and Lazo’s study provides first-hand interviews and feedback from the perspectives of the Spanish-speaking worker, a view that is not often heard or observed.

James L Nash conducted a separate study based on an expansion project at the Dallas/Ft. Worth International Airport (DFWA) and shared his findings in the article “*Construction Safety: Best Practices in Training Hispanic Workers*” (Nash, 2004). From 1997 to 2002, total fatalities in the construction industry rose by slightly more than

one percent, according to the Bureau of Labor Statistics. During this same period the number of Hispanic fatalities in the industry shot up by almost 50 percent. However one positive aspect amidst these startling statistics was a unique, 40-hour training course being used in the DFWA expansion project. The airport's safety training program (STP) seemed to be breaking down barriers of language, literacy and culture and had a big impact on safety.

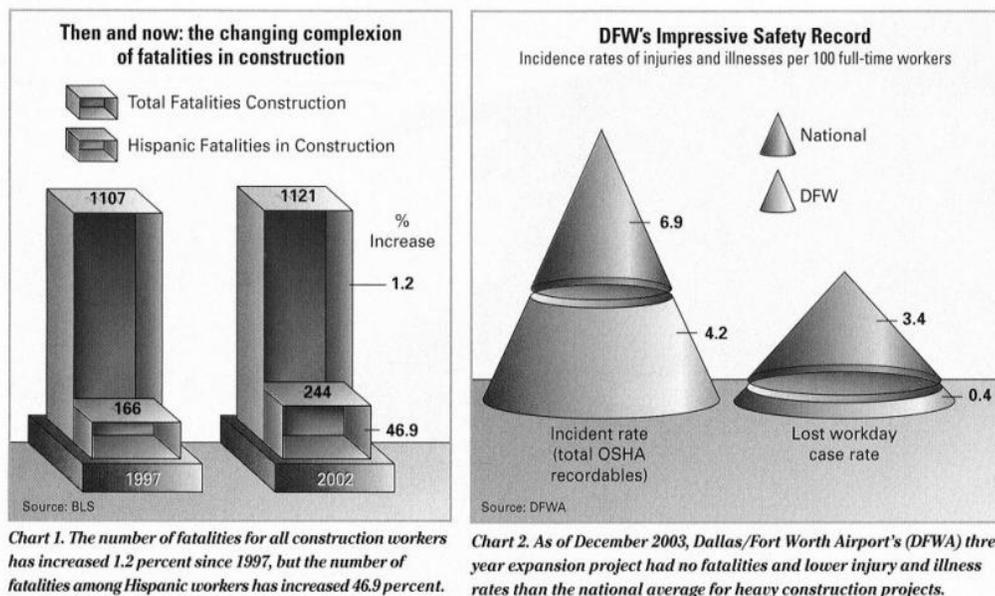


Figure 1: Fatalities in Construction and DFW's Safety Record

This specific project, a \$2.6 billion airport expansion project, has seen many positive results from their Spanish training, specifically in the areas of safety and money saved. However, their actions are specifically reactive rather than proactive. It is important to develop a program to give future construction management the skills necessary to communicate with their workers. Texas A&M would produce better

prepared construction managers if they implemented the teaching of Hispanic culture as well as specific vocabulary and leadership skills required to work with the Hispanic workforce in the United States and abroad. Integration of a Spanish Construction class into the undergraduate curriculum at Texas A&M University would serve as a segue to future projects that could expect to achieve many of the same benefits the DFWA project experienced. Therefore this raises the question: Can this need be established based on the opinions of professionals currently in the construction industry and students currently studying a construction curriculum? Also, If these two groups of people agree with what the statistics of projects such as the DFW Airport project, what is the level of support that might be received from the industry professionals and students alike?

Research methodology and response rates

The data collection portion of this study consisted of conducting two separate surveys (Appendix B and Appendix C). Both surveys were reviewed and approved by the Texas A&M Institutional Review Board (IRB). One survey was for students enrolled in various construction science courses at Texas A&M University (COSC 323 – “Soils in Construction” and COSC 463 – Construction Law and Ethics). The student survey along with its coversheet (Appendix A) was handed out to them in class following a brief verbal reminder that the survey was completely voluntary and anonymous. The surveys were collected upon completion and the results were tabulated. Graphical representations of the responses for each question were created in order to make it easier to observe the trends in the responses. This leads to the delimitation of

the student survey. Since the survey was only passed out to these two specific classes, this research is limited to only the students that attended class that day.

There were 129 total surveys handed out to students in these classes, and 104 completed surveys were returned for tabulation. This yields a response rate of approximately 81%.

The second survey was conducted via the use of a third-party internet survey website. A list of construction companies that attended the Texas A&M Construction Science Career Fair in 2009 provided the population of interest, and an initial email invitation was sent to a representative from each company on the list. A follow-up email was sent 3-4 weeks later to encourage anyone who had not yet taken the survey to still participate. The delimitation of this survey is that it is limited only to the companies that attended this Texas A&M University career fair in 2009.

In total, 91 invitations to participate in the study were sent out via email. Of these 91, 49 were returned with every question completed. Various participants occasionally chose to leave some questions blank, which means the response rate varies slightly for each question, however the overall response rate for the industry professional survey was approximately 54%.

Research objective

The purpose of this study is to investigate the value of Spanish speaking construction managers and determine the level of interest of students enrolled in COSC courses and construction industry professionals for a course teaching Hispanic culture

and leadership skills required to work with the Hispanic workforce in the United States and abroad.

2. STUDENT SURVEY RESULTS AND ANALYSIS

Question 1: “What is your classification?”

The first thing to be addressed in this survey is to find out some information about the survey participants. This survey was an anonymous survey, and therefore these preliminary background questions are important to provide insight into who is supplying these opinions. Prior to the survey the only things known about the survey participants was that they were students of Texas A&M University, from the Department of Construction Science, and enrolled in COSC 323 or COSC 463. Question 1 determines the classification, and therefore the age range and academic status, of each student surveyed. This information is also important because it reveals the amount of time each student has spent in the Department of Construction Science and how much of the program they have already been exposed to. The vast majority (93/104 or approximately 89%) of the students surveyed were juniors and seniors, which indicates they have spent at least 4-7 semesters in the program. Therefore 89% of the opinions reflected by this survey are from students who are very familiar with the current construction science curriculum at Texas A&M University. Figure 2 below shows all responses for this survey question and indicates that approximately 11% (11/104) of those surveyed said they were sophomores in the program, which means they have roughly 30-60 hours. No freshman students were included in this survey. Due to the process of selecting survey participants it is not surprising almost all the students are

upper classmen. COSC 323 and COSC 463 are both required, upper level classes, and therefore consist of almost strictly juniors and seniors from the program.

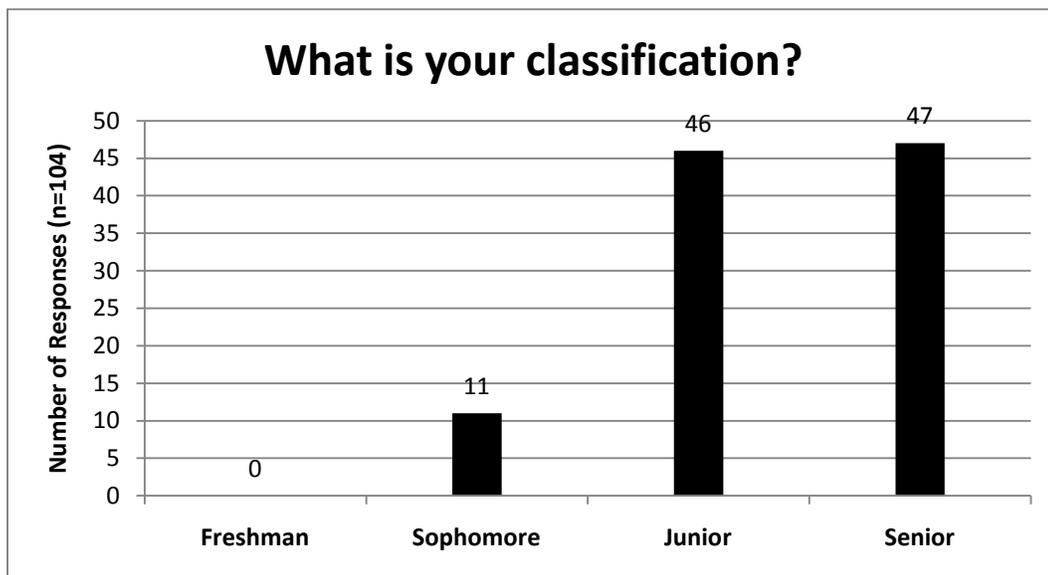


Figure 2: Student Survey Question 1 Results

Question 2: “How many semesters of Spanish classes have you had? (In high school and college combined)”

Question 2 was also asked in order to gather background information on the students. This question can be viewed as somewhat of a lead in to question 7. In essence this question aids in determining where students may have received their exposure (if any) to the Spanish language. Of all the students enrolled at Texas A&M University for the Spring 2010 semester, over 85% of them are residents of the State of Texas (Dutschke, 2010). This indicates they came through the Texas high school

system. That system requires recipients of the standard Texas high school diploma to complete two credits of the same foreign language (Texas Education Agency Department of Policy Coordination, 2007). The results of this survey (displayed in figure 3 below) are in accordance with these requirements in that 96/104 (approximately 92%) of the students surveyed indicated that they have had at least two semesters of Spanish classes in their past, while 46/104 (approximately 44%) of them have had four or more semesters of Spanish classes. These results verify what could have been assumed: most students have had previous exposure to Spanish teaching. Not only should they have a base knowledge of the language, but they should also have an appreciation for what is typically taught in Spanish classes.

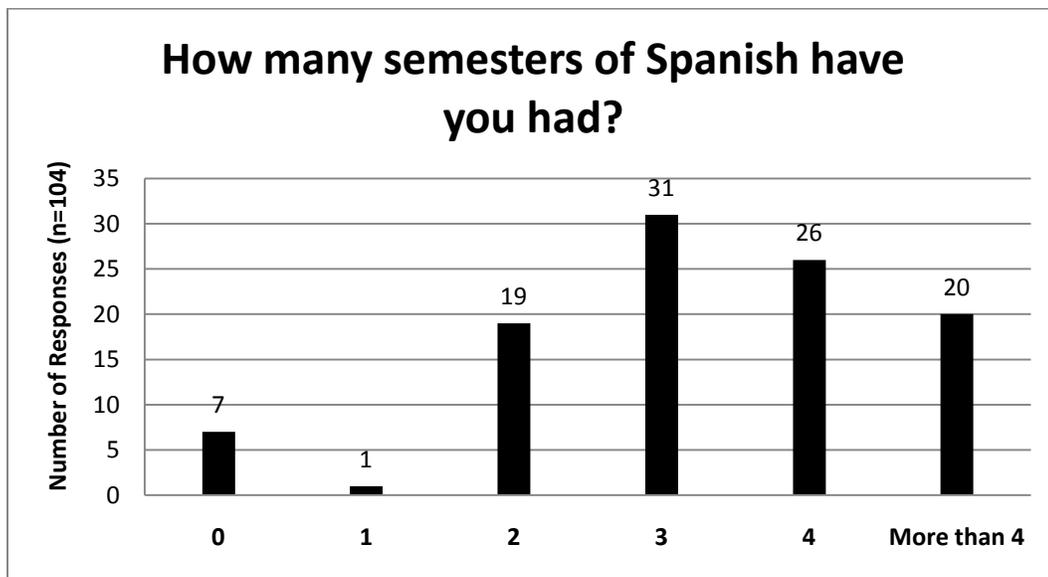


Figure 3: Student Survey Question 2 Results

Question 3: “Where are you from?”

Question 3 was also asked in order to gather information about the survey participants’ personal backgrounds. It is no surprise that the survey results for this question (represented in Figure 4) show that approximately 69% (72/104) of the students surveyed are from the two largest areas of Texas: South Texas (San Antonio, Houston, etc...) and North Texas (Dallas/Ft. Worth, Wichita Falls, etc...). San Antonio (included in the “South Texas” response) is the only city on this list that has a Hispanic majority (over 50%) population (Wikimedia Foundation, Inc., 2009). However the city of Dallas, for example, has been reported to have a Hispanic population over 35%, (North Central Texas Council of Governments, 2000) which is no small measure. All this indicates that the students in the Department of Construction Science at Texas A&M University are from areas with highly dense Hispanic populations (and therefore high density areas of Spanish speakers).

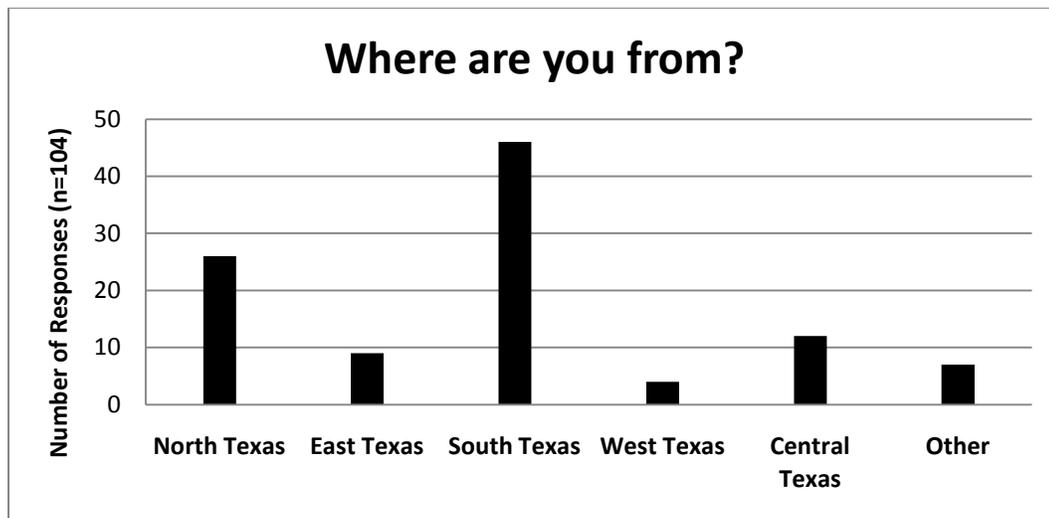


Figure 4: Student Survey Question 3 Results

Question 4: “Have you had an internship with a construction company?”

Question 4, whose results are displayed in Figure 5, can be considered in conjunction with question 5 and used to establish the number of students that have a certain amount of familiarity with the general construction industry in Texas. The Department of Construction Sciences requires a semester-long internship that exposes its students to real world aspects of the industry they are studying. Each student’s level of exposure to the industry establishes the validity of their opinions about the industry, which are inquired about in following questions. Results of this question indicate that approximately 43% (45/104) of those surveyed have already participated in their internship, while approximately 57% (59/104) have yet to complete their internship.

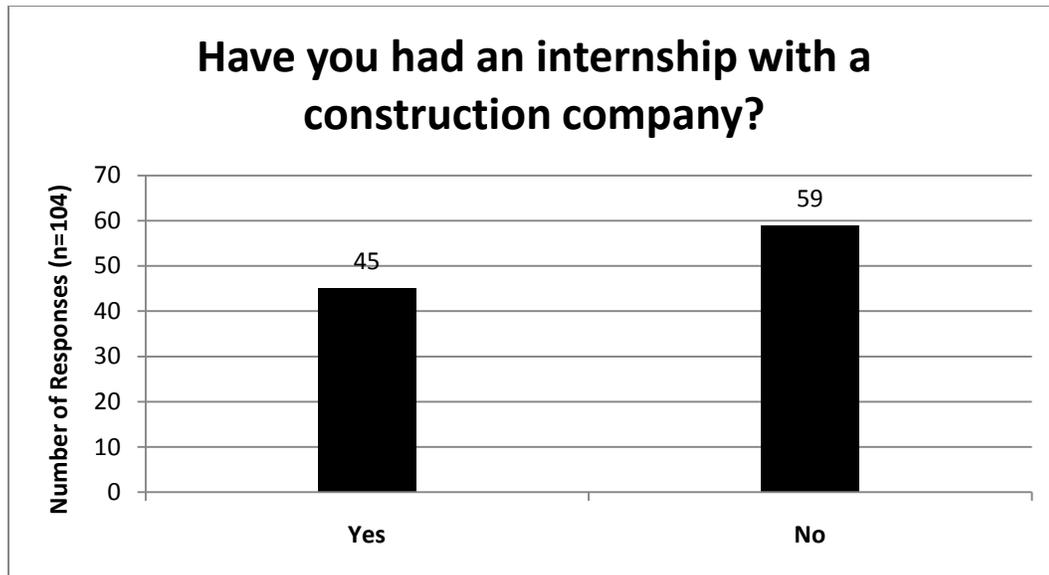


Figure 5: Student Survey Question 4 Results

Question 5: “Have you ever worked in the construction field? (outside of an internship)”

Question 5 acknowledges the fact that although some students may not have had their official university approved internship, various students may have taken advantage of other opportunities to work in the industry. Similar to question 4, this question adds credibility to the opinions about the construction industry in general that are expressed throughout various other questions in this survey. According to results for this question displayed in Figure 6, approximately 70% (73/104) of the students surveyed indicated that they have worked in the construction industry outside of their university required internship. The remaining 30% (31/104) have not.

One important fact to take into account is that when comparing responses to question 4 and question 5 simultaneously, only about 19% (20 out of 104) of the students surveyed responded “No” to both question 4 and question 5 simultaneously. Thus, over 80% (84/104) of the students that participated in this survey have had work experience with a construction firm and, in turn, are familiar with the industry. Therefore the opinions reflected in the survey results are informed and credible opinions.

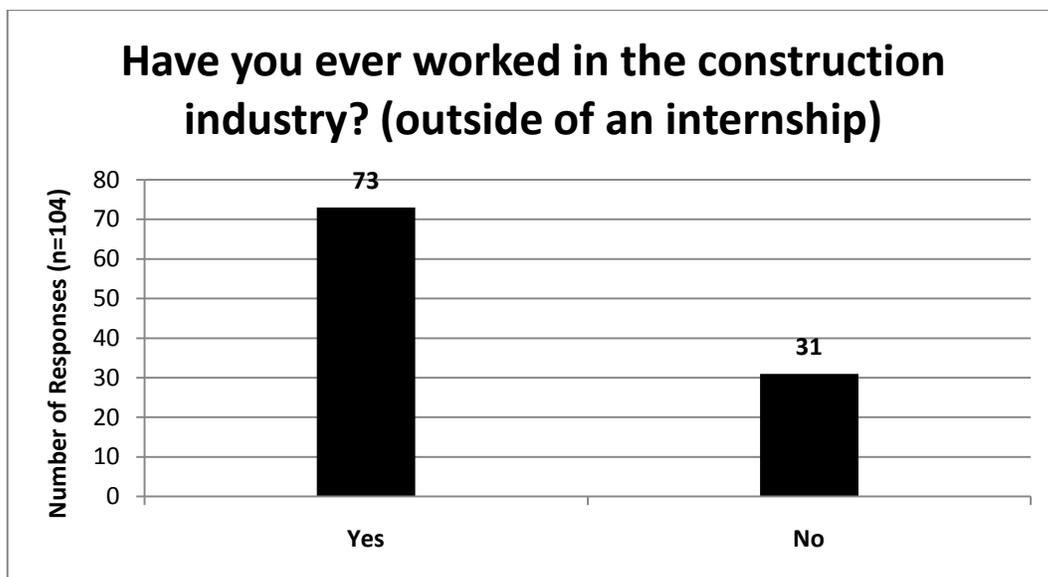


Figure 6: Student Survey Question 5 Results

Question 6: “_____ members of my immediate family speak Spanish.”

Inquiry 6 is similar to question 2 and question 3 in that it serves to give some insight into the personal background of the survey participants. The results (Figure 7) show that approximately 70% (73/104) of those surveyed do not have any immediate

family members that speak Spanish. The remaining 31 survey participants (approximately 30%) have at least one immediate family member that speaks Spanish: 16 students have 1, 4 students have 2, 5 students have 3, 0 students have 4, and 6 students claim to have more than 4 members of their immediate family that speak Spanish. Therefore, the second, smaller group of 31 students has at least had the opportunity to be exposed to the language in the household on a daily basis. This data indicates that this majority (73/104) of the students surveyed have received their only exposure to Spanish instruction in the classrooms of Spanish classes they may have taken (see question 2).



Figure 7: Student Survey Question 6 Results

Question 7: “I am completely comfortable using Spanish to communicate on a daily basis.”

Inquiry 7 is somewhat of a follow up inquiry to question 2 and question 6. While question 2 and question 6 gathered background information on the survey participants, question 7 provides information on their present day situation. Question 7, whose results are shown in Figure 8, shows approximately 18% of the students surveyed claim they are comfortable using Spanish to communicate on a daily basis (“agree” and “strongly agree” responses). Opportunities to learn the Spanish language typically derive either from classroom instruction (addressed in question 2) or from Spanish speakers in the home (addressed in question 6). Therefore, it is reasonable to expect that the number of students that indicated they would be comfortable speaking Spanish on a daily basis would be similar to the number of students who have either had multiple semesters of Spanish classes or who have Spanish speakers in their immediate family. However, approximately 30% of the students reported having immediate family members that speak Spanish, while only 18% claim they would be comfortable communicating in Spanish. Similarly, this same 18% of the students can be compared to those who have had multiple semesters of Spanish classes. While 46 of the students surveyed (approximately 44%) have had 4 or more semesters of Spanish, only 19 of them (approximately 18%) claim they would be comfortable using their Spanish skills to communicate on a regular basis. These results indicate that, regardless of how many students have been exposed to Spanish at home or extensively in the classroom, only a

fraction of the students surveyed would be comfortable communicating in Spanish on a regular basis. Conversely, a fairly large number of students (55/104 or approximately 53%) responded “neutral” or “disagree”. This reveals that they likely have some foundational knowledge of the Spanish language, and by taking a class that taught them specific areas of the language (construction related Spanish, for example) they would likely shift their answers towards “agree” in any subsequent surveys.

Furthermore, there were 8 students that indicated they “Strongly Agree” they would be comfortable using Spanish to communicate on a daily basis. When examining the survey responses (Appendix D) it becomes evident that out of these 8 students, 5 of them indicated they have more than four Spanish speakers in their immediate family. Of the remaining 3 students, two of them have 3 immediate family members that speak Spanish, and there is only one student that strongly agrees with question 7 while not having any immediate Spanish speaking family members.

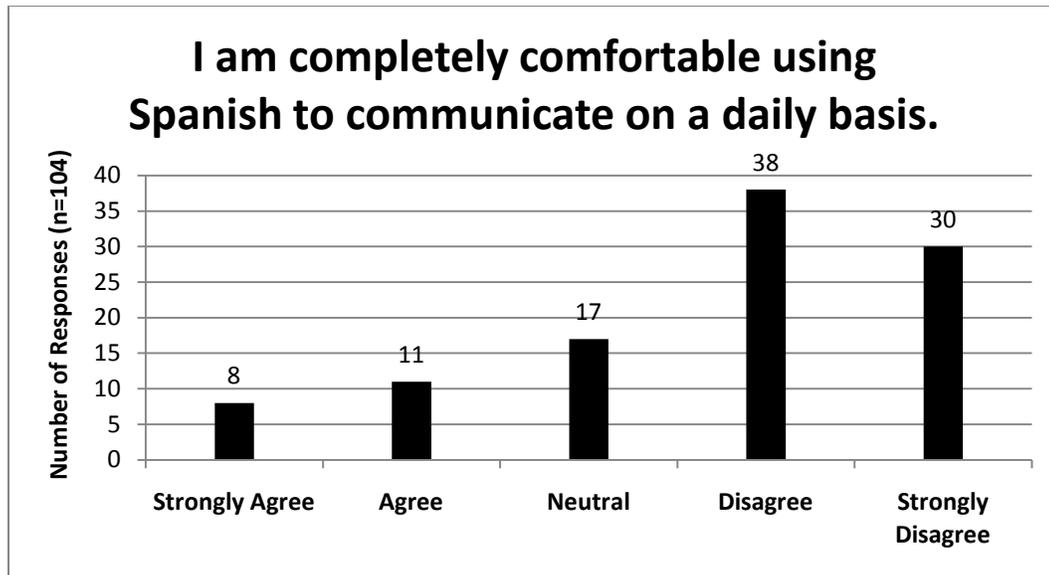


Figure 8: Student Survey Question 7 Results

Question 8: “There is no need for construction managers to be familiar with the construction related Spanish terminology.”

Question 8 intends to gather students’ views on the need for Spanish in the construction industry. It is important to remember here that the majority of the students surveyed (over 80%) have worked in the industry to some extent either through the departmentally required semester long internship, outside that internship, or both. Therefore this question reveals the students’ perceived value of Spanish speaking skills in the construction industry. Based on the survey results shown in Figure 9, approximately 93% (97 of the 104) answered either “disagree” or “strongly disagree” which indicates that almost all of these students think there is a need for construction

managers to be familiar with construction related Spanish terminology. These students would be expected to respond similarly to questions 10, 11, and 12.

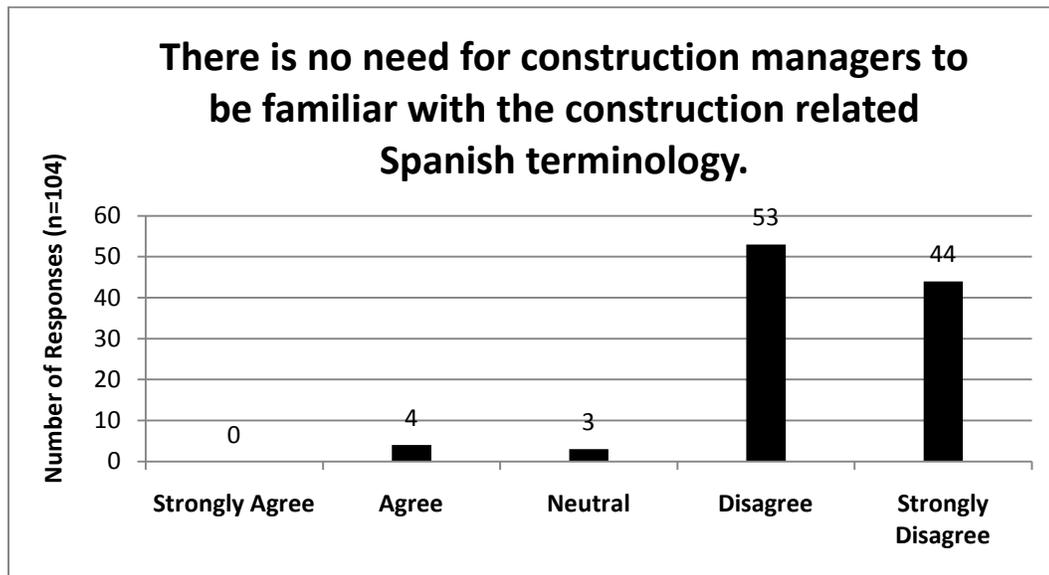


Figure 9: Student Survey Question 8 Results

Question 9: “Communication skills are essential to be a good leader.”

Question 9 is a very general question. In this survey, question 9 responses are intended to be used as a foundation for all other responses. In reality, this whole study is based on the premise of this question. If the survey participants do not agree on this fundamental aspect, there would be no value in pursuing this research. Therefore, it is important to emphasize the information presented in Figure 10: 103/104 (approximately 99%) of the students surveyed responded with either “Strongly Agree” or “Agree” indicating they agreed that communication skills were essential to be a good leader. The

other single student remained neutral on this issue. Just as question 4 and question 5 establish credibility of the students' opinions on the construction industry, question 9 serves to establish the students' credibility on communication skills in general.

Obviously if they did not feel communication skills were essential to be a good leader, Spanish speaking communication skills would be irrelevant.



Figure 10: Student Survey Question 9 Results

Question 10: “I believe English is the only language needed to communicate on a construction job site.”

Question 10, whose results are shown in Figure 11, goes in tandem with question 8. Responses to this question varied, which is likely due to the variety of internships and work history the students have experienced. In addition, the type of construction

performed, as well as the location of the company they worked for, could easily impact the demographic makeup of the workforce the students have been exposed to. Still, the majority (77/104 or approximately 74%) of the survey participants responded either “disagree” or “strongly disagree” which indicates that they feel English is not the only language needed to communicate on a construction site.

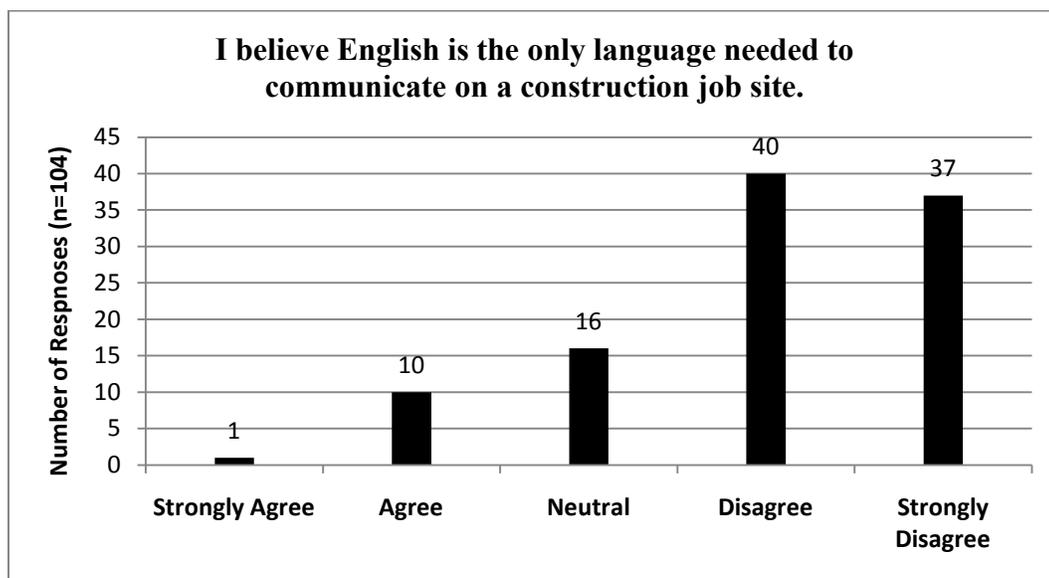


Figure 11: Student Survey Question 10 Results

Question 11: “I believe construction managers would be more effective if they were able to communicate in English and Spanish.”

Question 11 brings together opinions and views expressed throughout the other questions thus far. It is similar to question 10 in that it addresses communication on a construction site, yet it is more explicit because it refers specifically to construction

managers. Question 10 could have been interpreted more generally and caused survey participants to respond based on thoughts that many of the general laborers would benefit from speaking Spanish. However question 11 deals directly with “construction managers”. This is an employment position that all the students surveyed will likely find themselves in one day. Based on the results of this question (presented in Figure 12), not one student disagreed with the statement that “construction managers would be more effective if they were able to communicate in English and Spanish”. This, once again, reinforces their personal opinions on the value of Spanish speaking construction managers.

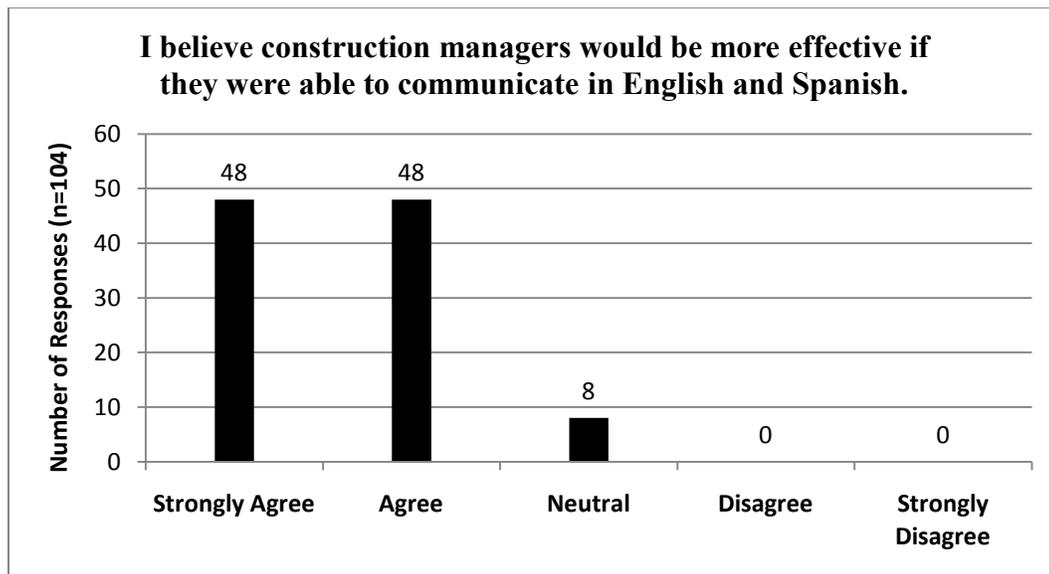


Figure 12: Student Survey Question 11 Results

Question 12: “If Texas A&M offered a class that gave students a working knowledge of construction related Spanish terminology I would be interested in taking it.”

Question 12 addresses the primary focus of performing a student survey for this research. By this point in the survey students have revealed information about their personal lives, their work history and their current views on Spanish in the construction industry. As shown in Figure 13, a combined 83/104 (approximately 80%) of the students surveyed responded either “agree” or “strongly agree” to this question. This means the large majority of these students would actually be interested in learning construction related Spanish if the program were to offer it. This hypothetical question and its responses indicate that Texas A&M University should offer (if not require) teaching of construction related Spanish for the students in the Department of Construction Science.

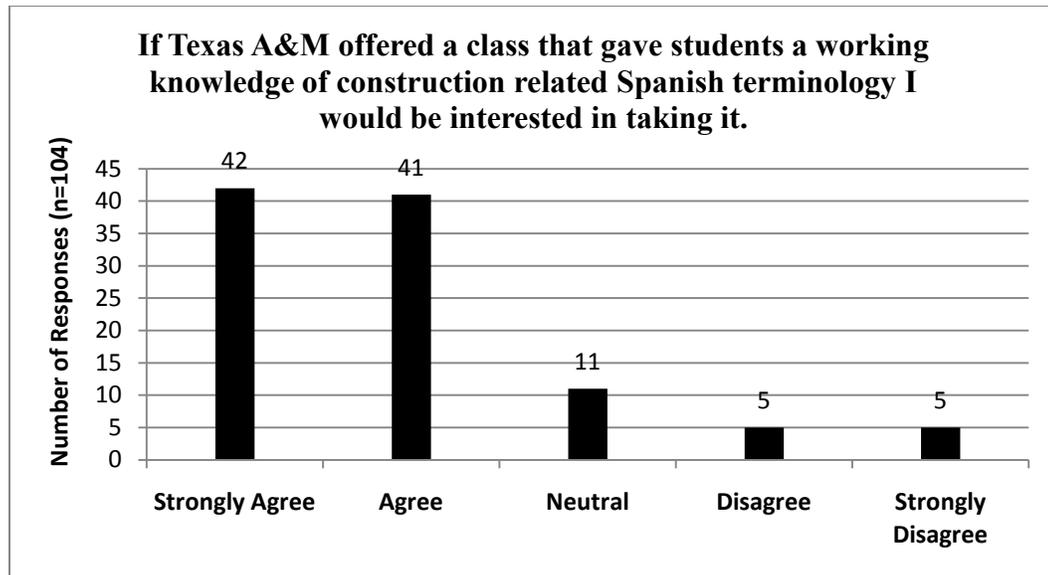


Figure 13: Student Survey Question 12 Results

3. INDUSTRY PROFESSIONAL SURVEY RESULTS AND ANALYSIS

The next set of figures presents the results from the surveys given to industry professionals. The purpose for collecting this data is to determine if company representatives, people who are very familiar with the construction industry, feel there is a legitimate benefit to having the ability to communicate in Spanish on a construction job site.

Question 1: “What type of contracting does your firm perform? (Select all that apply)”

The industry professional survey begins with some questions that collect background information on the companies surveyed. As seen in Figure 14, approximately 76% (37/49) of the companies that completed this survey were general contractors. This is due to the fact that the companies qualified for this survey by having attended one of the Texas A&M Department of Construction Science career fairs in 2009. Most of the companies the school invites to attend the career fair are larger firms that are typically general contractors. However, this is also beneficial to the study because it means these companies deal with all divisions of the construction process at some point in their operations. Therefore they have a higher level of exposure to all segments and employee demographics of the industry, and their opinions expressed in this survey should reflect this fact. It is important to note that the survey respondents

were instructed to select all responses that applied to their company; therefore there is some overlap in the responses, which can also be observed in Appendix D.

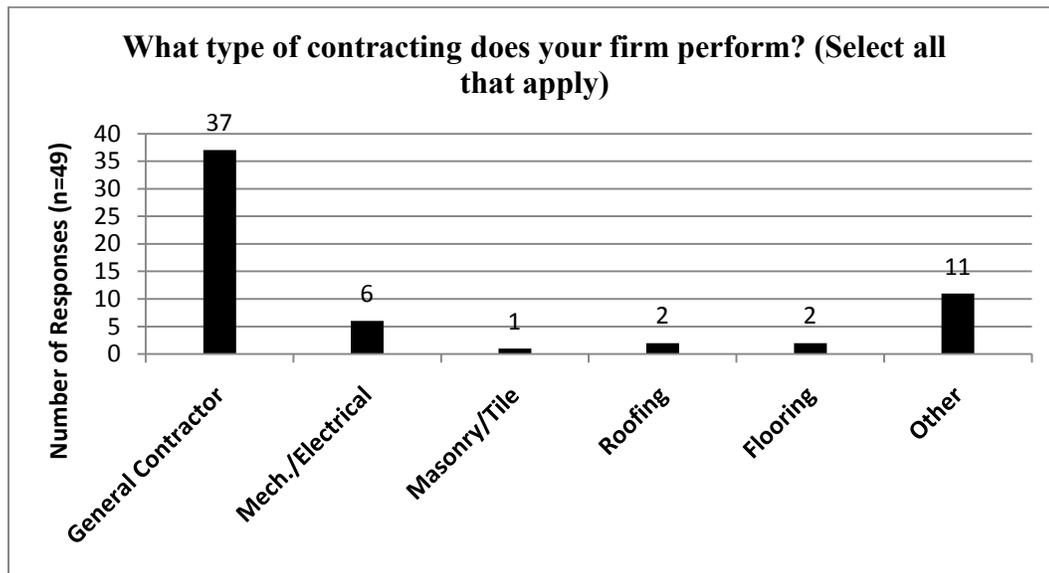


Figure 14: Industry Professional Survey Question 1 Results

Question 2: “Where does your company do business? (Select all that apply)”

Question 2, whose results are seen displayed in Figure 15, is another inquiry about the background of the companies participating in the survey. Due to the fact that this research is being conducted with specific reference to Texas A&M University it is crucial that the companies providing opinions are also located in Texas. This ensures that these companies are providing views and opinions that are directly relevant to the same general environment for which the students gave their opinions in the previous survey. Once again the survey participants were instructed to select all that apply,

therefore there is a great amount of overlap in the responses. From this question it becomes evident that the companies represented by these surveys perform their construction services all over the state of Texas. It is important to remember that there are only 49 companies represented by these survey results. This means multiple companies operate in any, if not all, of these geographical areas. The three main areas reported (as seen in Figure 15) are South Texas (39/49 or approximately 76%), North Texas (31/49 or approximately 63%), and Central Texas (30/49 or approximately 61%). Out of the 49 companies represented, 12 of them (approximately 24%) operate in only one of these geographical regions. Approximately 20% of them (10 out of 49) responded with an indication that they operate in two of these regions. The remaining 56% (27 out of 49) of the companies represented in this survey perform jobs located in 3 or more regions listed on this survey question. Therefore the majority of the opinions expressed are representative of all areas of Texas. Additionally, only one company indicated they operate solely outside of Texas, meaning only one company is unfamiliar with construction sites in Texas.

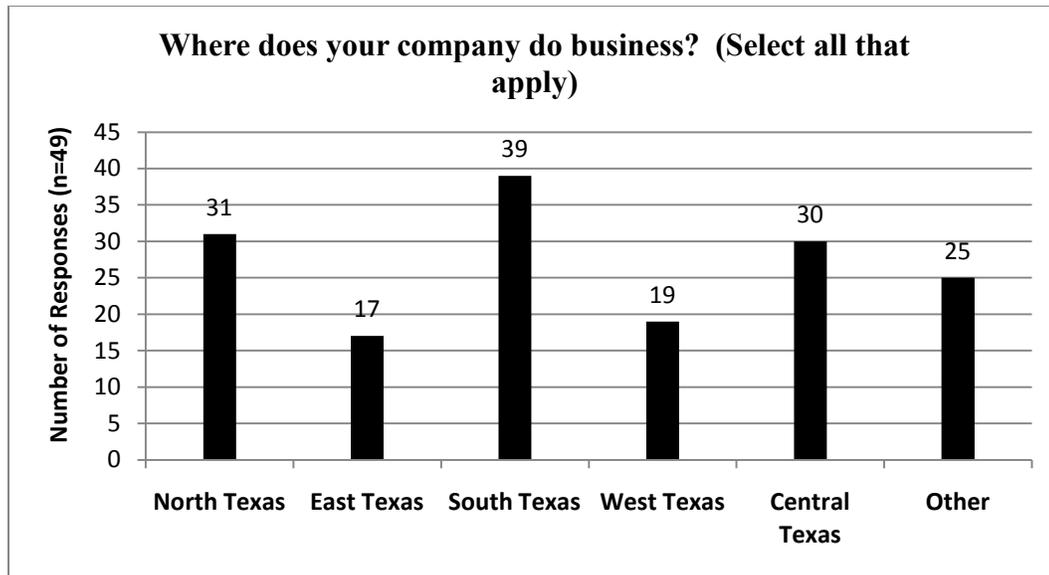


Figure 15: Industry Professional Survey Question 2 Results

Question 3: “Construction Management would benefit from having a basic knowledge of construction related Spanish terminology.”

Question 3 is the first question that asks about opinions on the need for a basic knowledge of Spanish language in the construction industry. The survey participants immediately establish a strong importance of Spanish in construction management. Figure 16 displays results for question 3 and shows that approximately 82% (40 of the 49) of those that responded to this question selected either “Strongly Agree” or “Agree”. Thus, an overwhelming majority agree that construction management would benefit from having a basic knowledge of construction related Spanish terminology. The students were asked a similar question (student survey question 11), and the results were

similar in that not a single person disagreed. There are only three outliers who chose “Disagree” (Appendix D, respondents 12, 26, and 47).

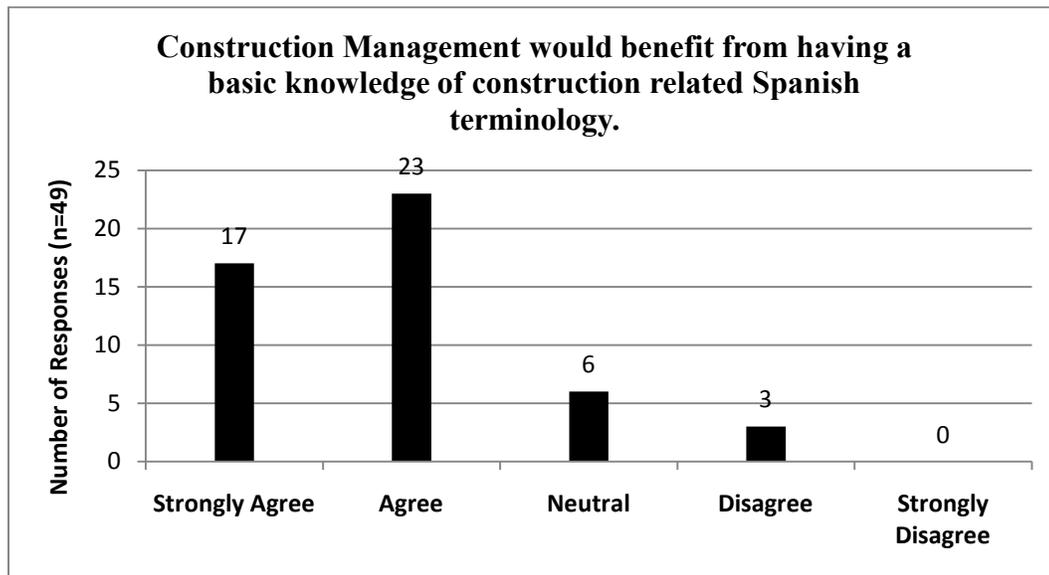


Figure 16: Industry Professional Survey Question 3 Results

Question 4: “In order to communicate affectively construction management should have at least a basic working knowledge of Spanish.”

Question 4 for the industry professionals is a question specifically relating to the ability to communicate with all employees. There are numerous ways to convey ideas and messages whether it is through the use of hand signals, drawings, or an interpreter. Hand signals and drawings are tools that are utilized daily on the construction site in the form of directions for equipment operators and plans. Interpreters are not so readily available, therefore having at least the “basic working knowledge of Spanish” that the

question refers to would be another tool to help people effectively communicate on the jobsite. According to the results presented in Figure 17, very few survey participants disagree with this statement. A total of 12 participants responded “Strongly Agree”, 16 responded “Agree”, thus, approximately 58% (28/48) agreed or strongly agreed with the premise that in order to communicate affectively construction management should have at least a basic working knowledge of Spanish.

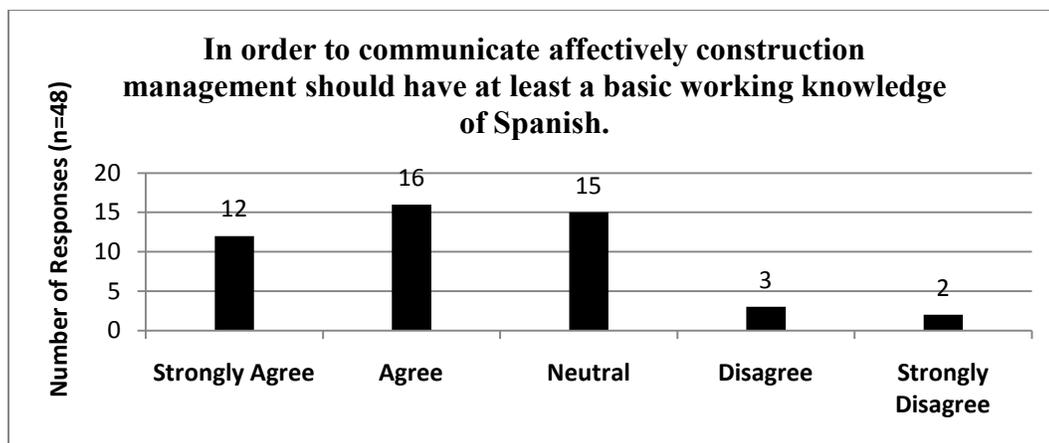


Figure 17: Industry Professional Survey Question 4 Results

Question 5: “Communication skills are essential to being a good leader.”

Just as in the students’ survey, this statement is included as a qualifier question. The whole point of this study is to determine the level of value that would be gained by providing construction science students tools to enhance their communication capabilities. Therefore it is important for everyone to agree on at least on the basic opinion that good leaders need to have good communication skills. Over 91% (44/48) of

these company representatives not only agree with this statement, but they strongly agreed. The remaining four respondents that answered this question simply selected “Agree”.

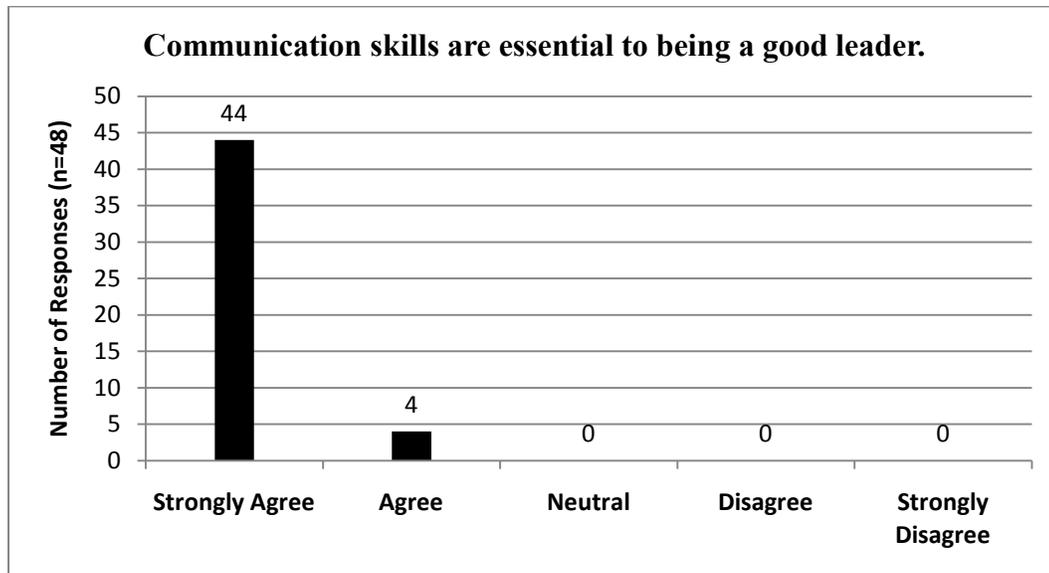


Figure 18: Industry Professional Survey Question 5 Results

Question 6: “When considering two prospective employees of roughly equal qualifications, preference would be given to one that had a working knowledge of Spanish over the other applicant.”

Due to this being an anonymous survey, the number of these company representatives that are active in the interviewing and hiring process is unknown. However the respondents’ perception of the companies’ views can be taken as a strong indication of the emphasis and value the company places on Spanish speaking abilities.

Colleges are always striving to give their students competitive advantages over students from other programs that may be applying for the same job. As of yet, it is extremely rare for a construction program to offer or require their students to take any foreign language credits. As seen in Figure 19, 60% (27/45) of the respondents to this question stated that in the hiring process preference would be given to a student familiar with construction Spanish over another student that was equally qualified on all levels except this one. This is of paramount importance and raises the question “why would the university not be interested in providing their students with another capability that would allow them to stand out when being compared to students of other similar programs of higher education?” Of the remaining 18 respondents, 10 remained neutral, 7 disagreed, and 1 strongly disagreed.

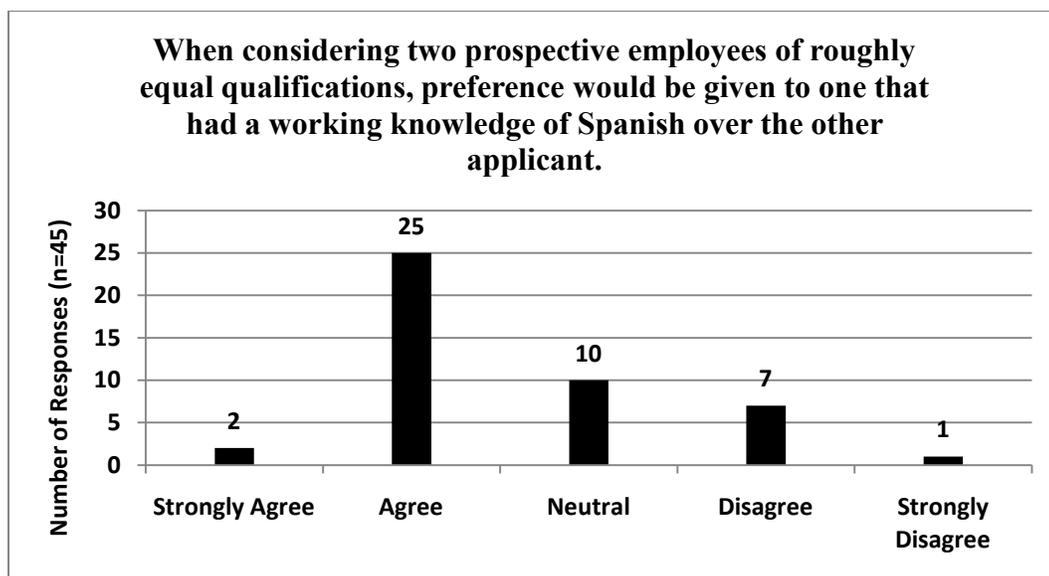


Figure 19: Industry Professional Survey Question 6 Results

Question 7: “English is the only language needed to communicate on a construction job site.”

This question serves to provide more information about the industry in general than it does to give insight into any one person’s opinions. The responses to this question are influenced once again by the markets they do business in, as well as, the geographical locations of their projects. When this question was asked to the industry professionals the outcome was nearly identical to the responses given by the students asked the same question. As seen in Figure 20, approximately 70% (33/47) of the industry professionals were in accordance with the 74% of the students that either disagreed or strongly disagreed with this statement indicating that they feel English is not the only language needed to communicate on a construction job site.

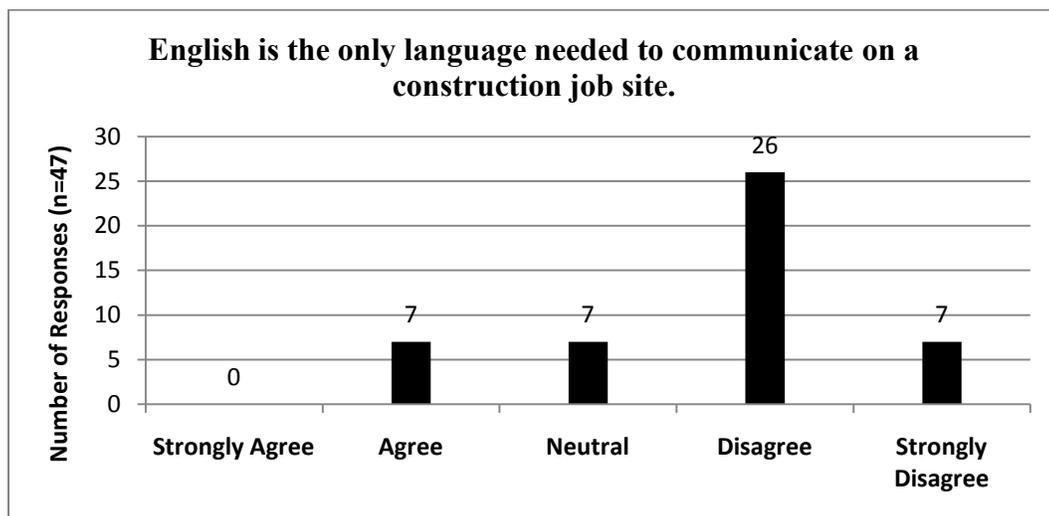


Figure 20: Industry Professional Survey Question 7 Results

Question 8: “There is no need for construction management to be familiar with construction related Spanish.”

At this point in the survey, the survey participants might begin to view the questions as somewhat redundant, although it is important to ask varied questions that cover seemingly the same material in order to reinforce the validity of the opinions expressed and ensures participants did not accidentally answer differently for similar questions. Therefore, it is not surprising that the results presented in Figure 21 are in line with the opinions previously expressed: a large majority (38/49 or approximately 78%) disagree with this statement. Thus, this expressly indicates that an overwhelming majority of the industry participants feel there is indeed a need for construction managers to be familiar with construction related Spanish.

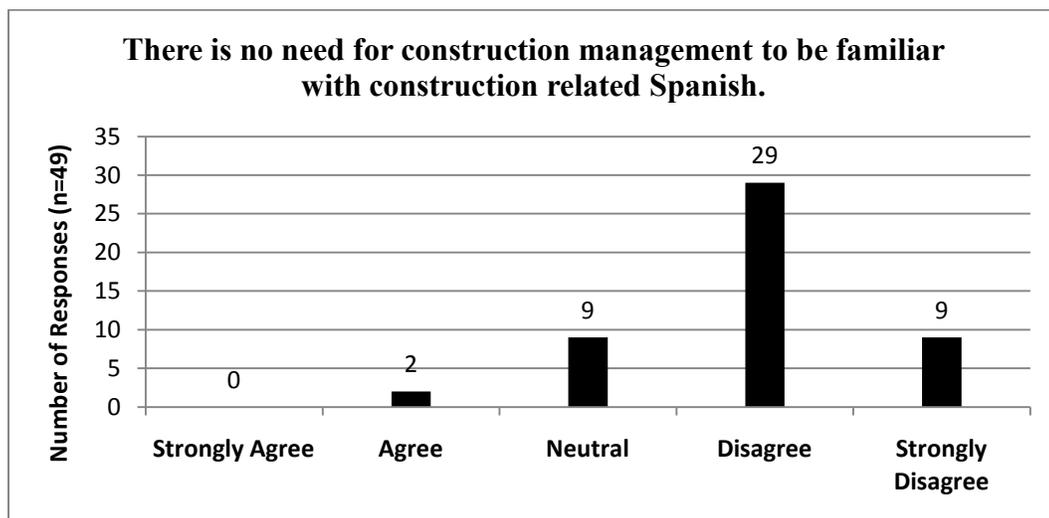


Figure 21: Industry Professional Survey Question 8 Results

Question 9: “It would be of value for Texas A&M to offer a “Construction Spanish” class that would give Construction Science students a working knowledge of construction related Spanish terminology.”

The industry professionals’ survey culminates with question 9 in which it asks an opinion based question specifically related to Texas A&M University. Each of these industry professionals, to some extent or another, has a connection with the university, which is a result of the population selection for this survey (page 4). It is logical to expect all the opinions expressed up to this point about Spanish in the construction industry to be reflective of the results of this final survey question. Indeed they are; the industry professionals indicate they definitely think it would be of value for Texas A&M to offer a “Construction Spanish” class that would give construction science students a working knowledge of construction related terminology. This is made clear in Figure 22 by approximately 73% (36 of the 49 people that responded to this question) responding with either “Strongly Agree” or “Agree”. Therefore similar to the students who were asked virtually an identical question, the outcome was strongly in favor of such a class being offered.

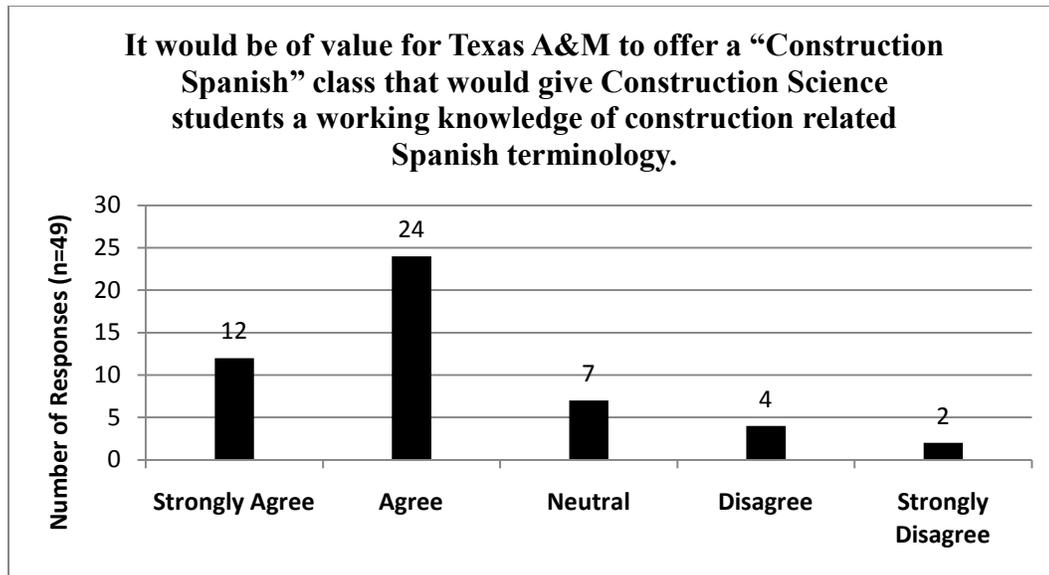


Figure 22: Industry Professional Survey Question 9 Results

4. CONSTRUCTION SPANISH CURRICULUM

There is a variety of higher education organizations throughout the United States that offer construction related degrees. A specific website that offers a “Guide to Accredited Schools Offering a Construction Management Degree” is www.constructionmanagementdegree.com (ConstructionManagementDegree.com, 2010). It maintains a database of listings for schools that offer either online degrees or campus based degrees. In Texas alone there are ten campus based programs listed. Besides Texas A&M University, nine other schools (Lamar University, North Lake College, Texas A&M University – Commerce, Texas State University, Texas Tech University, University of Houston, University of Texas at Arlington, University of Texas at San Antonio and University of Texas at Tyler) offer degrees similarly titled to that of Texas A&M.

Another similar website describes the University of Texas at San Antonio as follows: “With over 29,000 students enrolled in 133 undergraduate and graduate degree programs, UTSA is the second-largest institution in the UT System and has been one of the state’s fastest-growing public universities for much of the last decade. It offers 64 bachelors, 48 masters and 21 doctoral degree programs” (Construction Management Degree, 2010). One of the bachelor’s degrees offered through their college of architecture is a bachelor of science in Construction Science and Management. According to the school’s website, a student pursuing a degree in Construction Science and Management is required to take six credit hours from a list of 4 classes: ARC 1226 –

Design II, ARC 3433 – Topics in Architecture and Thought, SPN 2023 – Intermediate Spanish II or SPN 3153 – Spanish for the Business/Management Fields (Academic Publications, Office of the Registrar, 2009). The course description for Intermediate Spanish II is “Continued opportunity to develop listening, speaking, reading, and writing skills. Grammar review and further study of Hispanic culture” (Academic Publications, Office of the Registrar, 2009). Spanish for the Business/Management Fields is described as “Foreign language skills relevant to careers in business fields. Emphasis on reading skills and simple conversations on business topics. Exposure to terminology from contracts, financial statements, business law, marketing, and banking” (Academic Publications, Office of the Registrar, 2009). While these classes are obviously not specific construction classes, (they are taken through the school’s Department of Modern Languages and Literatures) the University of Texas at San Antonio is one example of a school that gives their students the opportunity to take Spanish classes towards their degree in Construction Science and Management.

Another major US university that offers Spanish teaching to their construction students is Colorado State University. This school offers a course entitled “CON 380 – Spanish for Construction”. The school catalog describes the class as “Spanish for non-Spanish speaking construction personnel to improve jobsite communication and safety”. The course description is as follows: “This course is designed to provide the construction personnel with knowledge necessary to improve jobsite communication and safety by teaching job-specific Spanish to non-Spanish speaking Construction personnel. This course will also address cultural issues such as the major Hispanic holidays that impact

the construction industry, the role of religion in the work like of the Hispanic workers, and other points of potential misunderstandings and conflict between Spanish and non-Spanish speakers” (Lopez del Puerto, 2010).

It is important to observe and justify each and every topic taught in this class due to the fact that any construction program could benefit from offering a similarly, if not identically, structured class. According to the syllabus for Dr. Lopez del Puerto’s class (Appendix D) the structure of the class is as follows:

Session One: Introduction

Class Objectives Discussion

Review Syllabus and Outline

Spanish Pronunciation

General Exchanges and Courtesies

Assignment: Listen to Sections I & II of your CD

Session Two: Communication Strategies

Language and Communication Issues in the Workplace

Communication Strategies

Numbers Review

Assignment: Listen to Sections III & IV of your CD

Assignment: Measurements used in Construction

Session Three: Complementing Employees

Demographics

Complementing Employees

Assignment: Listen to Section V of your CD

Assignment: Interview a Hispanic worker

Session Four: Employment Issues

Labor in Latin America

Employment Issues

Assignment: Listen to Section VI of your CD

Assignment: 3"x%" Flashcards of PPE

Session Five: Time and Work Schedule Issues

Cultural Tips

Time and Work Schedule Issues

Assignment: Listen to Section VII of your CD

Session Six: Oral Exam #1

Oral Exam #1 administered

Session Seven: Medical Emergencies

Hispanic Idiosyncrasy

Medical Emergencies

Assignment: Listen to Section VIII of your CD

Session Eight: Safety Issues

Safety Issues

Assignment: Listen to Section IX of your CD

Session Nine: Construction Safety in Latin America

Construction Safety in Latin America

OSHA Assignment

Session Ten: Safety Issues Cont.

Accident Rates Among Minorities

Safety Issues

Assignment: Listen to Section IX of your CD

Session Eleven: Control and Command for Site Supervision

Hispanic Surnames

Control and Command for Site Supervision

Assignment: Listen to Section X of your CD

Session Twelve: Oral Exam #2

Oral Exam #2 administered

Session Thirteen: General Construction Commands

Training Minority Populations

General Construction Commands

Assignment: Listen to Section XI of your CD

Final Project Distributed: Develop a training program for either Spanish or Non-Spanish speakers

Session Fourteen: Other Construction Commands

Immigration Issues

Other Construction Commands

Assignment: Listen to Section XII of your CD

Session Fifteen: Overcoming the Language and Communication Barrier in the Jobsite

Guest Speaker

Session Sixteen: Final Project Due

Final Project Presentation

Discussion

Session Seventeen: Oral Final Exam

Oral Final Exam Administered

Session one: Introduction

The class begins with a general overview of the class requirements in order to give the students an idea of what will be expected of them throughout the semester. It is important to remember that this class is geared towards non-Spanish speaking Construction personnel. Therefore Spanish instruction starts at some of the most basic levels: pronunciation and general exchanges and courtesies. These topics form the foundation for everything else that is taught in the class.

Session two: Communication strategies

Session two continues with language and communication issues in the workplace, communication strategies, and numbers review. These topics will benefit the students by making them aware of problems that may arise from the existence of a language barrier, as well as strategies to overcome such barriers. Numbers are also included in this session as a basic review of another simple topic.

Session three: Complementing employees

The third session explores the world of demographics and complementing employees. Construction sites are likely to include workers from varied demographic background which creates a diverse atmosphere. Some people may only see the negative aspects of this fact and consider it a burden to have to deal with people that are different than them. However as a manager (and as a construction manager to be more specific) it is your job to take these challenges and make something positive out of them. Rather than identifying differences that separate the people around you it is more beneficial to everyone involved if employee differences are seen as complementary. This will create a more cohesive environment for the job site. One of the assignments for this session is to interview a Hispanic worker. This is beneficial in that it engages the students in different ways than simple writing assignments or listening assignments, as in other sessions.

Session four: Employment issues

Session four examines employment issues and labor in Latin America. This is a topic that is likely very relevant to Spanish speaking employees. As a manager it is beneficial to have an appreciation for the things your employees may value and consider important. It is likely many of them have had work experience in Latin America, which is a significantly different work environment than here in the United States of America. It is important to realize their point of view and their background in order to be able to relate to them and effectively manage them. One of the assignments after session four is to make flashcards of construction PPE (Personal Protective Equipment). This is

important because it exposes the students to vocabulary words that will contribute to their abilities to communicate safety matters on the job site.

Session five: Time and work schedule issues

In session five the students are presented with cultural tips along with time and work schedule issues. These cultural tips will once again help give the students (future construction managers) a better appreciation and understanding of the Hispanic employees they will come in contact with. They will have an awareness of what aspects of their culture affect their work schedules. With this knowledge base they will know what to expect from their employees as well as how to react and handle certain situation in an informed, professional manner.

Session six: Oral exam #1

Session six provides the first checkpoint for the students in CON 380. It is important that this exam is oral rather than written in order to allow the professor to evaluate each student's pronunciation and ability to formulate words and sentences. Communication done by construction managers on a job site is typically all verbal communication. Therefore it is important to have these oral evaluations rather than a common written exam.

Session seven: Medical emergencies

Session seven deals with what could arguably be the most important area of this class. When a medical emergency is at hand, communication is vital. Hesitations or stutters due to a misunderstanding or simply a lack of ability to communicate may mean

the difference between life and death on a construction jobsite. It is also important at these times to be well aware of the idiosyncrasies related with the Hispanic culture in order to be able to better accommodate whatever the immediate need of the person in danger may be.

Session eight: Safety issues

Section eight would take a look at general safety issues on the jobsite. It can never be overemphasized how avoiding workplace injuries must be a group effort of everyone on the jobsite. Carelessness or laziness by one single person can easily and likely put many people around that person in great danger. Therefore when a person is on a construction site they need to realize this fact and pay extra attention to potential hazards. Having the ability to warn or communicate dangers in a common language would have huge benefits for the workers and the company in general.

Session nine: Construction safety in Latin America

Construction safety in Latin America is a topic that few non-Spanish speaking students are aware of. Often times the fact that OSHA (Occupational Safety and Health Administration) exists is taken for granted. OSHA makes great efforts to create safe work environments. Other countries such as those in Latin America, for example, do not have OSHA to examine and enforce safety standards. Therefore it then becomes increasingly more important for each person on site to be protective of himself as well as those around them.

Session ten: Safety issues cont.

This session continues topics from session nine. While furthering the investigation and discussion on general safety issues, the topic of rising accident rates among minorities is explored. This is a topic that directly applies to the construction industry. It is important that people are made aware of these statistics so that they may be addressed and overcome. Giving future construction managers this information will hopefully provide them with a heightened sense of awareness to these issues and aid in their efforts to reverse this growing trend.

Session eleven: Control and command for site supervision

All these previously discussed topics are useful when it comes time to learn about control and command for site supervision. It is likely that many of the students will in fact be site supervisors at one point or another, and it is therefore important they know have been introduced to topics such as Spanish surnames. Names are something that many people take personal pride in, and if someone does not have an appreciation for that it would be quite easy for them to cause embarrassment to themselves or, even worse, offend someone else by simply not pronouncing their name correctly. This session also provides a transition for the upcoming sessions that will follow the oral exam, which takes place in the next session.

Session twelve: Oral exam #2

Yet again, an oral exam takes place. As previously eluded to, oral exams are more beneficial for this type of material due to the fact that one of the main missions of this class is to develop verbal skills to go along with the information learned.

Session thirteen: General construction commands

Late in the semester verbal commands are taught. One of the main components to effective control and command on a site (session 7) is the ability to give commands. If the language barrier exists it then becomes increasingly difficult to have high levels of productivity. The general construction commands covered in this session will give the students a foundation to build upon in the weeks to come.

Session fourteen: Other construction commands

Session fourteen continues what was started in the previous session. Topics then expand to include immigration issues. It is again important for the future managers (students) to understand this topic as it is something constantly relevant to the Hispanic workers who themselves are immigrants.

Session fifteen: Overcoming the language and communication barrier in the jobsite

Session fifteen is the final session or opportunity to bring everything together that has been learned throughout the semester in CON 380. A guest speaker is brought in to provide the students with an opinion of what it is actually like outside of the classroom. Guest speakers offer unique opportunities for students to listen to industry professionals discuss the same concepts they have been learning about. These industry professionals are typically able to offer a different perspective on the subject matter and enhance the students' learning.

Session sixteen: Final project due

Session sixteen consists of turning in the final project for the class.

Session seventeen: Oral final exam

The class culminates in session seventeen with the cumulative oral exam.

Everything learned in each prior session should have been mastered and understood.

Success on this oral final exam it is indicative that the student has acquired various tools that will prove useful in the construction industry.

5. SUMMARY AND CONCLUSIONS

To begin with, it is somewhat startling how many students have had multiple semesters of Spanish classes, yet the majority of them admit they would not be comfortable being required to communicate in Spanish. This indicates that either they have forgotten the knowledge they learned in their previous Spanish classes, or maybe they simply did not learn much to begin with. Either way, it is likely that with a small amount of review many of the topics covered in their previously taken classes would be quickly recollected.

Many individual opinions of the student survey participants were taken into consideration with this survey. It was discovered that the majority of the students surveyed were in the second half of their academic career in the Department of Construction Science at Texas A&M University. Most of them are from Texas, yet few of them have immediate family members that speak Spanish. This means virtually all of their exposure to the Spanish language has come from a classroom setting. Regardless of how many semesters of Spanish classes the students have had, most of them would not feel comfortable communicating in Spanish on a daily basis. Most of them have some experience in the construction industry, either within the mandatory internship or on their own. These students highly value communication skills, think English is not the only language needed to communicate on a jobsite, and feel construction managers would be more effective if they were able to communicate in both Spanish and English. Most importantly, most of the students surveyed indicated they would be interested in

taking a course which gave them a working knowledge of construction related Spanish terminology.

Therefore, based on the students' perspectives, it seems odd why Texas A&M University does not offer any courses to accommodate this valued topic. While this survey provides mostly opinions of upper level students (students in their third or fourth year of the program) in the future it would be beneficial to evaluate the opinions of students in the first half of their academic career in order to determine if they share the same sentiments and interests.

A lot can be learned from these survey responses as well as the survey comments (Appendix E) from the industry professionals. One respondent (Respondent 14) voiced an important observation: "...Roughly 40% of our field personnel are Spanish-speaking. Those project/construction managers who are fluent Spanish-speakers not only communicate better with those on the crew who speak Spanish, but are more respected than others who are not fluent or do not attempt to try to learn some Spanish." Another respondent, Respondent 22 states "In Houston, 80% of trade work is done by people who speak Spanish at home. We are taking chances with both safety and quality when we cannot communicate." Some employees such as respondent 27 have decided to learn Spanish by means of their own. Respondent 27 stated "I graduated in 1984 and at that time felt Spanish should have been part of the program. To this day I feel the same. I am currently using Rosetta Stone to try and learn." Furthermore, some companies, such as the company that employs Respondent 20, have establish alternative means by which their employees can learn construction related Spanish. Respondent 20 wrote "We have

an internal university program at our company. We offer Spanish and it focuses on construction terms.”

There is now concrete evidence of the great importance of Spanish in the construction industry. Respondent In some instances, possessing Spanish speaking skills might even be the difference between receiving or not receiving a job offer. Most of the opinions expressed came from general contractors located in Texas, where there is one of the highest concentrations of Spanish speakers in the United States. In general, the industry professionals feel strongly that communication skills are crucial to be an effective leader, and that in order to utilize whatever communication skills one might have they should at least have a working knowledge of construction related Spanish. Many of the survey participants even indicated that having this type of knowledge could help a student get a job over a similarly qualified applicant. Most importantly they feel it is important enough that Texas A&M should incorporate it into the teaching of their construction science program.

In the future it would be beneficial to see other additional companies surveyed to find out if they feel the same way as those involved with Texas A&M. As for now all there is to go on is the views expressed by these 49 company representatives. The argument from them appears compelling that it would be very beneficial for the construction students to be educated in Spanish.

Overall the conclusions that can be gleaned from the two surveys administered are quite clear. One point of interest is the high level of correlation between the answers to similar questions by the students and the industry professionals. A few things stand

out as key points that can be taken away from this research. First of all, most of the students in Texas A&M's Department of Construction Science have already had an exposure to Spanish classes at some point in their past. Thus they already have the foundation of knowledge that could be built upon by taking a Spanish class directly focused on their field of study: construction.

Both the students and the industry professionals overwhelmingly agree on the importance of Spanish in the workplace. Projects such as the DFW International Airport serve as real life examples of what benefits can be gained when Spanish training is incorporated. The obvious need created here is that construction managers need to be able to communicate in Spanish, at least on a basic level. The students have expressed that need, and the industry professionals have expressed that need.

Various other universities have emphasized this need by either allowing or requiring their construction students to take Spanish classes that count towards their construction management related degree. Colorado State University is one school that has taken the initiative to provide their students with the opportunity to take a class focused on construction Spanish. While this is not common, it should fare its students very well in the long run. Depending on what type of job these students pursue after completing their academic careers, it is likely they will be able to apply the knowledge learned in CON 380 on a daily basis. Since this class is one of the first of its kind, it can serve as a model for those that follow. The topics covered in its syllabus provide a well rounded education on Spanish speaking skills as well as cultural matters that could potentially cause misunderstandings and disagreements in the workplace. Students in

the construction management program at Colorado State University are currently gaining an advantage over students of various other construction programs (including those of Texas A&M University) by being provided with these teachings.

One issue that some would be quick to point out is that there is no room for a construction Spanish class in the current degree plan at Texas A&M. The degree plan already includes the state regulated maximum of 120 credit hours. Therefore one suggestion to overcome this would be to incorporate parts of this curriculum into the required Construction Safety class (COSC 364). After all, jobsite safety is one of the areas that would receive the most improvement by overcoming the language barrier. Another option is to create the class and offer it as a departmental elective. Based upon the surveys conducted there would be a sufficient number of students to fill the class each semester and make it financially feasible for the university.

As observed, CON 380 at Colorado State University covers many of the necessary areas of the Spanish language and culture in order to equip the students with information to further their ability to be a better construction manager. There are various aspects of construction that would benefit from Spanish speaking managers more than others, such as safety. One specific example is that proves this is the success of the Spanish language safety training by the Dallas/Ft. Worth International Airport project. Thus, it would be highly beneficial for students to learn specific vocabulary words for construction related safety equipment, which aligns with the assignment after session four. Another thing that should be considered in this analysis is that surely this type of

Spanish education would be much more useful for employees who spend large amounts of time in the field and on the jobsites.

In the future it would be interesting to hear feedback from the students who went through this class after they have spent some time working in the industry. That is really the only way to analyze and judge the effectiveness and value of such teaching. It would also be valuable if other universities (in addition to UT San Antonio and Colorado State University) could be identified that are possibly offering a similarly structured class to their construction students.

Moving forward it is likely that in the future people will not notice Colorado State University or the University of Texas at San Antonio as rarities for allowing for Spanish in their construction programs. Rather than asking why these schools have put this type of teaching in place, people will likely be asking themselves why is Texas A&M University has not done the same.

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APPENDIX A

This study is being conducted by David Hudson, a graduate student of the Department of Construction Science at Texas A&M University in order to better understand the importance of the Spanish language in construction management. This research will help future construction science students and their employers to better understand how basic Spanish training could improve a construction student's curriculum. In the Spring of 2010 I plan to publish/distribute results of this study based on the data provided by survey respondents.

I would greatly appreciate your completing the survey at the following website. Since the validity of the results depend on obtaining a high response rate, your participation is crucial to the success of this study.

Your completion of this survey indicates your consent to participate in this study. Please be assured that your responses will be held in the strictest confidence, and no names will be attached to the survey responses. If the results of this study were to be written for publication, no identifying information will be used.

If you have any questions about this study, you can contact the person(s) below:

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This study has been reviewed and approved by Texas A&M University's Institutional Review Board (IRB). The IRB has determined that this study meets the ethical obligations required by federal law and University policies. If you have questions or concerns regarding this study please contact the Investigator or Advisor.

I hope that you will be able to participate in this study.

Sincerely,

David Hudson

David Hudson

APPENDIX B

Student Survey

1. What is your classification?
Freshman Sophomore Junior Senior
2. How many semesters of Spanish classes have you had? (in high school and college combined)
0 1 2 3 4 More than 4
3. Where are you from?
North Texas East Texas South Texas West Texas Central Texas Other
DFW, Wichita Falls, etc... Tyler, etc... San Antonio, Houston, etc... Lubbock, Abilene, Panhandle, etc...
Austin, Waco, etc... Anywhere other than Texas
4. Have you had an internship with a construction company?
Yes No
5. Have you ever worked in the construction field? (outside of an internship)
Yes No
6. _____ members of my immediate family speak Spanish.
0 1 2 3 4 More than 4
7. I am completely comfortable using Spanish to communicate on a daily basis.
Strongly Agree Agree Neutral Disagree Strongly Disagree
8. There is no need for construction managers to be familiar with the construction related Spanish terminology.
Strongly Agree Agree Neutral Disagree Strongly Disagree
9. Communication skills are essential to be a good leader.
Strongly Agree Agree Neutral Disagree Strongly Disagree
10. I believe English is the only language needed to communicate on a construction job site.
Strongly Agree Agree Neutral Disagree Strongly Disagree
11. I believe construction managers would be more effective if they were able to communicate in English and Spanish.
Strongly Agree Agree Neutral Disagree Strongly Disagree
12. If Texas A&M offered a class that gave students a working knowledge of construction related Spanish terminology I would be interested in taking it.
Strongly Agree Agree Neutral Disagree Strongly Disagree

APPENDIX C

Industry Professionals' Survey

1. What type of contracting does your firm perform?
 General contractor Mech./Electrical Masonry/Tile Roofing Flooring Other

2. Where does your company do business? (select all that apply)
 North Texas East Texas South Texas West Texas Central Texas Other
 DFW, Wichita Falls, etc... Tyler, etc... San Antonio, Houston, etc... Lubbock, Abilene, Panhandle, etc...
 Austin, Waco, etc... Anywhere other than Texas

3. Construction Management would benefit from having a basic knowledge of construction related Spanish terminology
 Strongly Agree Agree Neutral Disagree Strongly Disagree
4. In order to communicate affectively construction management should have at least a basic working knowledge of Spanish.
 Strongly Agree Agree Neutral Disagree Strongly Disagree
5. Communication skills are essential to being a good leader.
 Strongly Agree Agree Neutral Disagree Strongly Disagree
6. When considering two prospective employees of roughly equal qualifications, preference would be given to one that had a working knowledge of Spanish over the other applicant.
 Strongly Agree Agree Neutral Disagree Strongly Disagree
7. English is the only language needed to communicate on a construction job site.
 Strongly Agree Agree Neutral Disagree Strongly Disagree
8. There is no need for construction management to be familiar with construction related Spanish.
 Strongly Agree Agree Neutral Disagree Strongly Disagree
9. It would be of value for Texas A&M to offer a "Construction Spanish" class that would give Construction Science students a working knowledge of construction related Spanish terminology.
 Strongly Agree Agree Neutral Disagree Strongly Disagree

APPENDIX D

Student Survey Response Key			
Question 1	Question 6	Question 10	
1=Freshman	0=0	1=Strongly Agree	
2=Sophomore	1=1	2=Agree	
3=Junior	2=2	3=Neutral	
4=Senior	3=3	4=Disagree	
	4=4	5=Strongly Disagree	
Question 2	5=>4		
0=0		Question 11	
1=1	Question 7	1=Strongly Agree	
2=2	1=Strongly Agree	2=Agree	
3=3	2=Agree	3=Neutral	
4=4	3=Neutral	4=Disagree	
5=>4	4=Disagree	5=Strongly Disagree	
	5=Strongly Disagree		
Question 3		Question 12	
1=North Texas	Question 8	1=Strongly Agree	
2=East Texas	1=Strongly Agree	2=Agree	
3=South Texas	2=Agree	3=Neutral	
4=West Texas	3=Neutral	4=Disagree	
5=Central Texas	4=Disagree	5=Strongly Disagree	
6=Other	5=Strongly Disagree		
Question 4	Question 9		
0=No	1=Strongly Agree		
1=Yes	2=Agree		
	3=Neutral		
Question 5	4=Disagree		
0=No	5=Strongly Disagree		
1=Yes			

Student Survey Responses							
ID		1	2	3	4	5	6
1	What is your classification?	3	3	3	3	3	2
2	How many semesters of Spanish classes have you had? (In high school and college combined)	3	0	4	4	3	3
3	Where are you from?	3	6	6	6	3	1
4	Have you had an internship with a construction company?	0	0	0	0	0	0
5	Have you ever worked in the construction field (outside of an internship?)	0	1	1	1	1	1
6	How many members of your immediate family speak Spanish?	0	0	0	0	0	0
7	I am completely comfortable using Spanish to communicate on a daily basis.	4	4	5	5	5	5
8	There is no need for construction managers to be familiar with the construction related Spanish terminology.	4	4	4	4	4	5
9	Communication skills are essential to be a good leader.	1	1	1	1	1	1
10	I believe English is the only language needed to communicate on a construction job site.	4	4	4	4	4	4
11	I believe construction managers would be more effective if they were able to communicate in English and Spanish.	2	2	2	2	2	2
12	If Texas A&M offered a class that gave students a working knowledge of construction related Spanish terminology I would be interested in taking it.	2	2	2	2	2	2

59	60	61	62	63	64	65	66	67	68	69	70	71
4	3	2	3	3	4	4	3	4	3	3	3	3
2	4	5	3	4	4	5	4	3	3	2	3	2
3	1	1	3	3	1	1	3	3	6	3	3	3
0	1	0	0	0	1	1	1	1	0	1	0	0
1	1	1	0	0	1	0	1	0	1	1	0	1
1	0	3	0	0	0	0	0	2	5	0	1	0
4	5	3	5	4	5	2	5	5	1	4	5	4
4	4	4	4	5	4	4	3	5	4	4	4	4
1	2	1	1	1	1	1	2	1	1	1	1	1
4	3	3	2	5	5	5	2	5	4	4	4	4
2	2	2	2	2	2	2	3	1	1	2	2	2
1	1	1	1	1	1	1	3	3	3	3	3	3

72	73	74	75	76	77	78	79	80	81	82	83	84
3	3	3	4	3	3	4	4	4	4	4	3	4
3	3	3	2	5	2	3	3	3	5	2	0	0
1	3	3	1	5	2	1	1	5	3	3	1	3
0	0	0	0	0	0	1	1	1	1	1	0	1
0	1	1	0	1	1	1	1	1	1	1	1	1
0	0	0	0	0	0	0	0	1	1	0	5	3
5	3	3	3	5	5	4	4	4	5	4	1	1
4	4	4	4	4	3	2	2	3	4	2	2	4
1	2	2	2	1	1	2	3	1	1	2	1	1
4	4	3	3	3	2	2	2	3	5	1	5	4
2	2	2	2	2	3	3	3	3	1	3	1	1
3	3	3	3	3	4	4	4	4	4	5	5	5

85	86	87	88	89	90	91	92	93	94	95	96	97
4	2	4	2	4	3	4	4	4	4	4	4	3
3	5	1	5	0	4	3	3	5	2	5	4	5
3	4	4	4	5	1	3	3	3	3	1	5	1
1	0	1	0	0	0	1	1	0	1	1	1	1
0	1	0	1	0	1	1	1	0	1	0	1	1
0	0	0	0	0	0	0	0	0	1	0	0	0
5	5	3	2	5	4	4	4	2	5	4	3	4
4	4	5	5	4	4	4	4	4	4	4	4	4
1	2	1	1	1	1	1	1	1	2	2	2	2
4	2	5	5	5	5	3	2	3	3	3	3	4
2	2	2	2	2	2	3	2	2	2	2	2	2
5	5	2	2	2	2	3	2	2	2	2	2	2

98	99	100	101	102	103	104
4	3	3	3	3	3	2
5	4	4	4	4	4	4
1	2	3	1	3	6	2
1	0	0	0	0	0	0
0	0	1	0	1	1	1
0	1	0	0	0	1	1
4	5	3	3	2	4	4
4	5	4	4	4	4	5
2	2	2	2	1	1	1
4	4	4	4	4	4	5
2	2	2	2	2	2	1
2	2	2	2	2	2	1

Industry Professional Survey Response Key		
Question 1	Question 5	
1=General Contractor	1=Strongly Agree	
2= Mechanical/Electrical	2=Agree	
3= Masonry/Tile	3=Neutral	
4=Roofing	4=Disagree	
5=Flooring	5=Strongly Disagree	
6=Other		
	Question 6	
Question 2	1=Strongly Agree	
1=North Texas	2=Agree	
2=East Texas	3=Neutral	
3=South Texas	4=Disagree	
4=West Texas	5=Strongly Disagree	
5=Central Texas		
6=Other	Question 7	
	1=Strongly Agree	
Question 3	2=Agree	
1=Strongly Agree	3=Neutral	
2=Agree	4=Disagree	
3=Neutral	5=Strongly Disagree	
4=Disagree		
5=Strongly Disagree	Question 8	
	1=Strongly Agree	
Question 4	2=Agree	
1=Strongly Agree	3=Neutral	
2=Agree	4=Disagree	
3=Neutral	5=Strongly Disagree	
4=Disagree		
5=Strongly Disagree	Question 9	
	1=Strongly Agree	
	2=Agree	
	3=Neutral	
	4=Disagree	
	5=Strongly Disagree	

Industry Professional Survey Responses						
ID		1	2	3	4	5
1	What type of contracting does your firm perform? (Select all that apply)	1	5, 6 (Interior Specialty)	1	1	4
2	Where does your company do business? (select all that apply)	3, 5	1, 2, 3, 5, 6	3	1, 6	1, 2, 3, 4, 5, 6
3	Construction Management would benefit from having a basic knowledge of construction related Spanish terminology.	2	1	1	3	1
4	In order to communicate effectively construction management should have at least a basic working knowledge of Spanish.	2	2	1	3	2
5	Communication skills are essential to being a good leader.	2	1	1	1	1
6	When considering two prospective employees of roughly equal qualifications, preference would be given to one that had a working knowledge of Spanish over the other applicant.	3	2	2	4	1
7	English is the only language needed to communicate on a construction job site.	4	4	5	3	5
8	There is no need for construction management to be familiar with construction related Spanish.	4	5	5	4	5
9	It would be of value for Texas A&M to offer a "Construction Spanish" class that would give Construction Science students a working knowledge of construction related Spanish terminology.	2	2	1	3	1

6	7	8	9	10	11	12	13	14	15
2	1	1	6 (Drywall / EIFS / Plaster)	1	1	1	1	6 (EPC-heavy industrial)	1, 2, 3, 4, 5
1	1, 5	1, 2, 3, 1, 5	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6	3	1, 3, 4, 5	1, 2, 3, 4, 5, 6	1, 3, 5
3	2	2	2	1	2	4	2	1	2
3	3	3	2	1	3	4	2	2	1
1	1	1	1	1	1	1	1	1	1
	2	2	2	2	3	4	3	2	2
4	4	2	3	5	2	2	3	5	4
3	4	3	4	5	3	2	4	5	4
3	2	2	2	2	2	5	1	1	2

16	17	18	19	20	21	22	23	24	25	26
1	1	1	1	1	6 (Industrial)	1	1	1	1	1
1, 2, 3, 4, 5, 6	1, 3, 5	1, 2, 3, 4, 5, 6	3	2, 4, 6	3, 6	3	1, 2, 3, 4, 5, 6	1, 3, 5	3	3, 5
2	3	2	2	1	2	1	2	1	2	4
2	3	3	3	2	4	1	5	1	2	5
1	1	1	1	1	1	1	1	1	1	1
2	5	2	2	2	4	1	2		2	3
4	4	2	4	4	4	5	4	3	3	2
4	4	3	4	4	4	5	2	4	3	4
2	3	4	3	1	2	1	5	1	2	4

27	28	29	30	31	32	33	34	35	36
6 (Commercial Drywall/Acoustical ceilings)	1, 2, 6 (Industrial)	1	1	1, 2	1	1, 2, 6 (Department of Defense)	1	1	1
3, 5, 6	3, 6	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6	3, 6	3	1, 2, 3, 4, 5, 6	6	1	1, 3, 5
1	1	2	2	2	2	2	2	1	2
1	1	3	1	3	2	3	3	1	2
1	1	1	1		1	2	1	1	2
2	2	4	3		2	3	4	2	3
5	4	3	4		4	4	4	4	
5	4	3	4	4	4	4	4	4	3
1	2	3	2	4	2	2	2	2	3

37	38	39	40	41	42	43	44	45	46	47
1	1	1	6 (Specialty concrete)	1	2, 6 (Heavy Industrial)	1	1	1	1	1
1, 3, 5	1, 2, 3, 4, 5	1, 3, 4, 5, 6	1, 2, 3, 4, 5, 6	1, 3, 6	1, 2, 3, 4, 5, 6	1, 3, 4, 6	1	5	1, 2, 3, 4, 5, 6	3
2	1	1	1	2	3	3	3	1	1	4
2	2	2	1	2		3	3	1	1	4
1	1	1	1	1	1	2	1	1	1	1
2	2	2	2	4	3		3	3	2	4
4	4	4	4	3	2	4	2	5	4	4
4	4	5	4	4	4	3	4	5	4	3
2	1	2	2	2	2	3	2	1	1	4

48	49
1	1
3	1, 6
2	1
3	2
1	1
2	2
4	4
4	4
2	1

APPENDIX E

Industry Professional Survey Comments

Respondent 10: “We are a nationwide heavy industrial construction company and have a large workforce that is Spanish speaking. This is a need throughout the U.S.”

Respondent 12: “English is the language of our country and everyone should take necessary measure to learn and understand it. If a person is planning to work in a different country, then measures should be taken to learn the language.”

Respondent 14: “Our firm self-performs 90% of the work we are awarded--civil, steel, coatings, etc. New construction or project managers are expected to spend at least a year in the field, becoming familiar with processes and the personnel they will eventually support. Roughly 40% of our field personnel are Spanish-speaking. Those project/construction managers who are fluent Spanish-speakers not only communicate better with those on the crew who speak Spanish, but are more respected than others who are not fluent or do not attempt to try to learn some Spanish.

Respondent 17: “My experience with Spanish in the field is that most subcontractor foreman speak English, and that Spanish would be advantageous in terms of safety on the jobsite, should the need arise. Additionally, I believe that there are other classes/ courses that students could benefit more from, instead of taking a 'Construction Spanish' class.”

Respondent 20: “We have an internal university program at our company. We offer Spanish and it focuses on construction terms.”

Respondent 22: “In Houston, 80% of trade work is done by people who speak Spanish at home. We are taking chances with both safety and quality when we cannot communicate.”

Respondent 23: “Construction Spanish class is useless, if you're going to teach Spanish just require a normal Spanish class. Construction terms will come with time, it's more important to gain an overall knowledge of the language. Knowing Spanish in a management position isn't necessary. It is advantageous, but not necessary. I generally require that a subcontractor has someone on site that can communicate in English with our staff. If they can't communicate with us then they don't need to be working for us.”

Respondent 26: “General construction Spanish is a plus, but it is not needed.”

Respondent 27: “I graduated in 1984 and at that time felt Spanish should have been part of the program. To this day I feel the same. I am currently using Rosetta Stone to try and learn.”

Respondent 28: “I think it will take more than one Spanish class for a person to have any familiarity with the Spanish lesson, especially in the construction terminology. The language should be highly recommended in the elective field.”

Respondent 32: “Spanish is a value added benefit for those positioned in the field and dealing directly with the workforce”

Respondent 41: “I still believe English should be the only language spoken since this is America...but sadly people that come to this great nation do not take pride in learning the language--instead we are expected to adapt to their needs. That is just

wrong!! My ancestors came over and they didn't think twice about learning the language...people are just too dang lazy and we cater to them.”

Respondent 44: “Your questions are phrased as to whether Spanish is 'required' for construction management. Spanish skills are not required for management because every subcontractor crew will have (must have per contract) an English speaking foreman. Most management interaction will be through the foreman, so Spanish skills are not a requirement. These language skills are definitely a benefit, but not a requirement.”

Respondent 46: “Spanish would be a plus in International Construction Management especially in South America.”

APPENDIX F

CON 380

Spanish for Construction

Course Syllabus

Instructor: Carla Lopez del Puerto
Office: 224B Guggenheim Hall
Email: carlalp@colostate.edu
Office Hours:
Phone: 491-7960
Credits: 2 (1-0-1)
Course Restriction: CM Major or Department Approval

CATALOG DESCRIPTION

Spanish for non-Spanish speaking construction personnel to improve jobsite communication and safety.

COURSE DESCRIPTION

This course is designed to provide the construction personnel with knowledge necessary to improve jobsite communication and safety by teaching job-specific Spanish to non-Spanish speaking Construction personnel. This course will also address cultural issues such as the major Hispanic holidays that impact the construction industry, the role of religion in the work life of Hispanic workers, and other points of potential misunderstandings and conflict between Spanish and non-Spanish speakers.

COURSE OBJECTIVES/GOALS:

After completing the course, students must:

- Master basic Spanish vocabulary used in construction to be able to:
 - Greet and Compliment Employees
 - Give Simple Directions in Spanish
 - Control Medical and Safety Situations
- Understand more about Hispanic culture as it impacts the construction workplace.

REQUIRED TEXT:

- Slick, Sam (2001). "Spanish for Construction Sites" Command Spanish, Inc, Petal, MS

ADDITIONAL REQUIRED RESOURCES

- OSHA Compliance Assistance: Hispanic Employers and Workers:
http://www.osha.gov/dcsp/compliance_assistance/index_hispanic.html

COMPUTER APPLICATIONS:

- Microsoft Word

Department of Construction Management

METHOD FOR EVALUATION/GRADING:

Student performance shall be evaluated based on the following criteria:

- Assignments: 20%
- Oral Midterm Exam: 25%
- Oral Final Exam: 25%
- Final Project: 30%

Grading Scale:

- "A" = 90% and above
- "B" = 80% to 89%
- "C" = 70% to 79%
- "D" = 60% to 69%
- "F" = 59% and below

It is the department policy not to use the +/- grading system.

ADDITIONAL CLASS INFORMATION:

- **Exams**
Oral exams will be given. The final exam A cumulative final exam will be given
- **Homework Assignments and Quizzes**
Assignments will be produced by students working individually and/or in groups with a maximum of 4 students per group. Group membership will be directed/selected by the instructor. Deviations are subject to instructor approval. All homework/assignments are to be completed on 8 1/2 by 11" paper. Your name, course number and date must appear on a cover sheet. Papers are to be typed, with appropriate borders and margins. All papers are due at the beginning of the class period on the due date listed or given in class/lab. Late submittals will be accepted but there will be a 20% deduction if they are not turned in at the begging of the lab period, there will be a 20% deduction for every school day that the submittal is late.
- **Attendance and Participation:**
Punctuality, class attendance, participation and preparation are a reflection of your professionalism. You will be required to attend the lecture or lab for which you are registered unless prior arrangements are made with the instructor.
- **Policy on Plagiarism and/or Cheating**
Measures will be taken in keeping with university policy regarding academic dishonesty.

CON 380

Spanish for Construction

Course Outline/ Schedule

Session One: Introduction

- Class Objectives Discussion
- Review Syllabus and Outline
- Spanish Pronunciation
- General Exchanges and Courtesies
- Assignment: Listen to Sections I & II of your CD

Session Two: Communication Strategies

- Language and Communication Issues in the Workplace
- Communication Strategies
- Numbers Review
- Assignment: Listen to Sections III & IV of your CD
- Assignment: Measurements used in Construction

Session Three: Complementing Employees

- Demographics
- Complementing Employees
- Assignment: Listen to Section V of your CD
- Assignment: Interview a Hispanic worker

Session Four: Employment Issues

- Labor in Latin America
- Employment Issues
- Assignment: Listen to Section VI of your CD
- Assignment: 3"x%" Flashcards of PPE

Session Five: Time and Work Schedule Issues

- Cultural Tips
- Time and Work Schedule Issues
- Assignment: Listen to Section VII of your CD

Session Six: Oral Exam #1

- Oral Exam #1 administered

Session Seven: Medical Emergencies

- Hispanic Idiosyncrasy
- Medical Emergencies
- Assignment: Listen to Section VIII of your CD

Session Eight: Safety Issues

- Safety Issues
- Assignment: Listen to Section IX of your CD

Session Nine: Construction Safety in Latin America

- Construction Safety in Latin America
- OSHA Assignment

Session Ten: Safety Issues Cont.

- Accident Rates Among Minorities
- Safety Issues
- Assignment: Listen to Section IX of your CD

Session Eleven: Control and Command for Site Supervision

- Hispanic Surnames
- Control and Command for Site Supervision
- Assignment: Listen to Section X of your CD

Session Twelve: Oral Exam #2

- Oral Exam #2 administered

Session Thirteen: General Construction Commands

- Training Minority Populations
- General Construction Commands
- Assignment: Listen to Section XI of your CD
- Final Project Distributed: Develop a training program for either Spanish or Non-Spanish speakers

Session Fourteen: Other Construction Commands

- Immigration Issues
- Other Construction Commands
- Assignment: Listen to Section XII of your CD

Session Fifteen: Overcoming the Language and Communication Barrier in the Jobsite

- Guest Speaker

Session Sixteen: Final Project Due

- Final Project Presentation
- Discussion

Session Seventeen: Oral Final Exam

- Oral Final Exam Administered
- Schedule Subject to Change

VITA

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