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## Effects of an International Agricultural and Horticultural Internship on the Career and Personal Development of Young Adults

Michael R. Chrisman\* and Frederick S. Ruland\*\*

### Abstract

Interns evaluate their international agricultural and horticultural internship. Topics include: career and personal development, ability to learn and teach, and quality of life during internship. Findings are associated with intern's: gender, native language (English, non-English), type of placement during internship (agriculture, horticulture), present occupation (agriculture, horticulture, other), present work status (owns own business, works for others), and year of internship (1980-1994). Males report greater ability to teach the host. Females report higher quality of life during internship. Agricultural placement interns report greater personal development than horticultural placement interns. Non-native English speakers indicate greater career development than native English speakers. Male non-native English speakers indicate greater learning than female non-native English speakers. Interns now working in agriculture or horticulture and owning their own business report more learning than those now working for others. Personal development during internship has decreased over time for interns presently working in agriculture. Interns now working in other occupations, who had agricultural placements indicate more learning than those who had horticultural placements. Interns not presently working in agricultural or horticultural occupations rate their quality of life during the internship as lower than those now working in agriculture or horticulture. The survey instrument and its analysis are discussed, and the Ohio International Agricultural and Horticultural Intern Program is described.

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### Introduction

Agricultural educators, extension personnel, and other agricultural professionals may be called upon to give advice regarding internship or international internship programs. This advice may be for the development and evaluation of programs, the selection of interns and hosts, or the assessment of program impact on the interns themselves. This impact may be in the areas of career and personal development or the learning and application of new skills and technology.

This paper describes an international internship program, and presents the findings of a survey done in 1995. Interns evaluate their internships relative to: professional career development,

personal development, learning of skills and technology, quality of life during the internship, and the teaching of skills to their host. The internship program is for college students (or recent graduates) between the ages of 18 and 30, who have decided on a career in agriculture or horticulture, and who already have basic training in these areas. Findings in regard to the intern's; gender, type of placement while on the program (agriculture versus horticulture), year of participation (1980 through 1994), English language background (native speaker versus non-native speaker), and present occupation are reported and discussed. Details are presented regarding the development of the survey questionnaire, and the statistical methodology for its analysis.

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## **Program Description**

### ***Program History***

The Ohio International Agricultural and Horticultural Intern Program (OIAHIP) began in 1979 at The Ohio State University in Columbus, Ohio. More than 3,000 interns from 54 countries have participated in the program. International students have been placed in 40 of the 50 United States.

### ***Program Objectives***

The primary purposes of an internship are education (Newell and Will, 1951), and the opportunity to practice what has been learned in prior study (Bergevin and McKinley, 1964). The OIAHIP objectives are broad, but focus on international professional career development in agriculture and horticulture. The program promotes the interns' personal and cross-cultural development, international business experiences, and international contacts.

### ***Program Administrative Activities***

To attract international interns, the OIAHIP cooperates with universities, colleges, foundations, and young farmer organizations abroad. The OIAHIP locates and evaluates American hosts with the assistance of extension agents, agricultural professors, and agribusiness leaders. Interns and hosts are matched according to the intern's area of interest. The OIAHIP staff prepares agreements, and arranges for visas, and insurance. Orientation for hosts and interns is provided, as well as the monitoring of their on-going relationship (Hanson, 1984). Scholarships are also awarded and administered by OIAHIP.

### ***Program Placement Areas***

The internship program is divided into two placement categories: agriculture, and horticulture. Within the agricultural category, the most common interest areas are: livestock, dairy, horses, cropping and farm mechanics. Within the horticultural category the most common interest areas are: nursery and greenhouse operation, commercial flower production, vegetable production, turf grass management, and orchard and viticulture.

### ***Program Internship Timing***

The internship usually takes place between an intern's second and third year of college. The length of the internship is from three months to

18 months, depending upon the specific interest of the intern. The goal is for the intern to obtain a comprehensive view and practical experience through a growing cycle, or operational season.

## **Interns**

### ***Interns – Personal Characteristics***

The interns are unmarried, and have practical agricultural or horticultural experience. They are screened in their home countries relative to an interest in agriculture or horticulture as a future career and proficiency in the host country's language. Females currently represent 20 percent of the interns.

### ***Interns – Reasons for Participation***

For some interns, an internship is required for completing their academic degree. An internship is a way to partially fund the intern's education. Interns can learn from the experience and supervision of practicing professionals (Newell and Will, 1951). Often interns desire practical experience with different crops under different climatic conditions. Interns may be interested in foreign equipment and technology. Often they want to improve their language skills, travel, make international business connections, and improve their employment possibilities when they return home (Jones, 1993).

### ***Interns – Home Countries***

Interns in the OIAHIP come from: Argentina, Australia, Austria, Belgium, Botswana, Brazil, Bulgaria, Cameroon, Canada, Chile, China, Colombia, Czech Republic, Denmark, Dominican Republic, Estonia, Finland, France, Gambia, Germany, Greece, Hungary, Indonesia, Ireland, Israel, Italy, Japan, Kenya, Latvia, Lebanon, Lithuania, Mexico, Netherlands, New Zealand, Nigeria, Norway, Pakistan, Peru, Poland, Portugal, Romania, Russia, Slovakia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Thailand, Ukraine, United Kingdom, United States, Yugoslavia, and Zimbabwe.

## **Hosts**

### ***Hosts – Personal Characteristics***

Most hosts are specialized in their agricultural or horticultural operations. Hosts are suggested by agricultural educators, extension agents, agribusiness leaders, OIAHIP staff, and sometimes by an intern. The host must have the potential for

being a good trainer and the ability to provide housing for the intern. As the program has now been in operation for 20 years, some former interns are now participating as hosts.

### ***Hosts – Reasons for Participation***

The intern has skills useful to the host. The OIAHIP host is involved in the reviewing of the intern's qualifications; therefore, the host can expect productive assistance from an educated and interested intern. The intern has made an investment to travel to the host's country and is interested in creating a favorable impression (Ockerman and Plimpton, 1978). The host can gain insight into international agricultural and horticultural practices. The host also realizes that it is possible to make valuable international business connections and friendships via the intern. Having had a successful intern in the past is of considerable importance to the host's participation.

## **Survey**

### ***Survey Overview***

In 1995, the OIAHIP desired to conduct a long-term evaluation of the program's first 15 years of operation. Moore (1967) emphasizes that there are at least three distinct parties to an internship program. He indicates, however, that as the intern and host are transient, it is essential that the more permanent member, that is the administrator of the program, consider the expectations of all parties. To monitor these expectations the OIAHIP has required regular reports from the hosts and interns regarding current training activities, program operation, and final satisfaction upon completion of the internship. This survey was, in part, an attempt to see if the expectations of all parties to the program had been fulfilled – in the opinion of the intern.

Among the reasons for conducting a program evaluation according to the Web document of the United States Department of Education (1998) are:

- To determine the effectiveness of programs for participants, and
- To document that program objectives have been met.

### ***Specific OIAHIP Survey Objectives***

In accordance with the above reasons, the OIAHIP wished to determine whether the interns felt that:

- Their career development (opportunities) had been improved,
- They had achieved personal growth (maturity, self-understanding),
- They had learned (and/or taught) useful technical skills, and
- They were satisfied with the quality of life (living and training conditions) during their internship.

The OIAHIP also wished to establish baseline measures of the above responses, and determine what changes/trends had occurred over time (1980 through 1994). It was hoped that the analysis of the survey data would reveal any important program differences relative to the intern's gender, native language, and type of placement.

A mailed questionnaire was chosen as the most practical method for obtaining the above information. However, due to the age of the address list (some addresses were up to 15 years old) it was recognized that the response rate would be low.

## **Questionnaire**

### ***Questionnaire Development***

A draft questionnaire was prepared by the OIAHIP staff. Items incorporated concepts identified by Jones (1993) as similar and dissimilar among interns involved in international agricultural experiences. The items covered the teaching and learning of skills, personal growth, and professional career growth opportunities. The draft questionnaire was reviewed by three individuals familiar with the objectives of the survey. These reviewers had survey experience, agricultural backgrounds, international experience, internship experience, foreign language experience, and were knowledgeable regarding the speaking of English as a second/alternative language.

The resulting questionnaire had 20 Likert type items. A 10 point scale was chosen to reduce the number of cases in which respondents insert their own additional midpoint values on the scale, for example, 4.5. Among the 20 items, 17 had the same meaning across countries and across languages for native English speakers and non-native English speakers. (Readers interested in details of the questionnaire may contact the authors.)

### **Questionnaire Mailing and Returns**

In the spring of 1995, the questionnaire was mailed to 1803 former interns participating in the program from 1980 through 1994. The total number of questionnaires returned was 360, for a response rate of 20 percent. Of the 360, there were 326 filled-out completely, of which 305 were from International interns.

### **Factor Analysis Overview**

A factor analysis of the 17 "same meaning" items was performed to explore for underlying factor (sub-scale) structure (see Factor Analysis Details below). The following five factors having interpretable meanings relative to the objectives of the study were extracted:

- *Professional Career Development Factor*  
This factor included 6 items. These items concerned motivation to establish and develop a career and to be competitive in that field.
- *Personal Development Factor*  
This factor included 4 items. These items were concerned with self-discovery and maturity.
- *Learning of Skills and Technology Factor*  
This factor included 3 items. The items were concerned with acquisition of technical skills and the ability to apply them.
- *Quality of Life during the Internship Factor*  
This factor included 3 items. These items were concerned with work and living conditions during the internship.
- *Teaching of Skills and Technology to the Host Factor*  
This "factor" consisted of a single item. This item dealt with the teaching of technological skills to the intern's host.

### **Factor Score (Sub-Scale) Estimates**

An approach recommended by Cattell (as cited in Rummel 1970, pp. 441) calls for the summation of the group of items to represent the factor. The advantage of this approach is in the ease of communication and interpretation of the results to the user of the information. Rummel (1970, pp. 443) comments that exact factor scores are difficult to reproduce and therefore often remain specific to only one study.

### **Questionnaire Validity**

The experts who participated in the review and development of the questionnaire considered that the items adequately sampled the domain of the survey objectives and would provide for content validity.

### **Questionnaire Reliability**

Estimates of reliability were obtained using Cronbach's alpha for each of the four multiple item sub-scales: Professional Career Development = .87, Personal Development = .73, Learning of Skills and Technology = .74, and Quality of Life during the Internship = .74. (These estimates were based on 326 cases.)

### **Factor Analysis Details**

Alpha factor analysis, a method developed by Kaiser and Caffrey (as cited in Rummel 1970, pp. 130), a variant of common factor analysis, was utilized. The alpha factor analysis model has desirable properties relative to the generalizability of the instrument items to the universe of possible items, that is maximum correlation with those items. Alpha factor analysis iterates the common factors and communalities (having squared multiple correlations as starting values) until the communalities converge to unity (Rummel, 1970, pp. 160). With alpha factor analysis, the extraction of all factors with eigenvalues greater than unity enables any common factors existing in the universe of content to be retained in the solution. (Rummel, 1970, pp. 130-132). An oblique rotation, Promax, was utilized for the interpretability of the resulting factors. Statistical software from the SAS Institute (Release 6.08) was used to perform the factor analysis.

### **Statistical Analysis**

#### **Target/Sample**

The target population for this descriptive study was interns who participated in the program between 1980 and 1994. As a census of all past interns (1980 through 1994) was attempted, the resulting data (360 returned questionnaires) do not constitute a random sample. It is hoped however, that these data are representative of the past interns (see Addressing Sample "Representivity," later in this paper). The statistical analyses used only the 305 questionnaires from International interns being hosted in the US.

#### **Significance Levels**

The level chosen for statistical significance was 0.05. Practical levels of "importance" were also chosen: a mean difference of 0.5 units or more for "important" differences, and a 1.0 unit or more change across the 15 years, for "important" trends.

**Analysis of Variance**

Analysis of variance was performed on the five sub-scales. The independent variables (predictors) were:

- Language (native English speaker, non-native English speaker),
- Gender,
- Type of placement during internship (agriculture, horticulture),
- Present occupation (agriculture, horticulture, other),
- Present work status (owns own business, works for others), and
- Year of participation.

Country of intern's origin was included in the model as a blocking factor for all effects except language. Country within language (i.e., English, non-English), was used to estimate the error term for testing the effect of language. Thirty countries were represented in the returned surveys. Year of participation was treated as a covariate.

**Modeling**

The initial "full" model for each analysis consisted of all six main effects (predictors) plus all possible two-way interactions among the predictors. The quadratic term of the covariate was also included in the model. Three-way and higher interactions were not considered due to small (or missing) cell size counts.

A backwards elimination approach, analogous to backwards elimination in stepwise regression (Draper and Smith, 1966, pp. 167) was used to fit the models. After running the "full" model mentioned above, the interaction (or quadratic) term with the largest probability (least significance, but  $> 0.05$ ) was removed. Main effects were always left in the model and were not considered for removal. The final models for the five sub-scales are presented in the Appendix.

**Professional Career Development – Statistical Results****Relative to Native Language and Present Occupation:**

There was a significant ( $P < 0.02$ ) interaction between native language and present occupation relative to their association with professional career development scores. Non-native English speakers rated their professional career development higher than native English speakers with the exception of native English speakers working in "horticulture." For present occupation "other," this difference (1.35 units) is statistically significant ( $P < 0.02$ ). Moreover, native English speakers working in present occupation "other" rated their career development significantly ( $P < 0.02$ ) below the other five group combinations.

**Relative to Present Occupation and Year of Internship:**

Present occupation interacts significantly ( $P < 0.007$ ) with year of internship relative to professional career development scores. While the trends for present occupations "agriculture" and "other" change by more than 1 unit (the chosen "important" change) across the 15 years, only the slope (+0.111) for present occupation "other" is significantly ( $P < 0.02$ ) different from zero. The professional career development scores for present occupation "other" increased by approximately 1.6 units between 1980 and 1994.

**Personal Development – Statistical Results****Relative to Type of Placement:**

There was a significant ( $P < 0.03$ ) difference of 0.55 units in personal development mean scores between interns having an "agriculture" placement and those having a "horticultural" placement (see Table 1).

**Table 1. Personal Development Scores by Type of Placement**

Type of Placement	Mean	Standard Error	Number of Observations
Agriculture	8.64	0.228	149
Horticulture	8.09	0.232	156

Means are significantly different ( $P < 0.03$ ).

**Relative to Present Occupation and Year of Internship:**

Present occupation interacts significantly ( $P < 0.03$ ) with year of internship relative to their association with personal development. For those interns having a present occupation in "agriculture," there is a significant ( $P < 0.02$ ) decrease in personal development scores across the years of internship. The decrease over the 15 year period is 1.1 units or approximately  $-0.081$  units per year.

**Relative to Present Work Status:**

Present work status (owns own business, versus works for others) was associated with a significant ( $P < 0.03$ ) difference of (0.45 units) in personal development score (see Table 2). This difference, however, was less than the 0.5 units chosen as an "important" difference.

**Learning of Skills and Technology – Statistical Results**

**Relative to Language and Gender:**

There was a significant interaction ( $P < 0.04$ ) between language and gender in their association with learning of skills and technology. There was no difference between the scores of English native speaking males and females. However, for non-native English speaking interns, males had scores 0.88 units higher than females ( $P < 0.004$ ).

**Relative to Type of Placement and Present Occupation:**

There was a significant interaction ( $P < 0.04$ ) between type of placement and present occupation in their association with learning of

skills and technology. The scores did not differ significantly by type of placement for those interns with a present occupation in "agriculture" or "horticulture." However, for those interns with a present occupation of "other," those with a "horticulture" placement scored 1.55 units less than those with an "agriculture" placement ( $P < 0.0001$ ). Moreover, type of placement "horticulture" in combination with present occupation "other" is statistically ( $P < 0.02$ ) below the other five group combinations.

**Relative to Present Work Status and Present Occupation:**

There was a significant interaction ( $P < 0.02$ ) between present work status and present occupation relative to their association with learned skills and technology. Interns with present occupations in "agriculture" or "horticulture" who at the same time had a present work status of "owns their own business" had scores significantly ( $P < 0.05$ ) higher than the other four group combinations. The scores for those who "work for someone else," did not differ relative to present occupation. The lowest scoring group – those with work status "owned their own business" and a present occupation of "other" – did not differ significantly from those who "worked for someone else."

**Quality of Life during the Internship – Statistical Results**

**Relative to Gender:**

Females rated their quality of life during the internship significantly ( $P < 0.02$ ) higher (0.63 units) than the rating given by the males (see Table 3).

**Table 2. Personal Development Scores by Present Work Status**

Present Work Status	Mean	Standard Error	Number of Observations
Owns Own Business	8.59	0.228	101
Works for Someone	8.14	0.193	204

Means are significantly different ( $P < 0.03$ ).

**Table 3. Quality of Life During the Internship by Gender**

Gender	Mean	Standard Error	Number of Observations
Males	7.34	0.235	241
Females	7.97	0.296	64

Means are significantly different ( $P < 0.02$ ).

**Relative to Present Occupation:**

Interns presently working in "other" occupations, rated their quality of life during the internship as significantly ( $P < 0.03$ ) lower (by at least 0.61 units) than the ratings reported by interns presently working in "agricultural" or "horticultural" (see Table 4). There was no significant difference between the mean scores for present occupations of "agriculture" and "horticulture."

**Teaching of Skills and Technology to the Host – Statistical Results****Relative to Gender**

Male ratings were significantly ( $P < 0.03$ ) higher by 0.77 units than female ratings in the teaching of skills and technology to the host (see Table 5).

**Addressing Sample "Representivity"**

To address the issue of the data being non-representative of the population, an attempt was made at the time of the analysis to contact former non-respondents. Completed questionnaires were obtained from 20 interns at the time this paper was being completed. In every comparison, the scores obtained from the non-respondents exceeded the scores for the interns used in the analyses.

**Discussion in Regard to Central Questions**

This study was an attempt to uncover trends, discover differences, and provide answers and recommendations for agricultural professionals faced with questions and decisions regarding interns and internships. The reader should keep in mind that the nature of the study and its

analyses produce predictive models, rather than causal models. Therefore, interpretations in terms of "causes" are not appropriate. However, the authors would like to present possible views concerning observed associations involving important issues.

*- What if the intern does not stay in the agricultural or horticultural field after their internship? Does the intern still consider their internship of value?*

Relative to professional career development, for those interns now working in "other" present occupations, the trend has been one of increasingly higher scores over the years 1980 to 1994. The authors are at a loss to explain this association, unless these interns have benefited from basic career development skills common to many occupations. These interns may also be capitalizing on career development opportunities related to their language skills and international experiences.

This same phenomenon of increasing scores since 1980 is also evident in regard to the personal development rating of these interns working in "other" present occupations. As to why the scores are increasing for present occupation "other" (although not significant at the 0.05 level) and decreasing or essentially remaining the same for present occupations "agriculture" and "horticulture" respectively, is not clear to the authors.

Relative to the learning of skills and technology, those interns working in "other" present occupations were associated with lower ratings only if they had had a type of placement in

**Table 4. Quality of Life during the Internship by Present Occupation**

Present Occupation	Mean	Standard Error	Number of Observations
Agriculture	7.83 a	0.303	92
Horticulture	7.92 a	0.305	123
Other	7.22 b	0.286	90

Means with the same letter are not significantly different at the 0.05 level.

**Table 5. Teaching of Skills and Technology to the Host by Gender**

Gender	Mean	Standard Error	Number of Observations
Males	4.35	0.330	241
Females	3.58	0.416	64

Means are significantly different ( $P < 0.03$ ).

“horticulture.” The authors propose that perhaps the skills learned in the horticultural placement are somewhat less transferable to “other” present occupations.

*- Are there differences in ratings relative to whether the intern speaks English as a native language or as a non-native language?*

Higher ratings were given for professional development by non-native speakers of English presently working in “agriculture” or “other” occupations, than were given by native English speakers. For interns presently working in “horticulture” this difference in ratings relative to language was not apparent. The authors reason that the knowledge of an additional language would be associated with higher career development scores. The authors speculate that the similarity of the ratings when the present occupation is “horticulture” relates to the similarity of professional career development opportunities in horticulture – regardless of country and language.

*- Are differences in ratings associated with gender?*

In the learning of skills and technology, male non-native English speakers indicated greater learning than female non-native English speakers. There were no differences associated with gender for the native English speakers.

In the area of the teaching of skills and technology to their host, males reported higher teaching scores than females. The authors do not have an explanation for these differences.

Females indicated that their quality of life during the internship was higher (see Table 3). The quality of life score incorporates questions involving: maintenance allowance, work conditions, and living conditions. The authors will investigate this gender difference in a future study, but feel that there may be at least partial explanation for the females’ higher scores. Females are somewhat newer to the internship program, and hosts usually have fewer female interns. The combination of these two factors may have resulted in newer and more private living conditions for the female interns.

*- Are there differences with regard to type of placement, i.e., agriculture versus horticulture?*

The only difference associated with type of

placement was in the area of the learning of skills and technology. Those interns in the “horticulture” placement who had a present occupation of “other,” rated their learning during the internship as lower (see question 1 above.)

*- Does there seem to be any one group of interns associated with higher ratings during their internship?*

Those interns who are presently working in horticulture have rated their professional career development as high or higher than any other group. They rated personal development increasingly higher (although not significantly) with each passing year. This same group has also rated their learning of skills and technology as high or higher than any other group. Finally, those presently working in “horticulture” also reported the highest scores for quality of life during the internship (see Table 4). It seems to the authors that those presently working in horticulture are in an area ideally suited to capitalize on the “international” benefits of their internship experience, and that this is being reflected in their scores.

### **Follow-up Study**

The Ohio International Agricultural and Horticultural Intern Program hopes to conduct a follow-up study in the future. Using the baselines from the present study, it will be possible to better monitor changes and trends. The importance of the association of ratings with the intern’s present occupation will be investigated; this association will also be statistically controlled for in similar analyses. Particular attention will be given to those associations in the present study for which the authors had no explanation.

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## Appendix.

### Analysis of Variance Tables

#### Final Model for Professional Career Development

Source	d.f.	M.S.	F	Significance
Language	1	6.850	2.23	0.146
Country(Language)	28	3.069		
Gender	1	2.066	0.80	0.373
Type of Placement	1	9.149	3.53	0.061
Present Occupation	2	6.145	2.37	0.095
Work Status	1	0.916	0.35	0.552
Year of Internship	1	1.550	0.60	0.440
Language x Present Occupation	2	10.870	4.20	0.016
Year of Internship x Present Occupation	2	13.297	5.14	0.007
Error	265	2.588		

*R-Square = 0.22 (P < 0.001)*

#### Final Model for Personal Development

Source	d.f.	M.S.	F	Significance
Language	1	0.602	0.27	0.605
Country(Language)	28	2.201		
Gender	1	4.563	2.77	0.097
Type of Placement	1	7.864	4.77	0.030
Present Occupation	2	10.024	6.08	0.003
Work Status	1	10.856	6.58	0.011
Year of Internship	1	0.250	0.15	0.697
Year of Internship x Present Occupation	2	6.391	3.87	0.022
Error	267	1.649		

*R-Square = 0.18 (P < 0.02)*

**Appendix (continued)**

**Final Model for Learning of Skills and Technology**

Source	d.f.	M.S.	F	Significance
Language	1	0.209	0.09	0.767
Country(Language)	28	2.333		
Gender	1	6.210	3.05	0.082
Type of Placement	1	4.395	2.16	0.143
Present Occupation	2	10.671	5.24	0.006
Work Status	1	5.949	2.92	0.089
Year of Internship	1	0.152	0.07	0.785
Language x Gender	1	9.610	4.72	0.031
Type of Placement x Present Occupation	2	7.231	3.55	0.030
Present Occupation x Work Status	2	9.185	4.51	0.012
Error	264	2.037		

*R-Square = 0.26 (P < 0.0001)*

**Final Model for Quality of Life during the Internship**

Source	d.f.	M.S.	F	Significance
Language	1	7.027	1.69	0.204
Country(Language)	28	4.147		
Gender	1	15.710	6.24	0.013
Type of Placement	1	0.620	0.25	0.620
Present Occupation	2	10.882	4.32	0.014
Work Status	1	1.250	0.50	0.482
Year of Internship	1	2.571	1.02	0.313
Error	269	2.520		

*R-Square = 0.18 (P < 0.009)*

**Final Model for Teaching of Skills to Host**

Source	d.f.	M.S.	F	Significance
Language	1	0.183	0.02	0.883
Country(Language)	28	8.354		
Gender	1	23.729	4.79	0.030
Type of Placement	1	1.112	0.22	0.636
Present Occupation	2	3.892	0.79	0.457
Work Status	1	0.065	0.01	0.909
Year of Internship	1	2.739	0.55	0.458
Error	269	4.957		

*R-Square = 0.17 (P < 0.024)*