



Gender and educational influences of job mismatch: The Case of Forestry and Environmental Science Graduates of a Philippine State University

Michael Arie Padang Medina

Department of Environmental Science, College of Forestry and Environmental Science, Central Mindanao University, Bukidnon, Philippines

Address for correspondence:

Michael Arie Padang Medina, Department of Environmental Science, College of Forestry and Environmental Science, Central Mindanao University, Bukidnon, Philippines.
E-mail: mapmedina@cmu.edu.ph

Received: November 02, 2014

Accepted: November 25, 2014

Published: January 11, 2015

ABSTRACT

Aim: In order to come up with viable curricular programs and policies for the BS Forestry and BS Environmental Science programs of Central Mindanao University-College of Forestry and Environmental Science (CMU-CFES), a study on the extent of the occurrence of job mismatch among its graduates as well as the factors associated with it was conducted. **Materials and Methods:** An online survey questionnaire was administered to CMU-CFES graduates of school year 2001 to 2011 from December 18, 2012 to May 15, 2013. Out of the 470 graduates from the inclusive school years, 106 graduates answered the questionnaire with substantially complete responses needed for the study. Logistic regression analysis was done in order to test the factors that could influence the occurrence of job mismatch among the respondents. **Results:** Gender and scholarship were found to significantly influence job mismatch among the respondents. Female graduates have a high probability of job mismatch than male graduates. Likewise, scholars have lesser probability of job mismatch than non-scholars. **Conclusion:** The substantial case of job mismatch observed among the respondents urges a revisit of the curricular programs as well as the provision of job searching services to graduates.

KEY WORDS: Higher education, job mismatch, logistic regression, Philippines

INTRODUCTION

It has been observed that the Philippine educational system has been producing graduates that create a mismatch with the needs of industry. This leads to a majority of educated workers with jobs unrelated to what they train for [1]. This type of phenomenon called job mismatch is considered as one of the major types of underemployment in the country [2]. Based on data from 1976 to 2000, there is a 23% decrease in the proportion of graduates practicing their professions in the Philippines [3]. This clearly indicates that majority of college graduates in the country are underutilized in the employment market.

In a study by Robst [4] job mismatch is influenced by the quality of the college they graduated from. In the Philippines, high quality jobs are held by graduates coming from the leading public (University of the Philippines and other State Universities) and private (Ateneo and de La Salle) schools in the country [3]. Consequently, this is also related to the fact that employers tend to favor applicants with higher academic performance [5,6] thus giving more chances for academic achievers to have matching jobs.

Furthermore, the field of study is also shown to be strongly related to job match. Graduates of health sciences and education are more likely to have matching jobs among the 2001 graduates of Canadian universities with the least job matches found among arts and humanities graduates [5]. In the United States, health majors are also highly likely to have matching jobs along with library science majors. English and foreign languages, social sciences, and liberal arts on the other hand are considered as college majors with high likelihood of job mismatch [7]. In the case of the latter, such field of study provides general skills rather than occupation specific skills. Furthermore, university graduates of engineering, natural science and math, and health and welfare were also found to be less likely to have a job mismatch in Spain and Germany [8]. Similar results are also shown in a recent study of German graduates [9].

Presently, studies giving light on the influence of field of study on the occurrence of job mismatch in the Philippines are yet to be conducted. However, it is important to note that in the case of United States and Europe, job mismatch has not increased significantly for the past 20 years [10].

Gender has also been proven to influence the likelihood of job mismatch. For instance, gender gaps are found to be present in all fields of study in Germany [9]. In this particular study, women are more likely to have a job mismatch than men. Same results were also observed in a study done in Kenya [11]. Gender differences in job mismatch is said to be connected with spatial factors [12]. Males tend to seek jobs on a global scale, while females tend to seek jobs at a local scale thereby increasing their chance of job mismatch. In contrast however, gender poses no influence on job mismatch on Canadian graduates [5,13].

In the Philippines, job mismatches are rarely found among women in blue collar jobs as well as in agriculture related fields according to a study in 1977 [14]. The authors explained that this could be because there are relatively few women who graduate on this particular field. It is further noted in the study that there is a high case of women with job mismatches in white collar jobs. However, this particular study, being more than three decades old needs to be verified at the present time. It can be generally observed that several female graduates now come from agriculture related fields including forestry and environmental science.

Presently, there has been a pronounced job mismatch among forestry graduates in the Philippines [15]. On the other hand, there has never been any study in the country relating to the job mismatch among environmental science graduates. Although in other countries, a great demand for environmental professionals is observed [16-18] however, we cannot directly assume that this would be the case in the Philippines.

Thus, in this context, this study was designed to determine the occurrence of job mismatch among the forestry and environmental science graduates of Central Mindanao University (CMU). Furthermore, several determinants will be tested in order to find out if this is related to the cases of job mismatch among the respondents. This will hopefully be beneficial for curriculum and program planning of the university in order to prepare its future graduates in coping up with the demands of the employment market.

The Study Area

CMU is a Level 4 state university situated in Bukidnon, an agricultural province in the Philippines. Formerly established by Americans as an agricultural elementary school in 1910, CMU became a state university by virtue of Republic Act 4498 in 1965. Currently it was awarded by the Commission on Higher Education (CHED) as center of excellence in agriculture, veterinary medicine, and forestry education and center of development in both Mathematics and Biology.

The College of Forestry and Environmental Science (CFES) first offered the BS Forestry (BSF) curriculum in 1964 and recently, the BS Environmental Science curriculum (BSES) in 1997. Both programs are accredited Level III Phase 2 and Level I respectively by the Accrediting Agency of Chartered Colleges and Universities in the Philippines. CFES has been producing graduates to fill up the employment needs of

government agencies, non-government organizations, and private industries specifically in forest and environmental protection and management.

MATERIALS AND METHODS

Data Source

Data used in this study was taken from the 2012 Graduate Tracer Study conducted by the (CMU-CFES). The survey was conducted online from December 18, 2012 to May 15, 2013 using the CHED Graduate Tracer Study Questionnaire. Given the limitations of online surveys, convenience sampling was undertaken specifically of the graduates from 2001 to 2011 from two programs of CMU-CFES: BSF and BSES. After the data gathering, responses from 106 respondents were found to be substantially complete and appropriate for this study. This sample comprises 23% of the 470 graduates of the CFES from 2001 to 2011 from both degree programs.

The Variables

The specific variables used in this study are gender, program graduated from, scholarship, and job mismatch. These variables are part of the graduate tracer study survey questions. Specifically, question No. 5 (Gender), No. 10 (Degree finished at CMU-CFES), No. 12 (Were you awarded scholarship at CMU-CFES?), and No. 29 (Is your first job related to your course in college?) were considered as variables of the study.

The responses for Nos. 12 and 29 were coded for the purpose of the study. The respondents who answered "Yes" in Question No. 12 were considered as ones who enjoyed a scholarship during college, and vice versa. Scholarship in this context is considered as a proxy variable for academic achievement. Furthermore, respondents who answered "No" in Question No. 29 were considered as ones who experienced a job mismatch on their initial jobs and vice versa.

Gender, program graduated from, and scholarship (academic achievement) are considered as independent variables. Consequently, Job Mismatch is considered as the dependent variable in this study.

Data Analysis

In the descriptive part of the study, frequency counts and percentage were used in analyzing the data. Furthermore, logistic regression analysis was employed in testing for the relationships between the independent variables (gender, degree, academic achievement) and the dependent variable (job mismatch).

RESULTS

Characteristics of the Respondents

Gender: As shown in Table 1, there are more females (62%) than males (38%) among the 106 respondents of the study. The

Table 1: Characteristics of the respondents

Characteristics	Frequency (<i>n</i> =106)	Percentage
Gender		
Male	40	38
Female	66	62
Degree		
BSF	40	38
BSES	66	62
Scholarship		
With scholarship	31	29
Without scholarship	75	71
Relatedness of job to degree		
Related	61	58
Not related	45	42

BSF: BS Forestry, BSES: BS Environmental Science

above values are a bit congruent to the data retrieved from the College Secretary's Office in which around 55% are females while 45% are males out of the 470 graduates of CFES from 2001 to 2011. Based on this data we can actually consider BSF and BSES programs as becoming more attractive to women. This is a shift from the past trend in the said programs when these professions were dominated mostly by males as previously observed [14].

Degree finished: Table 1 also shows the distribution of the respondents in terms of programs finished from CMU-CFES. As shown, there are more BSES graduates (62%) than BSF graduates (38%) out of the 106 respondents.

Scholarship: As shown in Table 1, 29% of the respondents are beneficiaries of academic scholarship programs as against 71% who are not. The scholarship programs refer to academic scholarships (e.g. University Scholarship, College Scholarship, etc.), government scholarships (e.g. Department of Science and Technology, CHED, etc.) and private scholarships (Philippine Agricultural Resources Research Foundation, Inc.).

Job Mismatch among the Respondents

As shown in Table 1, almost half (42%) of the respondents reported that their initial jobs are not related to their program of study in contrast to 58% who said that their first job is related to their fields. This result presents the harsh reality among the graduates of the CMU-CFES. Although both the BSF and BSES programs are vital given the ongoing crises regarding climate change, pollution, and deforestation, etc., there are still cases wherein forestry and environmental science graduates take jobs which are unrelated to their degree.

Cruz *et al.* (2013) attributes this to the slow adaptation of higher education institutions offering such programs with the demands of the job market for such professions. This leads to the production of ill-prepared graduates for specific jobs in this sector. In the case of declining government demand for forest and environmental professionals, this is attributed to the "rationalization" policy of the Department of Environment and Natural Resources which is geared towards cost cutting measures in terms of its number of personnel [15]. However, recently the

National Greening Program of the country has caused a sudden increase in the demand mostly for forestry graduates in the forest rehabilitation activities of the government, although majority of these are temporary positions until 2016.

The survey question regarding job mismatch however, refers only to their initial jobs. This means that further studies regarding their job mobility which may include moving into a course-related job afterwards should be considered. Furthermore, it should also be noted that the question in the survey regarding job mismatch refers to horizontal mismatch (jobs unrelated to their degree). From the data alone, we cannot reveal if they are either overqualified or under-qualified for the job (also called vertical mismatch).

Factors Affecting Job Mismatch among Respondents

Using logistic regression analysis, a model for explaining the occurrence of job mismatch among the respondents was generated. As shown in Table 2, the probability of having a job mismatch on their first employment is significantly influenced by gender. Based on the negative sign of the original logistic coefficient ($B = -1.498$), males are less likely to have a job mismatch than females. The coefficient is significant at 99% level of confidence based on the Wald statistic. Basing our interpretation on the reciprocal of the exponentiated logistic coefficient [$1/\text{Exp}(B)$], female respondents are 4.54 times more likely to have a job mismatch on their first job than male respondents ($1/0.22 = 4.54$).

Several reasons could be attributed to the above result. One is based on the theory that females have more tendencies to have mismatched jobs because of spatial considerations [12]. Women tend to limit their job search locally (as in the case of single women graduates whose parents hesitate to send them to other places to look for a job) while men have a global perspective in terms of job search thus giving them a higher chance for course-related jobs.

Furthermore, both forestry and environmental science professions are field/outdoor based occupations, thus males are preferred by the specific industries involved. A study conducted more than three decades ago revealed that job mismatch among women is rare in agriculture-related professions (as in the case of forestry and environmental science) considering there are few women who graduated from this particular field during that time [14]. At present however, both programs have attracted both gender almost equally, so it can be expected that job mismatch can be more pronounced among female graduates of the said programs.

On the other hand, respondents who are scholarship beneficiaries have lesser odds of having a job mismatch on their first job than non-scholars ($B = -0.950$). This is significant at 95% level of confidence based on the Wald statistic. Consequently, as the reciprocal of the exponentiated logistic coefficient [$1/\text{Exp}(B)$] suggests, non-scholars are 2.56 times more likely to have a mismatch on their initial employment than scholars ($1/0.39 = 2.56$).

Table 2: Logistic regression results with occurrence of job mismatch as dependent variable

Explanatory variables	B	Wald statistics	P value	Exp (B)	1/Exp (B)
Gender (Male)	-1.498	10.443	0.001**	0.22	4.54
Scholarship	-0.950	3.853	0.050*	0.39	2.56

*Significant at $\alpha=0.05$, **Significant at $\alpha=0.01$

Academic performance has always been considered as an advantage in employment. It is thus expected that graduates with higher grades such as scholars are more favorable to employers. This assumption is revealed in several studies attributing job match with academic performance or good grades [5,6].

Degree finished was not included in the model because it has a non-significant influence on job mismatch. This means that job mismatch among the respondents is not in any way influenced by being a graduate of either the BSF or the BSES program. Literature suggests that the BSF graduates are prone to job mismatch [15,19]. Given this particular result of the study we can infer that likewise, the BSES graduates also has the tendency towards job mismatch although studies affirmatively stated its high demand in the job market abroad [16-18].

DISCUSSIONS

It is found out that there is a substantial case of job mismatch among forestry and environmental science graduates of CMU in terms of the relatedness of their first job with their field of study. However, it should be noted that job mismatch is referred here as pertaining to their first job. Thus, further studies regarding job matching in their employment afterwards should be considered owing to the fact that some may consider their first jobs as temporary.

Furthermore, it is found out that cases of job mismatch among the respondents are more pronounced among female graduates owing either to spatial factors associated with job search as well as the nature of jobs demanded for such graduates which gives priority to male applicants. Moreover, academic performance can be considered as a factor that influences job match among the respondents. In fact, scholars are more favored for course related jobs than non-scholars thus the latter opt to be more flexible by having unmatched jobs.

Given the above circumstances, it is recommended that a more adaptive curriculum be developed which will give equal chances on both genders for course related jobs. It is a known fact that both programs (BSF and BSES) are necessary in order to further society's quest for a more livable environment. However, as the study suggests, graduates of the said programs don't get the job that they expect. Hence, there is a need to revisit the existing curricula for the said programs and align it with the predetermined needs of the employment market.

For a start there is a need to revolutionize the traditional performance standards-based curricula to an outcomes-based

educational system [19]. Graduates of such outcomes-based system will be more attractive to employers because it will directly suit the predetermined needs of the employment market. Another is to intensify the incorporation of enterprise skills within the courses comprising the curriculum. This will lead to graduates willing to venture into the business side of the forestry and environmental science professions such as consultancy or development services.

It is also recommended that job searching activity of the graduates should be augmented by optimizing the existing and future linkages of higher education institutions to include employer-employee matching. In addition to graduates relying individually on their own capability and resources in looking for a job, The College should act as a medium by linking with employers which can offer related jobs to their graduates. Although this has already been practiced by CMU-CFES, a more formal approach is needed by institutionalizing such efforts through the establishment of a College Employment Services Center.

However, the above recommendations, if implemented, would only benefit the university concerned. In general, it will not solve job mismatch at the national level. Such would require policies which include regulating the offering of degree programs which are highly prone to job mismatch and prioritizing programs required by the present employment market. In the case of forestry and environmental science graduates of the country, creation of jobs related to the said programs can be a valid option as a national thrust given the recent global environmental issues and concerns which undeniably needs the expertise of such graduates.

ACKNOWLEDGMENTS

The author would like to thank Central Mindanao University for funding this study.

REFERENCES

1. Sicat GP. Unlimited and abundant labor supply: Econometric and other evidence in Philippine industry (No. 2008, 12). Discussion Paper//School of Economics, University of the Philippines; Available from: <http://www.econstor.eu/bitstream/10419/46633/1/584112165.pdf> [Last Accessed on 2013 Nov 06].
2. National Economic Development Authority (NEDA). Socioeconomic Report: The First Two Years of the Aquino Administration 2010 – 2012. Republic of the Philippines; Available from: <http://www.neda.gov.ph/wp-content/uploads/2013/10/SER2010-2012.pdf>. [Last Accessed on 2013 Nov 06].
3. Orbeta AC. Education, labor market and development: A review of the trends and issues in the Philippines for the past 25 years (No. DP 2002-19). Philippine Institute for Development Studies; 2002. Available from: <http://www.dirp3.pids.gov.ph/ris/dps/pidsdps0219%28rev%29.pdf>. [Last Accessed on 2013 Nov 06].
4. Robst J. College quality and overeducation. *Econ Educ Rev* 1995;14(3):221-8.
5. Boudarbat B, Chernoff V. The Determinants of Education-Job Match among Canadian University Graduates (No. 4513). Institute for the Study of Labor (IZA); Available from: <http://www.ftp.iza.org/dp4513.pdf>. [Last Accessed on 2013 Nov 06].
6. Bertrand-Cloodt D, Cörvers F, Kriechel B, van Thor J. Why do recent graduates enter into flexible jobs? *Dev Econ* 2012;160:157-75.

7. Robst J. Education, college major, and job match: Gender differences in reasons for mismatch. *Educ Econ* 2007;15:159-75.
8. Ortiz L, Kucel A. Do fields of study matter for over-education? The cases of Spain and Germany. *Int J Comp Sociol* 2008;49:305-27.
9. Berlingieri F, Erdsiek D. How relevant is job mismatch for German graduates? ZEW-Centre for European Economic Research Discussion Paper, (12-075). Available from: <http://www.ftp.zew.de/pub/zew-docs/dp/dp12075.pdf>. [Last Accessed on 2013 Nov 06].
10. Groot W, Maassen Van Den Brink H. Overeducation in the labor market: A meta-analysis. *Econ Educ Rev* 2000;19(2):149-58.
11. Vuluku G, Wambugu A, Moyi E. Unemployment and underemployment in Kenya: A gender gap analysis. *Economics* 2013;2:7-16.
12. Frank RH. Why women earn less: The theory and estimation of differential over qualification. *Am Econ Rev* 1978;68:360-73.
13. Yuen J. Job-education match and mismatch: Wage differentials. *Persp Labour Income* 2010;11(4):17-26.
14. Smith PC, Domingo LJ. The social structure of underutilized labor in the Philippines: An application of Hauser's labor utilization framework. *Phillip Rev Econ* 1977;14(2):29-63.
15. Carandang MG, Landicho LD, Andrada RT II, Malabrigo Jr PI, Angeles AM, Oliva AT, *et al.* Demystifying the state of forestry education: Are forestry schools in the Philippines at par with the needs of the times? *Ecosyst Dev J* 2008;1:46-54.
16. Brown AL, Clarke S. Employability of environmental science graduates in Australia. *Environmentalist* 1997;17:45-55.
17. Maguire S, Guyer C. Preparing geography, earth and environmental science (GEES) students for employment in the enterprise culture. *J Geogr Higher Educ* 2004;28:369-79.
18. Thomas I, Lane R, Ribon-Tobon L, May C. Careers in the environment in Australia: Surveying environmental jobs. *Environ Educ Res* 2007;13:97-117.
19. Cruz RV, Bantayan RB, Landicho LD, Bantayan NC. Reformulating agriculture and forestry education in the Philippines: Issues and concerns. *J Dev Sustain Agric* 2013;8:49-62.

© SAGEYA. This is an open access article licensed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/3.0/>) which permits unrestricted, noncommercial use, distribution and reproduction in any medium, provided the work is properly cited.

Source of Support: Nil, Conflict of Interest: None declared.