

Job Satisfaction of Industrial Women Specializing in STEM in The Busan-Ulsan-Gyeongnam Region

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Abstract

A survey was conducted on 300 working women(one woman/company) who specialize in STEM(Science, Technology, Engineering and Mathematics) in the Busan region(south of Korea) to determine their job satisfaction. The overall response of women working in industry is relatively positive although they do experience a certain limit as female workers. The serious difficulties are long work hours and restriction of behavior in consequence of being the minority. Respondents anticipate an increase in number of working women in the STEM field due to the enforcement of women resource policies in Korea. Survey results about career development show that some of the most important factors in professionalism are responsibility, gumption and cooperation. The expectation of promotion is very low. Sexual discrimination is distinctly appearing in wages and promotions. If they decide to quit their job in the midstream, the key reason is in the difficulties of compatibility between home and occupation. Survey results about job satisfaction to work in industry reveal that 31.0% of respondents are satisfied because their job is consistent with their specialty; 30.7% of respondents are working where they wanted. Among respondents who intend to change their job, only 20.7% of respondents wanted to keep their specialties. Two factors involved in the respondents' satisfaction during work are special technical achievement and practical application of their knowledge. But, they are unsatisfied in terms of implementing their leadership.

Keywords: STEM, Woman, Career development, Job satisfaction

1. Introduction

In the 21st century, a nation's competitiveness is said to totally depend upon the knowledge based industry, which can be developed by virtue of science, technology and man power(Drucker, 1993). Korea has experienced a tremendous increase in the number of science and engineering graduates since the 1970s, a time when Korea went through an impressive improvement in economic growth. This conomic growth changed life styles and traditional customs. In particular women's life style has been influenced very strongly. Korean women now reach higher education levels with very diverse specialties, which probably is the cause of the low natality(KNSO, 2007; Ministry

of labor, 2006). According to the demands of society, Korean government policies tend to focus on the fact that managing woman resource power can be a key point for the national economic innovation strategy. Since 2001, the declaration of article 24 has been incorporated in policies for women in science and technology; an example is the opening of the National Institute for Supporting Women in Science and Technology. Due to these efforts, the employment rate of women in science and technology seems to be increasing, although no progress is observed in the quality of employment(Kim, 2006; Ahn 2005). In science and technology, the industrial sector has been recognized as a male-dominated sector. Women face several obstacles like sexual discrimination, social bias and social limit in working and career development. These are reasons why women have difficulty getting high quality employment and also in keeping the job(Park, 2003). Through this survey we expect to obtain fundamental data on working women who

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specialize in STEM(Science, Technology, Engineering and Mathematics). The survey is expected to provide information on the prospect of women employment in the science and technology sector by analysis of their level of adaptation and satisfaction. The results of the survey will be used eventually to establish a suitable curriculum to prepare female students for work in industry.

II. Methods

Surveys have been conducted by preparing a structured questionnaire. Female participants specializing in STEM who have received post-high school education for 2~4 years have been chosen for the survey. 300 participants were randomly selected from 300 companies (one participant/company) in Busan, Ulsan and Changwon(100 companies from each city). The three cities are the most industrialized zone in the southern part of Korea. Questionnaires were distributed and collected by trained researchers of the survey and statistics office in person (Jungum research Co.). All of the 300 questionnaires were returned. Data processing was conducted by editing, coding and punching and statistical analysis was performed using the SPSS program (SPSS Inc., Chicago). Results are considered significant at $p < 0.05$.

III. Results and Discussions

1. General view of STEM specialized women employees in industry

Concerning the prospect of STEM specialized women employment in industry, the results show that 65.7% of respondents showed positive view that women will be employed if they are very competent (50.7%) and enter the industrial sector where women have not launched yet their career(15%). 34.3% of respondents responded negatively and gave reason that it is too hard for women to adapt. The anticipated difficulties women face in a male-dominated industrial sector including the science and engineering domain are shown in <Table 1>. The serious difficulties they face were working hours(long work hours) and restriction of behavior in consequence of being the minority. 75.3% of respondents agreed with social issues that necessitate the enforcing of women employment in a male-dominating industrial sector as STEM based field, but 24.7% of respondents still do not agree with it because they think it is unnecessary (22.7%). As for the reason why women employment have to increase, 49.1% of respondents think that women are cable of being specialists in a male-dominated STEM based industrial sector. Respondents think that women's strong point is being delicate, which is a weak point in male(25.7%) for not being competent in STEM based field. The reason why industry avoids to employ women is because of the role conflict in family-job balance(66.7%), because of just being female(16.7%) and because of the inconvenience caused by sex difference in working(16.7%). These results have already been proven by several previous research(Colaner and Warner 2005; Kenny et al. 2003).

<Table 1> Estimated difficulties for women in a male-dominated industrial sector.

Characteristics	Mean	Respondents(%)*				
		None	Some	Average	Much	Very much
Physical limits	2.96	8.7	25.7	32.7	27.0	6.0
Long work hours	3.10	8.7	25.7	23.3	31.7	10.7
Adeptness at technical term	2.69	15.7	27.3	31.7	22.7	2.7
Handling a machine	2.99	11.3	24.0	27.7	28.0	9.0
Collective and authoritative ambience	2.92	7.0	29.3	34.7	23.0	6.0
Sexual discrimination	2.96	8.3	27.0	32.7	24.3	7.7
Behavior restrict due to being minority	3.13	8.3	20.3	28.3	35.7	7.3
Prejudice in a male-dominated sector	3.02	8.0	24.3	33.3	26.7	7.7

* None(1), Some(2), Average(3), Much(4), Very much(5)

<Table 2> Professionalism and professional skills of industry demand.

Characteristics	Mean	Respondents(%)*				
		None	Some	Average	High	Very high
Sense of responsibility	3.91	0.7	3.0	24.3	48.7	23.3
Hard work / gumption	3.86	0.7	3.3	26.0	49.7	20.3
Professional knowledge	3.65	0.3	5.7	38.0	41.0	15.0
Apprehension / judgment ability	3.73	0.7	3.3	33.3	48.0	14.7
Planning-creativity	3.30	1.0	13.0	49.0	28.7	8.3
Leadership skills	3.15	3.0	13.7	54.0	23.7	5.7
Cooperativeness (human relation)	3.72	0.7	5.0	33.3	43.3	17.7
Negotiation skills	3.32	3.7	9.3	47.7	30.0	9.3
Information analysis	3.48	1.3	7.0	44.0	37.7	10.0
Problem solving	3.60	1.3	5.3	38.0	43.0	12.3
Computer skills	3.60	1.3	5.0	38.3	42.7	12.7
Communication skills	3.59	1.3	8.0	34.3	42.7	13.7
Foreign language	2.87	9.7	22.3	44.7	18.3	5.0

* None(1), Some(2), Average(3), High(4), Very high(5)

<Table 3> Discrimination extent at the work place.

Characteristics	Mean	Respondents(%)*				
		Never	Rarely	Average	Sometimes	Very often
Hiring	3.09	8.3	19.3	37.0	25.7	9.7
Job placement	3.18	7.0	17.3	35.7	30.7	9.3
Personnel evaluation	3.08	9.3	15.7	41.0	25.7	8.3
Opportunity of study/ training/reward	2.98	8.7	23.0	39.3	20.0	0.9
Promotions	3.27	6.7	18.0	30.7	31.3	13.3
Wages	3.29	6.7	17.7	33.0	25.7	17.0

* Never(1), Rarely(2), Average(3), Sometimes(4), Very often(5)

2. Opinion on women career development from women in industry who specialize in STEM

Survey results <Table 2> on career development showed that some of the most demanding factors in professionalism were responsibility(3.91), hard work/gumption(3.86), apprehension/judgment ability(3.73) and cooperation(3.72). Foreign language skill did not present as an important factor for career development in this survey, which was very contrary to our students' preparation for employment; students allocate large portions of their time in improving their English skills nowadays.

The results showing the extent of discrimination in the work place is shown in <Table 3>. Sexual discrimination is distinctly appearing in wages(3.29) and promotions(3.27). The expectation of promotion is very

low; only 3.3% of respondents expect to reach executive officer, 24.3% of respondents do not think of any promotion opportunity which represent a realistic meaning of the "glass ceiling". 41.0% of respondents will continue with their job as much as possible, 14.7% until she gives birth, 11.0% until marriage and just 6.0% until retirement age. It seems that female workers are not ready to persistently pursue their careers in industry. If they decide to quit their job in the midstream, the key reason was in the difficulties of compatibility between home and occupation(33.7%).

3. Job satisfactions of women in industry who specialize in STEM

Survey results on job satisfaction in industry

<Table 4> Stimulating factors at work.

Characteristics	Mean	Respondents(%)*				
		None	Some	Average	Much	Very much
Strong specialty over other workers.	3.15	2.0	13.3	54.3	28.3	2.0
Getting the credit for a technical achievement	3.21	1.7	13.7	48.3	34.3	2.0
Chance to feel an achievement	3.32	2.7	10.7	44.0	37.3	5.3
Superior productivity than others.	3.24	2.3	11.7	51.0	30.0	5.0
Influencing role in an important decision-making	3.02	5.3	19.3	46.7	25.7	3.0
Flourishing leadership	2.94	6.3	18.3	53.3	19.3	2.7

* None(1), Some(2), Average(3), Much(4), Very much(5)

<Table 5> Difficulties experienced by respondents at work.

Characteristics	Mean	Respondents(%)*				
		None	Some	Average	Much	Very much
Physical limitation	2.93	10.7	25.7	30.0	27.3	6.3
Shop-floor working	2.57	18.7	30.3	29.7	18.0	3.3
Excess business trip	2.17	34.0	30.0	24.0	9.0	3.0
Over loading working time	2.82	15.7	26.0	27.3	23.0	8.0
After work get together	2.51	20.7	31.7	29.0	13.3	5.3
Insufficient leadership	2.41	23.0	29.3	33.3	12.0	2.3
Ambience of work place	2.75	14.7	2.5	37.7	16.0	6.7
Being the minority(women)	2.84	13.0	24.3	32.7	25.3	4.7
Bias of a superior rank on female	2.64	15.3	29.0	35.7	16.3	3.7
Bias of outsider on female	2.78	13.3	26.7	33.0	22.3	4.7

* None(1), Some(2), Average(3), Much(4), Very much(5)

revealed that 72.4% of respondents are involved in work comparable with their academic background while 28.7% of respondents work under their academic level. 31.0% of respondents are satisfied because their job is consistent with their specialty; 30.7% of respondents are working where they wanted. This result made us know that the choice of job is just to get an occupation and not to realize their competence. Among respondents who intend to change their job, only 20.7% of respondents wanted to keep their specialties.

In <Table 4>, three stimulating factors involved in the respondents' work are the chance to feel an achievement, getting the credit for a technical achievement and their superior productivity over others. But, they were not sensible in terms of implementing their leadership. In realizing their specialty for job, no difference between female and male was observed. <Table 5> shows the difficulties which women have

<Table 6> Respondents' Reasons for satisfaction in the present job.

Characteristics	n	%
Self-confidence working in male-dominated field	3	1.4
Practical application of knowledge in industry	35	16.1
Working in the wanted field	74	34.1
Equitable treatment between sexes	13	6.0
Fair evaluation according to records	46	21.2
No sexual discrimination at work	38	17.5
Etc.	8	3.7
Total	217	100.0

ever experienced during work. Female workers in a male-dominating field do not have serious difficulties. It means female workers carry out their job very solidly because they have already anticipated the difficulties they would face in a male-dominating field, as shown in <Table 1>.

<Table 7> Respondents'Reasons for unsatisfaction in the present job.

Characteristics	n	%
Low wages	17	20.5
Not fitting one's major	8	9.6
Work overload and poor job environment	20	24.1
Poor prospect of promotions	27	32.5
Human relationships	4	4.8
Sexual discriminations	1	1.2
Compatibility between occupation and home	2	2.4
Etc.	4	4.8
Total	83	100.0

On <Table 6>, the reasons for their satisfaction are because they are working in the field where they want, because they are evaluated according to their records and because they can apply their knowledge in industry.

On <Table 7>, the reasons for their unsatisfaction are poor prospect of promotions, work overload and poor job environment and low wages.

IV. Conclusions

In conclusion, professional women in the Busan region expect a great potentiality as career women in the STEM field. They are content because they can apply their specialty in industry, but there are still some difficulties experienced because of sexual discrimination in the point of social structure and overall system.

References

- Drucker P. F.(1993). Post-Capitalist Society, Harper N.Y.
- Korea National Statistical Office(2007). Economically Active Populations, <http://www.kosis.kr>.
- Ministry of labor(2006). 2006's Women and Employment.
- Kim Y.(2006). The Polarization of the Korean Women's Labor market. Research report, KWDI.
- Ahn J.(2005). The Effect of Institutional Social Capital on Female University Graduates' Employment. Ph.D. thesis at Sookmyung University, pp.85-110.
- Park. S.(2003). The Logitudinal Research on the Korean Women's Second Labor Market Transition. Journal of Korean Women's Studies, 19(1) : 43-80.
- Colaner C. W. and Warner S. C.(2005). The Effect of Egalitarian and Complementarian Gender Role Attitudes on Career Aspirations in Evangelical Female Undergraduate College students. Journal of Psychology & Theology, 33(3) : 224-228.
- Kenny M. E. et al(2003). The Role of Perceived Barriers and Relational Support in the Educational and Vocational Lives of Urban High Students. Journal of Counseling Psychology, 50 : 142-155.

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