

high. One of the important factors in the global construction industry is an in-depth understanding of the local environment (Kangari & Lucas, 1997). The project personnel must have a broader and deeper professional training than that is required to perform the similar works in the familiar home environment (Choudhury, 1989). Challenges that managers face abroad are substantially greater than what they come across in the domestic arena. Failure rates for expatriates in lodging industry are roughly reported to be 30 per cent, mainly attributed to a lack of comprehensive cross-cultural training (Shay & Tracey, 1997). Literature indicates that socio-cultural mishaps affect the productivity of project personal engaged in the construction of international projects (Dadfar & Gustavsson, 1993). In order to help the project personnel toward appropriate, sensitive, and consistent behavior in their human interactions, most of the global corporations provide some cross-cultural training to their expatriates (Aschkenasy, 1997; Harris & Moran, 1993). It is, however, not evident from existing literature the extent of training provided by the international construction companies for their personnel slated for overseas assignments. One study done in the early 1980's found that only about 33 percent of the US international construction firms provide any pre-departure cross-cultural training to their expatriates (Maloney, 1982).

Issues related to cross-cultural training include physical, social, religious, linguistic, political, economic, and technological environments of the host country. While an exposure to all these issues may be important for the expatriate managers for successful completion of their assignments, it may not be possible to provide training encompassing the wide range of factors because of time constraint. Priorities may vary according to the nature of job to be performed. Professionals hired for developing health and safety programs in foreign countries, for example, are required to go through a language program on a priority basis (Petreycik, 1994). The objective of this study is to identify the factors perceived to be important by the US international construction companies with reference to overall cross-cultural training of their overseas project personnel and to find out the effects of these factors on the productivity of the project personnel.

## **METHODOLOGY**

### *Study Population*

The study population consists of a sample of 35 US international construction companies currently working in an international environment. The entities under study are the individual US international construction companies represented either by the Chief Executive Officers or their representatives.

### *Data Collection Procedure*

A survey instrument was prepared to collect the data. It was mailed to a total number of 80 randomly selected US international construction contractors. The list of the contractors was obtained from the ENR (1997) and the International Construction Division of the Associated General Contractors of America. The number of responses received was 35, the rate of response being 43.75 per cent.



## *Variables and their Operationalization*

### Productivity (*PRODUCT*)

It is the reported importance of overall cross-cultural training on the perceived productivity of the project personnel. It was operationalized using a single-item measure on a seven-point Leikert scale.

### Physical Environment (*ENVIRON*)

It is the reported importance of the knowledge of the physical environment of the overseas country on the perceived productivity of the project personnel. It was operationalized using a single-item measure on a seven-point Leikert scale.

### Indigenous Technology (*TECHNLGY*)

It is the reported importance of the knowledge of the indigenous construction technology of the overseas country on the perceived productivity of the project personnel. It was operationalized using a single-item measure on a seven-point Leikert scale.

### Language (*LANGUAGE*)

It is the reported importance of the knowledge of the native language of the overseas country on the perceived productivity of the project personnel. It was operationalized using a single-item measure on a seven-point Leikert scale.

### Political Environment (*POLITICS*)

It is the reported importance of the knowledge of the political environment of the overseas country on the perceived productivity of the project personnel. It was operationalized using a single-item measure on a seven-point Leikert scale.

### Economic Environment (*ECONOMIC*)

It is the reported importance of the knowledge of the economic conditions of the overseas country on the perceived productivity of the project personnel. It was operationalized using a single-item measure on a seven-point Leikert scale.

### Labor (*LABOR*)

It is the reported importance of the knowledge of skilled, semi-skilled, and ordinary construction labor forces of the overseas country on the perceived productivity of the project personnel. It was operationalized using a single-item measure on a seven-point Leikert scale.

### Social Environment (*SOCIAL*)

It is the reported importance of the knowledge of the social environment of the overseas country on the perceived productivity of the project personnel. It was operationalized using a single-item measure on a seven-point Likert scale.

## RESULTS

Extensive use of information technology has been made for analyzing the data obtained for the study. Statistical Package for the Social Sciences (SPSS) program was utilized for processing the data. A multiple regression analysis was performed in order to ascertain the relationship between overall cross-cultural training and the factors that are perceived to be important with respect to productivity of the project personnel engaged in international construction. Regression analysis is a modeling technique for identifying a function that describes the relationship between a dependent variable and one or more independent variables. The following model was used for the analysis:

$$PRODUCT = \beta_0 + \beta_1 ENVIRON + \beta_1 TECHNLOGY + \beta_2 LANGUAGE + \beta_3 POLITICS + \beta_4 ECONOMIC + \beta_5 LABOR + \beta_6 SOCIAL + e \quad (1)$$

where  $\beta_0$  = Intercept

$\beta_1, \beta_2$ , etc. = regression coefficients, and

$e$  = error term.

Results of the analysis are shown in Table 1.

Based on the results of the analysis, the regression equation can be written as follows:

$$PRODUCT = -0.05 + 0.15*ENVIRON + 0.16*TECHNLOGY + 0.22*LANGUAGE + 0.07*POLITICS + 0.17*ECONOMIC + 0.20*LABOR + 0.11*SOCIAL \quad (2)$$

The F-value of the model used for the multiple regression analysis was found to be statistically significant at the 0.0001 level. The F statistic basically tests how well the model, as a whole, accounts for the dependent variable's behavior. The predictive efficacy of the model was found to be moderately high with an  $R^2$  of 0.76 and an adjusted  $R^2$  of 0.75.  $R^2$  value is the coefficient of determination of the model. It measures how much variation in the dependent variable can be accounted for by the model. The larger the value of  $R^2$ , the better the fit of the model, and the higher is its predictive efficacy.

The results indicated that the knowledge of physical environment of the country where the construction project is located was related to the productivity of the project personnel at the level of significance of 0.1—0.0786 to be exact. The knowledge of indigenous construction technology, language, economic environment, and labor conditions, and social environment of the country were related to the productivity of the project personnel at the levels of significance of 0.0036, 0.0001, 0.0016, and 0.0007 respectively. The findings suggest that the US international construction contractors perceive these factors as important enough to be included in the cross-cultural training curriculum of their project personnel recruited for overseas projects in order to increase the productivity of their project personnel.

Table 1: Multiple Regression Analysis of TRAINING

Variable	Intercept	Regression Coefficient	T	p> T	Critical Value of  T
Intercept	-0.50		-1.13	0.2616	1.29
ENVIRON		0.15	1.78	0.0786	
TECHNLGY		0.16	2.98	0.0036	
LANGUAGE		0.22	4.62	0.0001	
POLITICS		0.07	1.19	0.2341	
ECONOMIC		0.18	3.24	0.0016	
LABOR		0.20	3.49	0.0007	
SOCIAL		0.11	1.19	0.2369	
Model F = 48.49	p>F = 0.0001	Critical Value of F = 2.48	Model R <sup>2</sup> = 0.76	Adjusted R <sup>2</sup> = 0.75	

## DISCUSSION

It can be concluded from the results of the study that a broad spectrum of issues pertinent to a host country were perceived to be important by the US international contractors in relation to the perceived productivity of their project personnel employed for the implementation of international construction projects. The factors included knowledge of (1) physical environment, (2) indigenous technology, (3) language, (4) economic environment, (5) labor conditions of the host country.

An in-depth understanding of the physical environment of a country is particularly important to a person assigned to implement a project in that region. A successful implementation of any construction project requires detailed information about the climatic, hydrologic, soil, and other environmental conditions of the site of construction.

Indigenous methods may sometimes be more economic for a region where they are applied. Even if they may not be applied for certain types of construction, an analysis of the indigenous methods may provide some direction toward the transfer of traditional skills for the effective use of contemporary methods and materials. Knowledge of this factor is, therefore, essential for making an informed choice of the construction methods to be adopted for a project.

A multiplicity of languages in a work force causes numerous integration problems. It is often difficult to translate exact meanings of concepts, particularly if they are technologically based. One of the most important issues to be addressed while working abroad is the language of the host country (Clark, 1999). Literature (Terpstra & David, 1991) suggests the appointment of bilingual project managers to facilitate communication and expedite progress of works on international projects.

Factors such as economic growth, exchange rate, rate of inflation, etc. of a country are likely to influence international construction. The impact of these factors on construction may vary from country to country. Knowledge of the economic environment will definitely help the contractors to identify the issues they are likely to confront while working abroad and formulate strategies to handle them.

Labor forces are an integral part of any construction project. Proper project planning requires an in-depth knowledge of the work forces available to implement the project. In some countries, human resources are plenty but may not be suitable for doing certain types of construction work; in some others, suitable labor forces may not be available at all (Enhassi & Burgess, 1991). In order to ascertain the quality and quantity of the labor forces available in the host country, it is necessary to analyze this factor before taking up any international construction assignment. A knowledge of the prevailing labor conditions in the host country will help the contractors to implement the projects successfully.

In the light of above discussions, it seems only logical that there would be a positive relationship between the perceived productivity of the project personnel and their knowledge of the physical environment, indigenous technology, language, economic environment, and labor conditions of the country where the project is to be implemented.

The results of the study, however, did not indicate any relationship between the response variable and knowledge of political environment of the host country. All international business ventures are exposed to political risk to a greater or lesser extent; international construction is no exception (Ashley & Bonner, 1987). Political risk is defined as the probability of occurrence of some events that will change the prospects for profitability of a given investment (Haendel, 1979). Detailed information about the prevailing political environment of the host country may provide some guidelines to the contractors for preparation of a political risk analysis framework. Further studies are necessary to investigate the factor.

The other independent variable that did not have a statistically significant relationship with productivity of the project personnel was the knowledge of social environment pertaining to the host country. This was surprising. Literature indicates that an understanding of the social and cultural values prevalent in the host country is essential for successful implementation of international projects. Dadfar & Gustavsson (1993) credit high success rate of the Swedish contractors in Saudi Arabia to their rigorous pre-departure training on the social values of the Arabs. Harris & Moran (1993) suggest that cross-cultural training curriculum should include cognitive studies involving the knowledge of other peoples and their social institutions. Further studies are also necessary to investigate this factor.

The US construction firms prospered for many years on international construction projects. About fifty percent of the values of contract award to the major US international construction companies are accountable to international construction (ENR, 1997). Competition for international projects is increasing. It is coming both from the established international contractors as well as from new contractors from the developing countries. In order to retain and improve the competitive edge of the US construction companies on the global construction market, it is necessary for the companies to recruit professionals with a motivation for foreign assignment and proper training to carry it out successfully. Identifying the issues that are required to be included for cross-cultural training of these professionals in order to improve their productivity would be a right step in this direction.

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