The Glass Ceiling for Asian Women in STEM

The 2015 APNN Joint Survey Report

Association of Korean Women Scientists and Engineers

Preface

In March 2015, *The Economist* published the "glass-ceiling index" for 28 OECD member countries where Japan and the Republic of Korea, which were the only two Asian countries, ranked 27th and 28th, respectively. The Association of Korean Woman Scientists and Engineers (KWSE) has thus initiated a study on how the Asia and Pacific Nations Network (APNN) members perceive the "glass-ceiling." This report provides statistical analyses of a survey on the glass ceiling conducted among 1,049 respondents in 11 member countries of the APNN, a regional network of the International Network of Women Engineers and Scientists (INWES) in which KWSE has been playing a key role. Funded by the KWSE's international cooperation policy project, the research began in January 2015 as a policy study on gender balance among professional scientists and engineers.

Established in 2011, the APNN has so far successfully held five annual meetings in Australia (2011), Malaysia (2012), Taiwan (2013), the Republic of Korea (2014), and Mongolia (2015). Since 2011, new member organizations have been established in Taiwan, Vietnam, Nepal, Sri Lanka, and Bangladesh. The Asian network is expected to further expand in terms of numbers as well as collaborative activities which include the joint international survey conducted in 2014 and 2015 by KWSE. We are happy that KWSE has created an opportunity for continued cooperation and networking through the joint project. We anticipate more systematic research and studies among APNN members to be conducted in the future, and hope that this report will serve in strengthening the capabilities of women scientists and engineers in the Republic of Korea and Asia by laying the foundation for human resource development policy in STEM in each nation.

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International Cooperation Policy Research Team
The Association of Korean Woman Scientists and Engineers

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Advisors
Office of Assemblywoman Dr. Byung-Joo Min
Kong-Joo Lee, Ph.D. (President of INWES)
Kong-Ju-Bock Lee, Ph.D. (Professor of Ewha Womans University)

Funding
National Research Foundation of Korea
Ministry of Science, ICT and Future Planning

Administrative Support
Hanna Choi (KWSE Secretariat)
Sunha Myung (KWSE Secretariat)
INWES APNN member organizations

Survey and Statistical Analysis
Jung Sun Kim, Ph.D. (Professor of Dongseo University)
Sun Jung Kim, Ph.D. (Professor of Daegu Health College)
Kyongon Choi, Ph.D. (Researcher, Yonsei Business Research Institute)

The International Joint Survey Team

Organization	**APNN Representative**[1)]	**Country**
IEM	Ir. Raftah Mahfar	Malaysia
INWES-Japan	Kayoko Sugahara	Japan
KWSE	Jung Sun Kim	Korea
TWiST	Chia-Li Wu	Taiwan
VAFIW	Nguyen Thi Mai Lan	Vietnam
WESTIP	Durdana Habib	Pakistan
WISE-Bangladesh	Siddika Sultana	Bangladesh
WISE-India	Dillip Pattanaik	India
WISE-Nepal	Jun Hada	Nepal
WISE-Sri Lanka	Vishaka Hidelage	Sri Lanka
WSTEM	Ariunbolor Purvee	Mongolia

1) *Representative to APNN or the person in charge of the survey.*
2) *Established in 2011, APNN is the Asia-Pacific regional network of INWES. APNN currently has 13 member countries which are INWES members of the Asia and Pacific region. The first chair organization of APNN was KWSE of Korea; INWES-Japan is the current chair organization for 2014-2016. The 2016 APNN meeting will take place in New Zealand.*

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1. Introduction

The Economist has annually published a "glass-ceiling index" of the 28 OECD countries. In 2015, Republic of Korea once again ranked 28th and Japan 27th, placing the only two Asian countries at the bottom of the list (Table 1-1). New Zealand and Australia, the two countries from Oceania among the APNN members, were placed in 10th and 15th place, respectively; data on Asian countries other than the Republic of Korea and Japan were not reported this year. Republic of Korea has assumed the bottom rank for the past three years; this result is related to its performance over the past three years in the Global Gender Gap Report, announced by the World Economic Forum, in which the country ranked 111th out of 136 countries in 2013, 117th out of 142 countries in 2014, and 115th out of 145 countries in 2015 (Table 1-2).

Table 1-1. Glass-ceiling index of OECD members

Rank	Country	Glass-ceiling index	Rank	Country	Glass-ceiling index
1	Finland	80.0	**15**	Germany	58.4
2	Norway	79.4	**15**	Australia	58.4
2	Sweden	79.4	**17**	United States	58.2
4	Poland	73.1	**18**	Italy	57.7
5	France	72.1	**19**	Greece	57.1
6	Hungary	67.8	**20**	Netherlands	56.4
7	Denmark	67.4	**21**	Austria	55.1
8	Spain	65.9	**22**	United Kingdom	54.2
8	Belgium	65.9	**23**	Ireland	53.6
10	New Zealand	64.3	**24**	Czech	49.9
11	Canada	63.7	**25**	Switzerland	43.7
12	Portugal	62.3	**26**	Turkey	29.6
12	Israel	62.3	**27**	Japan	27.6
14	Slovakia	61.0	**28**	South Korea	25.6
OCED average			**60.3**		

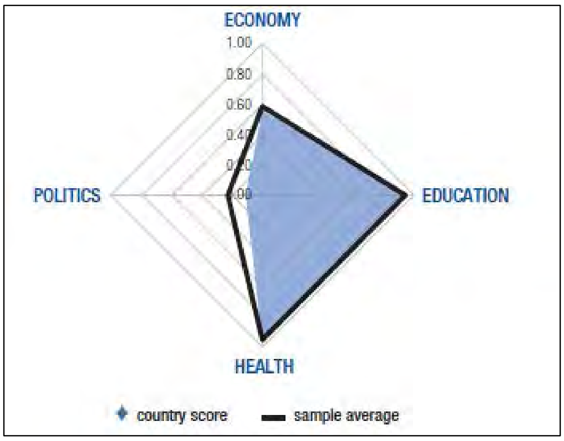
Source: http://www.economist.com (The glass-ceiling index, March 2015)

Table 1-2. Republic of Korea’s Gender Gap Index since 2006

Surveyed area		**GGI**		**Economic participation**		**Educational opportunities**		**Health**		**Political participation**	
Year	No. of countries	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
2015	**145**	**115**	**0.651**	**125**	**0.557**	**102**	**0.965**	**79**	**0.973**	**101**	**0.107**
2014	142	117	0.640	124	0.512	103	0.965	74	0.973	93	0.112
2013	136	111	0.635	118	0.504	100	0.959	75	0.973	86	0.105
2012	135	108	0.636	116	0.509	99	0.959	78	0.973	86	0.101
2006	115	92	0.616	96	0.481	82	0.948	94	0.967	84	0.067
Change between 2006 and 2015		**Δ 0.035**		**Δ 0.077**		**Δ 0.017**		**Δ 0.006**		**Δ 0.040**	

Source: WEF, Global Gender Gap Report 2015

The Global Gender Gap Report (GGGR) published by the World Economic Forum (WEF) since 2006 has shown Republic of Korea to have a relatively smaller gender gap in terms of opportunities for higher education. However the level of women’s economic participation still places the country in the lower ranks. The WEF’s GGGR defines its gender gap index (GGI) with figures between 0.000 and 1.000 by measuring the inequality levels in economic activities, education, health, and political participation; the full figure of 1.000 means a state of perfect gender equality. The final index for the Republic of Korea in 2015 stood at 0.651, showing a very gentle rise by 0.035 from 0.616 in 2006. In particular, the index of economic participation rose only to 0.557 from 0.481 in 2006, while the level of political participation also rose slightly to 0.107 from 0.067. On the other hand, the scores for educational opportunities and health stood at 0.965 and 0.973, respectively, approaching the full gender balanced score of 1.000, even in the year 2006 (0.948 and 0.967, respectively).



Source: WEF Global Gender Gap Report 2015

Figure 1-1. Index by GGI area in Republic of Korea

The GGI of APNN member nations was reported in the Policy Report for Balanced Development of Future Talent (Lee Kong-Ju-Bock et al., 2014) published by KWSE. Asian countries generally demonstrate a wide gender gap. Except for New Zealand and Australia, which took the 13th and 24th places, respectively, Mongolia was found to have the narrowest gender gap among the APNN nations, ranking 42nd. Mongolia also took first place with Sri Lanka in the health and survival ranking. The Republic of Korea had the largest gender gap, second only to Pakistan.

Although the gender gap in Republic of Korea has narrowed in the areas of university entrance and employment, the level of result-based equality, including income gaps, has not improved much. This is the aspect that has constantly been pointed out by various reports published by the World Economic Forum and *The Economist*. The ratio of women drastically falls and the income gap between men and women widens, suggesting the existence of a glass ceiling.

This report surveyed women in science and technology in the Republic of Korea and APNN member countries to identify how they realize and recognize the glass ceiling. Questionnaires regarding the glass ceiling were developed and distributed to women working in the science and technology fields. The results of this study were then used in further analyzing the quantitative glass-ceiling index by country and by area.

2. Discussion of Glass Ceiling Phenomenon

2.1 Origin of Term

The term “glass ceiling” was first introduced by Katherine Lawrence of Hewlett Packard at the National Press Club in July 1979 at a Conference of the Women’s Institute for Freedom of the Press, while she was making a presentation on the company’s policy for promotion and benefits for women. In 1984, Gay Bryant was reported as saying, “Women have reached a certain point—I call it the glass ceiling. They’re in the top of middle management and they're stopping and getting stuck. There isn't enough room for all those women at the top. Some are going into business for themselves. Others are going out and raising families.” The term was then mentioned in a number of her books and magazine articles. It was not until 1986, however, when *The Wall Street Journal* ran an article “The Glass Ceiling: Why Women Can’t Seem to Break the Invisible Barrier That Blocks Them from the Top Jobs” that the term “glass ceiling” became popular. In 1991, Lynn Morley Martin of the US Labor Department conducted a research project called “The Glass Ceiling Initiative” to survey top corporate executives in the United States; she found that women were outnumbered by men and faced less favorable treatment than that accorded their male counterparts. During the 1990s, the US and other governments across the world observed the glass-ceiling effect across almost all occupational groups and began to discuss its causes and measures to counter it.

2.2 Definitions

According to David Cottier, the term “glass ceiling” can be used in the following cases:

- Where the different treatment for employees within an organization cannot be explained by difference in individuals’ job-related abilities, other than sex or race;
- Where the difference in treatment and performance within an organization grows larger at higher levels of the organization’s hierarchy;
- Where opportunities to climb to higher levels of the organizational hierarchy are differently granted to persons of specific sex or race, and when the gender or racial ratios at higher levels are different from those ratios among the entire population;
- Where gender or racial inequalities gradually get worse in terms of career development.

In sum, a glass ceiling can mean both the phenomenon of different ratios of people of specific gender or race at higher levels and the invisible discrimination or barriers causing such phenomena. This not only includes any implied culture of discrimination, but also extensively encompasses self-censorship and a social atmosphere that pushes discriminated individuals to have lower expectations of promotion to higher levels.

Strictly speaking, the concept of the glass ceiling refers to discrimination caused by a number of causes such as race, religion, class, region of origin, and gender. However, what is covered in this report is a survey and description of the glass-ceiling phenomenon based on gender alone.

2.3 Understanding Glass-Ceiling Phenomenon

2.3.1 Flow of gender structure within organization

The glass ceiling within an organization does not merely mean a one-layer wall that prevents women from being promoted to the highest positions. Although the word “ceiling” was used in the initial stage of establishing the concept as a reference to a wall, the subsequent in-depth studies vigorously conducted in regard to the reality, causes, and solutions of the glass ceiling problem eventually formed a common understanding that a glass ceiling is not a unique phenomenon found at the highest levels of the hierarchy, but a structural problem inherent in each level of organizations.

2.3.2 Lower level: Sticky floor

The term coined to explain the practice of tying women employees to the lowest-level positions within an organization is called the “sticky floor.” This refers to all barriers that keep women from escaping the lowest levels of their organizations and climbing to middle management and includes not only organizational cultures and systems, but also senses of social and cultural awareness that cause people to take such a reality for granted. A combination of perception that there are physical differences between men and women (e.g., women are weak), stereotypes regarding mental abilities (e.g., men are logical; women are emotional, not good at math, and have less patience), and social bias (e.g., women place their family before the organization and have a weaker sense of responsibility) results in creating a perception that women may as well remain at lower ranks instead of assuming a responsible position in top management and establishes a system in which such gender gap can be both implicit and explicit. The sticky floor is most visible in education. In most countries other than developed nations, the ratio of women undergoing higher education to at least the college level is far lower than that of their male counterparts, and this lower level of education leads to education-based discrimination instead of gender discrimination in terms of available jobs at companies, membership in occupational groups, and promotion after being employed. When a male-dominated society and organizational culture gradually develops into a society of gender equality, the first thing to be intensively improved in the initial stage is the sticky-floor phenomenon.

At a national level, a number of countries that had taken a male-dominant society for granted finally began guaranteeing a voting right to both genders and women’s rights to access a level of education equal to that of men from elementary school to higher education. As a result, gender gaps in terms of educational opportunities are now rapidly narrowing or disappearing.

However, this education-related improvement is often misunderstood as a solution to gender gaps and the central issues of the glass-ceiling phenomenon, causing an improvement above certain level to be mistaken as removing the glass ceiling. In other words, solving the issue of the sticky floor can be wrongly considered a sign of the disappearance of the glass ceiling, and can form an awareness that any gender gap found at higher levels afterwards is only a result of natural competition.

2.3.3 Mid-level: Mid-level bottleneck

The mid-level bottleneck means discriminatory treatment in being promoted to mid management within an organization. For instance, some common elements of the mid-level bottleneck are implicit discrimination based on race or gender, including various stereotypes that benefit White men in the United States in pursuing promotions, male-dominant management structures, and decision-making systems involving promotion.

In many academic disciplines, the similar ratios of men and women at the undergraduate level gradually lead to an increasingly higher ratio of men in master's and doctoral courses. In particular, the gender gap at the stages of earning a doctoral degree and being employed as a faculty member is commonly observed across all academic disciplines and countries. In seeking for research grants affecting research performance after being employed as a professor, women are constantly reported to face greater discrimination in relation to resource distribution. This creates a vicious cycle of discrimination against women in the distribution of research funds, leads to different research performance in terms of publications and other accomplishments, and causes differences in employment as faculty, including areas of both promotion and appointment to leadership positions. On the surface level, however, this may be a result of an inherent structural discrimination that takes into account only differences in research performance and the abilities of men and women.

The mid-level bottleneck, as a result, restricts the pool of women who can be promoted to the highest positions. Compared to the sticky floor, which directly reveals problems and improvement effects, the mid-level bottleneck is more deeply rooted inside organizational cultures and members' awareness. In addition, since the mid-level bottleneck does not have clearly visible substantiality even though it actually exists in reality, there is a difficulty in pointing out problems and drawing and applying solutions. This is also an issue being discussed and highlighted most vigorously in the developed countries, including the United States and members of the European Union.

2.3.4 Upper level: Glass ceiling

In a narrow sense, the glass ceiling refers to a barrier that prevents women who have survived the sticky floor and mid-level bottleneck mentioned above from entering the top hierarchy level. Affecting entry into and success at the top levels, the glass ceiling in a narrow sense can be hard to generalize because the number of those facing the glass ceiling remains highly limited. Also, since the glass ceiling depends not only on quantitative assessment, but also on qualitative assessment, it exists in a variety of forms and with greater impact. As a result, it is often difficult to identify specific causes for and to suggest solutions to the glass ceiling at the upper levels. Instead, the existence and strength of a glass ceiling is proved through the survivors who break the barrier and join the top levels. For instance, examining gender ratios among high-level government officials of Grade V or higher, lawmakers, executives at large corporations, and tenured university professors and observing yearly trends is one way to witness the existence of a glass ceiling and how it improves over time. Gender equality-related committees, policies, and reports in the United States and Europe also focus on performing time-series analysis of those results to identify improvements and formulate and revise policy measures necessary for the time.

2.3.5 The glass-ceiling index

The glass-ceiling index has been published by *The Economist* around 8 March, International Women’s Day since 2011. Based on OECD data, the British weekly newspaper ranks countries with favorable environments for women at workplaces by analyzing the following five areas: the number of men and women undergoing higher education, gender gaps in economic participation rates, income gaps between men and women, the ratio of women in top management, and the ratio of women lawmakers.

3. Development and Analysis of International Questionnaire

This study began in January 2015; the development of a questionnaire and of the actual survey were conducted between June and August among the member nations of the Asia and Pacific Nations Network (APNN) of the International Network of Women Engineers and Scientists (INWES). The women scientists and engineers responding to the survey were asked, either online or offline, to express their perceptions of the glass ceiling as they experienced it in their careers.

3.1 Development of the questionnaire

3.1.1. Defining survey respondents and survey types

The respondents to this survey were limited to women scientists, engineers, and medical professionals (doctors, nurses, pharmacists, etc.) who have at least a bachelor’s degree and work in the areas of natural sciences, engineering, or medical sciences. Except for the demographic questions, the questionnaire was formulated into 12 direct and clear questions in total, requiring no more than ten minutes for responding to all of them. The responses to those 12 questions were measured with a five-point Likert scale. As an international survey targeting the APNN member nations, the questionnaire was printed in English for offline response. Due to each nation’s different accessibility to Internet networks, the questionnaire development followed the most traditional process of printing, distributing, and collecting offline questionnaires. An additional online survey page was also provided to allow respondents to participate with increased convenience in varying Internet mobile environments. For members of the KWSE, the online survey page translated into the Korean language was provided as well.

3.1.2. Determining questionnaire items – Research items

The questionnaire consisted of questions asking the following: if there is an actual barrier that makes it more difficult for women scientists and engineers to develop their career and reach the higher career level, compared to for their male counterparts, in academic or industrial sectors; what causes such phenomenon (e.g. inherent difference in abilities of men and women, difference in perception of socially learned gender roles, unique culture in science and engineering research and development organizations); if any policy consideration is required in order to eliminate such a glass ceiling. The questionnaire included the following content:

① General perception of social gender roles

- Female scientists are limited in how much they can succeed in science compared to male scientists.
- Science is a field more advantageous to men than to women.

② Gender discrimination in university majors and R&D sector.

- Women face more difficulties or require longer time than men do when completing a master’s or doctoral program and acquiring a degree.
- I have experienced some disadvantages to lead or participate in a research project because I am a woman...
- I have experienced some disadvantages in research funding or scholarships because I am a woman.

③ Glass ceiling at higher levels

- Becoming a tenured professor, being promoted or becoming a principal investigator is more difficult for female scientists than for male scientists.
- There are more men than women among those with similar or more professional experience than mine.

④ Expectation for the future

- Female college students newly joining science and engineering departments will study in a better environment than I did

.

⑤ Difference in capabilities between genders

- There is a difference in ability (math, analytical skills, logical thinking, etc) that needs to be acquired in science for men and women.
- The responsibility for marriage and child-rearing works is a handicap for women at work.

⑥ Demand for policy

- It is crucial to have policy support that ensures equal opportunity in order to solve the gender inequality in science.

3.1.3. Determining questionnaire items – Demographic items

In terms of demographic statistics, the questionnaire included the following:

- Year of birth
- Year of college admission: To estimate the years of career since admission to college
- Career Break (Out-of-work years since college admission): To measure the degree of career discontinuity because of marriage, pregnancy, or child-rearing
- Major (the latest major, in case of two or more majors): To filter participants who are not research targets, and to analyze differences in perceptions of glass ceiling among participants in different majors
- Current occupational group
- Current occupation (e.g. student, professor, researcher)
- Marital status: To understand the effect of marriage on the perception of glass ceiling

- Number of children: To understand the effect of pregnancy, childbirth, and child-rearing on the perception of glass ceiling
- Nationality

As a means to prevent duplicate participation in the online survey, respondents were also asked to provide their email addresses.

3.2 Completed questionnaire (Appendix 1)

3.3 Conducting and analyzing the survey

3.3.1. Conducting the survey

The survey was conducted in eleven APNN member countries for one month, from July 1 to 31, 2015. In each country, online and offline surveys were conducted simultaneously.

3.3.2. Methods of analyzing the survey results

The survey results were analyzed in the following manner with the IBM SPSS Statistics version 23:

① The demographic statistics of respondents were subject to frequency analysis to obtain frequency and percent ratios.

② The descriptive statistics for each item on glass ceiling were subject to descriptive statistics analysis to obtain average and standard deviation.

③ The differences from general characteristics were subject to an independent t-test and ex-post analysis of ANOVA and Scheffe. When ANOVA was conducted, if the equal variance assumption was not satisfied, the Welch test and Games-Howell ex-post analysis were conducted additionally.

4. Results of Glass-Ceiling Survey of APNN Members

4.1 Comprehensive comparative analysis of survey results in 11 countries

4.1.1 Status of survey respondents

A total of 1,049 valid responses had been collected from seven countries by September 25, 2015. In most participating countries, more than 100 women scientists and engineers participated in the survey.

A. By country

A total of 1,049 participants responded to the survey: 148 in the Republic of Korea; Over 100 each in Nepal, Taiwan, Bangladesh, Vietnam, and India; 94 in Japan; 90 in Sri Lanka; 82 in Malaysia; 70 Pakistan; and 55 in Mongolia. Those respondents who left too many questions unanswered or who were not appropriate targets of the survey were excluded from the analysis.

B. By age

Respondents were distributed across the age groups of 20s to 50s: 292 respondents in their 20s, 27.8%; 298 in their 30s, 28.4%; 231 in their 40s, 22.0%; and 228 in their 50s, 21.7%.

C. Marital status

In a number of previous studies, marital status was found to be a major factor affecting women's career management and promotion in relation to the glass ceiling. With regards to marital status, 353 respondents (33.7%) were single and 635 respondents (60.5%) were married. The number of divorced respondents was 52 (5.0%), and nine respondents (0.9%) did not reply.

D. Number of children

In addition to marital status, the number of children tends to exert the greatest effect on women's career management and promotion. A total of 495 respondents (47.2%) had no child, constituting the largest share, and 228 respondents (21.7%) had one child. In addition, 248 respondents (23.6%) had two children, and 78 respondents (7.4%) had three or more children.

E. Occupation

Regarding the current occupation, most participants were scientists (369 respondents, 35.2%), followed by 384 engineers (36.6%), 148 medical professionals (14.1%), 39 researchers (3.7%), and 50 students (4.8%). The number of respondents working in other areas was 59 (5.6%).

F. Career break

The response to the duration of career break since college graduation due to pregnancy, childbirth, or other reasons, revealed a total of 494 respondents (47.1%) with less than one year, followed by 203 respondents (19.4%) for one year, 162 respondents (15.4%) for two years, and 190 respondents (18.1%) for three years or more.

Table 4-1-1. Summary of participants of the survey

		Number of Respondents	Percent (%)
Country[1]	Nepal	102	9.7
	Malaysia	82	7.8
	Mongolia	55	5.2
	Bangladesh	104	9.9
	Vietnam	100	9.5
	Sri Lanka	90	8.6
	India	100	9.5
	Japan	94	9.0
	Taiwan	104	9.9
	Pakistan	70	6.7
	Republic of Korea	148	14.1
Age	20s or younger	292	27.8
	30s	298	28.4
	40s	231	22.0
	50s or older	228	21.7
Marital status	Single	353	33.7
	Married	635	60.5
	Divorced	52	5.0
	Other (Non- response)	9	.9
No. of children	None	495	47.2
	1	228	21.7
	2	248	23.6
	3 or more	78	7.4
Occupation	Scientist	369	35.2
	Engineer	384	36.6
	Professional medical staff	148	14.1
	Professional researcher	39	3.7
	Student	50	4.8
	Others	59	5.6
Career break	Less than 1 year	494	47.1
	1 year	203	19.4
	2 years	162	15.4
	3 years or more	190	18.1
Total number of respondents		1,049	100.0

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[1] The countries are listed according to the Korean "Hanguel," and not in alphabetical order.

4.1.2. Descriptive statistics analysis of survey results

Table 4-1-2. Mean Values (Average) of Responses to the Questionnaire

	Question	Average	Standard deviation
Q1	Female scientists are limited in how much they can succeed in science compared to male scientists.	3.24	1.16
Q2	Men have an advantage over women in Science.	3.20	1.18
Q3	To attain a masters or doctoral degree, women should work harder and take longer time to finish their studies than men.	2.79	1.23
Q4	I have experienced some disadvantages to lead or participate in a research project because I am a woman.	2.89	1.13
Q5	I have experienced some disadvantages in research funding or scholarships because I am a woman.	2.48	1.00
Q6	Becoming a tenured professor, being promoted or becoming a principal investigator is more difficult for female scientists than for male scientists.	3.24	1.09
Q7	There are more men than women among those with similar or more professional experience than mine.	3.69	1.06
Q8	Girls who are entering college today will be studying in a better (more gender equal) environment than I did.	3.76	.92
Q9	There is a difference in ability (math, analytical skills, logical thinking, etc) that needs to be acquired in science for men and women.	2.64	1.12
Q10	Having to balance work and life (marriage and child care) is a handicap for women.	3.78	1.05
Q11	It is crucial to have policy support that ensures equal opportunity in order to solve the gender inequality in science.	4.08	.91

The average number of points of 1,049 responses to the 11 questions on glass ceiling, each measured with a five-point Likert scale, resulted in a score of 3.24. The total number of questions may not be sufficient for generalization. Yet the results as shown in Table 4-1-2 shows that the respondent’s do perceive the glass ceiling phenomenon to a certain extent in 7 of the questions, considering 3.0 is neutral. For Q1 and Q2 on general perception against women’s position in the science sector, the average response of 3.2 points indicates a certain degree gender gap felt by women in STEM. On the contrary, the average number of points for Q3, Q4, and Q5 about any disadvantages in selecting a science major, obtaining a degree, and pursuing professional career was below 3.0, indicating that respondents did not experience significant disadvantage. In particular, Q5 asked about gender discrimination in the distribution of research funds, such as research grant and scholarships—an issue that has recently emerged in the United States and Europe. The average number of points for Q5 was 2.48, showing no significant financial discrimination experienced after selection of a science major. In terms of career management, Q6 asked the respondents about any barrier to higher levels within an organization, such as employment as university faculty, promotion to major managerial positions, or becoming a project manager. Overall, the respondents showed an average number that points of 3.24, indicates that they perceive a certain level of barrier. In Q7, the respondents were asked if they witnessed any gender differences in the makeup of their area, and most of them replied that the number of men was higher than that of women in the respective field they are working in, showing an average number of points of 3.8. Q8 asked if the glass-ceiling phenomenon was improving in general, and the resulting score of 3.8 points demonstrates most respondents' expectations for improvement in the future. The respondents were asked in Q9 if they perceived any difference in men's and women's capabilities in science and engineering, and the average number of points of 2.6 indicates that, unlike the conventional wisdom that science and engineering are not advantageous to women, the respondents tend not to agree with the view stating that men and women have different levels of capabilities. As in other departments, however, most respondents admit that pregnancy, childbirth, and child-rearing tend to be handicaps to women in science and technology, showing an average number of points of 3.8. In addition, they expressed high hope for policy support to address the issue, with the average number of points for this question being 4.1.

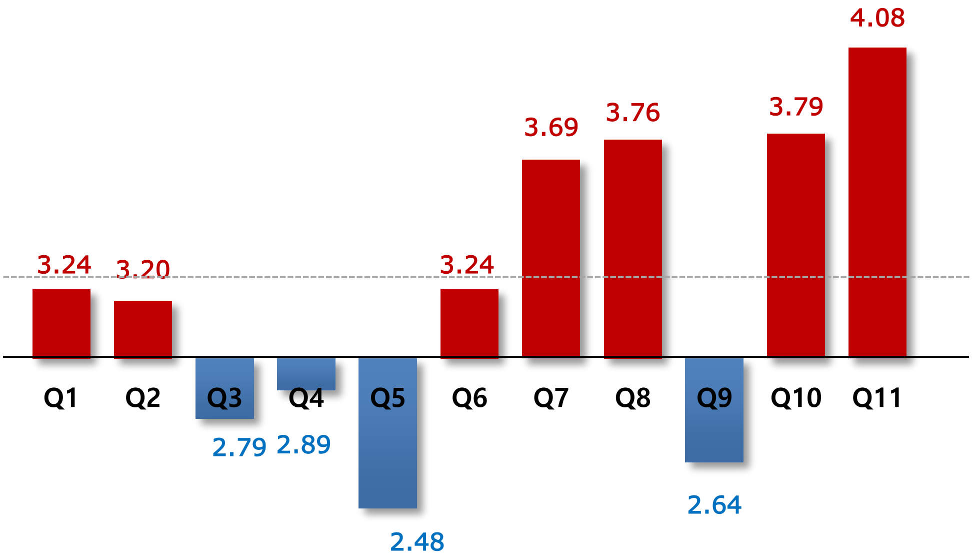


Figure 4-1-1. Comparison of average value by survey results questionnaire

4.1.3 Comparison by country

The results by country are provided in the following.
By the average score, Vietnam showed the thickest glass ceiling with a score of 3.64 points, followed by Nepal (3.41), Republic of Korea (3.35), and Bangladesh (3.3), and the glass-ceiling phenomenon was weakest in Sri Lanka (2.86), and Malaysia (2.93). Further details will be discussed in each country’s analysis results.

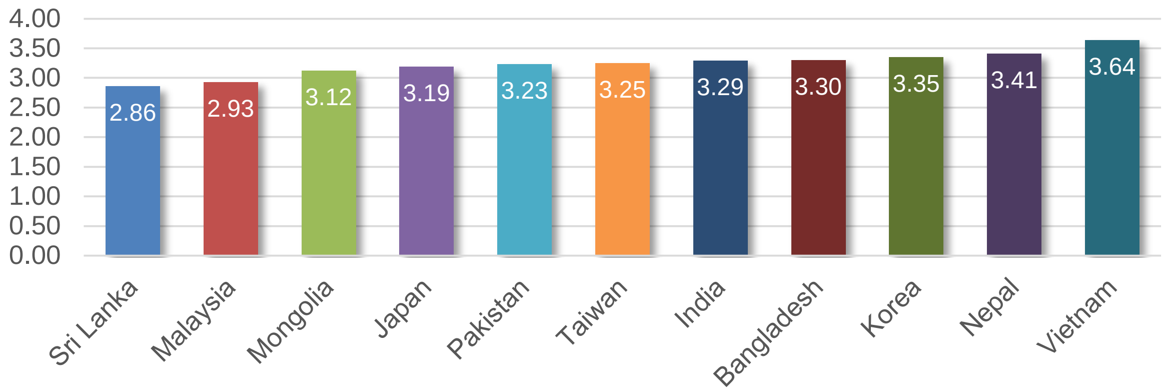


Figure 4-1-2. Overall average scores by country of the Glass Ceiling questionnaire

Table 4-1-3. Comparison of average scores of participating counties by questions

Question Country	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11
Nepal	3.75	3.57	2.98	3.12	1.91	3.57	4.23	3.70	2.48	3.74	4.43
Taiwan	3.31	3.47	2.61	2.67	2.52	3.14	3.65	3.67	2.79	3.94	3.97
Republic of Korea	3.39	3.22	2.61	2.84	2.64	3.26	4.02	3.82	2.64	4.34	4.11
Malaysia	2.63	2.67	2.39	2.61	2.43	2.74	3.40	3.61	2.95	3.22	3.63
Mongolia	3.31	2.80	3.36	2.53	2.71	2.96	2.96	3.42	2.75	3.69	3.78
Bangladesh	3.17	3.00	2.93	3.08	2.62	2.98	3.40	4.01	3.20	3.75	4.17
Vietnam	3.65	3.67	3.69	3.66	3.15	3.84	3.32	4.11	2.81	3.98	4.19
Sri Lanka	2.58	2.37	2.29	2.72	2.59	2.72	3.09	3.39	2.53	3.30	3.92
India	3.06	3.53	2.99	2.87	1.90	3.54	4.08	4.18	2.12	3.76	4.14
Japan	3.34	3.28	2.23	2.68	2.46	3.55	4.12	3.61	2.03	3.61	4.18
Pakistan	3.27	3.29	2.80	2.80	2.33	3.04	3.73	3.59	2.84	3.80	4.04
Average	3.24	3.20	2.79	2.89	2.48	3.24	3.69	3.76	2.64	3.78	4.08
F	9.73	12.32	13.60	7.84	13.81	11.51	17.54	7.95	9.90	10.37	5.11
p	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

4.1.4 Comparison by question

Q1. **Female scientists are limited in how much they can succeed in science compared to male scientists.**

When directly asked in Q1 about the presence of a glass ceiling in the field, the responses of the 1,049 respondents resulted in a score of 3.24 points out of the five-point Likert scale. The results of ANOVA analysis of difference in average number of points of demographic variants (age, marital status, number of children) and occupation-related variants do not show statistically significant differences, but ex-post analysis of detailed items produced some meaningful implications as follows:

First, the results by respondents’ age group demonstrate that older respondents perceive the existence of a glass ceiling more clearly. Whereas 292 respondents in their 20s, who completed their study and began working in the science sector in relatively recent years, showed 3.17 points which tends to increase among older respondents in their 30s and 40s to 3.21 points and 3.38 points, respectively. This indicates an age-dependent tendency. The ex-post analysis of each of the detailed items also showed that there was statistically significant difference among the respondents in their 20s and 40s.

Second, unlike age, occupational differences did not affect the responses, with the points being 3.28 for scientists, 3.26 for engineers, 3.18 for medical professionals, 3.21 for researchers, and 3.15 for other occupational group. One-on-one analysis between detailed items did not reveal any statistically significant differences.

Third, in the ANOVA analysis of responses based on the marital status, no statistically significant difference was observed at the 95% significance level, but the average value of 3.31 among 635 married respondents was slightly higher than that of 3.12 among 353 single respondents. This difference between the single and married groups also proved a statistically relevant difference during ex-post analysis.

Fourth, with regard to childbirth and child-rearing, the two factors known to affect women’s social participation more directly than marriage does, the survey also asked respondents’ the number of children. Although the ANOVA analysis did not produce statistically significant differences, an increasing trend is observed: the respondents with more children responded with a higher score for the glass-ceiling phenomenon, compared to those without children (495 respondents, an average point of 3.19). The score of those with one child (228 respondents) was 3.26 on average, higher than that of those without children, and the score of those with two children (248 respondents) was even higher with an average score of 3.36.

By country, Nepal had the highest average scores of 3.75, followed by Vietnam of 3.65; Sri Lanka and Malaysia had the lowest scores of 2.58 and 2.63, respectively. Meanwhile, the Republic of Korea marked 3.39 points, ranking third out of the 11 countries, indicating that women in science and technology perceive a considerable degree of the glass ceiling.

Table 4-1-4. Comparative survey result of Q1 by age, occupation and marital status

		N	Average	Standard deviation	F	*p*
Total		1049	3.24	1.162		
Age	20s or younger	292	3.17	1.100	1.447	.228
	30s	298	3.21	1.235		
	40s	231	3.38	1.209		
	50s or older	228	3.24	1.086		
Occupation	Scientist	369	3.28	1.208	.452	.771
	Engineer	384	3.26	1.159		
	Professional medical staff	148	3.18	1.165		
	Professional researcher	39	3.21	1.239		
	Others	109	3.15	.980		
Marital status	Single	353	3.12	1.131	2.103	.098
	Married	635	3.31	1.175		
	Divorced	52	3.17	1.184		
	Other	9	3.22	1.093		
No. of children	None	495	3.19	1.123	1.513	.209
	1	228	3.26	1.287		
	2	248	3.36	1.101		
	3 or more	78	3.12	1.195		

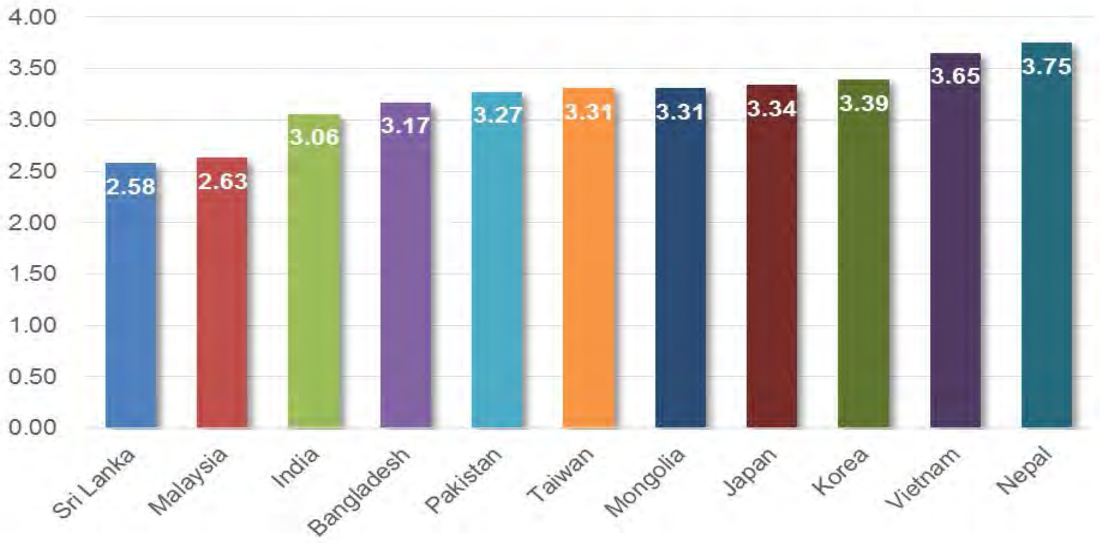


Figure 4-1-3. Average point of Q1 by country

Q2. **Men have an advantage over women in Science.**

The overall average scores of the 1,049 respondents for Q2 resulted in a score of 3.20. By age group, the average score of 292 respondents in their 20s was 3.09, and the scores among those in their 30s, 40s, and 50s, were 3.12, 3.37, and 3.28, respectively. This result shows that older respondents tend to agree that men have more advantages. These differences of average number of points were verified by the ANOVA analysis to have a statistically significant difference at the 95% significance level. The one-on-one ex-post analysis also demonstrated a statistically relevant difference between the respondents in their 20s and 40s.

By occupation, the average score of 369 scientists was 3.20; that of 384 engineers was 3.25; and that of 148 medical professionals was 3.13. This means that different occupational groups do not show significant differences; the ANOVA analysis results also prove that no statistically significant difference was observed. By marital status, single and married respondents showed scores of 3.11 and 3.25 points, respectively, and the 52 divorced respondents showed an average score of 3.27. This indicates that married scientists and engineers tend to perceive that men in their respective major area assume a higher career level, but the ANOVA analysis results do not demonstrate a statistically significant difference from marital status at the 95% significance level.

According to the number of children, the respondents with children showed a higher average score than those without children (3.15 for those without children, and 3.29 for those with one or two children), but this difference failed to show any statistical relevance.

By country, Sri Lanka had the lowest score of 2.37, followed by Malaysia (2.67), Mongolia (2.80), and Bangladesh (3.00). Three countries—Republic of Korea (3.22), Japan (3.28), and Pakistan (3.29)—formed a mid-range group near the entire average scores of 3.20. In addition, Taiwan (3.47), India (3.53), Nepal (3.57), and Malaysia (3.67) showed a higher perception that men hold more advantage in the science sector.

Table 4-1-5. Comparative survey result of Q2 by age, occupation and marital status

		N	Average	Standard deviation	F	*p*
Total		1049	3.20	1.177		
Age	20s or younger	292	3.09	1.121	3.222	.022
	30s	298	3.12	1.200		
	40s	231	3.37	1.208		
	50s or older	228	3.28	1.168		
Occupation	Scientist	369	3.20	1.236	1.246	.290
	Engineer	384	3.25	1.132		
	Professional medical staff	148	3.13	1.139		
	Professional researcher	39	3.44	1.071		
	Others	109	3.04	1.209		
Marital status	Single	353	3.11	1.148	1.236	.295
	Married	635	3.25	1.183		
	Divorced	52	3.27	1.300		
	Other	9	3.00	1.118		
No. of children	None	495	3.15	1.159	1.770	.151
	1	228	3.29	1.177		
	2	248	3.29	1.171		
	3 or more	78	3.03	1.289		

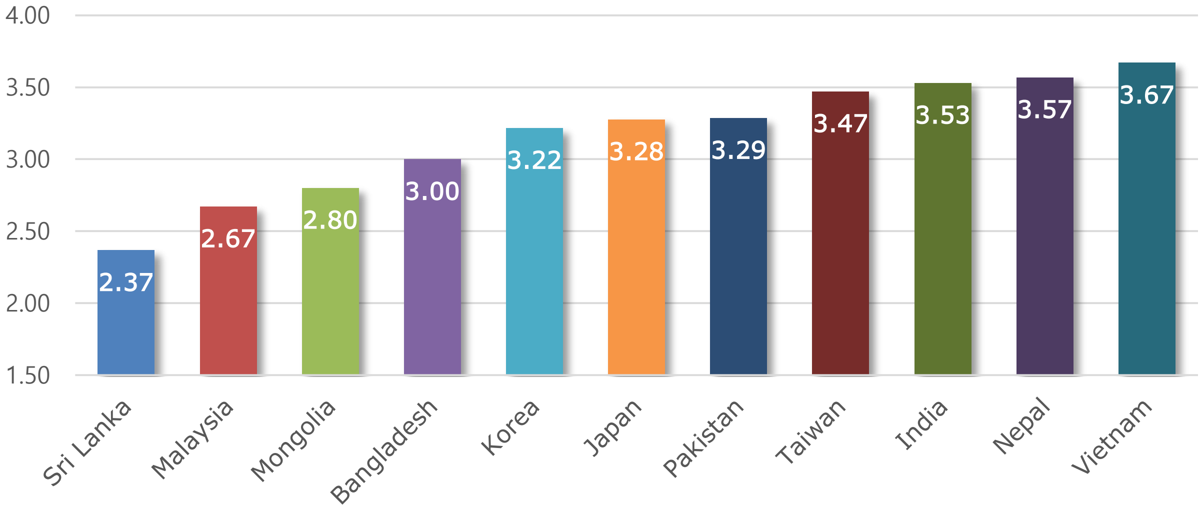


Figure 4-1-4. Average point of Q2 by country

Q3. **To attain a masters or doctoral degree, women should work harder and take longer time to finish their studies than men**

For the question about gender discrimination in the course of completing a master's or doctoral program and obtaining a degree, the respondents produced an average score of 2.79 points. By age group, the scores of those in their 20s, 30s, and 40s were 2.71, 2.82 and 2.96, indicating correlations between higher age (thus, longer period since the acquisition of a degree) and more experience of gender discrimination. However, the scores of those in their 50s resulted in an average score of 2.68, lower than that of any other group. Although the ANOVA analysis suggests an average slightly below the 95% significance level (p=0.057) and therefore no statistically significant difference, one-on-one ex-post analysis observed a significant difference between the age groups of 20s and 40s and between 40s and 50s. By occupation, scientists (3.28), engineers (3.26), medical professionals (3.18), professional researchers (3.21), and those with other occupations (3.15) do not reveal significant differences, a result also supported by the ANOVA and one-on-one ex-post analysis

Table 4-1-6. Comparative survey result of Q3 by age, occupation and marital status

		N	Average	Standard deviation	F	*p*
Total		1049	2.79	1.225		
Age	20s or younger	292	2.71	1.246	2.513	.057
	30s	298	2.82	1.211		
	40s	231	2.96	1.334		
	50s or older	228	2.68	1.078		
Occupation	Scientist	369	3.28	1.208	1.012	.400
	Engineer	384	3.26	1.159		
	Professional medical staff	148	3.18	1.165		
	Professional researcher	39	3.21	1.239		
	Others	109	3.15	.980		
Marital status	Single	353	2.51	1.161	10.448	.000
	Married	635	2.92	1.232		
	Divorced	52	3.15	1.258		
	Other	9	2.44	1.014		
No. of children	None	495	2.59	1.175	10.448	.000
	1	228	2.98	1.220		
	2	248	3.05	1.272		
	3 or more	78	2.68	1.179		

Marital status was found to have correlate with perception of gender discrimination. Where the average scores of 353 single respondents was only 2.51, the average scores of 635 married respondents and 52 divorced respondents were 2.92 and 3.15, implying experience of gender discrimination among those who have been married in the process of earning a degree. A statistically significant difference was also observed in the ANOVA analysis. Similar to marital status, the having children produced distinctly different results. The average score of the respondents without children was 2.59, but those with one or two children showed average scores of 2.98 and 3.05, respectively, a clearly higher level. Although this survey did not examine the point of time of childbirth and that of earning a degree, it can be concluded that childbirth and child-rearing may have hindered the process of earning a degree, to a certain extent; this assumption is related to the results of Q10 as well. By country, Japan had an average score of 2.23, showing the lowest level of gender discrimination regarding the degree-seeking process. Sri Lanka (2.29), Malaysia (2.39), Taiwan (2.61), and Republic of Korea (2.61) obtained below-average scores and tend to be fairly free from degree-related gender discrimination. On the other hand, four countries including Pakistan (2.80), Nepal (2.98), and India (2.99) had above-average scores, but still below 3.0; scores in Mongolia (3.36) and Vietnam (3.69) imply a significant level of discrimination in degree-seeking process.

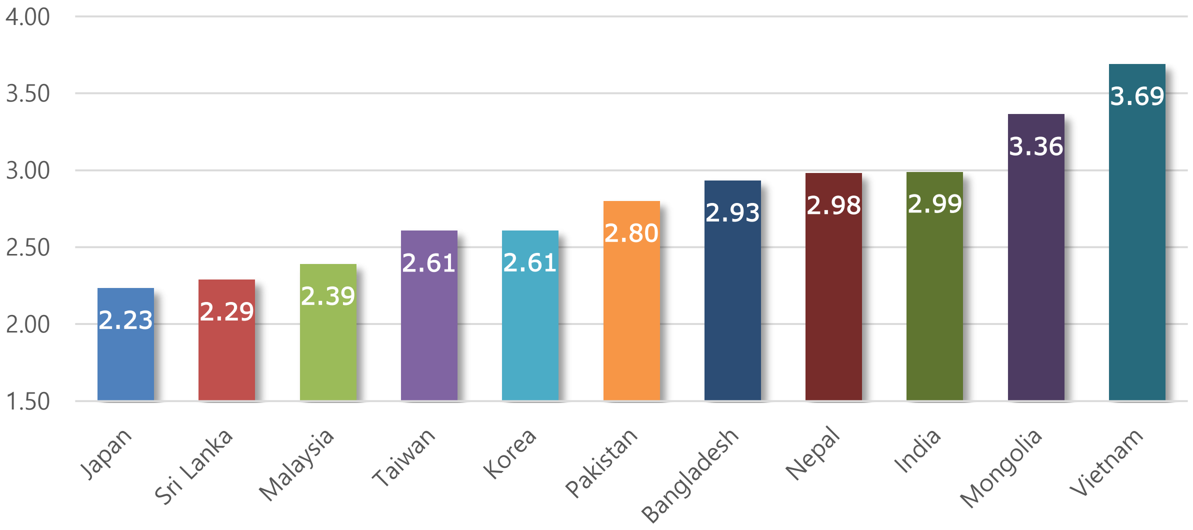


Figure 4-1-5. Average point of Q3 by country

Q4. **I have experienced some disadvantages to lead or participate in a research project because I am a woman.**

Q4 was designed to identify the existence in Asian countries of restrictions on initiative and accessibility to research projects, which have been pointed out as a factor contributing to the glass-ceiling phenomenon henomenon facing women scientists and engineers in developed countries. As the overall average was 2.89, below the neutral level of 3.0, the situations in Asia were found to be relatively neutral. By age group, older respondents are more likely to perceive a barrier corresponding to this question: scores were 2.79 points for those in their 20s, 2.86 for 30s, 3.04 for 30s, and 2.92 for 50s. In the ANOVA analysis about the entire sample divided into four age groups, it was little short of obtaining a statistically significant result at the 95% significance level, but a statistically relevant difference was observed between those in their 20s and 40s as a result of one-on-one ex-post analysis.

Table 4-1-7. Comparative survey result of Q4 by age, occupation and marital status

		N	Average	Standard deviation	F	*p*
Total		1049	2.89	1.132		
Age	20s or younger	292	2.79	1.080	2.256	.080
	30s	298	2.86	1.185		
	40s	231	3.04	1.179		
	50s or older	228	2.92	1.067		
Occupation	Scientist	369	2.78	1.159	5.344	.000
	Engineer	384	3.06	1.113		
	Professional medical staff	148	2.78	1.087		
	Professional researcher	39	3.31	1.173		
	Others	109	2.73	1.060		
Marital status	Single	353	2.76	1.085	3.713	.011
	Married	635	2.95	1.144		
	Divorced	52	3.21	1.210		
	Other	9	2.56	1.130		
No. of children	None	495	2.82	1.112	3.920	.008
	1	228	2.96	1.172		
	2	248	3.06	1.135		
	3 or more	78	2.65	1.067		

By occupation, the average score of scientists was 2.78, with scores of 3.06 for engineers, 2.78 for medical professionals, and 3.31 for researchers; the average score of 109 respondents with other occupations was 2.73. In the ANOVA analysis of the entire sample divided into five age groups, a statistically significant difference was observed. In addition, engineers and researchers were observed to have more experiences of discrimination when taking the lead and participating in research projects than other occupational groups did. By marital status, single respondents had an average score of 2.76, while married and divorced counterparts had scores of 2.95 and 3.21, respectively, showing that those who have been married had statistically significant higher scores. The number of children also contributed to the differences. Those without children had an average number of points of 2.82, but the respondents with children tend to perceive the issue more strongly, with scores of 2.96 points for those with one child and 3.06 for those with two children. This result was confirmed statistically as well.

The averages of 11 Asian countries indicate that Mongolia has the most favorable result, with an average score of 2.53, followed by seven other countries with below-average scores: Malaysia (2.61), Taiwan (2.67), Japan (2.68), Sri Lanka (2.72), Pakistan (2.80), Republic of Korea (2.84), and India (2.87). In the meantime, Bangladesh (3.08) and Nepal (3.12) had scores exceeding the overall average score of 2.89 and the neutral score of 3.00, indicating a slight degree of discrimination in accessibility to research projects. In particular, Vietnam (3.66) had the lowest ranking and therefore exhibited the most perception for gender discrimination.

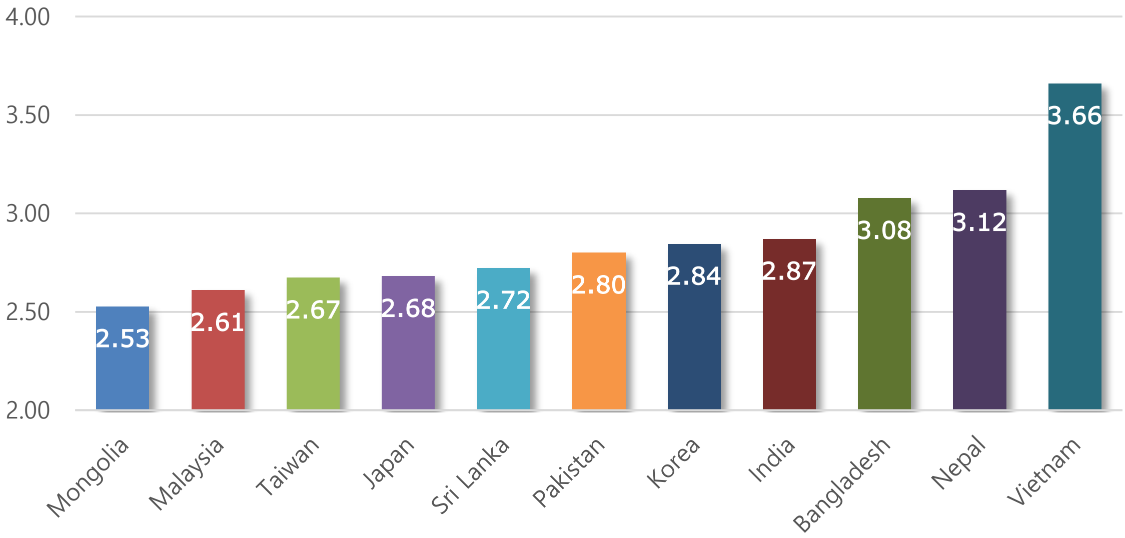


Figure 4-1-6. Average point of Q4 by country

Q5. **I have experienced some disadvantages in research funding or scholarships because I am a woman.**

Accessibility to financial resources is considered one barriers for women in science and technology in the United States, Europe, and other developed countries. The survey results suggest that Asian countries do not have significantly unfavorable conditions in this regard, with an average score of 2.48. By age group, 292 respondents in their 20s responded with the lowest score of 2.33, and older respondents showed a certain level of discrimination with a score of 2.40 for 298 respondents in their 30s, 2.52 for 231 respondents in their 40s, and 2.72 for those in their 50s. These differences were confirmed by the ANOVA analysis to have statistical significance. By occupation, no evident difference was observed, with 2.51 for scientists, 2.48 for engineers, and 2.53 for medical professionals, but the average score of 39 researchers was significantly low at 2.08. The ANOVA analysis results did not reveal any statistically significant difference among groups.

Table 4-1-8. Comparative survey result of Q5 by age, occupation and marital status

		N	Average	Standard deviation	F	*p*
Total		1049	2.48	1.001		
Age	20s or younger	292	2.33	1.017	7.476	.000
	30s	298	2.40	.924		
	40s	231	2.52	1.012		
	50s or older	228	2.72	1.023		
Occupation	Scientist	369	2.51	1.032	1.829	.121
	Engineer	384	2.48	.956		
	Professional medical staff	148	2.53	1.006		
	Professional researcher	39	2.08	1.133		
	Others	109	2.43	.975		
Marital status	Single	353	2.31	.920	11.222	.000
	Married	635	2.52	1.014		
	Divorced	52	3.12	1.060		
	Other	9	2.22	1.093		
No. of children	None	495	2.39	.965	3.184	.023
	1	228	2.49	1.043		
	2	248	2.57	1.019		
	3 or more	78	2.69	.997		

By marital status, the average score for single respondents was 2.31, while that for married respondents and for 52 divorced respondents was 2.52 and 3.12, respectively. This indicates that the higher average among the married respondents was statistically relevant. Examined based on the number of children, those without children had an average score of 2.39, followed by 2.49 for those with one child, 2.57 for those with two children, and 2.69 for those with three children. As a result, the average score among the respondents with children was higher than that among the respondents without children, with statistical significance.

By country, India and Nepal showed the lowest average scores of 1.90 and 1.91, respectively. In addition, eight countries were included in the group near the overall average: Pakistan (2.33), Malaysia (2.43), Japan (2.46), Taiwan (2.52), Sri Lanka (2.59), Bangladesh (2.62), Republic of Korea (2.64), and Mongolia (2.71). As found with Q4, it is assumed that Vietnamese participants (3.15) tend to perceive the most restrictions on women's access to financial resources, such as research grants and scholarships among the 11 countries

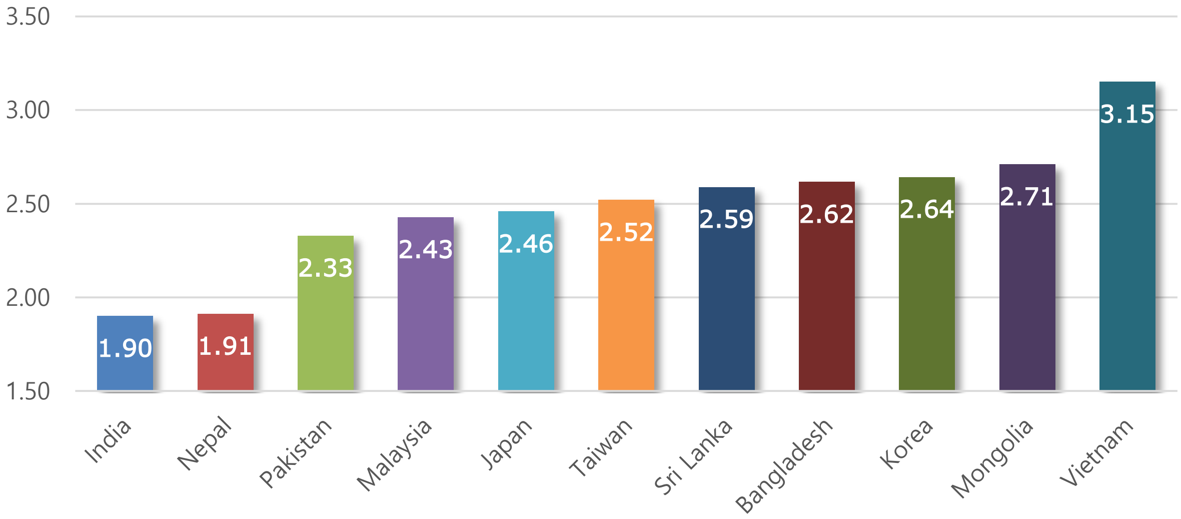


Figure 4-1-7. Average point of Q5 by country

Q6. **Becoming a tenured professor, being promoted or becoming a principal investigator is more difficult for female scientists than for male scientists.**

Q6 asked about any discrimination against promotion of women in science and technology, and the average score was 3.24, showing a certain degree of discrimination perceived by the respondents. By age group, older respondents tend to perceive gender discrimination against promotion more clearly, with an average score of 3.11 for those in their 20s, 3.28 for 30s, and 3.34 for 40s. In the ANOVA analysis about the entire sample divided into four age groups, no statistically significant difference was found at the 95% significance level, but one-on-one ex-post analysis confirmed a difference in average scores between those in their 20s and 40s. By occupation, the averages of scientists (3.31) and engineers (3.34) were not considerably different, but medical professionals had a lower average score of 2.99, indicating least discrimination among the group of medical professionals. This reflects the reality that most medicine-related departments have nearly equal gender ratios, including the nursing department, in which the number of female students tends to be higher than that of male; this also shows that there is less gender discrimination in the healthcare and medicine sectors compared to the science and technology sectors. The differences in average scores by occupation were also confirmed to be statistically significant by the ANOVA analysis and one-on-one ex-post analysis.

Table 4-1-9. Comparative survey result of Q7 by age, occupation and marital status

		N	Average	Standard deviation	F	*p*
Total		1049	3.24	1.091		
Age	20s or younger	292	3.11	1.060	2.136	.094
	30s	298	3.28	1.097		
	40s	231	3.34	1.111		
	50s or older	228	3.26	1.091		
Occupation	Scientist	369	3.31	1.102	4.757	.001
	Engineer	384	3.34	1.058		
	Professional medical staff	148	2.99	1.088		
	Professional researcher	39	3.26	1.229		
	Others	109	2.99	1.041		
Marital status	Single	353	3.16	1.051	1.341	.259
	Married	635	3.28	1.112		
	Divorced	52	3.37	1.103		
	Other	9	3.00	.866		
No. of children	None	495	3.19	1.053	1.680	.170
	1	228	3.32	1.073		
	2	248	3.33	1.157		
	3 or more	78	3.10	1.146		

Although the respondents who have been married generally had a higher score, with 3.15 for single respondents, 3.28 for the married, and 3.37 for the divorced, this trend was not statistically significant. The respondents with children also had a slightly higher average (3.32 for those with one or two children and 3.19 for those without children), but this difference did not have any statistical relevance.

The overall average of the scores of the 11 countries was 3.24. Sri Lanka (2.72) and Malaysia (2.74) had the most favorable results, followed by Mongolia (2.96), Bangladesh (2.98), Pakistan (3.04), Taiwan (3.14), and Republic of Korea (3.26). Meanwhile, India (3.54), Japan (3.55), and Nepal (3.57) were observed to have a certain level of gender discrimination in terms of promotion at work. Just as in the results from other questions, Vietnam (3.84) once again showed the highest level of gender unbalance perception.

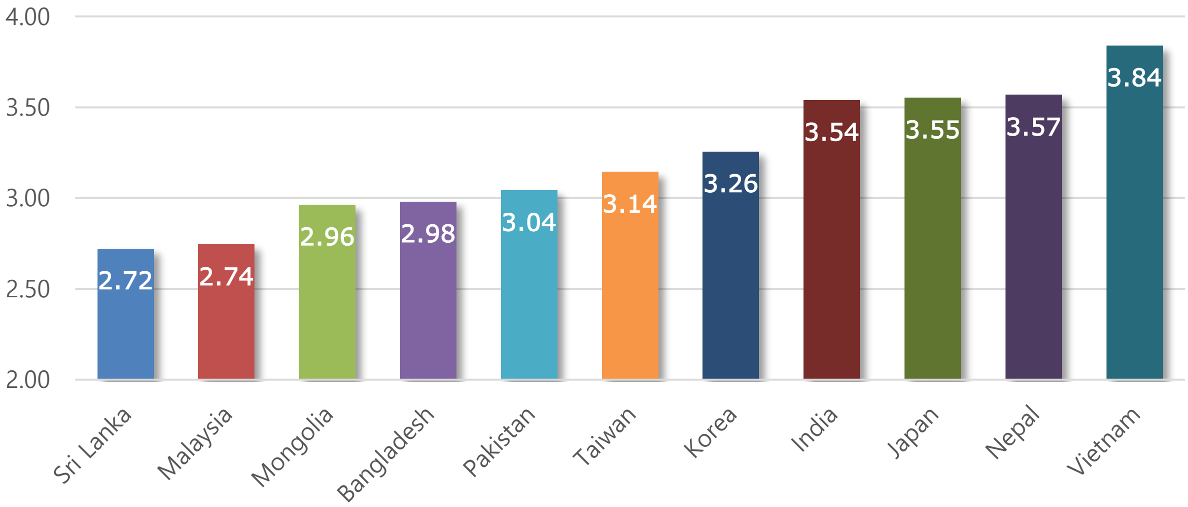


Figure 4-1-8. Average point of Q6 by country

Q7. **There are more men than women among those with similar or more professional experience than mine.**

Q7 was intended to understand the gender ratios as a result of the glass-ceiling phenomenon. The overall average was 3.69, and it is assumed that men outnumber women in the science and technology sector. The respondents were not asked if the numbers of men and women were significantly different in the entire area they were working in, but asked if more men were assuming identical or higher career levels than they were. By age group, older respondents tend to report higher differences in gender makeup, with average scores of 3.59 for those in their 20s, 3.69 for 30s, 3.76 for 40s, and 3.74 for 50s. However, the ANOVA test and one-on-one ex-post analysis failed to confirm any statistically significant difference. Similar to many other questions, this question did not show a particularly high difference between the groups of scientists (3.82) and engineers (3.86), but medical professionals displayed a lower average score of 3.18. This difference was verified by the ANOVA and one-on-one ex-post analysis to be statistically significant.

Table 4-1-10. Comparative survey result of Q7 by age, occupation and marital status

		N	Average	Standard deviation	F	*p*
Total		1049	3.69	1.055		
Age	20s or younger	292	3.59	1.076	1.387	.245
	30s	298	3.69	1.051		
	40s	231	3.76	1.064		
	50s or older	228	3.74	1.019		
Occupation	Scientist	369	3.82	1.035	16.416	.000
	Engineer	384	3.86	.921		
	Professional medical staff	148	3.18	1.194		
	Professional researcher	39	3.64	1.063		
	Others	109	3.35	1.075		
Marital status	Single	353	3.65	1.097	1.895	.129
	Married	635	3.73	1.031		
	Divorced	52	3.50	1.019		
	Other	9	3.11	1.054		
No. of children	None	495	3.68	1.081	2.027	.108
	1	228	3.72	1.036		
	2	248	3.75	1.023		
	3 or more	78	3.42	1.013		

It is logically difficult to expect for marital status and the number of children to have correlations with the gender makeup at workplaces, and the analysis results also support the absence of statistically relevant differences.

By country, Mongolia (2.96) and Sri Lanka (3.09) showed the most favorable circumstances, followed by the five mid-range countries of Vietnam (3.32), Malaysia (3.40), Bangladesh (3.40), Taiwan (3.65), and Pakistan (3.73). The other four countries—Republic of Korea (4.02), India (4.08), Japan (4.12), and Nepal (4.23)—were found to have the widest gap in gender makeup in the science and technology sector.

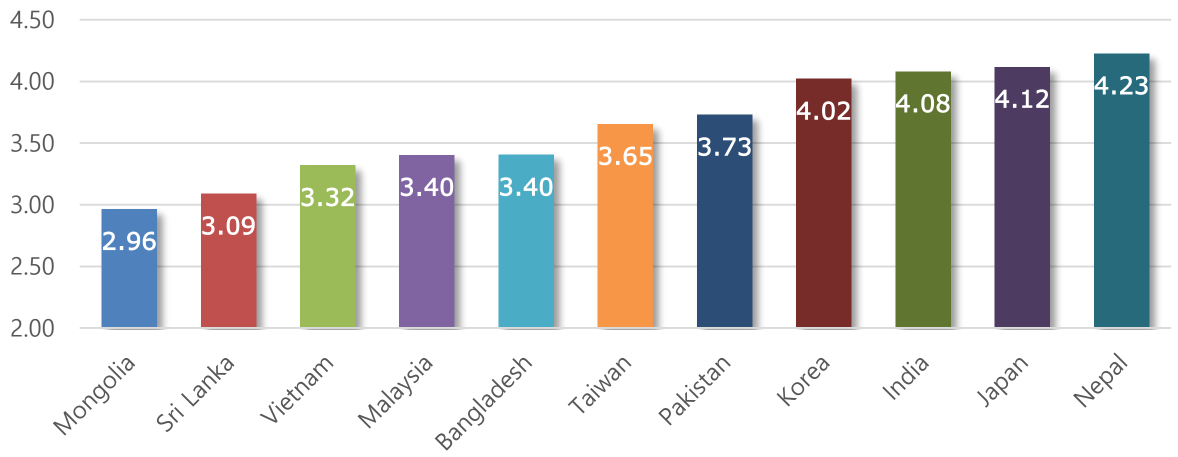


Figure 4-1-9. Average point of Q7 by country

Q8. **Girls who are entering college today will be studying in a better (more gender equal) environment than I did.**

Asked about the prospect for improvement in gender gaps in the science and technology sector, most respondents stated that the situation was improving, and would continue to improve, compared to the time when they were undergraduate students, showing an average score of 3.76. Respondents from all age groups expressed a positive prospect, with average scores of 3.73 for those in their 20s, 3.59 for 30s, 3.92 for 40s, and 3.88 for 50s; the ANOVA analysis results verified a statistically relevant difference. However, further analysis seems necessary for the particularly lower average scores of 3.59 among the 298 respondents in their 30s. As with Q7, scientists (3.75) and engineers (3.80) showed similar average scores, while medical professionals had a statistically significant lower average score of 3.58. This result may indicate that the group does not see further room for improvement since the medical sector no longer has a wide gender gap in the learning environment. By marital status, those who have been married showed a higher average (3.80) than single respondents (3.69), indicating a stronger perception of improvement in progress. However, this difference was slightly away from the 95% significance level, and therefore it cannot be said that it is statistically significant. According to the number of children, those without children had an average score of 3.69, which is statistically significantly lower than 3.90 for those with one child, 3.76 for those with two children, and 3.81 for those with three children. It is therefore concluded that the respondents with children are more likely to realize improvements.

Table 4-1-11. Comparative survey result of Q8 by age, occupation and marital status

		N	Average	Standard deviation	F	*p*
Total		1049	3.76	.920		
Age	20s or younger	292	3.73	.998	7.106	.000
	30s	298	3.59	.985		
	40s	231	3.92	.830		
	50s or older	228	3.88	.764		
Occupation	Scientist	369	3.76	.908	2.494	.042
	Engineer	384	3.80	.835		
	Professional medical staff	148	3.58	1.010		
	Professional researcher	39	4.03	1.135		
	Others	109	3.81	1.004		
Marital status	Single	353	3.69	.926	1.332	.263
	Married	635	3.80	.927		
	Divorced	52	3.87	.817		
	Other	9	3.89	.601		
No. of children	None	495	3.69	.934	2.750	.042
	1	228	3.90	.885		
	2	248	3.76	.929		
	3 or more	78	3.81	.869		

The countries with the least expectation for improvement are Sri Lanka (3.39) and Mongolia (3.42), and those in the mid-range include Pakistan (3.59), Japan (3.61), Malaysia (3.61), Taiwan (3.67), Nepal (3.70), and Republic of Korea (3.82). Meanwhile, Bangladesh (4.01), Vietnam (4.11), and India (4.18) displayed the highest level of expectation for possible improvements in gender quality.

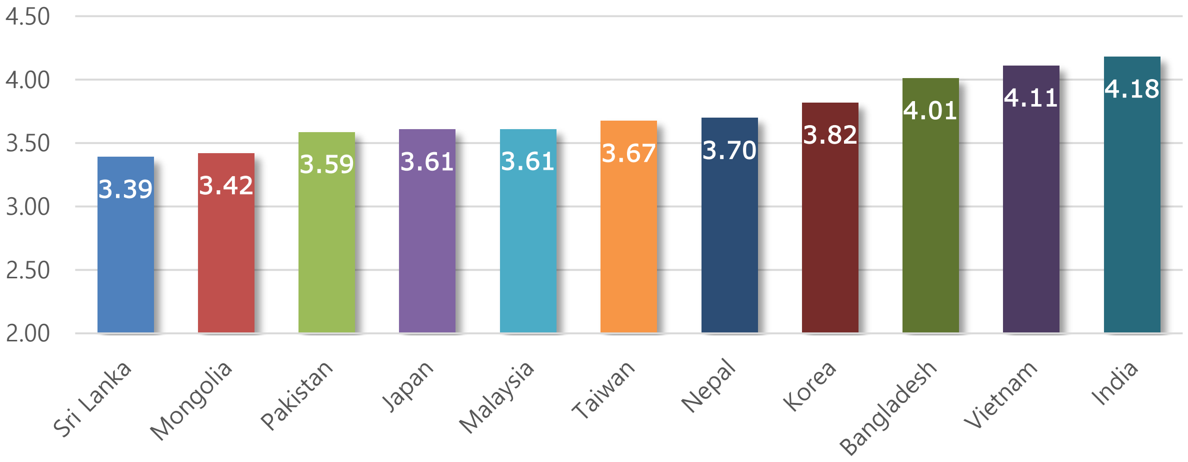


Figure 4-1-10. Average point of Q8 by country

Q9. **There is a difference in ability (math, analytical skills, logical thinking, etc) that needs to be acquired in science for men and women.**

Q9 was designed to identify any perception that there are differences in men' and women's abilities in the science sector; the overall average amounted to 2.64. This result shows that the respondents who studied and are working in the science field tend not to acknowledge gender inequality in abilities. A strong tendency of not acknowledging gender difference was observed among different age groups, with average scores of 2.87 (20s), 2.64 (30s), 2.56 (40s), and 2.43 (50s); this difference was verified to have statistical significance. By occupation, no particular difference was found among scientists (2.61), engineers (2.53), and medical professionals (2.57). A statistically significant difference was found in the ANOVA analysis, because the average scores of 109 respondents with other occupations was 3.15. It is hard to say this result is relevant, however, since "other" occupations cannot be translated into a group with a common nature. Marital status was not found to be correlated with the perception of difference in each gender's abilities. In addition, although the respondents with children (2.52-2.63) reported a higher perception than those without children (2.72), this difference did not show statistical significance.

Table 4-1-12. Comparative survey result of Q9 by age, occupation and marital status

		N	Average	Standard deviation	F	*p*
Total		1049	2.64	1.122		
Age	20s or younger	292	2.87	1.235	7.004	.000
	30s	298	2.64	1.036		
	40s	231	2.56	1.061		
	50s or older	228	2.43	1.095		
Occupation	Scientist	369	2.61	1.123	7.252	.000
	Engineer	384	2.53	1.039		
	Professional medical staff	148	2.57	1.037		
	Professional researcher	39	2.87	1.418		
	Others	109	3.15	1.261		
Marital status	Single	353	2.67	1.167	1.112	.343
	Married	635	2.61	1.096		
	Divorced	52	2.69	1.147		
	Other	9	3.22	.972		
No. of children	None	495	2.72	1.177	1.790	.147
	1	228	2.63	1.081		
	2	248	2.52	1.026		
	3 or more	78	2.60	1.155		

By country, respondents in Japan (2.03) and India (2.12) demonstrated the weakest perception that there is a difference in each gender's abilities, followed by Nepal (2.48), Sri Lanka (2.53), Republic of Korea (2.64), Taiwan (2.79), Vietnam (2.81), Pakistan (2.84), and Malaysia (2.95). The highest average score was reported in Bangladesh (3.20), indicating that the country acknowledges difference in abilities of men and women in the science and technology sector. Table 4-1-12 Comparative survey result of Q9 by age, occupation and marital status

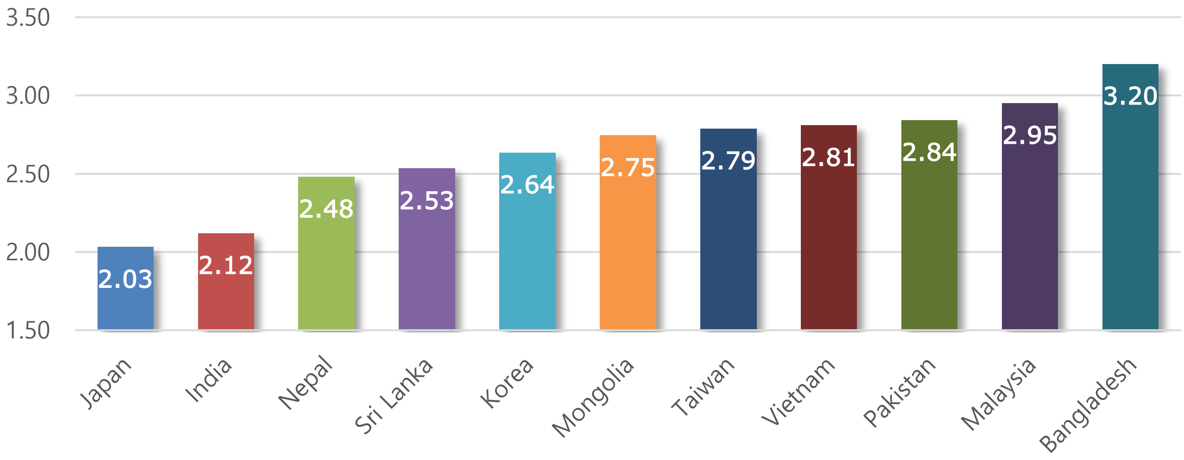


Figure 4-1-11. Average point of Q9 by country

Q10**. Having to balance work and life (marriage and child care) is a handicap for women.**

It is widely known that pregnancy, childbirth, and child-rearing affect women's social life to a great extent. The overall average for this question was 3.78, the second highest score following the score for policy consideration. By age group, whereas the 292 respondents in their 20s produced an average score of 3.56, the score was higher among those in their 30s (3.81), 40s (3.92), and 50s (3.89), indicating greater burden of childbirth and child-rearing experienced among older respondents. A statistically significant difference was confirmed by the ANOVA and one-on-one ex-post analysis results as well. By occupation, scientists, engineers, and medical professionals reported average scores of 3.97, 3.66, and 3.72, respectively, showing a considerable difference among the respondents in different occupational groups; this result was also verified to have statistical relevance. The results based on marital status reveal that married respondents reported greater burden from marriage and child-rearing, with an average score of 3.64 for single respondents, 3.86 for the married, and 3.96 for the divorced. This result was also verified by the ANOVA and one-on-one ex-post analysis to be a statistically relevant difference. Whereas the respondents without children had an average score of 3.66, those with children showed averages between 3.79 and 3.96, once again hinting at the degree of burden they experience. A statistically relevant difference was also found in this case.

Table 4-1-13. Comparative survey result of Q10 by age, occupation and marital status

		N	Average	Standard deviation	F	*p*
Total		1049	3.78	1.045		
Age	20s or younger	292	3.56	1.097	6.821	.000
	30s	298	3.81	1.051		
	40s	231	3.92	1.003		
	50s or older	228	3.89	.970		
Occupation	Scientist	369	3.97	.969	4.930	.001
	Engineer	384	3.66	1.034		
	Professional medical staff	148	3.72	1.130		
	Professional researcher	39	3.69	.977		
	Others	109	3.66	1.156		
Marital status	Single	353	3.64	1.060	6.868	.000
	Married	635	3.86	1.032		
	Divorced	52	3.96	.907		
	Other	9	2.78	1.093		
No. of children	None	495	3.66	1.062	5.152	.002
	1	228	3.85	.988		
	2	248	3.96	1.015		
	3 or more	78	3.79	1.109		

The countries with the weakest realization of handicap were Malaysia (3.22) and Sri Lanka (3.30), followed by Japan (3.61), Mongolia (3.69), Nepal (3.74), Bangladesh (3.75), India (3.76), and Pakistan (3.80). Two of the highest scores came from Taiwan (3.94) and Vietnam (3.98). It is worth noting that Republic of Korea had the highest average score of 4.34 among the 11 countries; this score was far higher than the second-highest average, obtained in Vietnam. This result seems to be related to the world's lowest birth rate in Republic of Korea; it seems necessary for the country to establish social infrastructure and encourage a change of awareness across society to narrow structural gaps due to pregnancy and childbirth, as a means to utilize women's talent in science and technology at a national level.

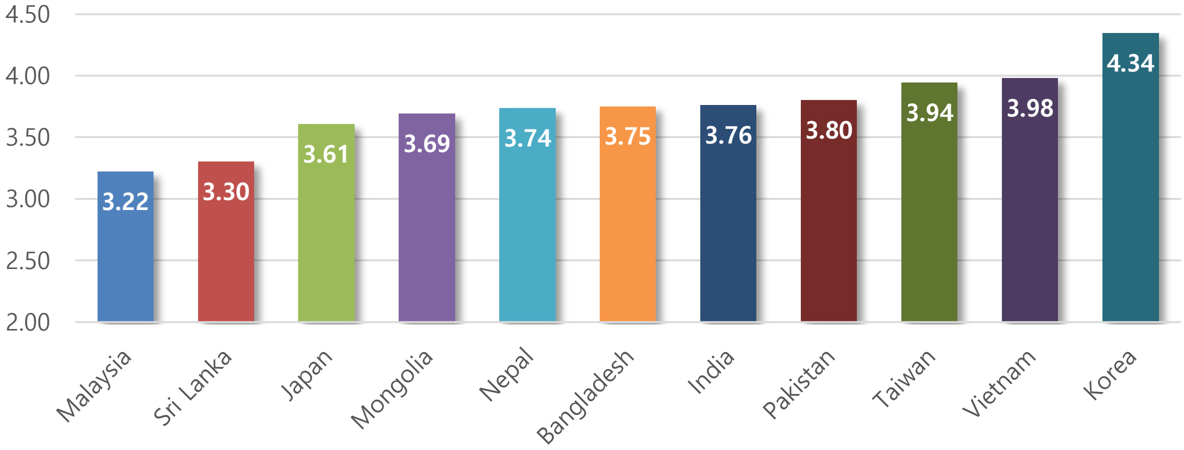


Figure 4-1-12. Average point of Q10 by country

Q11. **It is crucial to have policy support that ensures equal opportunity in order to solve the gender inequality in science.**

The average for the question about the necessity of policy to address gender inequality in science and technology was 4.08, the highest among the 11 questions. No particular difference was observed among the four age groups, with figures of 4.01 for those in their 20s, 4.10 for 30s, 4.13 for 40s, and 4.07 for 50s; this difference did not show statistical relevance. By occupation, scientists (4.10) and engineers (4.09) showed almost similar scores, and the group of medical professionals with relatively weaker gender inequality had an average score of 3.92. This variant did not show a statistically significant difference either. In the meantime, compared to single respondents (4.02), married and divorced respondents (4.12) expressed a stronger need for policy consideration, with a statistically significant difference. When the number of children was considered, those with one child (4.17) showed a stronger perception of the need for policy consideration than those without children (4.04). The average scores of those with two and three children (4.08 and 3.99, respectively) indicate that these respondents may have adapted themselves to reality.

Most countries expressed a need for policy consideration targeting women in science and technology. Malaysia (3.63), Mongolia (3.78), Taiwan (3.97), and Pakistan (4.04) reported a score below the average, and the mid-range was occupied by Republic of Korea (4.11), India (4.14), Bangladesh (4.17), Japan (4.18), and Vietnam (4.19). Nepal (4.43) had the highest average and therefore the highest necessity for policy consideration for women scientists and engineers.

Table 4-1-14. Comparative survey result of Q11 by age, occupation and marital status

		N	Average	Standard deviation	F	*p*
Total		1049	4.08	.912		
Age	20s or younger	292	4.01	.930	.849	.467
	30s	298	4.10	.919		
	40s	231	4.13	.906		
	50s or older	228	4.07	.886		
Occupation	Scientist	369	4.10	.918	1.496	.201
	Engineer	384	4.09	.842		
	Professional medical staff	148	3.92	.965		
	Professional researcher	39	4.23	1.038		
	Others	109	4.09	.996		
Marital status	Single	353	4.02	.895	4.410	.004
	Married	635	4.12	.917		
	Divorced	52	4.12	.808		
	Other	9	3.11	1.269		
No. of children	None	495	4.04	.910	1.203	.307
	1	228	4.17	.870		
	2	248	4.08	.929		
	3 or more	78	3.99	.987		

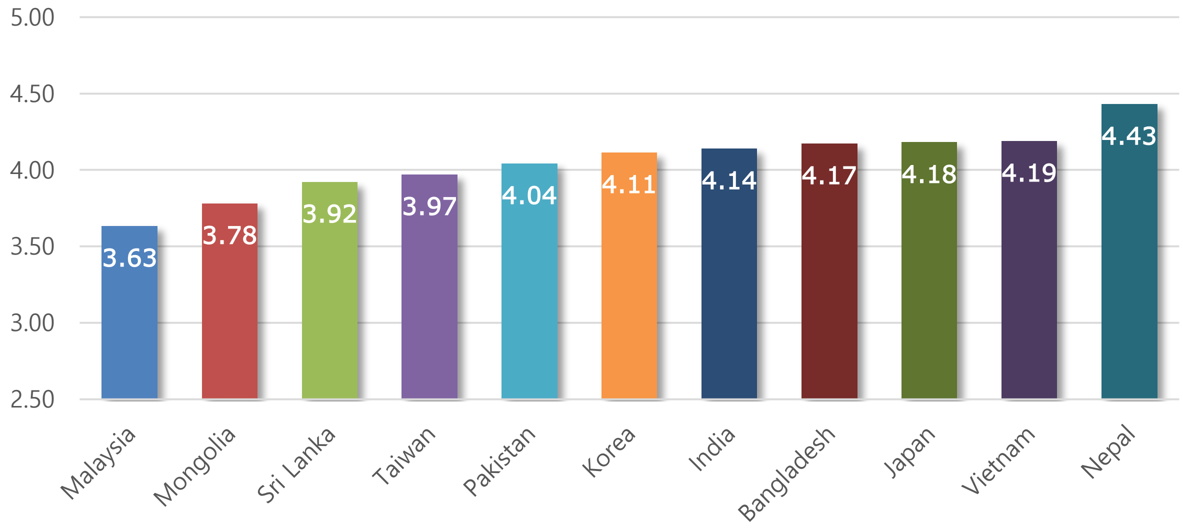


Figure 4-1-13. Average point of Q11 by country

4.2 Analysis of survey results by country

4.2.1 Nepal

A total of 102 participants in Nepal responded to the survey. By age, the share of younger respondents was the highest, with 44 participants in their 20s (43%), 40 in their 30s (39%), and 16 in their 40s (16%). By occupation, the group of engineers participated most with 57 engineers (56%), followed by 25 scientists (25%), and 9 medical professionals (9%). Among the 102 respondents, 36 were single (35%) and 64 were married (63%). In terms of the number of children, those without children took the largest share (52 respondents, 51%), followed by 30 participants with one child (29%) and 20 with two children (20%). The inter-national comparison suggests that the average score of Nepal for all 11 questions was 3.41, or 10th highest score out of the 11 countries surveyed

Table 4-2-1. Status of survey participants in Nepal

		N	%
Age	20s or younger	44	43.1
	30s	40	39.2
	40s	16	15.7
	50s or older	2	2.0
Occupation	Scientist	25	24.5
	Engineer	57	55.9
	Professional medical staff	9	8.8
	Professional researcher	6	5.9
	Student	1	1.0
	Others	4	3.9
Job	Student	7	6.9
	Professor/teacher	13	12.7
	Researcher	15	14.7
	Manager	11	10.8
	Professional medical staff	8	7.8
	Engineer	47	46.1
	Other	1	1.0
Marital status	Single	36	35.3
	Married	64	62.7
	Divorced	1	1.0
	Other	1	1.0
No. of children	None	52	51.0
	1	30	29.4
	2	20	19.6
	Total	102	100.0

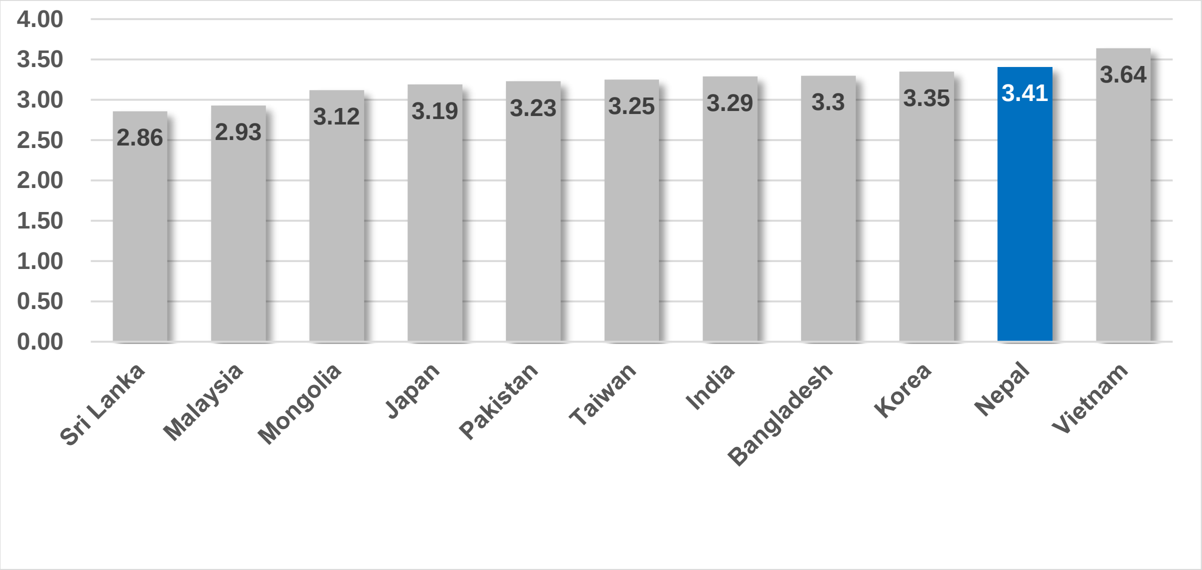


Figure 4-2-1. Average value of Nepal in comparison to other participating countries

Nepal had higher scores with statistical significance in five questions (Q1, Q2, Q6, Q7, Q11) than other countries did, and the country had a statistically relevantly lower average score only in Q5 (discrimination related to funding) compared to the averages in the other ten countries. No statistically significant difference was observed in the remaining five questions (Q3, Q4, Q8, Q9, Q10).

Table 4-2-2. Comparison of average value in Nepal

	Question	Nepal	Except Nepal	t	*(p)*
Q1	Female scientists are limited in how much they can succeed in science compared to male scientists.	3.75	3.19	4.64	0.000
Q2	Men have an advantage over women in Science.	3.57	3.16	3.34	0.001
Q3	To attain a masters or doctoral degree, women should work harder and take longer time to finish their studies than men.	2.98	2.77	1.65	0.099
Q4	I have experienced some disadvantages to lead or participate in a research project because I am a woman.	3.12	2.87	1.89	0.061
Q5	I have experienced some disadvantages in research funding or scholarships because I am a woman.	1.91	2.54	-8.27	0.000
Q6	Becoming a tenured professor, being promoted or becoming a principal investigator is more difficult for female scientists than for male scientists.	3.57	3.21	3.67	0.000
Q7	There are more men than women among those with similar or more professional experience than mine.	4.23	3.63	6.60	0.000
Q8	Girls who are entering college today will be studying in a better (more gender equal) environment than I did.	3.70	3.77	-0.79	0.429
Q9	There is a difference in ability (math, analytical skills, logical thinking, etc) that needs to be acquired in science for men and women.	2.48	2.66	-1.52	0.129
Q10	Having to balance work and life (marriage and child care) is a handicap for women.	3.74	3.79	-0.47	0.637
Q11	It is crucial to have policy support that ensures equal opportunity in order to solve the gender inequality in science.	4.43	4.04	4.17	0.000
N		102	947		

Q1. **Female scientists are limited in how much they can succeed in science compared to male scientists.**

Table 4-2-3. Comparative survey result of Q1 by age, occupation and marital status in Nepal

		N	Average	Standard deviation	F	*p*
	Total	102	3.75	1.16		
Age	20s or younger	44	3.57	0.85	1.41	.244
	30s	40	4.03	1.27		
	40s	16	3.50	1.55		
	50s or older	2	4.00	0.00		
Occupation	Scientist	20	3.40	1.50	0.90	.483
	Engineer	56	3.73	1.05		
	Professional medical staff	9	4.33	1.00		
	Professional researcher	6	3.33	1.03		
	Student	1	4.00			
	Others	4	4.25	0.96		
Marital status	Single	36	3.75	0.770	2.85	.041
	Married	64	3.81	1.283		
	Divorced	1	2.00			
	Other	1	1.00			
No. of children	None	52	3.69	0.875	0.39	.681
	1	30	3.70	1.442		
	2	20	3.95	1.356		

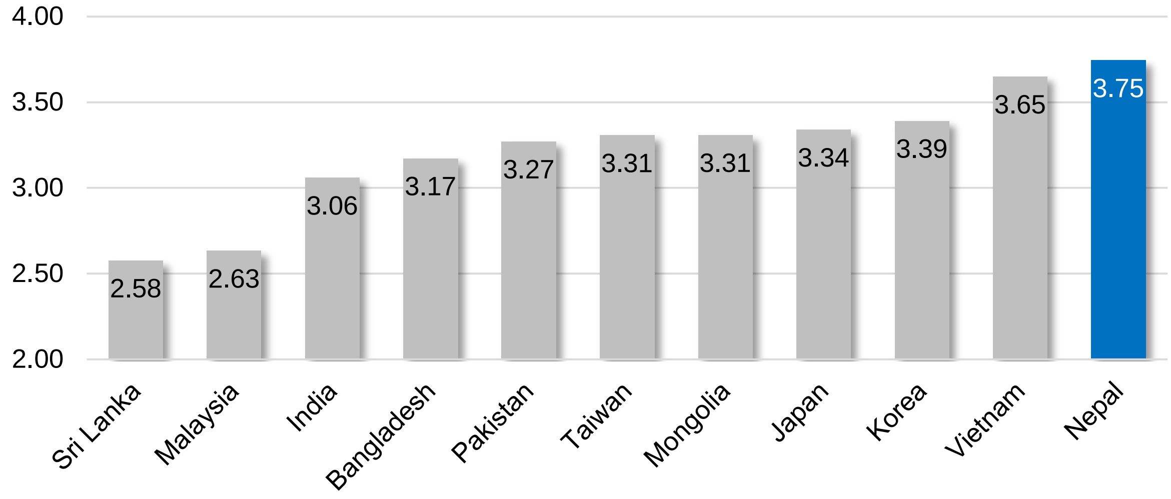


Figure 4-2-2. Average point of Q1 of Nepal

Q2. **Men have an advantage over women in Science.**

One-on-one ex-post analysis found that the average among those in their 20s (3.34) was lower than that of those in their 30s (3.75) and in their 40s (3.69). The score of those without children was 3.35, lower than the value of 3.60 of those with one child and 4.10 of those with two children; this difference was also confirmed to have statistical significance.

Table 4-2-4. Comparative survey result of Q2 by age, occupation ad marital status in Nepal

		N	Average	Standard deviation	F	*p*
	Total	102	3.57	1.13		
Age	20s or younger	44	3.34	1.01	1.10	.354
	30s	40	3.75	1.21		
	40s	16	3.69	1.25		
	50s or older	2	4.00	0.00		
Occupation	Scientist	20	3.40	1.27	1.01	.414
	Engineer	56	3.52	0.99		
	Professional medical staff	9	4.11	1.17		
	Professional researcher	6	3.67	1.21		
	Student	1	5.00			
	Others	4	3.75	1.89		
Marital status	Single	36	3.47	1.055	2.14	.100
	Married	64	3.67	1.142		
	Divorced	1	3.00			
	Other	1	1.00			
No. of children	None	52	3.35	1.064	3.38	.038
	1	30	3.60	1.221		
	2	20	4.10	1.021		

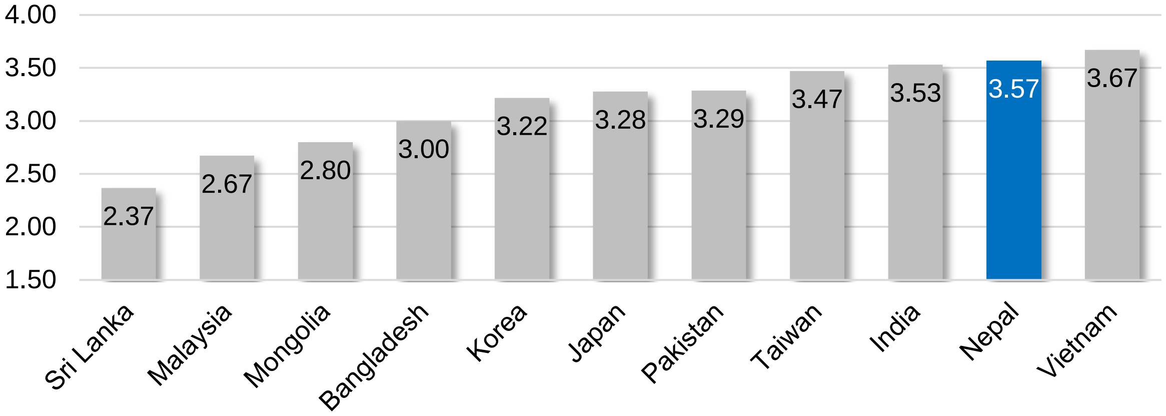


Figure 4-2-3. Average point of Q2 of Nepal

Q3. **To attain a masters or doctoral degree, women should work harder and take longer time to finish their studies than men.**

The ANOVA analysis found statistically significant differences in terms of occupation, marital status, and the number of children. The one-on-one ex-post analysis by age group found that the average score of those in their 20s (2.61) was lower than the average scores of older respondents. By occupation, whereas the average scores of scientists and medical professionals were 3.20 and 3.33, respectively, the average among engineers was 2.86, indicating less gender discrimination in the learning environment in the engineering disciplines, compared to the sciences and medicine. Marital status produced a statistically significant difference, with average scores of 2.58 for single respondents and 3.25 for married respondents. Likewise, those without children showed a lower average than those with children did, with a statistically significant difference.

Table 4-2-5. Comparative survey result of Q3 by age, occupation and marital status in Nepal

		N	Average	Standard deviation	F	*p*
	Total	102	2.98	1.33		
Age	20s or younger	44	2.61	1.19	2.19	.094
	30s	40	3.33	1.33		
	40s	16	3.06	1.53		
	50s or older	2	3.50	2.12		
Occupation	Scientist	20	3.20	1.36	2.68	.026
	Engineer	56	2.86	1.24		
	Professional medical staff	9	3.33	1.73		
	Professional researcher	6	2.00	0.63		
	Student	1	5.00			
	Others	4	4.50	0.58		
Marital status	Single	36	2.58	1.131	3.02	.034
	Married	64	3.25	1.380		
	Divorced	1	2.00			
	Other	1	1.00			
No. of children	None	52	2.69	1.213	3.61	.031
	1	30	3.07	1.337		
	2	20	3.60	1.465		

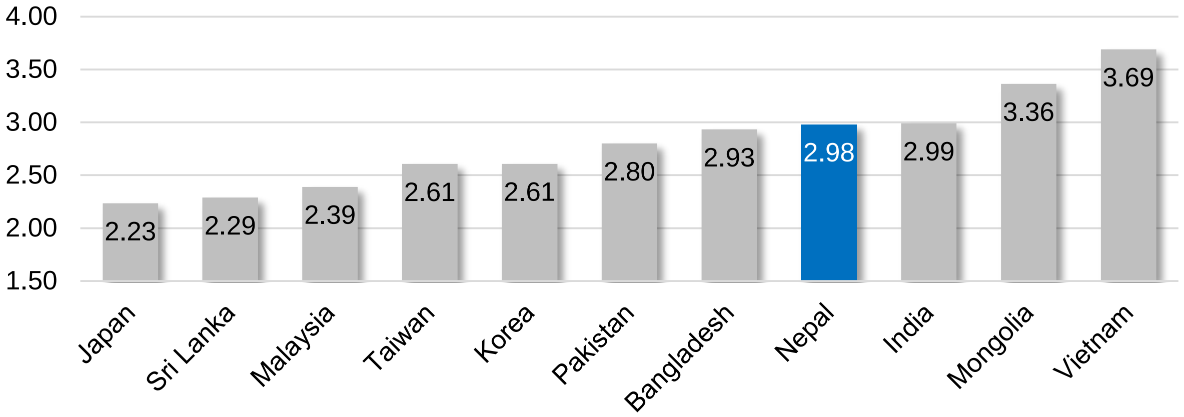


Figure 4-2-4. Average point of Q3 by Nepal

Q4. **I have experienced some disadvantages to lead or participate in a research project because I am a woman.**

Table 4-2-6. Comparative survey result of Q4 by age, occupation and marital status in Nepal

		N	Average	Standard deviation	F	*p*
	Total	102	3.12	1.27		
Age	20s or younger	44	2.89	1.08	2.29	.083
	30s	40	3.50	1.32		
	40s	16	2.75	1.48		
	50s or older	2	3.50	0.71		
Occupation	Scientist	20	3.05	1.28	0.97	.438
	Engineer	56	3.16	1.14		
	Professional medical staff	9	3.11	1.90		
	Professional researcher	6	2.83	1.33		
	Student	1	2.00			
	Others	4	2.00	1.41		
Marital status	Single	36	2.97	1.108	2.40	.072
	Married	64	3.27	1.312		
	Divorced	1	1.00			
	Other	1	1.00			
No. of children	None	52	3.00	1.120	2.25	.111
	1	30	2.97	1.474		
	2	20	3.65	1.226		

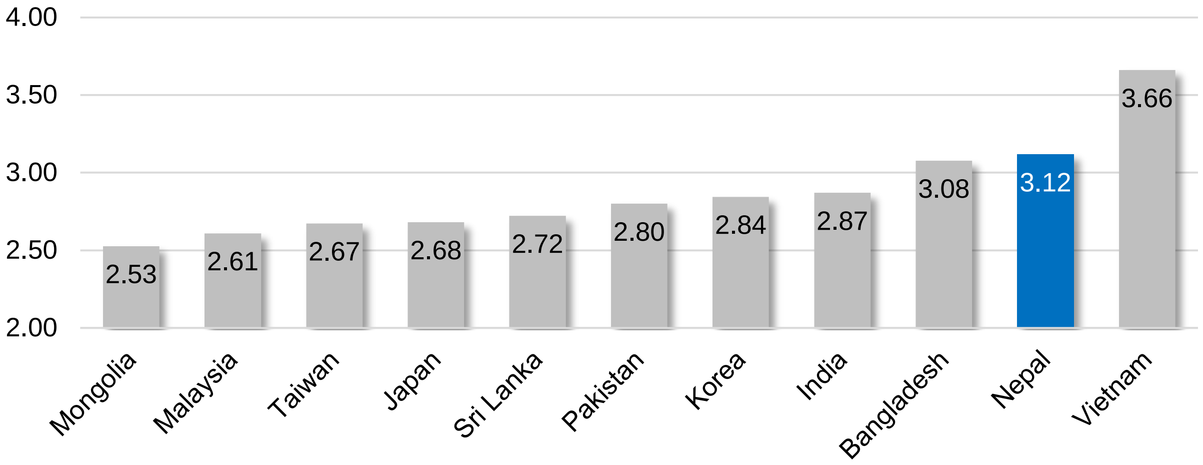


Figure 4-2-5. Average point of Q4 of Nepal

Q5. **I have experienced some disadvantages in research funding or scholarships because I am a woman.**

Table 4-2-7. Comparative survey result of Q5 by age, occupation and marital status in Nepal

		N	Average	Standard deviation	F	*p*
	Total	102	1.91	0.69		
Age	20s or younger	44	1.93	0.59	0.13	.939
	30s	40	1.93	0.76		
	40s	16	1.81	0.83		
	50s or older	2	2.00	0.00		
Occupation	Scientist	20	2.05	0.83	1.84	.112
	Engineer	56	1.95	0.62		
	Professional medical staff	9	1.67	0.50		
	Professional researcher	6	1.50	0.84		
	Student	1	1.00			
	Others	4	1.50	0.58		
Marital status	Single	36	2.00	0.535	1.77	.159
	Married	64	1.86	0.753		
	Divorced	1	3.00			
	Other	1	1.00			
No. of children	None	52	1.94	0.574	0.13	.876
	1	30	1.90	0.923		
	2	20	1.85	0.587		

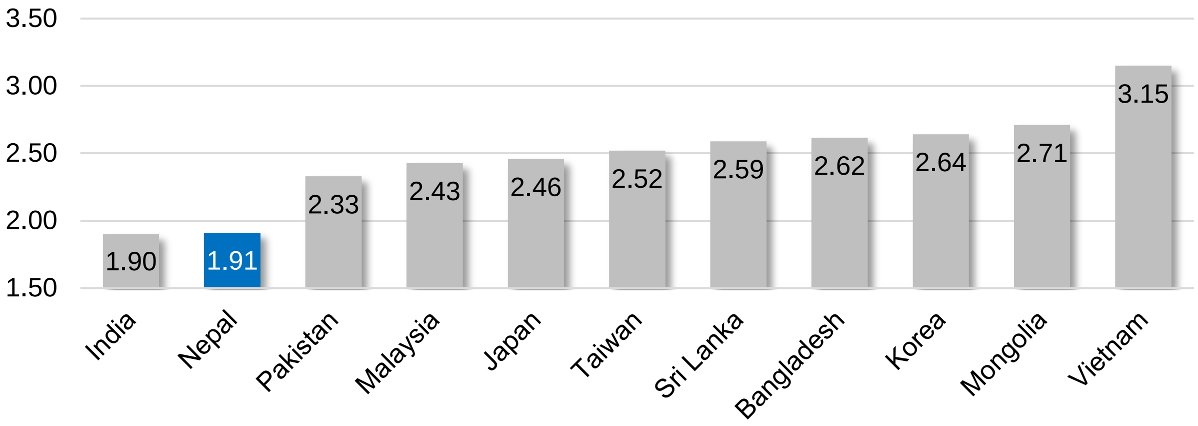


Figure 4-2-6. Average point of Q5 of Nepal

Q6. **Becoming a tenured professor, being promoted or becoming a principal investigator is more difficult for female scientists than for male scientists.**

Table 4-2-8. Comparative survey result of Q6 by age, occupation and marital statue in Nepal

		N	Average	Standard deviation	F	*p*
	Total	102	3.57	0.93		
Age	20s or younger	44	3.50	0.82	1.00	.397
	30s	40	3.75	1.03		
	40s	16	3.31	0.95		
	50s or older	2	3.50	0.71		
Occupation	Scientist	20	3.50	0.83	0.11	.990
	Engineer	56	3.54	0.89		
	Professional medical staff	9	3.56	1.42		
	Professional researcher	6	3.67	1.37		
	Student	1	4.00			
	Others	4	3.50	0.58		
Marital status	Single	36	3.64	0.762	0.32	.808
	Married	64	3.55	1.022		
	Divorced	1	3.00			
	Other	1	3.00			
No. of children	None	52	3.48	0.874	0.54	.585
	1	30	3.70	0.915		
	2	20	3.60	1.095		

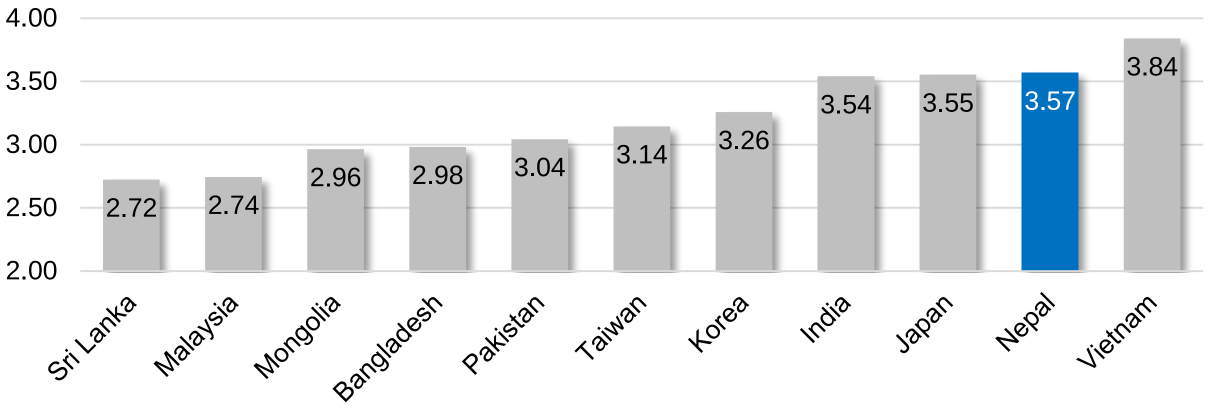


Figure 4-2-7. Average point of Q6 of Nepal

Q7. **There are more men than women among those with similar or more professional experience than mine.**

By age, while the average scores of those in their 20s and 40s were 4.09 and 4.00, respectively, the average score of those in their 30s (4.53) was statistically relevantly higher. In the meantime, the respondents without children had an average score of 3.98, while those with one or two children had scores of 4.47 and 4.50, respectively. Considering the nature of this survey question, however, it is difficult to conclude that the number of children affected the result.

Table 4-2-9. Comparative survey result of Q7 by age, occupation and marital status in Nepal

		N	Average	Standard deviation	F	*p*
	Total	102	4.23	0.84		
Age	20s or younger	44	4.09	0.71	4.21	.008
	30s	40	4.53	0.82		
	40s	16	4.00	0.97		
	50s or older	2	3.00	1.41		
Occupation	Scientist	25	4.16	0.85	1.59	.171
	Engineer	57	4.33	0.55		
	Professional medical staff	9	4.22	1.30		
	Professional researcher	6	4.00	1.55		
	Student	1	5.00			
	Others	4	3.25	1.50		
Marital status	Single	36	4.00	0.828	1.61	.192
	Married	64	4.34	0.840		
	Divorced	1	5.00			
	Other	1	4.00			
No. of children	None	52	3.98	0.918	4.82	.010
	1	30	4.47	0.629		
	2	20	4.50	0.761		

Among the 11 countries, Nepal reported the highest average scores of 4.23.
According to the Global Gender Gap Report 2014 published by the World Economic Forum, Nepal ranked 112th, among the lowest rankings, and 121st in terms of gender gap among professional and technical workers.

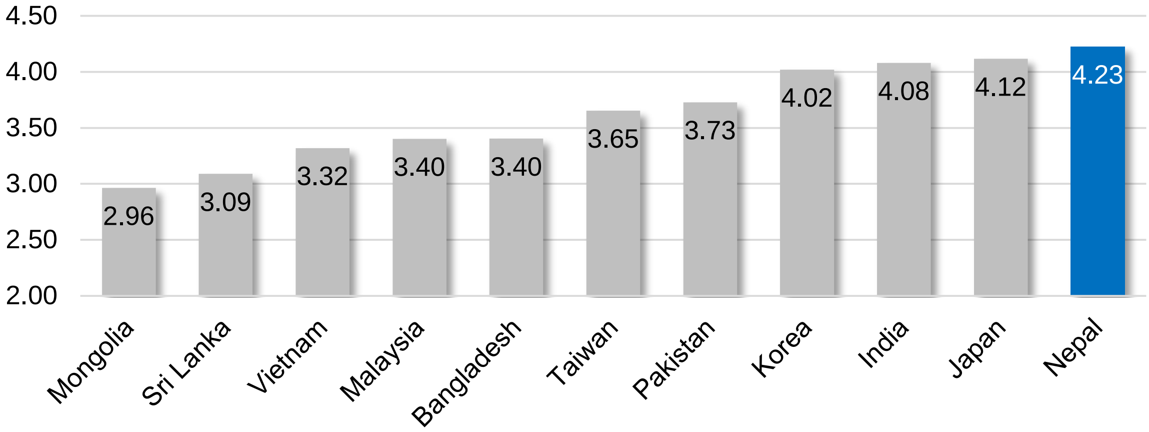


Figure 4-2-8. Average point of Q7 of Nepal

Q8. **Girls who are entering college today will be studying in a better (more gender equal) environment than I did.**

When asked about their expectation for future improvements, the respondents in their 20s showed an average score of 3.50, with scores of 3.78 and 3.88 for the older groups, suggesting a tendency of growing expectation among the older respondents, as confirmed in other countries as well. By occupation, whereas scientists and medical professionals had average scores of 4.05 and 4.22, respectively, the average among engineers was only 3.61. This result is contrary to the circumstances in many other countries where medical professionals expressed lower levels of expectation, but it is hard to generalize the result as the number of respondents working as medical professionals in Nepal was only nine. By marital status, single respondents (3.36) expressed higher expectation than their married counterparts (3.89), showing consistency with the results in other countries. Likewise, while the average among respondents without children was 3.37, the scores for those with one or two children were 3.90 and 4.25, respectively, indicating the higher expectation for the future among the parents.

Table 4-2-10. Comparative survey result of Q8 by age, occupation and marital status in Nepal

		N	Average	Standard deviation	F	*p*
	Total	102	3.70	0.91		
Age	20s or younger	44	3.50	1.02	2.46	.067
	30s	40	3.78	0.80		
	40s	16	3.88	0.72		
	50s or older	2	5.00	0.00		
Occupation	Scientist	20	4.05	0.76	4.42	.001
	Engineer	56	3.61	0.76		
	Professional medical staff	9	4.22	0.44		
	Professional researcher	6	2.67	1.51		
	Student	1	2.00			
	Others	4	3.50	1.29		
Marital status	Single	36	3.36	0.990	3.00	.034
	Married	64	3.89	0.819		
	Divorced	1	3.00			
	Other	1	4.00			
No. of children	None	52	3.37	1.010	9.18	.000
	1	30	3.90	0.662		
	2	20	4.25	0.550		

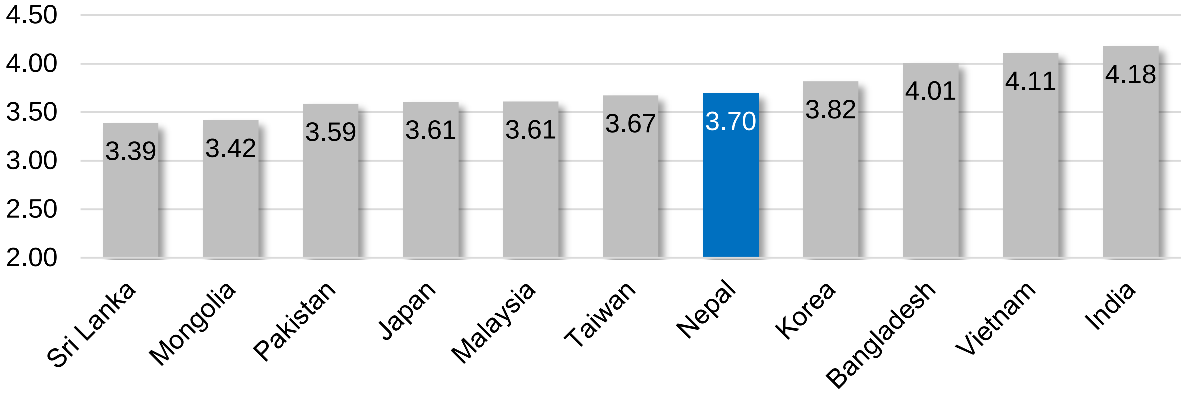


Figure 4-2-9. Average point of Q8 of Nepal

Q9. **There is a difference in ability (math, analytical skills, logical thinking, etc) that needs to be acquired in science for men and women.**

Asked about gender inequality perceived in terms of abilities required in the science sector, the respondents in their 40s showed an average score of 3.25, higher than 2.45 and 2.20 of those in their 20s and 30s, respectively. Statistical significance was also confirmed. By occupation, the group of scientists (2.90) exhibited a higher level of perception than engineers (2.27) and medical professionals (2.44). Such perception was found not to be affected by marital status and the number of children.

Table 4-2-11. Comparative survey result of Q9 by age, occupation and marital status in Nepal

		N	Average	Standard deviation	F	*p*
	Total	102	2.48	1.06		
Age	20s or younger	44	2.45	1.15	4.10	.009
	30s	40	2.20	0.88		
	40s	16	3.25	0.93		
	50s or older	2	2.50	0.71		
Occupation	Scientist	20	2.90	1.21	2.28	.053
	Engineer	56	2.27	0.80		
	Professional medical staff	9	2.44	1.13		
	Professional researcher	6	1.83	1.17		
	Student	1	4.00			
	Others	4	2.50	1.00		
Marital status	Single	36	2.61	1.178	1.16	.327
	Married	64	2.38	0.984		
	Divorced	1	3.00			
	Other	1	4.00			
No. of children	None	52	2.46	1.111	0.61	.548
	1	30	2.37	1.033		
	2	20	2.70	0.979		

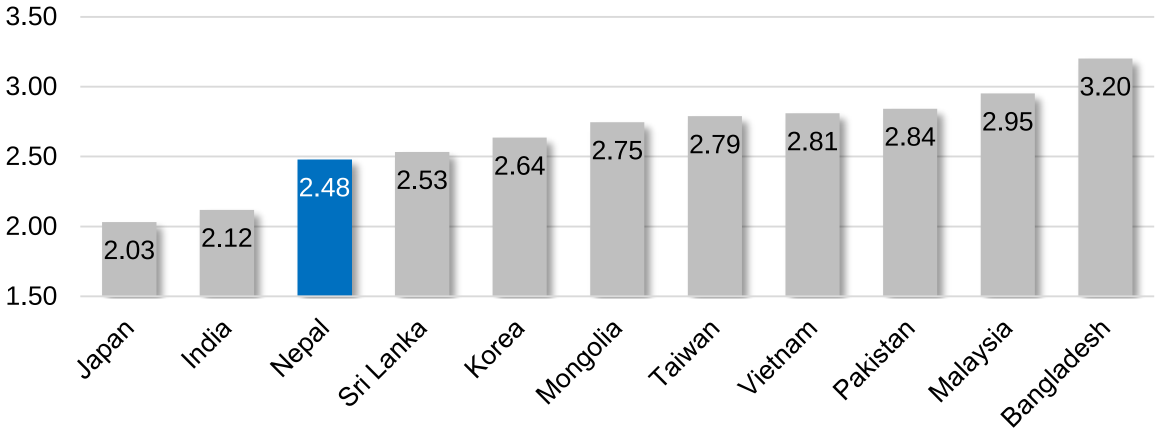


Figure 4-2-10. Average point of Q9 of Nepal

Q10. Having to balance work and life (marriage and child care) is a handicap for women.

Asked about the influence of marriage and child-rearing on the social life of women in science and technology, the respondents in their 20s and 40s showed average scores of 3.55 and 3.25, respectively, but those in their 30s reported an average score of 4.18, showing the actual burden of striking a balance between work and child-rearing. Although there was a failure to reach the statistically significant level in the ANOVA analysis, the analysis based on marital status and the number of children suggests that the average scores among married respondents and those with children were higher than those among single and childless respondents.

Table 4-2-12. Comparative survey result of Q10 by age, occupation and marital status in Nepal

		N	Average	Standard deviation	F	*p*
	Total	102	3.74	1.10		
Age	20s or younger	44	3.55	1.04	4.30	.007
	30s	40	4.18	0.96		
	40s	16	3.25	1.24		
	50s or older	2	3.00	1.41		
Occupation	Scientist	20	3.60	1.14	2.11	.071
	Engineer	56	3.79	0.93		
	Professional medical staff	9	4.22	1.09		
	Professional researcher	6	2.67	1.51		
	Student	1	5.00			
	Others	4	3.25	1.71		
Marital status	Single	36	3.58	1.052	1.30	.279
	Married	64	3.84	1.116		
	Divorced	1	4.00			
	Other	1	2.00			
No. of children	None	52	3.58	1.054	1.25	.292
	1	30	3.97	1.066		
	2	20	3.80	1.240		

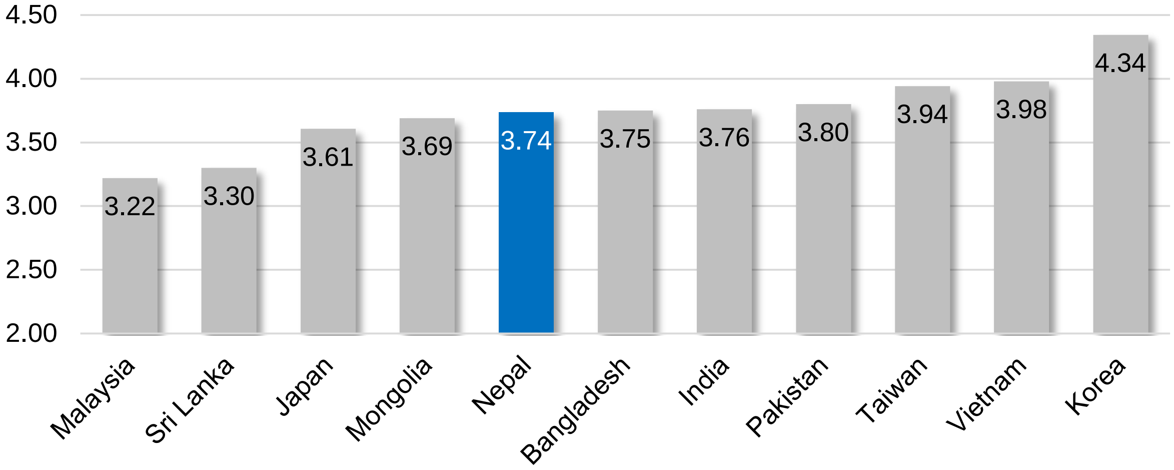


Figure 4-2-11. Average point of Q10 of Nepal

Q11. It is crucial to have policy support that ensures equal opportunity in order to solve the gender inequality in science.

Table 4-2-13. Comparative survey result of Q11 by age, occupation and marital status in Nepal

		N	Average	Standard deviation	F	*p*
	Total	102	4.43	0.83		
Age	20s or younger	44	4.36	0.69	2.62	.055
	30s	40	4.68	0.66		
	40s	16	4.06	1.29		
	50s or older	2	4.00	1.41		
Occupation	Scientist	20	4.30	1.22	1.16	.333
	Engineer	56	4.41	0.71		
	Professional medical staff	9	4.89	0.33		
	Professional researcher	6	4.00	1.10		
	Student	1	5.00			
	Others	4	4.75	0.50		
Marital status	Single	36	4.42	0.604	8.53	.000
	Married	64	4.52	0.816		
	Divorced	1	3.00			
	Other	1	1.00			
No. of children	None	52	4.31	0.755	1.19	.307
	1	30	4.57	0.898		
	2	20	4.55	0.887		

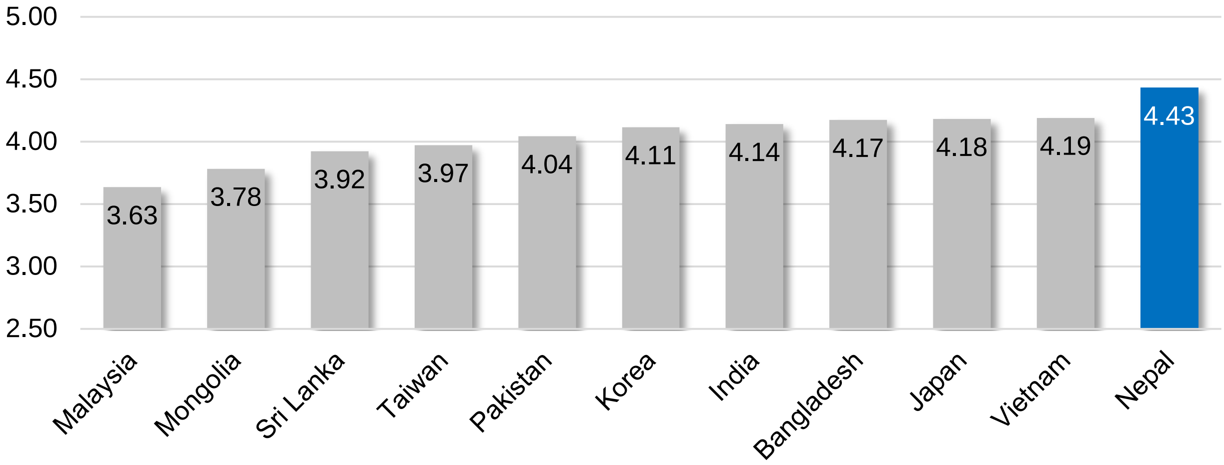


Figure 4-2-12. Average point of Q11 of Nepal

4.2.2 Malaysia

A total of 82 respondents participated in the survey in Malaysia. The respondents were evenly distributed across all age groups: 28 in their 20s (34%), 30 in their 30s (37%), 10 in their 40s (12%), and 14 in their 50s (17%). By occupation, the number of engineers was extraordinarily high at 65 (79%), which made it difficult for the analysis based on occupational groups to have statistical significance. The respondents consisted of 38 single (46%) and 42 married (51%) participants. The number of those without children was 48 (59%), and numbers of those with one, two, or more children were 8 (10%), 11 (13%), and 15 (18%), respectively. The international analysis results suggest that Malaysia's average score of 2.93 was the second lowest, following Sri Lanka (2.86).

Malaysia had a statistically significant lower average in eight out of eleven questions, and the country's average score was higher with statistical significance than that of other nations only in the question about one's perception of gender inequality in scientific abilities. In addition, no statistically significant difference was found in Q5 (discrimination in accessibility to research funds) and in Q8 (expectation for future improvements in gender inequality) between Malaysia and the other ten countries

Table 4-3-1. Status of survey participants in Malaysia

		N	%
Age	20s or younger	28	34.1
	30s	30	36.6
	40s	10	12.2
	50s or older	14	17.1
Occupation	Scientist	8	9.8
	Engineer	65	79.3
	Professional medical staff	1	1.2
	Student	2	2.4
	Others	6	7.3
Job	Student	19	23.2
	Professor/teacher	16	19.5
	Researcher	6	7.3
	Manager	6	7.3
	Technicians	35	42.7
Marital status	Single	38	46.3
	Married	42	51.2
	Divorced	1	1.2
	Other	1	1.2
No. of children	None	48	58.5
	1	8	9.8
	2	11	13.4
	3 or more	15	18.3
Total		82	100

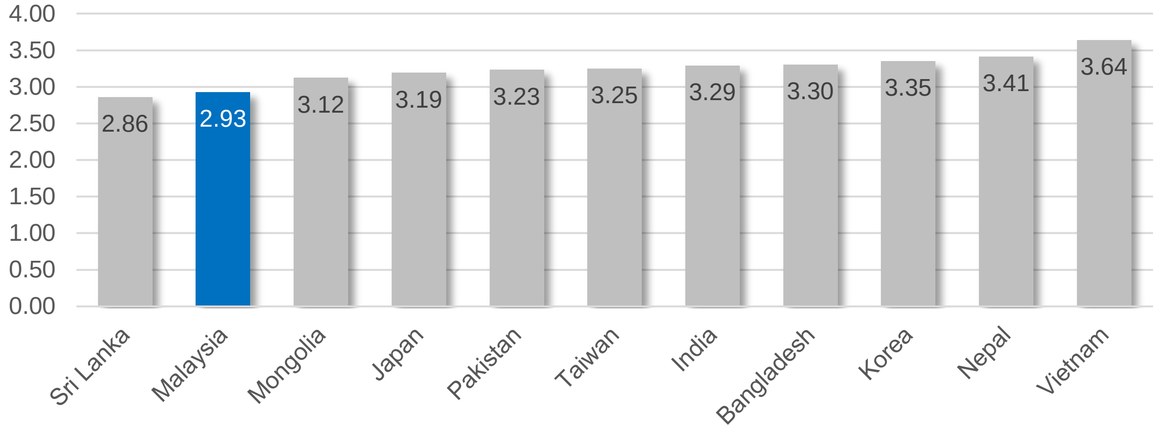


Figure 4-3-1. Average value of Malaysia in comparison to other participating countries

Table 4-3-2. Comparative average value of questionnaire in Malaysia

	Question	Malaysia	Except Malaysia	t	*(p)*
Q1	Female scientists are limited in how much they can succeed in science compared to male scientists.	2.63	3.29	-6.01	0.000
Q2	Men have an advantage over women in Science.	2.67	3.25	-4.28	0.000
Q3	To attain a masters or doctoral degree, women should work harder and take longer time to finish their studies than men.	2.39	2.82	-3.86	0.000
Q4	I have experienced some disadvantages to lead or participate in a research project because I am a woman.	2.61	2.92	-2.84	0.005
Q5	I have experienced some disadvantages in research funding or scholarships because I am a woman.	2.43	2.48	-0.65	0.516
Q6	Becoming a tenured professor, being promoted or becoming a principal investigator is more difficult for female scientists than for male scientists.	2.74	3.28	-4.76	0.000
Q7	There are more men than women among those with similar or more professional experience than mine.	3.40	3.71	-2.55	0.011
Q8	Girls who are entering college today will be studying in a better (more gender equal) environment than I did.	3.61	3.78	-1.59	0.113
Q9	There is a difference in ability (math, analytical skills, logical thinking, etc) that needs to be acquired in science for men and women.	2.95	2.61	2.62	0.009
Q10	Having to balance work and life (marriage and child care) is a handicap for women.	3.22	3.83	-5.13	0.000
Q11	It is crucial to have policy support that ensures equal opportunity in order to solve the gender inequality in science.	3.63	4.11	-4.62	0.000
N		82	967		

Q1. **Female scientists are limited in how much they can succeed in science compared to male scientists.**

Table 4-3-3. Comparative average value of Q1 by age, occupation and marital status in Malaysia

		N	Average	Standard deviation	F	*p*
	Total	82	2.63	0.936		
Age	20s or younger	28	2.61	0.956	0.30	0.823
	30s	30	2.60	1.037		
	40s	10	2.90	0.738		
	50s or older	14	2.57	0.852		
Occupation	Scientist	8	2.75	1.035	0.08	0.987
	Engineer	65	2.62	0.947		
	Professional medical staff	1	3.00			
	Student	2	2.50	0.707		
	Others	6	2.67	1.033		
Marital status	Single	38	2.47	0.951	0.73	0.539
	Married	42	2.76	0.932		
	Divorced	1	3.00			
	Other	1	3.00			
No. of children	None	48	2.58	0.964	2.22	0.093
	1	8	2.50	0.756		
	2	11	3.27	0.905		
	3 or more	15	2.40	0.828		

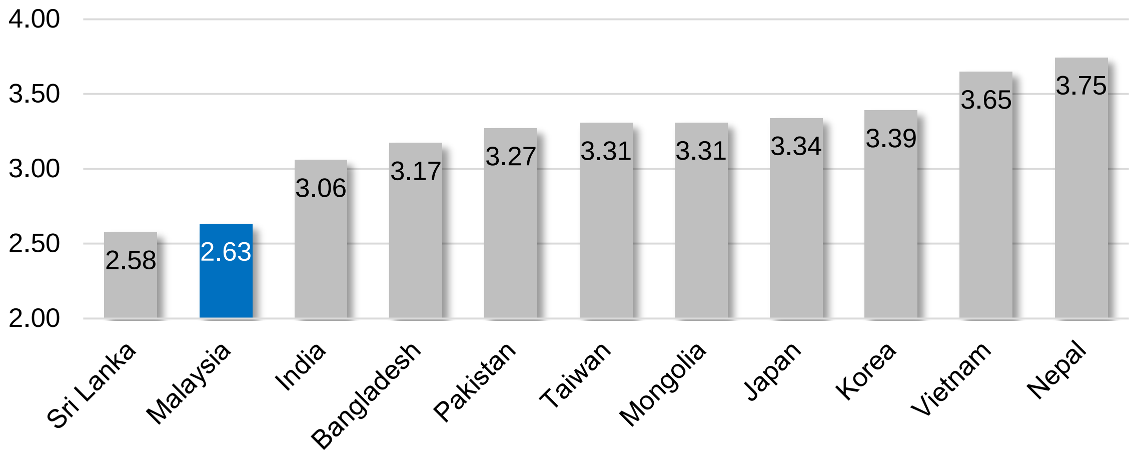


Figure 4-3-2. Average point of Q1 of Malaysia

Q2. Men have an advantage over women in Science.

In relation to the question about whether men have an advantage over women in the science field, the ANOVA analysis found that the only variant that brought a statistically significant difference was the number of children. The respondents with children were observed to be more likely than those without children to believe that men have an advantage. Compared to the average score of 2.45 among the single respondents, the average score of married respondents was higher at 2.86 but this did not suggest a statistically significant difference.

Table 4-3-4. Comparative survey result of Q2 by age, occupation and marital status in Malaysia

		N	Average	Standard deviation	F	*p*
	Total	82	2.67	1.066		
Age	20s or younger	28	2.54	0.999	0.54	0.655
	30s	30	2.83	1.177		
	40s	10	2.80	1.135		
	50s or older	14	2.50	0.941		
Occupation	Scientist	8	2.50	1.195	0.48	0.753
	Engineer	65	2.66	1.050		
	Professional medical staff	1	2.00			
	Student	2	2.50	0.707		
	Others	6	3.17	1.329		
Marital status	Single	38	2.45	0.978	1.05	0.376
	Married	42	2.86	1.138		
	Divorced	1	3.00			
	Other	1	3.00			
No. of children	None	48	2.58	0.986	3.39	0.022
	1	8	3.13	1.126		
	2	11	3.36	1.120		
	3 or more	15	2.20	1.014		

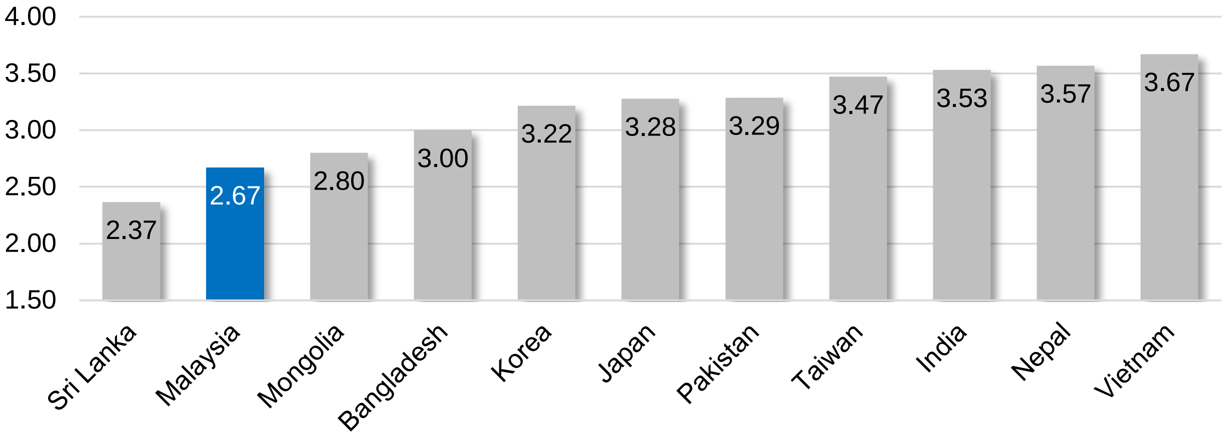


Figure 4-3-3. Average point of Q2 of Malaysia

Q3. **To attain a masters or doctoral degree, women should work harder and take longer time to finish their studies than men.**

Table 4-3-5. Comparative survey result of Q3 in age, occupation and marital status in Malaysia

		N	Average	Standard deviation	F	*p*
	Total	82	2.39	0.953		
Age	20s or younger	28	2.32	1.020	0.30	0.825
	30s	30	2.47	1.042		
	40s	10	2.20	0.919		
	50s or older	14	2.50	0.650		
Occupation	Scientist	8	2.25	1.035	0.78	0.540
	Engineer	65	2.37	0.894		
	Professional medical staff	1	4.00			
	Student	2	2.50	0.707		
	Others	6	2.50	1.517		
Marital status	Single	38	2.32	0.933	1.04	0.380
	Married	42	2.48	0.969		
	Divorced	1	1.00			
	Other	1	3.00			
No. of children	None	48	2.33	0.930	1.88	0.141
	1	8	2.25	1.165		
	2	11	3.00	1.095		
	3 or more	15	2.20	0.676		

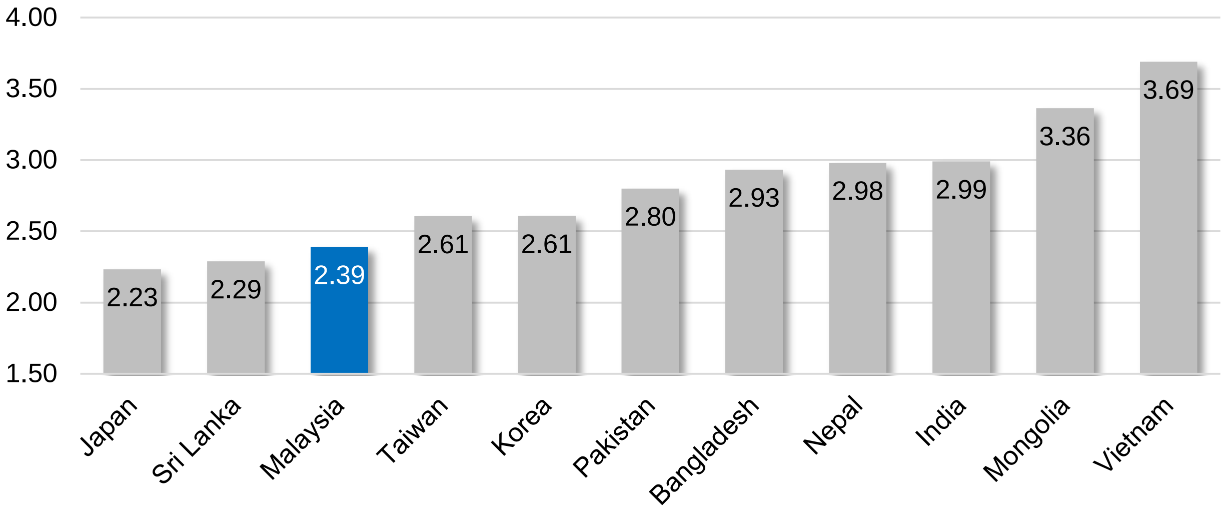


Figure 4-3-4. Average point of Q3 of Malaysia

Q4. **I have experienced some disadvantages to lead or participate in a research project because I am a woman.**

Table 4-3-6. Comparative average value of Q4 by age, occupation and marital value in Malaysia

		N	Average	Standard deviation	F	*p*
	Total	82	2.61	0.926		
Age	20s or younger	28	2.50	1.072	0.72	0.541
	30s	30	2.60	0.894		
	40s	10	3.00	0.667		
	50s or older	14	2.57	0.852		
Occupation	Scientist	8	2.63	0.916	1.34	0.263
	Engineer	65	2.58	0.950		
	Professional medical staff	1	3.00			
	Student	2	1.50	0.707		
	Others	6	3.17	0.408		
Marital status	Single	38	2.53	1.059	0.27	0.849
	Married	42	2.67	0.816		
	Divorced	1	3.00			
	Other	1	3.00			
No. of children	None	48	2.56	1.009	1.36	0.261
	1	8	3.00	0.535		
	2	11	2.91	0.944		
	3 or more	15	2.33	0.724		

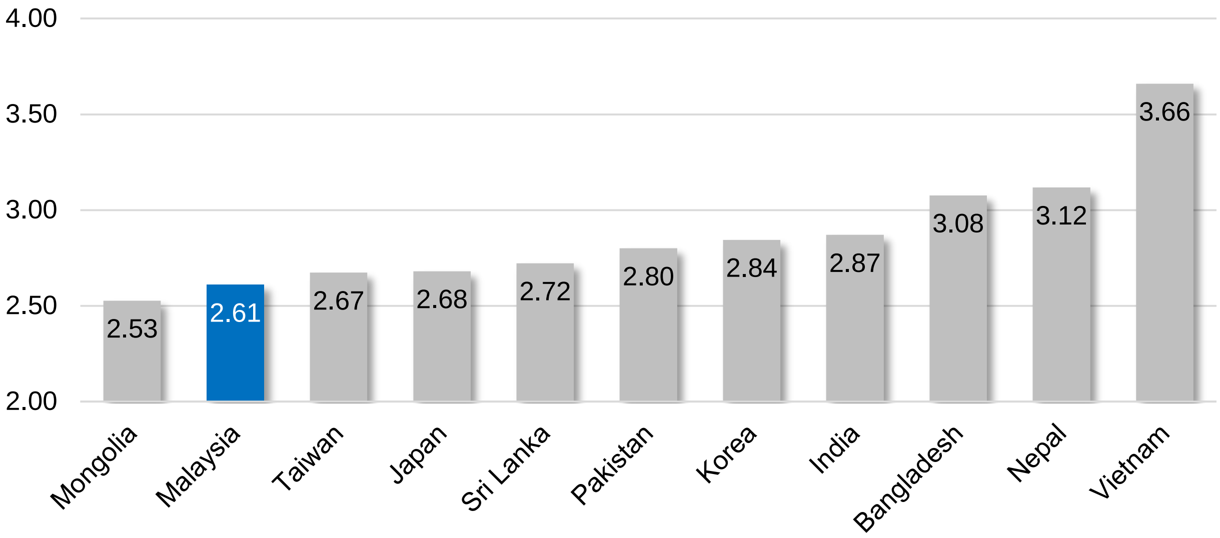


Figure 4-3-5. Average point of Q4 of Malaysia

Q5. **I have experienced some disadvantages in research funding or scholarships because I am a woman.**

Table 4-3-7. Comparative average value of Q5 by age, occupation and marital status in Malaysia

		N	Average	Standard deviation	F	*p*
	Total	82	2.43	0.721		
Age	20s or younger	28	2.39	0.875	0.11	0.952
	30s	30	2.40	0.621		
	40s	10	2.50	0.707		
	50s or older	14	2.50	0.650		
Occupation	Scientist	8	2.50	0.756	1.44	0.230
	Engineer	65	2.37	0.741		
	Professional medical staff	1	3.00			
	Student	2	2.00	0.000		
	Others	6	3.00	0.000		
Marital status	Single	38	2.39	0.823	0.36	0.781
	Married	42	2.45	0.633		
	Divorced	1	2.00			
	Other	1	3.00			
No. of children	None	48	2.46	0.771	0.50	0.685
	1	8	2.63	0.518		
	2	11	2.36	0.505		
	3 or more	15	2.27	0.799		

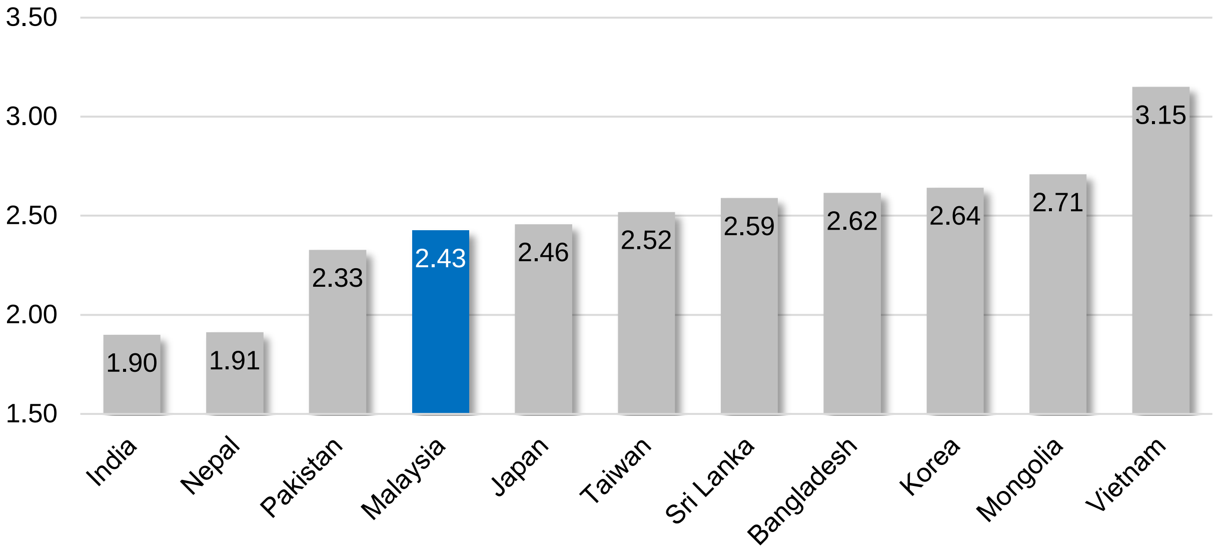


Figure 4-3-6. Average point of Q5 of Malaysia

Q6. **Becoming a tenured professor, being promoted or becoming a principal investigator is more difficult for female scientists than for male scientists.**

Table 4-3-8. Comparative survey result of Q6 in age, occupation and marital status in Malaysia

		N	Average	Standard deviation	F	*p*
	Total	82	2.74	0.979		
Age	20s or younger	28	2.68	1.156	0.09	0.967
	30s	30	2.80	0.925		
	40s	10	2.80	0.789		
	50s or older	14	2.71	0.914		
Occupation	Scientist	8	2.88	1.246	0.34	0.849
	Engineer	65	2.75	0.969		
	Professional medical staff	1	3.00			
	Student	2	2.00	0.000		
	Others	6	2.67	1.033		
Marital status	Single	38	2.58	1.056	0.95	0.420
	Married	42	2.90	0.906		
	Divorced	1	2.00			
	Other	1	3.00			
No. of children	None	48	2.73	1.026	0.52	0.667
	1	8	2.88	0.991		
	2	11	3.00	0.775		
	3 or more	15	2.53	0.990		

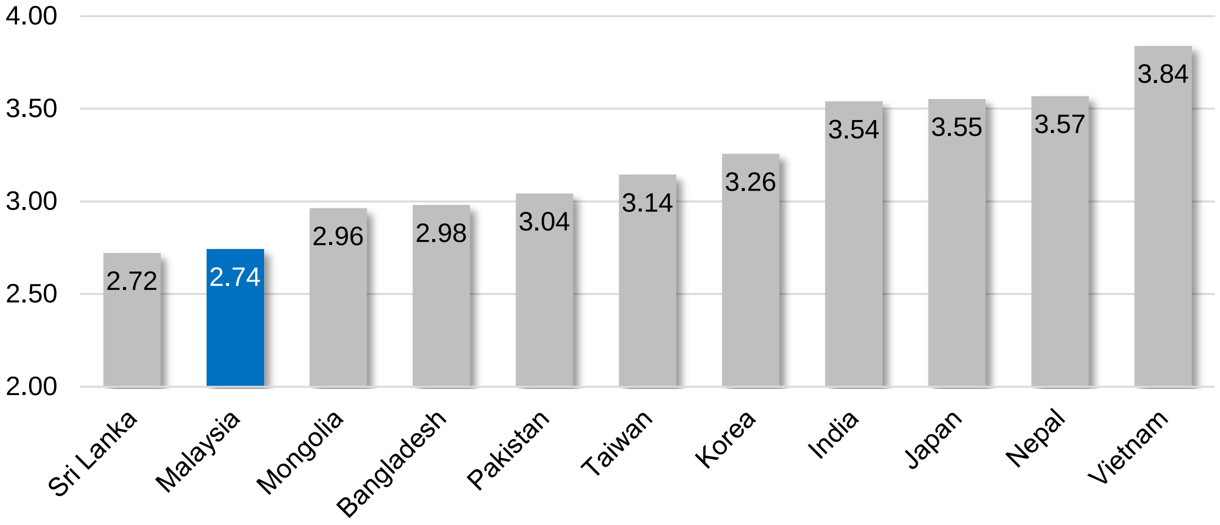


Figure 4-3-7. Average point of Q6 of Malaysia

Q7. **There are more men than women among those with similar or more professional experience than mine.**

Table 4-3-9. Comparative survey result of Q7 in age, occupation and marital status in Malaysia

		N	Average	Standard deviation	F	*p*
	Total	82	3.40	1.004		
Age	20s or younger	28	3.32	1.307	0.24	0.866
	30s	30	3.50	0.777		
	40s	10	3.50	0.972		
	50s or older	14	3.29	0.825		
Occupation	Scientist	8	3.75	1.165	1.28	0.285
	Engineer	65	3.42	0.967		
	Professional medical staff	1	3.00			
	Student	2	2.00	0.000		
	Others	6	3.33	1.211		
Marital status	Single	38	3.34	1.214	0.22	0.881
	Married	42	3.48	0.804		
	Divorced	1	3.00			
	Other	1	3.00			
No. of children	None	48	3.38	1.142	0.54	0.659
	1	8	3.63	0.744		
	2	11	3.64	0.505		
	3 or more	15	3.20	0.941		

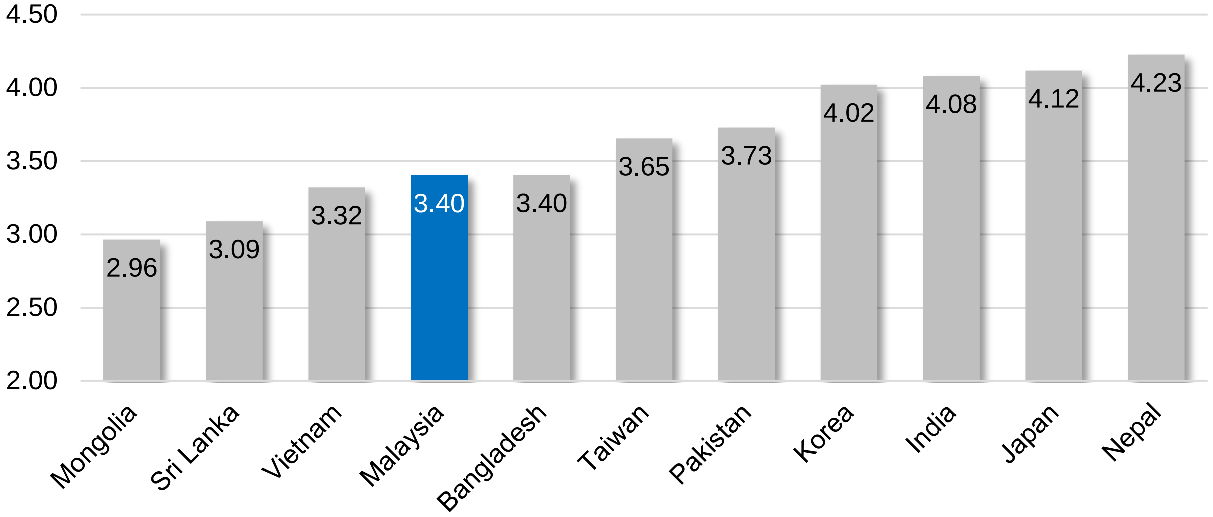


Figure 4-3-8. Average point of Q6 of Malaysia

Q8. **Girls who are entering college today will be studying in a better (more gender equal) environment than I did.**

By age group, whereas those in their 20s and 30s had an average score of 3.43, those in their 40s and 50s had average scores of 4.00 and 4.07, respectively, indicating that expectation for environmental improvements increased among the generation 20 years older.

Table 4-3-10. Comparative survey result of Q8 in age, occupation and marital status in Malaysia

		N	Average	Standard deviation	F	*p*
	Total	82	3.61	0.813		
Age	20s or younger	28	3.43	0.742	3.51	0.019
	30s	30	3.43	0.935		
	40s	10	4.00	0.471		
	50s or older	14	4.07	0.616		
Occupation	Scientist	8	3.50	0.535	0.30	0.878
	Engineer	65	3.65	0.837		
	Professional medical staff	1	4.00			
	Student	2	3.50	2.121		
	Others	6	3.33	0.516		
Marital status	Single	38	3.47	0.797	0.97	0.413
	Married	42	3.74	0.828		
	Divorced	1	4.00			
	Other	1	3.00			
No. of children	None	48	3.42	0.821	3.43	0.021
	1	8	4.13	0.354		
	2	11	3.55	0.820		
	3 or more	15	4.00	0.756		

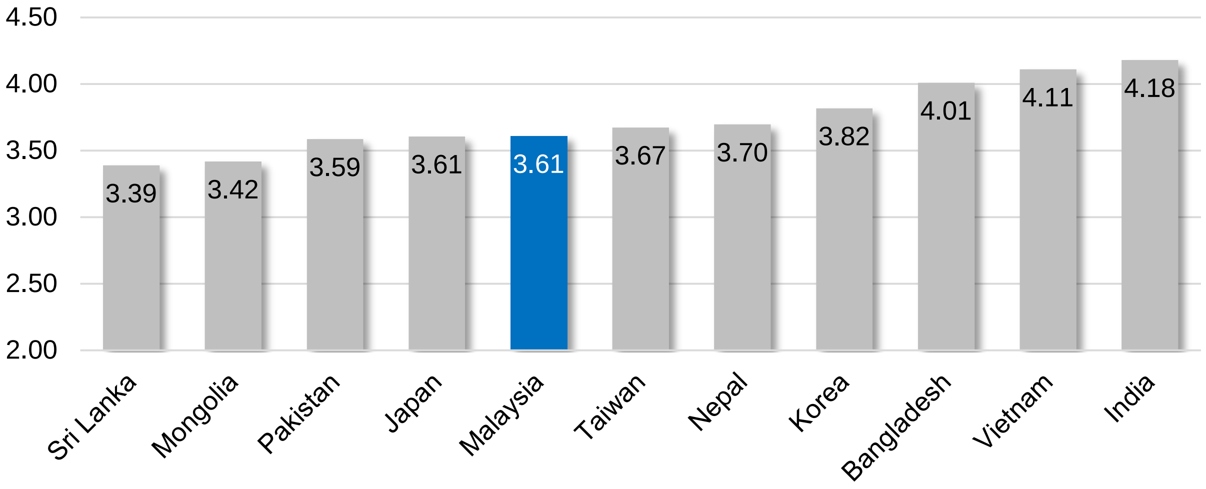


Figure 4-3-9. Average point of Q8 of Malaysia

Q9. **There is a difference in ability (math, analytical skills, logical thinking, etc) that needs to be acquired in science for men and women.**

Table 4-3-11. Comparative survey result of Q9 in age, occupation and marital status in Malaysia

		N	Average	Standard deviation	F	*p*
	Total	82	2.95	1.099		
Age	20s or younger	28	3.04	1.138	0.71	0.546
	30s	30	2.73	1.081		
	40s	10	3.00	0.816		
	50s or older	14	3.21	1.251		
Occupation	Scientist	8	3.50	0.756	1.77	0.144
	Engineer	65	2.94	1.102		
	Professional medical staff	1	4.00			
	Student	2	1.50	0.707		
	Others	6	2.67	1.211		
Marital status	Single	38	2.92	1.148	0.31	0.821
	Married	42	2.95	1.081		
	Divorced	1	4.00			
	Other	1	3.00			
No. of children	None	48	2.96	1.091	0.01	0.998
	1	8	3.00	1.195		
	2	11	2.91	0.831		
	3 or more	15	2.93	1.335		

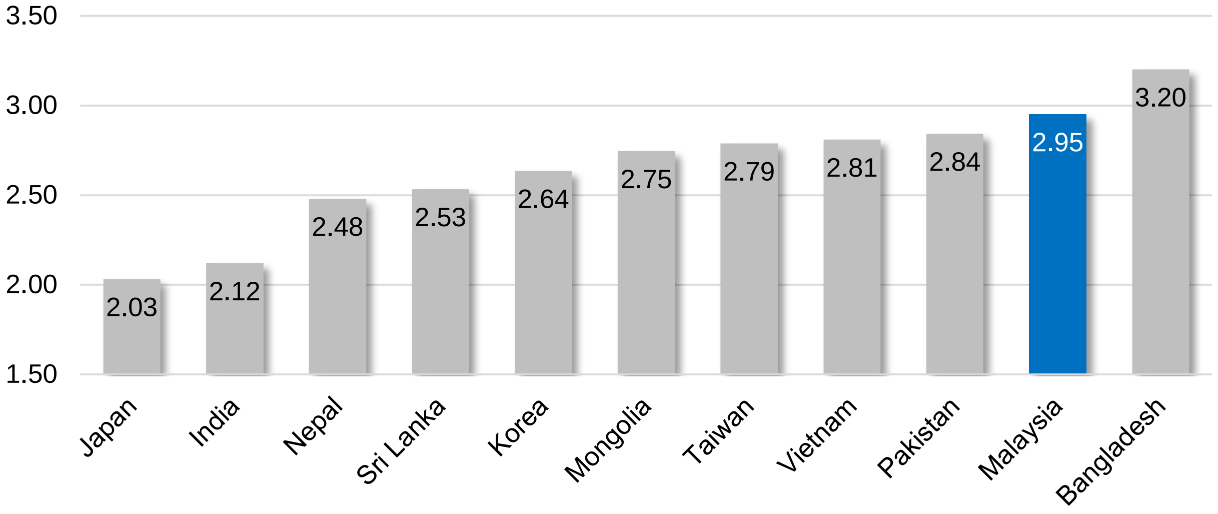


Figure 4-3-10. Average point of Q9 of Malaysia

Q10. **Having to balance work and life (marriage and child care) is a handicap for women.**

Table 4-3-12. Comparative survey result of Q10 in age, occupation and marital status in Malaysia

		N	Average	Standard deviation	F	*p*
	Total	82	3.22	1.089		
Age	20s or younger	28	3.07	1.086	0.67	0.573
	30s	30	3.17	1.020		
	40s	10	3.60	1.430		
	50s or older	14	3.36	1.008		
Occupation	Scientist	8	3.75	1.035	1.30	0.277
	Engineer	65	3.15	1.093		
	Professional medical staff	1	5.00			
	Student	2	3.00	0.000		
	Others	6	3.00	1.095		
Marital status	Single	38	3.16	1.079	0.24	0.868
	Married	42	3.26	1.127		
	Divorced	1	4.00			
	Other	1	3.00			
No. of children	None	48	3.02	1.021	2.71	0.051
	1	8	4.13	0.641		
	2	11	3.45	1.293		
	Total	15	3.20	1.146		

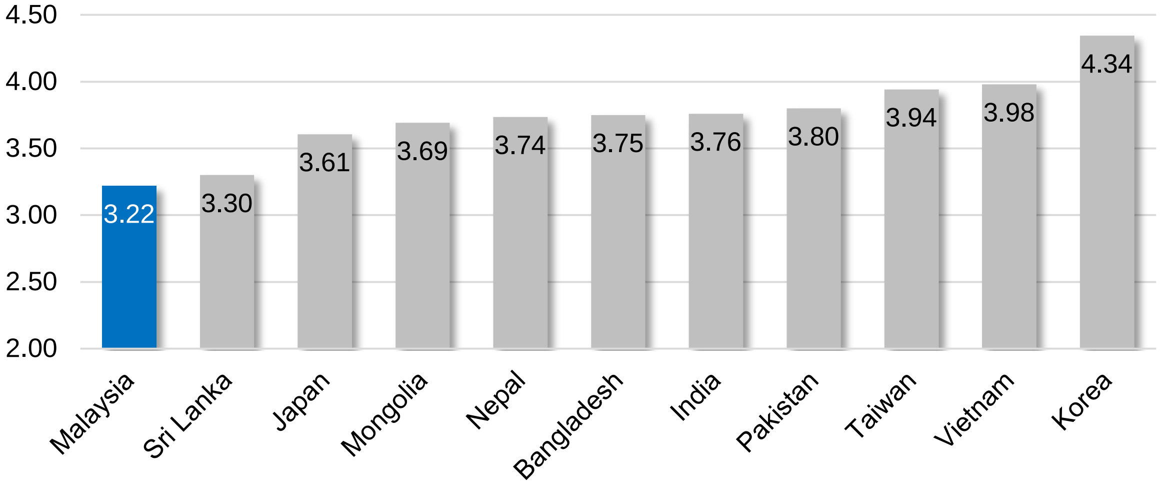


Figure 4-3-11. Average point of Q10 of Malaysia

Q11. **It is crucial to have policy support that ensures equal opportunity in order to solve the gender inequality in science.**

Table 4-3-13. Comparative survey result of Q11 in age, occupation and marital status in Malaysia

		N	Average	Standard deviation	F	*p*
	Total	82	3.63	0.923		
Age	20s or younger	28	3.54	0.922	0.34	0.793
	30s	30	3.60	1.003		
	40s	10	3.80	0.789		
	50s or older	14	3.79	0.893		
Occupation	Scientist	8	3.50	0.926	0.80	0.532
	Engineer	65	3.58	0.934		
	Professional medical staff	1	4.00			
	Student	2	4.50	0.707		
	Others	6	4.00	0.894		
Marital status	Single	38	3.61	0.946	0.23	0.873
	Married	42	3.67	0.928		
	Divorced	1	4.00			
	Other	1	3.00			
No. of children	None	48	3.54	0.944	1.07	0.368
	1	8	3.63	0.744		
	2	11	4.09	0.831		
	3 or more	15	3.60	0.986		

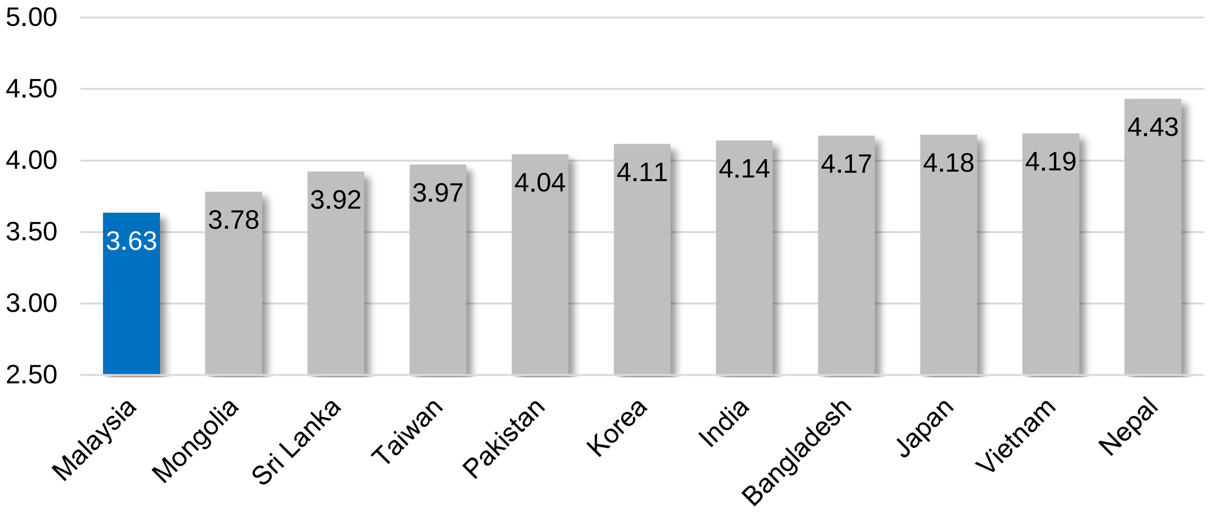


Figure 4-3-12. Average point of Q11 of Malaysia

4.2.3 Mongolia

A total of 55 participants responded to the survey in Mongolia. By age, the respondents came from all age group: 15 in their 20s (27%), 15 in their 30s (27%), 18 in their 40s (33%), and 7 in their 50s (13%).

Table 4-4-1. Status of survey participants in Mongolia

		N	%
Age	20s or younger	15	27.3
	30s	15	27.3
	40s	18	32.7
	50s or older	7	12.7
Occupation	Scientist	18	32.7
	Engineer	6	10.9
	Professional medical staff	4	7.3
	Student	26	47.3
	Others	1	1.8
Job	Student	1	1.8
	Professor/teacher	13	23.6
	Researcher	16	29.1
	Manager	5	9.1
	Professional medical staff	3	5.5
	Engineer	12	21.8
	Others	5	9.1
Marital status	Single	8	14.5
	Married	38	69.1
	Divorced	9	16.4
No. of children	None	12	21.8
	1	14	25.5
	2	19	34.5
	3 or more	10	18.2
Total		55	100.0

A total of 18 were scientists (33%); 6 were engineers (11%), and 4 were medical professionals (7%). Since the number of students was the most with 26 (47%), the occupational makeup was not perfectly suitable to the purpose of studying the perception of glass ceilings. By marital status, the numbers of single and married respondents were 8 (15%) and 38 (69%), respectively. The number of respondents without children was 12 (22%), and numbers of respondents with one, two, and three or more children were 14 (26%), 19 (35%), and 10 (18%), respectively. Since the number of respondents in sub-groups was not high, it was hard to identify significant results. Compared with other countries, Mongolia had an average score of 3.12, ranking third out of 11 countries.

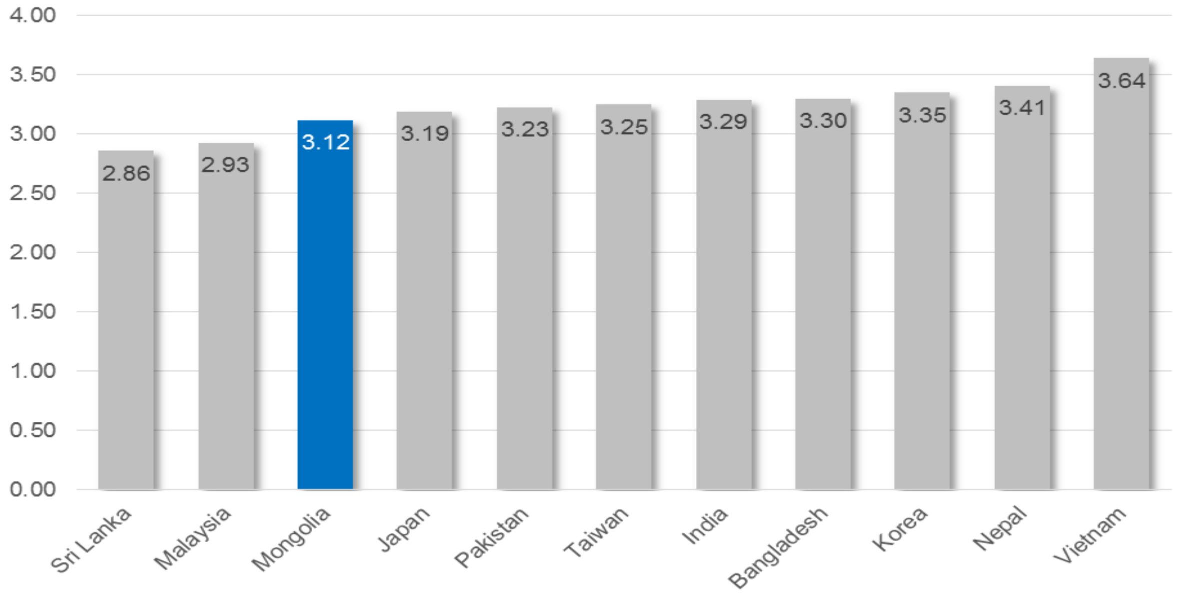


Figure 4-4-1. Average value of Mongolia in comparison to other participating countries

The comparison of Mongolia's average and the averages of the ten other countries' suggests that the country had statistically significant lower average scores in five questions: Q2, Q4, Q7, Q8, Q11. On the contrary, the result of Q3 about discrimination in degree programs shows that Mongolia had a statistically significant higher average than other countries did.

Table 4-4-2. Comparison of average value in Mongolia

	Question	Mongolia	Except Mongolia	t	*(p)*
Q1	Female scientists are limited in how much they can succeed in science compared to male scientists.	3.31	3.24	0.43	0.665
Q2	Men have an advantage over women in Science.	2.80	3.22	-2.60	0.010
Q3	To attain a masters or doctoral degree, women should work harder and take longer time to finish their studies than men.	3.36	2.76	3.59	0.000
Q4	I have experienced some disadvantages to lead or participate in a research project because I am a woman.	2.53	2.91	-2.48	0.013
Q5	I have experienced some disadvantages in research funding or scholarships because I am a woman.	2.71	2.47	1.76	0.079
Q6	Becoming a tenured professor, being promoted or becoming a principal investigator is more difficult for female scientists than for male scientists.	2.96	3.26	-1.95	0.052
Q7	There are more men than women among those with similar or more professional experience than mine.	2.96	3.73	-5.30	0.000
Q8	Girls who are entering college today will be studying in a better (more gender equal) environment than I did.	3.42	3.78	-2.88	0.004
Q9	There is a difference in ability (math, analytical skills, logical thinking, etc) that needs to be acquired in science for men and women.	2.75	2.63	0.71	0.477
Q10	Having to balance work and life (marriage and child care) is a handicap for women.	3.69	3.79	-0.66	0.508
Q11	It is crucial to have policy support that ensures equal opportunity in order to solve the gender inequality in science.	3.78	4.09	-2.12	0.038
N		55	994		

Q1. Women in science and technology face more limits in succeeding in the science sector than men do.

Table 4-4-3. Comparative survey result of Q1 in age, occupation and marital status in Mongolia

		N	Average	Standard deviation	F	*p*
	Total	55	3.31	1.07		
Age	20s or younger	15	3.13	0.92	0.37	.774
	30s	15	3.33	1.29		
	40s	18	3.50	1.15		
	50s or older	7	3.14	0.69		
Occupation	Scientist	18	3.50	1.10	0.96	.436
	Engineer	6	3.00	1.55		
	Professional medical staff	4	2.50	0.58		
	Student	26	3.35	0.98		
	Others	1	4.00			
Marital status	Single	8	3.13	0.835	0.13	.874
	Married	38	3.34	1.072		
	Divorced	9	3.33	1.323		
No. of children	None	12	3.42	1.084	0.54	.656
	1	14	3.00	1.240		
	2	19	3.37	1.012		
	3 or more	10	3.50	0.972		

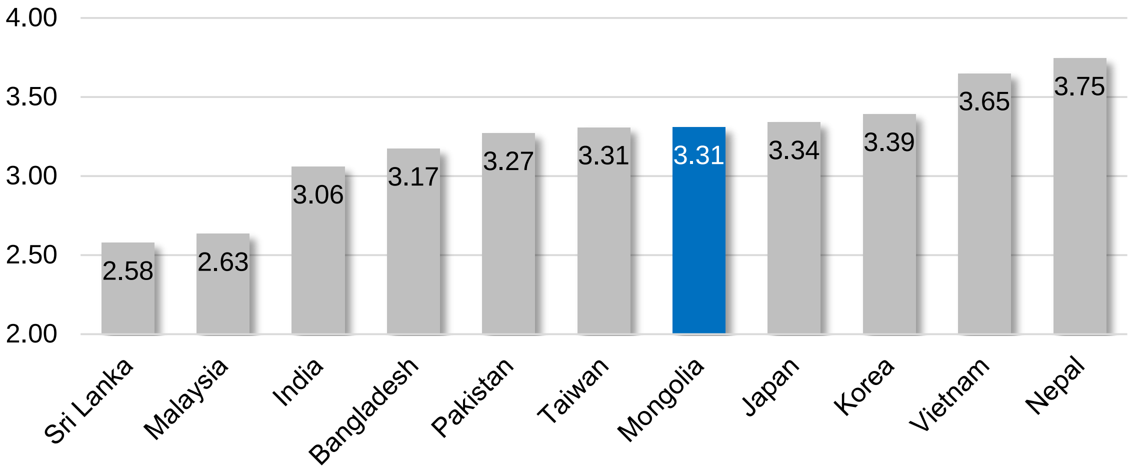


Figure 4-4-2. Average value of Q1 in Mongolia

Q2. **Men have an advantage over women in Science**.

Table 4-4-4. Comparative survey result of Q2 in age, occupation and marital status in Mongolia

		N	Average	Standard deviation	F	*p*
	Total	55	2.80	1.13		
Age	20s or younger	15	3.20	1.01	1.08	.364
	30s	15	2.47	1.25		
	40s	18	2.78	1.22		
	50s or older	7	2.71	0.76		
Occupation	Scientist	18	2.78	1.17	1.93	.120
	Engineer	6	3.50	1.05		
	Professional medical staff	4	2.00	0.82		
	Student	26	2.85	1.08		
	Others	1	1.00			
Marital status	Single	8	3.38	0.518	1.39	.259
	Married	38	2.66	1.146		
	Divorced	9	2.89	1.364		
No. of children	None	12	3.33	0.888	1.31	.281
	1	14	2.50	1.225		
	2	19	2.68	1.250		
	3 or more	10	2.80	0.919		

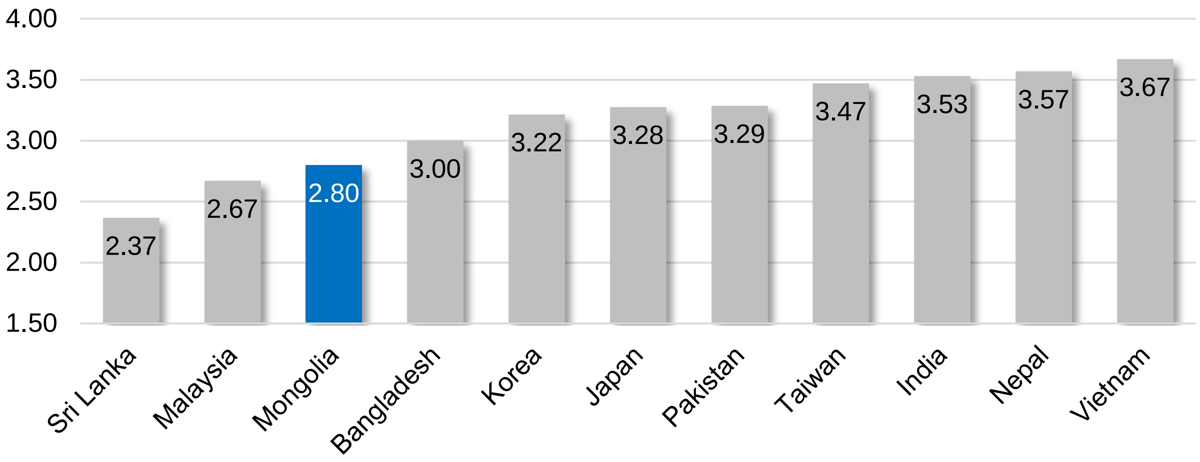


Figure 4-4-3. Average point of Q2 of Mongolia

Q3. **To attain a masters or doctoral degree, women should work harder and take longer time to finish their studies than men.**

Table 4-4-5. Comparative survey result of Q3 in age, occupation and marital status in Mongolia

		N	Average	Standard deviation	F	*p*
	Total	55	3.36	1.19		
Age	20s or younger	15	3.33	0.90	0.25	.860
	30s	15	3.20	1.37		
	40s	18	3.56	1.42		
	50s or older	7	3.29	0.76		
Occupation	Scientist	18	3.50	1.34	1.16	.342
	Engineer	6	3.67	1.03		
	Professional medical staff	4	2.25	0.50		
	Student	26	3.35	1.16		
	Others	1	4.00			
Marital status	Single	8	3.00	0.926	0.65	.524
	Married	38	3.37	1.195		
	Divorced	9	3.67	1.414		
No. of children	None	12	3.17	1.030	1.78	.163
	1	14	2.86	1.406		
	2	19	3.74	1.147		
	3 or more	10	3.60	0.966		

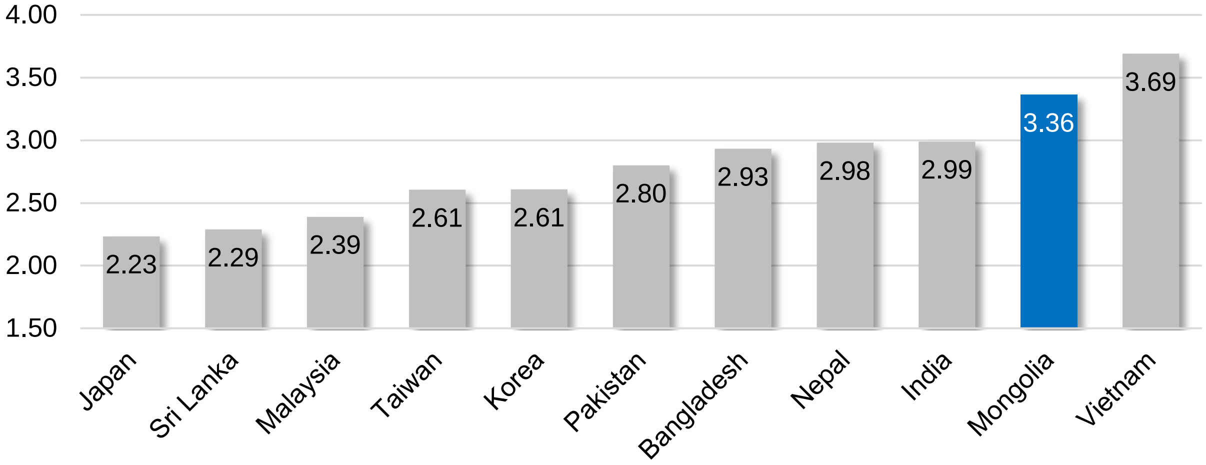


Figure 4-4-4. Average point of Q3 of Mongolia

Q4. **I have experienced some disadvantages to lead or participate in a research project because I am a woman.**

Table 4-4-6. Comparative survey result of Q4 in age, occupation and marital status in Mongolia

		N	Average	Standard deviation	F	*p*
	Total	55	2.53	1.14		
Age	20s or younger	15	2.60	1.18	0.97	.412
	30s	15	2.20	1.21		
	40s	18	2.83	1.15		
	50s or older	7	2.29	0.76		
Occupation	Scientist	18	2.44	1.25	1.13	.352
	Engineer	6	3.17	1.17		
	Professional medical staff	4	2.25	0.50		
	Student	26	2.42	1.10		
	Others	1	4.00			
Marital status	Single	8	2.25	0.707	2.96	.060
	Married	38	2.39	1.079		
	Divorced	9	3.33	1.414		
No. of children	None	12	2.50	1.168	0.19	.905
	1	14	2.57	1.222		
	2	19	2.63	1.257		
	3 or more	10	2.30	0.823		

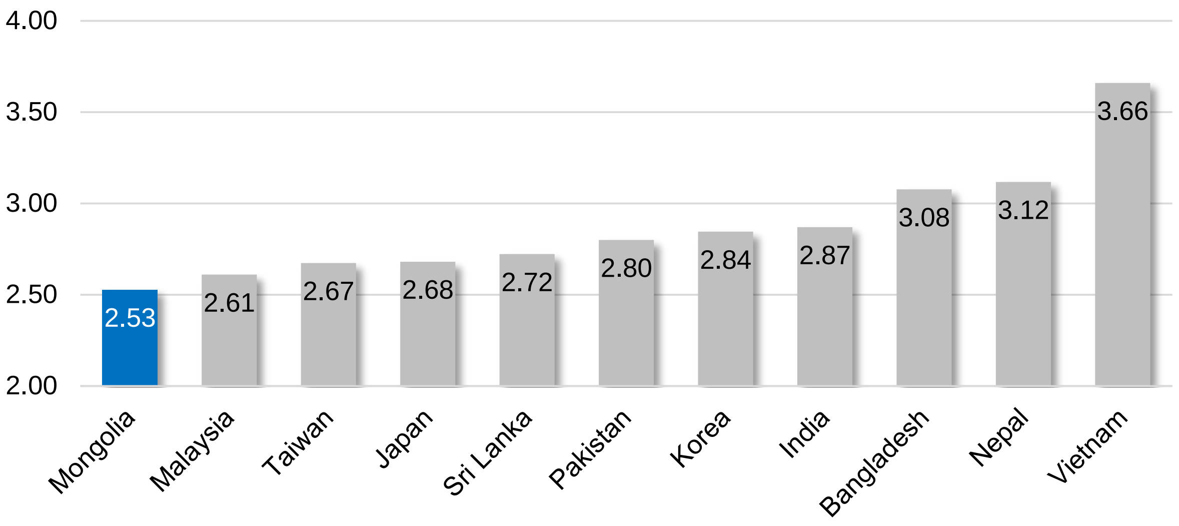


Figure 4-4-5. Average point of Q5 of Mongolia

Q5. **I have experienced some disadvantages in research funding or scholarships because I am a woman.**

Table 4-4-7. Comparative survey result of Q5 in age, occupation and marital status in Mongolia

		N	Average	Standard deviation	F	*p*
	Total	55	2.71	0.96		
Age	20s or younger	15	2.93	0.96	0.39	.763
	30s	15	2.60	1.12		
	40s	18	2.67	0.91		
	50s or older	7	2.57	0.79		
Occupation	Scientist	18	2.67	1.08	0.90	.469
	Engineer	6	3.17	1.17		
	Professional medical staff	4	2.00	0.00		
	Student	26	2.73	0.87		
	Others	1	3.00			
Marital status	Single	8	2.50	0.756	2.46	.095
	Married	38	2.61	0.887		
	Divorced	9	3.33	1.225		
No. of children	None	12	2.67	0.985	0.06	.979
	1	14	2.64	1.216		
	2	19	2.74	0.933		
	3 or more	10	2.80	0.632		

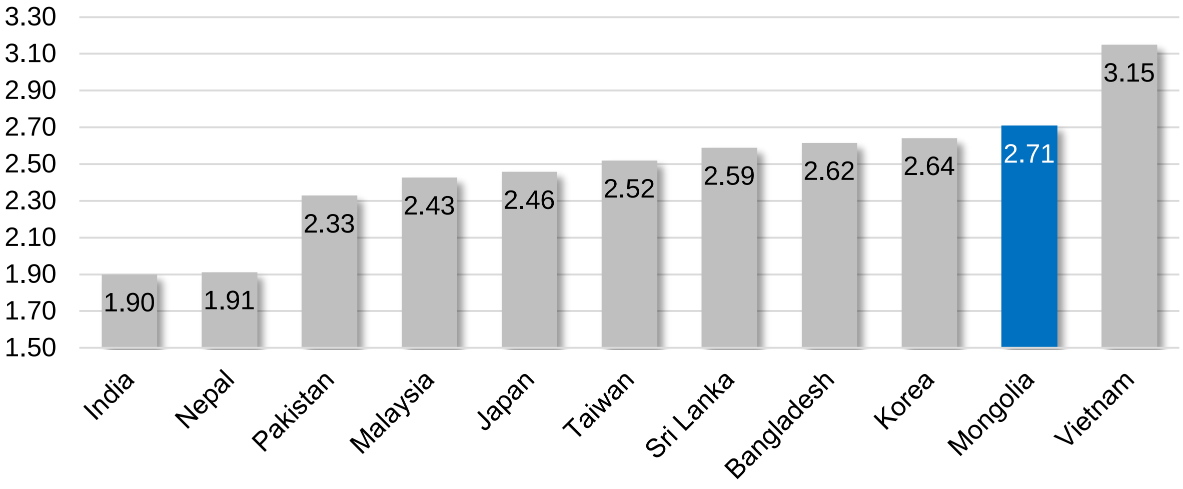


Figure 4-4-6. Average point of Q5 of Mongolia

Q6. **Becoming a tenured professor, being promoted or becoming a principal investigator is more difficult for female scientists than for male scientists.**

Table 4-4-8. Comparative survey result of Q6 in age, occupation and marital status in Mongolia

		N	Average	Standard deviation	F	*p*
	Total	55	2.96	1.14		
Age	20s or younger	15	2.87	1.06	0.48	.697
	30s	15	2.87	1.19		
	40s	18	3.22	1.26		
	50s or older	7	2.71	0.95		
Occupation	Scientist	18	2.94	1.21	0.44	.778
	Engineer	6	3.17	1.17		
	Professional medical staff	4	2.50	1.00		
	Student	26	2.96	1.15		
	Others	1	4.00			
Marital status	Single	8	2.88	0.991	0.96	.390
	Married	38	2.87	1.070		
	Divorced	9	3.44	1.509		
No. of children	None	12	3.17	1.115	0.59	.622
	1	14	2.64	1.216		
	2	19	3.11	1.243		
	3 or more	10	2.90	0.876		

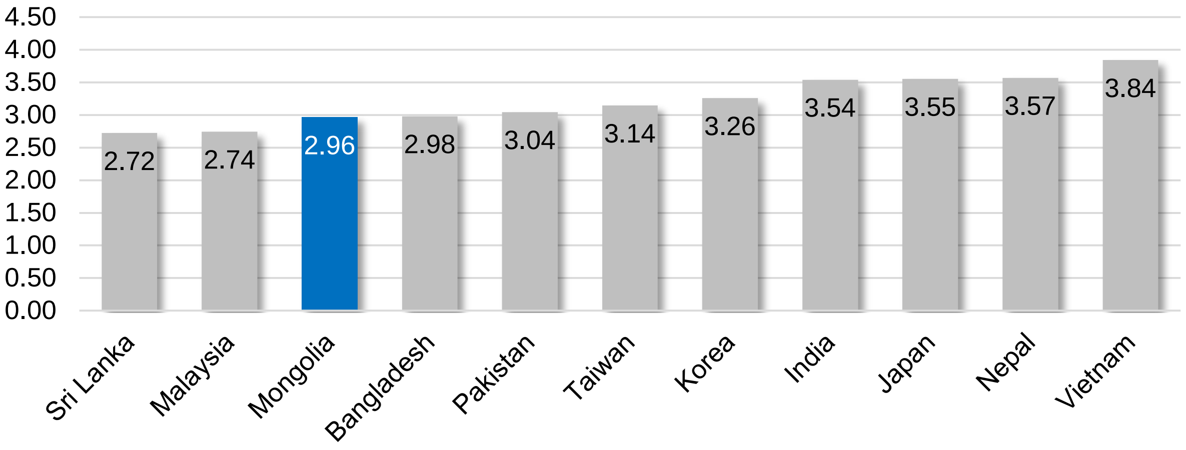


Figure 4-4-7. Average point of Q6 of Mongolia

Q7. **There are more men than women among those with similar or more professional experience than mine.**

Table 4-4-9. Comparative survey result of Q7 in age, occupation and marital status in Mongolia

		N	Average	Standard deviation	F	*p*
	Total	55	2.96	1.09		
Age	20s or younger	15	3.13	0.99	0.82	.490
	30s	15	2.67	1.05		
	40s	18	3.17	1.29		
	50s or older	7	2.71	0.76		
Occupation	Scientist	18	3.00	1.14	1.13	.355
	Engineer	6	3.17	1.33		
	Professional medical staff	4	2.00	0.00		
	Student	26	3.00	1.06		
	Others	1	4.00			
Marital status	Single	8	3.13	0.835	1.98	.149
	Married	38	2.79	0.991		
	Divorced	9	3.56	1.509		
No. of children	None	12	3.17	1.030	0.83	.482
	1	14	2.57	1.222		
	2	19	3.05	1.177		
	3 or more	10	3.10	0.738		

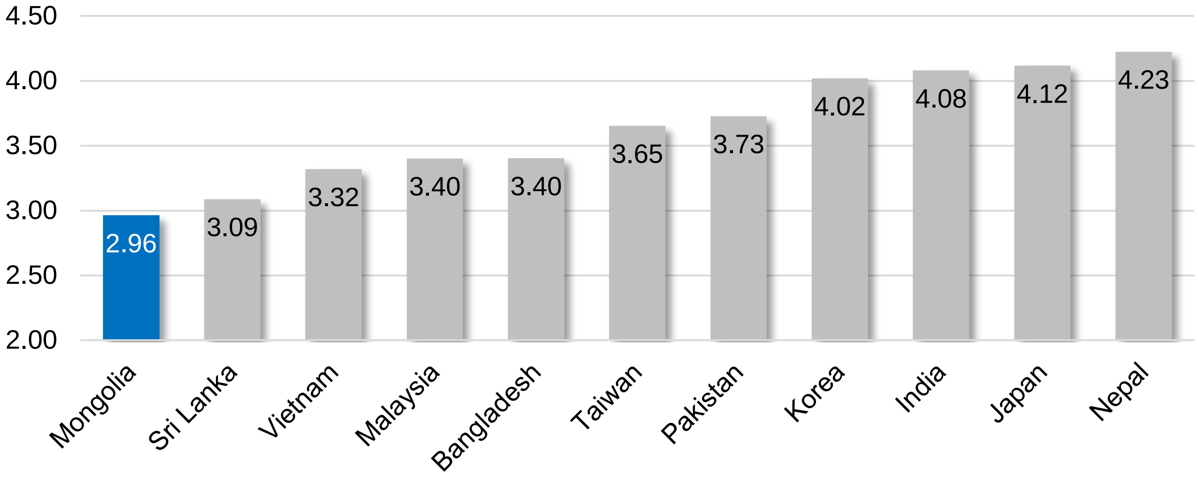


Figure 4-4-8. Average point of Q7 of Mongolia

Q8. **Girls who are entering college today will be studying in a better (more gender equal) environment than I did.**

Table 4-4-10. Comparative survey result of Q8 in age, occupation and marital status in Mongolia

		N	Average	Standard deviation	F	*p*
	Total	55	3.42	1.01		
Age	20s or younger	15	3.07	0.88	1.88	.145
	30s	15	3.20	1.08		
	40s	18	3.78	1.06		
	50s or older	7	3.71	0.76		
Occupation	Scientist	18	3.67	0.84	2.35	.067
	Engineer	6	4.00	0.63		
	Professional medical staff	4	2.75	0.96		
	Student	26	3.15	1.08		
	Others	1	5.00			
Marital status	Single	8	3.00	0.756	0.93	.402
	Married	38	3.53	0.951		
	Divorced	9	3.33	1.414		
No. of children	None	12	3.25	0.754	0.96	.420
	1	14	3.29	1.204		
	2	19	3.37	1.065		
	3 or more	10	3.90	0.876		

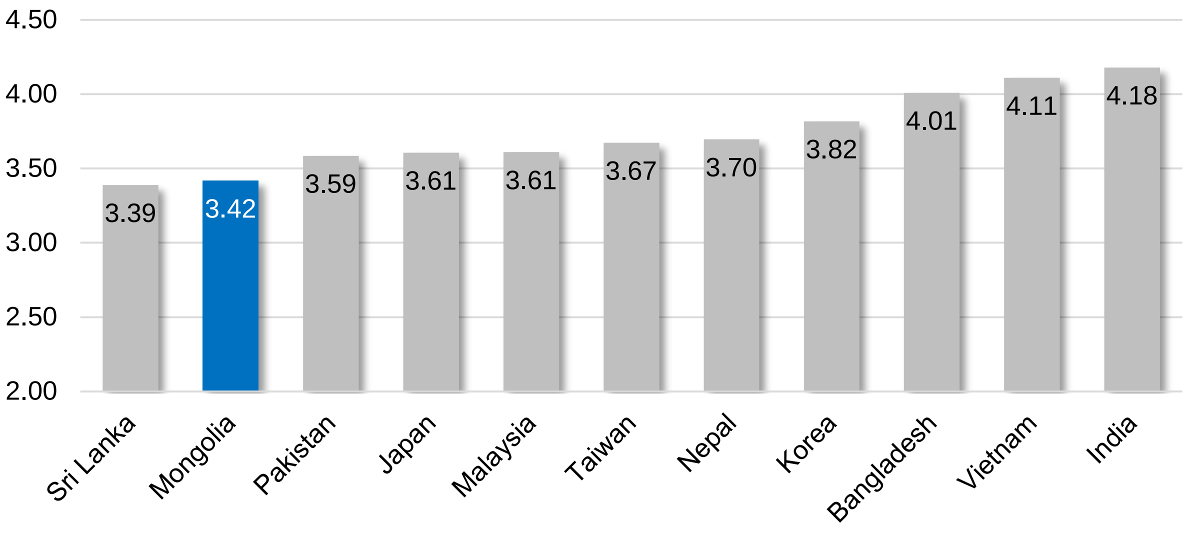


Figure 4-4-9. Average point of Q8 of Mongolia

Q9. **There is a difference in ability (math, analytical skills, logical thinking, etc) that needs to be acquired in science for men and women.**

Table 4-4-11. Comparative survey result of Q11 in age, occupation and marital status in Mongolia

		N	Average	Standard deviation	F	*p*
	Total	55	2.75	1.06		
Age	20s or younger	15	2.87	1.19	0.68	.571
	30s	15	2.53	0.99		
	40s	18	2.94	1.11		
	50s or older	7	2.43	0.79		
Occupation	Scientist	18	2.67	0.91	1.17	.335
	Engineer	6	3.33	1.21		
	Professional medical staff	4	2.75	0.96		
	Student	26	2.73	1.12		
	Others	1	1.00			
Marital status	Single	8	3.13	0.991	1.55	.221
	Married	38	2.58	1.030		
	Divorced	9	3.11	1.167		
No. of children	None	12	3.08	0.996	0.75	.526
	1	14	2.57	1.016		
	2	19	2.58	1.017		
	3 or more	10	2.90	1.287		

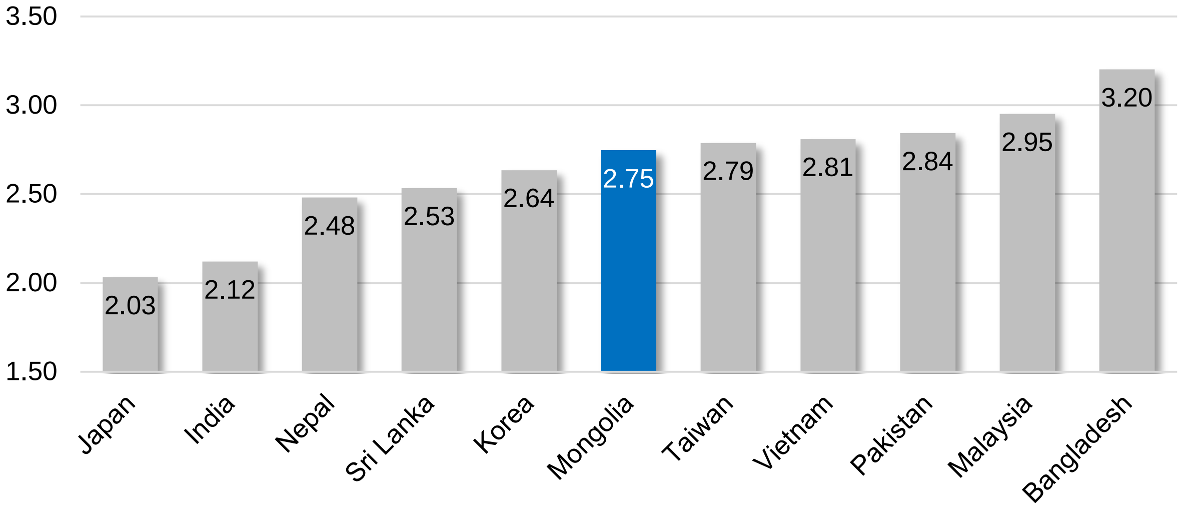


Figure 4-4-10. Average point of Q10 of Mongolia

Q10. **Having to balance work and life (marriage and child care) is a handicap for women.**

Table 4-4-12. Comparative survey result of Q10 in age, occupation and marital status in Mongolia

		N	Average	Standard deviation	F	*p*
	Total	55	3.69	0.98		
Age	20s or younger	15	3.93	0.70	1.91	.140
	30s	15	3.27	1.39		
	40s	18	3.94	0.80		
	50s or older	7	3.43	0.53		
Occupation	Scientist	18	3.61	0.70	0.64	.639
	Engineer	6	4.17	0.98		
	Professional medical staff	4	3.25	0.96		
	Student	26	3.69	1.16		
	Others	1	4.00			
Marital status	Single	8	3.38	1.061	0.60	.553
	Married	38	3.71	0.898		
	Divorced	9	3.89	1.269		
No. of children	None	12	3.75	1.055	0.25	.862
	1	14	3.57	1.089		
	2	19	3.63	1.065		
	3 or more	10	3.90	0.568		

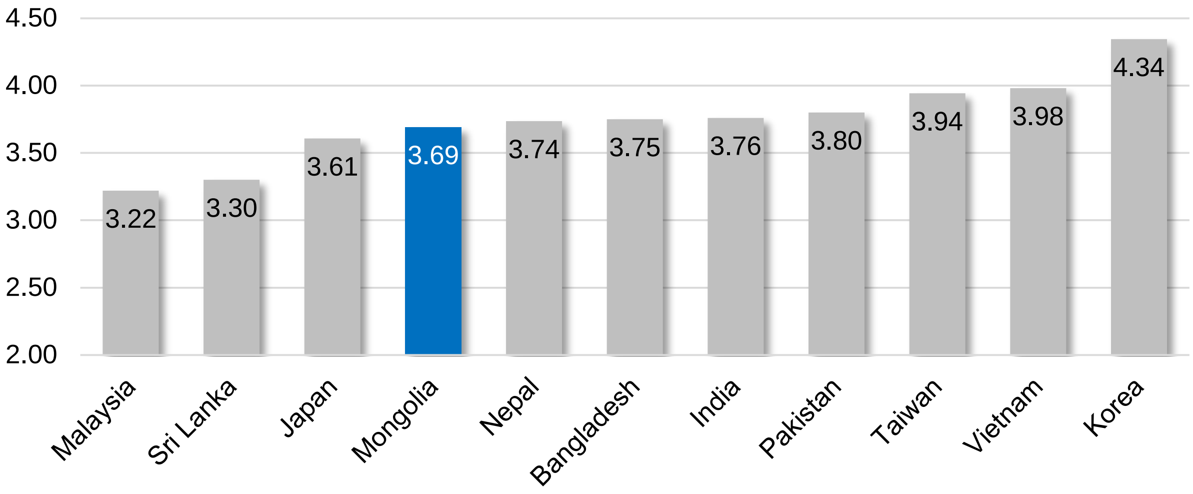


Figure 4-4-11. Average point of Q10 of Mongolia

Q11. **It is crucial to have policy support that ensures equal opportunity in order to solve the gender inequality in science**.

Table 4-4-13. Comparative survey result of Q11 in age, occupation and marital status in Mongolia

		N	Average	Standard deviation	F	*p*
	Total	55	3.78	1.07		
Age	20s or younger	15	3.73	0.88	0.85	.475
	30s	15	3.47	1.30		
	40s	18	4.06	1.06		
	50s or older	7	3.86	0.90		
Occupation	Scientist	18	3.89	1.02	1.03	.400
	Engineer	6	4.00	0.63		
	Professional medical staff	4	3.00	1.15		
	Student	26	3.73	1.15		
	Others	1	5.00			
Marital status	Single	8	3.25	0.707	1.47	.240
	Married	38	3.82	1.062		
	Divorced	9	4.11	1.269		
No. of children	None	12	3.75	0.965	0.74	.532
	1	14	3.93	1.072		
	2	19	3.53	1.307		
	3 or more	10	4.10	0.568		

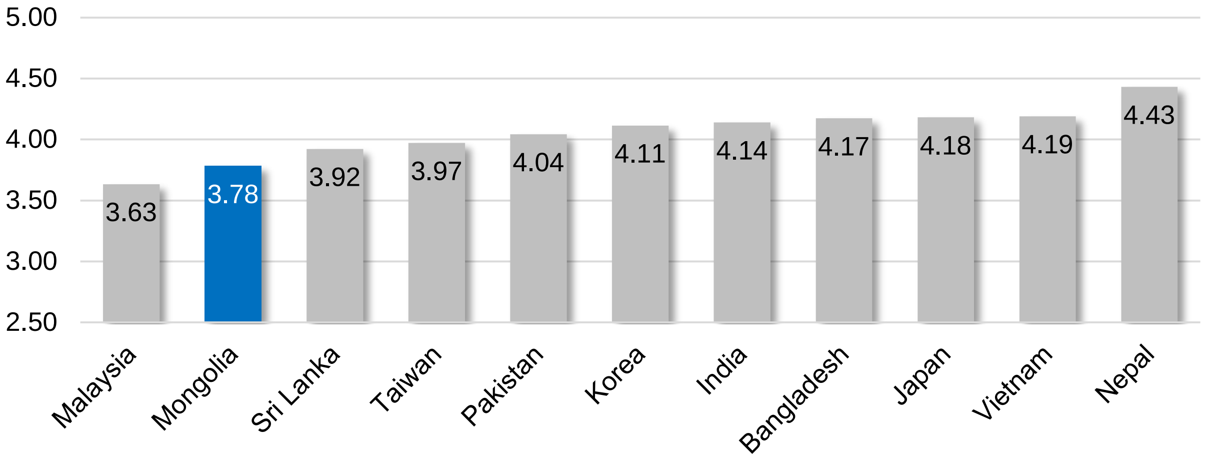


Figure 4-4-12. Average point of Q11 of Mongolia

4.2.4 Bangladesh

In Bangladesh, a total of 104 women in science and technology participated in the survey. Unfortunately, since 90 of them (86.5%) were in their 20s, it is difficult to say that the survey results accurately represent real-life experience of women at higher ranks in work environments or women competing for promotion, in terms of the glass-ceiling phenomenon. By occupation, respondents were distributed across all areas, with 26 scientists (25%), 7 engineers (6.7%), and 23 medical professionals (22.1%), but the number of students amounted to as many as 20. As most respondents were quite young, 71 participants (68.3%) were single, and 32 respondents (30.8%) were married. In addition, the number of respondents without children was 81, or 78%.

Table 4-5-1. Status of survey participants in Bangladesh

		N	%
Age	20s or younger	90	86.5
	30s	10	9.6
	40s	1	1.0
	50s or older	3	2.9
Occupation	Scientist	26	25.0
	Engineer	7	6.7
	Professional medical staff	23	22.1
	Professional researcher	11	10.6
	Student	20	19.2
	Manager	12	11.5
	Others	5	4.8
Job	Student	54	51.9
	Professor/teacher	5	4.8
	Researcher	16	15.4
	Manager	5	4.8
	Professional medical staff	20	19.2
	Engineer	4	3.8
	Other		
Marital status	Single	71	68.3
	Married	32	30.8
	Divorced	1	1.0
No. of children	None	81	77.9
	1	16	15.4
	2	3	2.9
	3 or more	4	3.8
Total		104	100.0

As a result of comparing the entire survey results of 11 countries, Bangladesh scored an average of 3.30, ranking eighth.

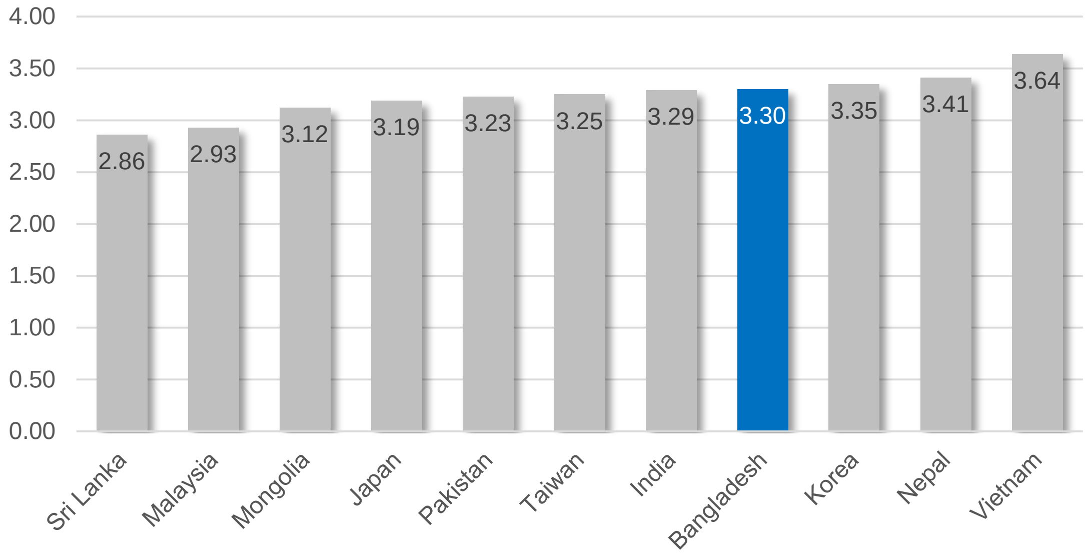


Figure 4-5-1. Average value of Bangladesh in comparison to other participating countries

When the average scores of Bangladesh and those of the ten other countries were compared through the independent sample t test, it was found that Bangladesh showed a statistically significant difference in four questions. Bangladesh had a score lower than the average scores of the ten other countries in Q6 (if women have more limits in becoming organizational or project managers) and in Q7 (if the respondents see more men than women in their occupational area); this difference exhibited statistical significance. However, Bangladesh's average was statistically relevantly higher compared to those of the ten other countries in Q8 (expectation for future improvements in glass ceiling and gender inequality) and in Q9 (perception that there is a difference in men's and women's abilities required in the science and technology sector). With regard to the remaining questions, the statistical analysis results suggest no significant differences

Table 4-5-2. Comparison of average value in Bangladesh

	Question	Bangladesh	Without Bangladesh	t	*(p)*	Rank
Q1	Female scientists are limited in how much they can succeed in science compared to male scientists.	3.17	3.25	-0.65	0.518	4
Q2	Men have an advantage over women in Science.	3.00	3.22	-1.83	0.068	4
Q3	To attain a masters or doctoral degree, women should work harder and take longer time to finish their studies than men.	2.93	2.77	1.25	0.212	7
Q4	I have experienced some disadvantages to lead or participate in a research project because I am a woman.	3.08	2.87	1.74	0.083	9
Q5	I have experienced some disadvantages in research funding or scholarships because I am a woman.	2.62	2.46	1.20	0.232	8
Q6	Becoming a tenured professor, being promoted or becoming a principal investigator is more difficult for female scientists than for male scientists.	2.98	3.27	-2.58	0.010	4
Q7	There are more men than women among those with similar or more professional experience than mine.	3.40	3.72	-2.90	0.004	5
Q8	Girls who are entering college today will be studying in a better (more gender equal) environment than I did.	4.01	3.74	2.45	0.016	9
Q9	There is a difference in ability (math, analytical skills, logical thinking, etc) that needs to be acquired in science for men and women.	3.20	2.58	4.52	0.000	11
Q10	Having to balance work and life (marriage and child care) is a handicap for women.	3.75	3.79	-0.29	0.775	6
Q11	It is crucial to have policy support that ensures equal opportunity in order to solve the gender inequality in science.	4.17	4.07	0.95	0.342	4
N		104	945			

Q1**. Female scientists are limited in how much they can succeed in science compared to male scientists.**

The demographic factor that affected the average score most was marital status. Whereas single respondents had an average score of 3.06, their married counterparts recorded an average score of 3.50, indicating that married women took this issue more seriously; this result was also proved by statistical analysis. Other factors did not lead to any significant difference in the ANOVA analysis, but one-on-one ex-post analysis found that the group of engineers scored statistically significant lower average scores of 2.86 than scientists (3.38) and medical professionals (3.22).

Table 4-5-3. Comparative survey result of Q1 in age, occupation and marital status in Bangladesh

		N	Average	Standard deviation	F	*p*
Total		104	3.17	1.144		
Age	20s or younger	90	3.12	1.140	2.01	.118
	30s	10	3.10	1.101		
	40s	1	4.00			
	50s or older	3	4.67	0.577		
Occupation	Scientist	24	3.38	1.345	0.76	.601
	Engineer	7	2.86	1.345		
	Professional medical staff	23	3.22	1.242		
	Professional researcher	11	3.18	1.250		
	Student	20	3.25	0.550		
	Manager	12	2.58	1.165		
	Others	3	3.33	0.577		
Marital status	Single	71	3.06	1.157	3.66	.029
	Married	32	3.50	1.016		
	Divorced	1	1.00			
No. of children	None	81	3.12	1.155	.363	.780
	1	16	3.25	0.931		
	2	3	3.67	1.528		
	3 or more	4	3.50	1.732		

Among the 11 countries, Bangladesh scored an average of 3.17 for Q1, ranking fourth.

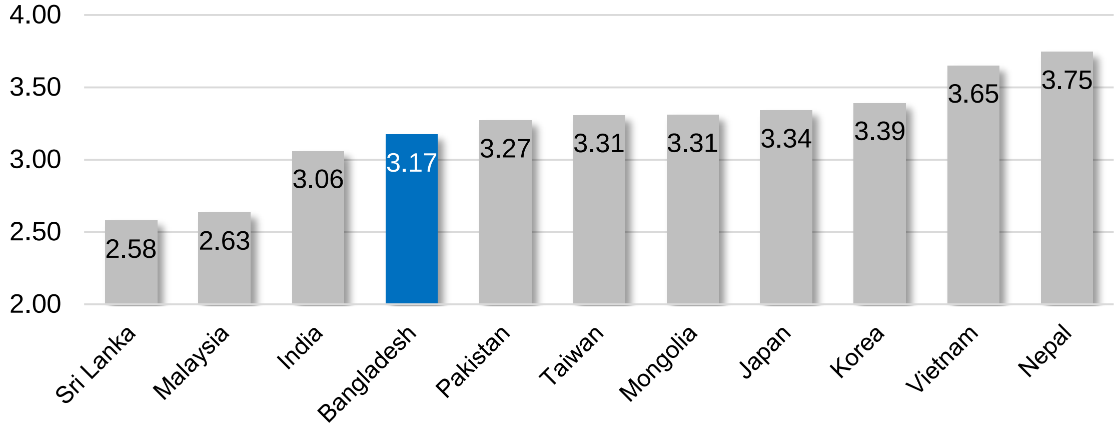


Figure 4-5-2. Average point of Q1 of Bangladesh

Q2. **Men have an advantage over women in Science.**

By age group, those in their 20s had an average score of 3.03, statistically higher than the score of 2.10 of those in their 30s. However, since the number of those in their 20s (90 respondents) remarkably outnumbered those in their 30s (10 respondents), it is hard to conclude that this difference bears any statistical significance. The results of one-on-one ex-post analysis found that the average scores of scientists and engineers were 3.08 and 3.43, respectively, while that of the 23 respondents working as medical professionals was only 2.74, suggesting that medical professionals were least likely to perceive difference in competitiveness between men and women.

Table 4-5-4. Comparative survey result of Q2 in age, occupation and marital status in Bangladesh

		N	Average	Standard deviation	F	*p*
	Total	104	3.00	1.215		
Age	20s or younger	90	3.03	1.175	4.35	.006
	30s	10	2.10	1.101		
	40s	1	5.00			
	50s or older	3	4.33	0.577		
Occupation	Scientist	24	3.08	1.381	0.84	.545
	Engineer	7	3.43	1.134		
	Professional medical staff	23	2.74	1.214		
	Professional researcher	11	2.73	1.191		
	Student	20	3.20	0.894		
	Manager	12	2.67	1.371		
	Others	3	3.67	0.577		
Marital status	Single	71	3.14	1.125	2.59	.080
	Married	32	2.75	1.344		
	Divorced	1	1.00			
No. of children	None	81	3.14	1.191	2.70	.050
	1	16	2.31	0.946		
	2	3	3.67	1.528		
	3 or more	4	2.50	1.732		

Consistent with the results with Q1, Bangladesh's average value ranked 4th place among the 11 countries that participated.

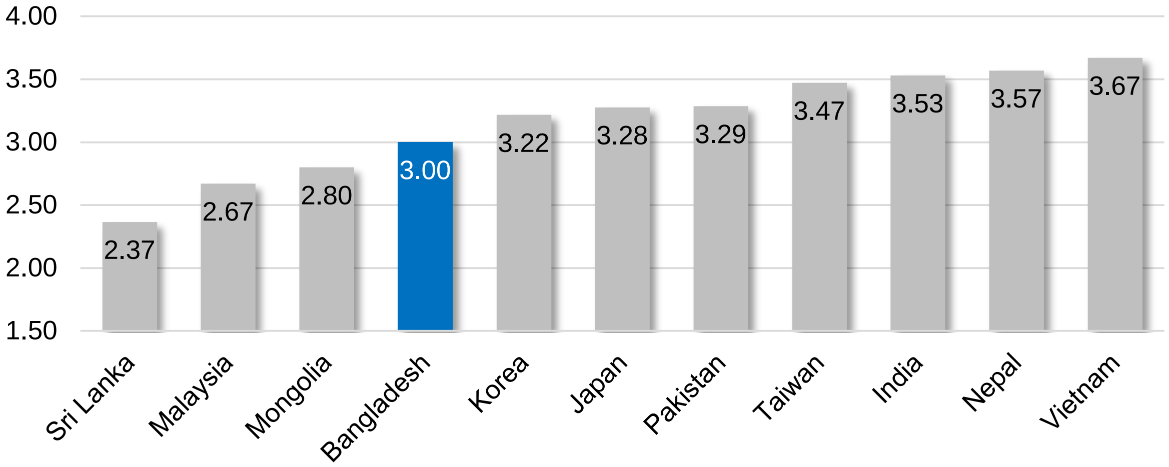


Figure 4-5-3. Average point of Q2 of Bangladesh

Q3. **To attain a masters or doctoral degree, women should work harder and take longer time to finish their studies than men.**

Table 4-5-5. Comparative survey result of Q3 by age, occupation and marital status in Bangladesh

		N	Average	Standard deviation	F	*p*
	Total	104	2.93	1.346		
Age	20s or younger	90	3.02	1.332	1.01	.390
	30s	10	2.40	1.430		
	40s	1	2.00			
	50s or older	3	2.33	1.528		
Occupation	Scientist	24	2.96	1.398	0.65	.690
	Engineer	7	2.29	1.113		
	Professional medical staff	23	2.91	1.345		
	Professional researcher	11	3.36	1.502		
	Student	20	3.15	1.182		
	Manager	12	2.83	1.467		
	Others	3	2.33	1.528		
Marital status	Single	71	2.94	1.382	1.05	.355
	Married	32	2.97	1.257		
	Divorced	1	1.00			
No. of children	None	81	3.01	1.401	1.65	.183
	1	16	2.88	0.957		
	2	3	3.00	1.732		
	3 or more	4	1.50	0.577		

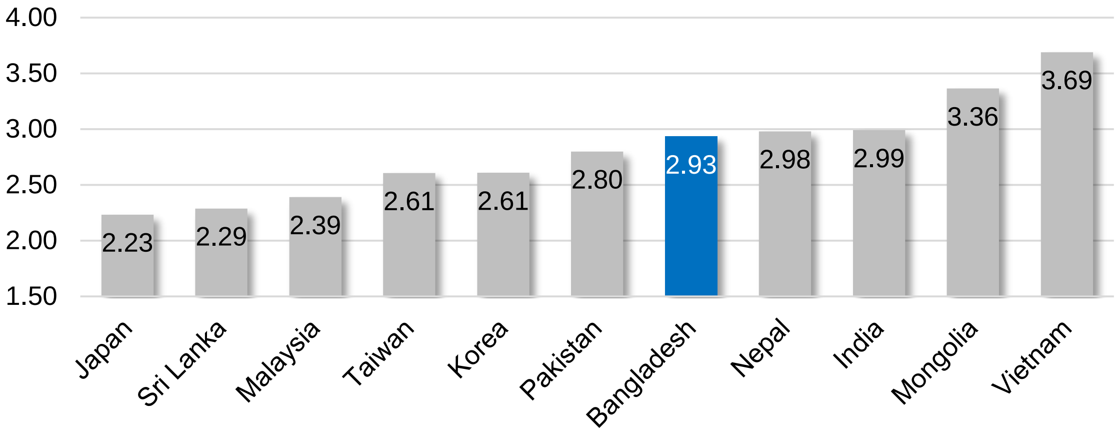


Figure 4-5-4. Average point of Q3 of Bangladesh

Q4. **I have experienced some disadvantages to lead or participate in a research project because I am a woman.**

Table 4-5-6. Comparative survey result of Q4 in age, occupation and marital status in Bangladesh

		N	Average	Standard deviation	F	*p*
	Total	104	3.08	1.146		
Age	20s or younger	90	3.12	1.120	1.23	.302
	30s	10	2.90	1.370		
	40s	1	4.00			
	50s or older	3	2.00	1.000		
Occupation	Scientist	24	2.92	1.139	1.45	.203
	Engineer	7	3.57	1.134		
	Professional medical staff	23	2.74	1.137		
	Professional researcher	11	3.45	1.293		
	Student	20	3.15	1.040		
	Manager	12	3.42	1.240		
	Others	3	2.00	1.000		
Marital status	Single	71	3.10	1.097	0.04	.961
	Married	32	3.03	1.282		
	Divorced	1	3.00			
No. of children	None	81	3.22	1.140	2.58	.058
	1	16	2.75	1.125		
	2	3	2.33	0.577		
	3 or more	4	2.00	0.816		

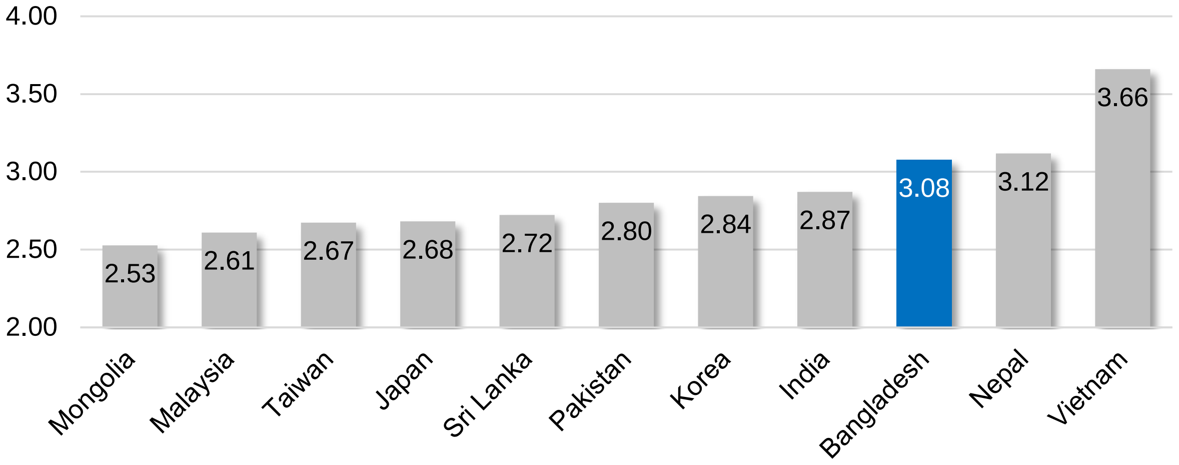


Figure 4-5-5. Average point of Q4 of Bangladesh

Q5. I have experienced some disadvantages in research funding or scholarships because I am a woman.

Table 4-5-7. Comparative survey result of Q5 in age, occupation and marital status in Bangladesh

		N	Average	Standard deviation	F	*p*
	Total	104	2.62	1.249		
Age	20s or younger	90	2.60	1.270	0.05	.984
	30s	10	2.70	1.337		
	40s	1	3.00			
	50s or older	3	2.67	0.577		
Occupation	Scientist	24	2.79	1.215	0.81	.567
	Engineer	7	2.29	1.113		
	Professional medical staff	23	2.74	1.054		
	Professional researcher	11	2.73	1.794		
	Student	20	2.10	0.788		
	Manager	12	2.75	1.545		
	Others	3	2.33	2.309		
Marital status	Single	71	2.61	1.189	0.05	.952
	Married	32	2.63	1.408		
	Divorced	1	3.00			
No. of children	None	81	2.65	1.247	0.13	.942
	1	16	2.50	1.506		
	2	3	2.33	0.577		
	3 or more	4	2.50	0.577		

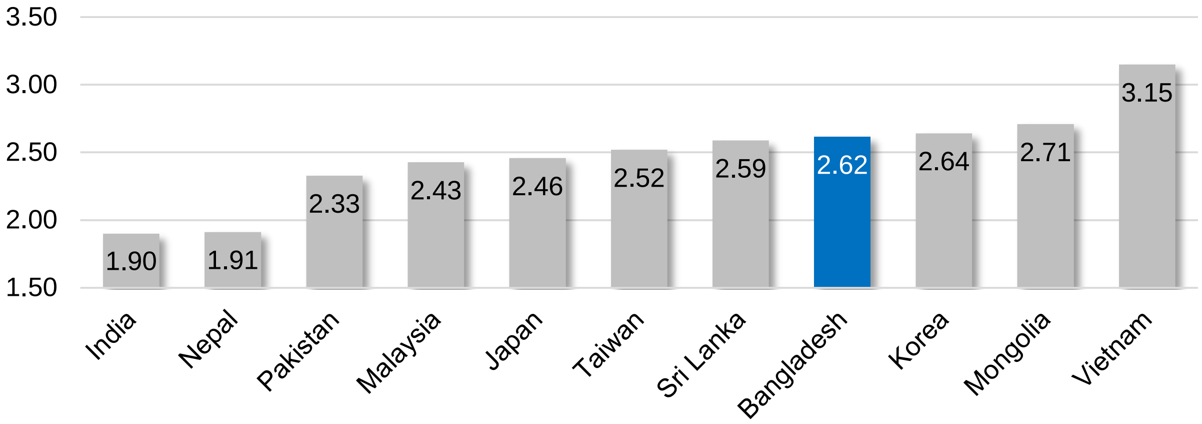


Figure 4-5-6. Average point of Q5 of Bangladesh

Q6. **Becoming a tenured professor, being promoted or becoming a principal investigator is more difficult for female scientists than for male scientists.**

With regard to the question about possible promotion of women to higher occupational ranks, Bangladesh had an average score of 2.98. While the average among those in their 20s was 3.10, that among those in their 30s was merely 2.00, demonstrating that older respondents who might have more realistic experience of promotion-related issues within an organization did not perceive the issue more seriously. This result proved to have statistical significance as well. By marital status, single respondents showed a statistically significant higher average score of 3.25 than married respondents with 2.41. When the number of children was factored in, those without children had an average score of 3.20, whereas those with one child scored 2.19, with a statistically significant difference.

Table 4-5-8. Comparative survey result of Q6 in age, occupation and marital status in Bangladesh

		N	Average	Standard deviation	F	*p*
	Total	104	2.98	1.190		
Age	20s or younger	90	3.10	1.181	3.31	.023
	30s	10	2.00	0.667		
	40s	1	4.00			
	50s or older	3	2.33	1.528		
Occupation	Scientist	24	3.13	1.116	0.22	.968
	Engineer	7	2.86	1.345		
	Professional medical staff	23	2.83	1.154		
	Professional researcher	11	2.82	1.601		
	Student	20	3.05	1.191		
	Manager	12	2.75	1.215		
	Others	3	3.00	1.000		
Marital status	Single	71	3.25	1.143	6.57	.002
	Married	32	2.41	1.103		
	Divorced	1	2.00			
No. of children	None	81	3.20	1.156	5.27	.002
	1	16	2.19	1.047		
	2	3	3.00	1.000		
	3 or more	4	1.75	0.500		

As a result of international comparison, Bangladesh ranked fourth out of the 11 countries for this question, and the independent sample t test comparing the average scores of Bangladesh and those of the other ten countries found that Bangladesh had a statistically significant lower result.

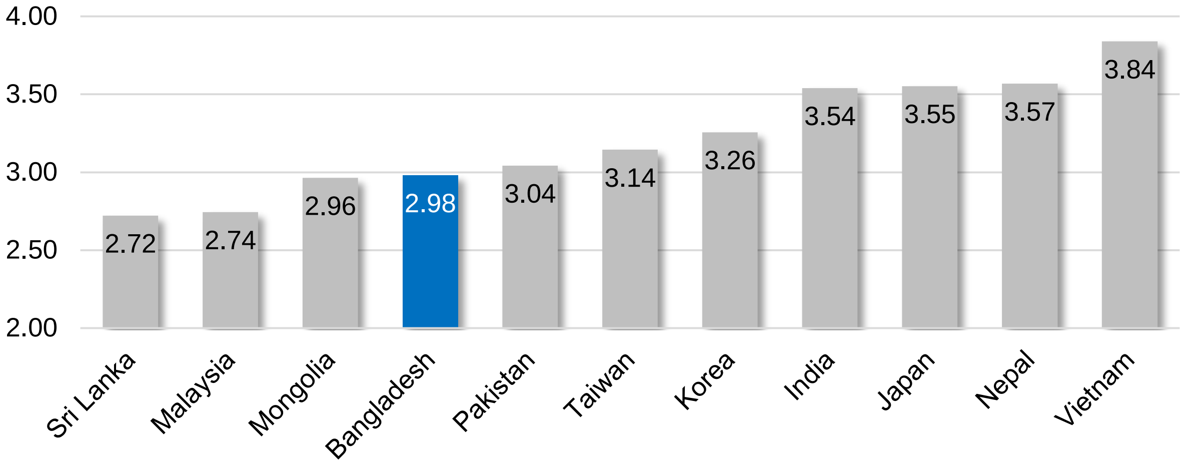


Figure 4-5-7. Average point of Q6 of Bangladesh

Q7. **There are more men than women among those with similar or more professional experience than mine.**

Asked about the gender makeup in their occupational area, the respondents in Bangladesh had an average score of 3.40, lower than those scores for the other ten countries (3.72). By age group, while those in their 20s scored 3.50, those in their 30s scored an average of 2.60, a statistically significant lower result. By occupation, the scores of scientists and engineers were 3.42 and 3.43, respectively, but medical professionals had a lower average score of 3.00. This difference suggests that the medical sector has a more evenly distributed gender makeup and this is consistent with the results for other countries. The average score of students was exceptionally high at 3.80. In the meantime, the single respondents showed an average score of 3.62, statistically significantly higher than the average score of 3.00 among the married respondents. This result was in line with that based on the number of children. Those without children recorded an average score of 3.59, but those with one, two, and three or more children showed scores of 2.81, 3.00, and 2.25, respectively, indicating that the respondents who are parents have a statistical tendency to produce a lower average score.

Table 4-5-9. Comparative survey result of Q7 in age, occupation and marital status in Bangladesh

		N	Average	Standard deviation	F	*p*
	Total	104	3.40	1.066		
Age	20s or younger	90	3.50	1.019	3.62	.016
	30s	10	2.60	1.075		
	40s	1	5.00			
	50s or older	3	2.67	1.155		
Occupation	Scientist	24	3.42	1.213	1.07	.385
	Engineer	7	3.43	0.787		
	Professional medical staff	23	3.00	1.128		
	Professional researcher	11	3.55	1.128		
	Student	20	3.80	1.056		
	Manager	12	3.33	0.651		
	Others	3	3.67	1.155		
Marital status	Single	71	3.62	0.884	7.03	.001
	Married	32	3.00	1.244		
	Divorced	1	1.00			
No. of children	None	81	3.59	0.972	4.64	.004
	1	16	2.81	1.167		
	2	3	3.00	1.000		
	3 or more	4	2.25	1.258		

Compared to the ten other countries, Bangladesh assumed the 5th place. With regard to Q6 and Q7, an additional survey targeting respondents from all age groups in balance will be required in the future, together with an analysis of the results.

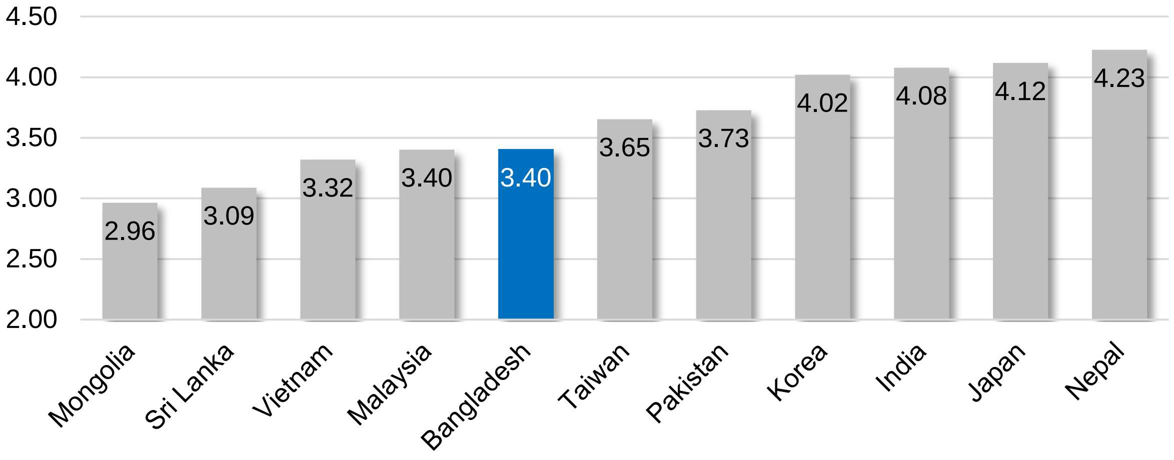


Figure 4-5-8. Average point of Q7 of Bangladesh

Q8. **Girls who are entering college today will be studying in a better (more gender equal) environment than I did.**

Bangladesh′s average for Q8 asking about expectation for improvements in gender inequality was found to be 4.01, a statistically significant higher result leading to a ranking of ninth among the 11 countries. The results in Bangladesh for this question show a different pattern from those in other countries. In this regard, further study is necessary to identify whether the reason is the excessively high share (86%) of respondents in their 20s and students, or whether any unique characteristics of women in science and technology in Bangladesh played out. By age, the average among those in their 20s was 4.12, higher, with statistical significance, than the average score of 3.30 among those in their 30s; this result is contrary to the outcomes obtained in other countries. By occupation, the group of scientists marked a statistically significant higher average score of 4.50, compared to engineers (3.29) and medical professionals (3.22). This might be a result of rapidly improving gender equality among scientists, but figures that cannot be intuitively understood were also found, such as the average scores of professional researchers (3.91) and students (4.40).

Table 4-5-10. Comparative survey result of Q8 in age, occupation and marital status in Bangladesh

		N	Average	Standard deviation	F	*p*
	Total	104	4.01	1.093		
Age	20s or younger	90	4.12	0.992	3.79	.013
	30s	10	3.30	1.252		
	40s	1	5.00			
	50s or older	3	2.67	2.082		
Occupation	Scientist	24	4.50	0.722	5.17	.000
	Engineer	7	3.29	0.756		
	Professional medical staff	23	3.22	1.445		
	Professional researcher	11	3.91	1.044		
	Student	20	4.40	0.754		
	Manager	12	4.50	0.522		
	Others	3	3.67	1.528		
Marital status	Single	71	4.10	0.897	0.75	.474
	Married	32	3.81	1.447		
	Divorced	1	4.00			
No. of children	None	81	4.15	0.950	3.49	.018
	1	16	3.81	1.167		
	2	3	2.67	2.082		
	3 or more	4	3.00	1.826		

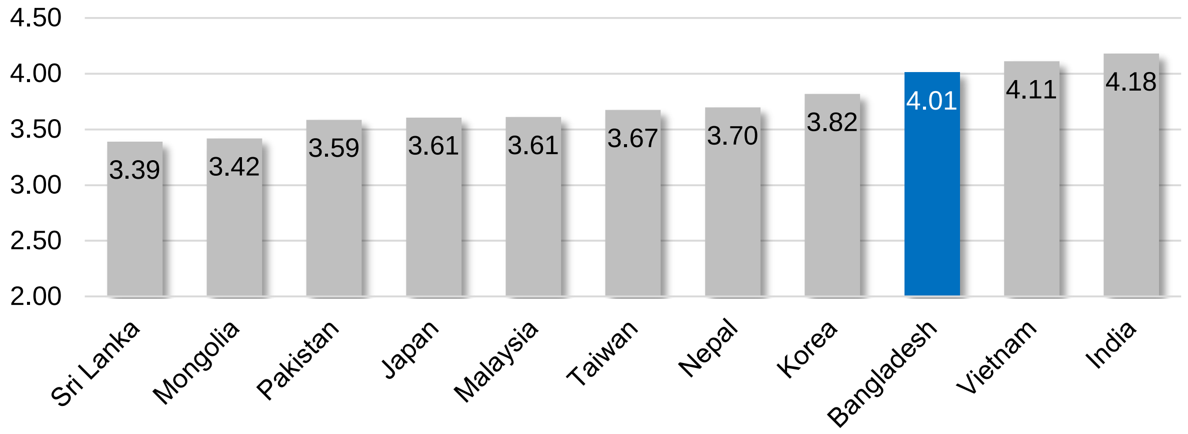


Figure 4-5-9. Average point of Q8 of Bangladesh

Q9. **There is a difference in ability (math, analytical skills, logical thinking, etc) that needs to be acquired in science for men and women.**

Table 4-5-11. Comparative survey result of Q9 in age, occupation and marital status in Bangladesh

		N	Average	Standard deviation	F	*p*
	Total	104	3.20	1.361		
Age	20s or younger	90	3.22	1.388	0.29	.834
	30s	10	3.10	1.197		
	40s	1	4.00			
	50s or older	3	2.67	1.528		
Occupation	Scientist	24	3.00	1.285	5.81	.000
	Engineer	7	1.71	0.756		
	Professional medical staff	23	2.61	1.076		
	Professional researcher	11	3.64	1.433		
	Student	20	4.05	1.317		
	Manager	12	3.92	1.240		
	Others	3	2.00	0.000		
Marital status	Single	71	3.18	1.334	0.18	.837
	Married	32	3.22	1.453		
	Divorced	1	4.00			
No. of children	None	81	3.21	1.376	1.33	.268
	1	16	3.50	1.265		
	2	3	3.00	1.000		
	3 or more	4	2.00	1.414		

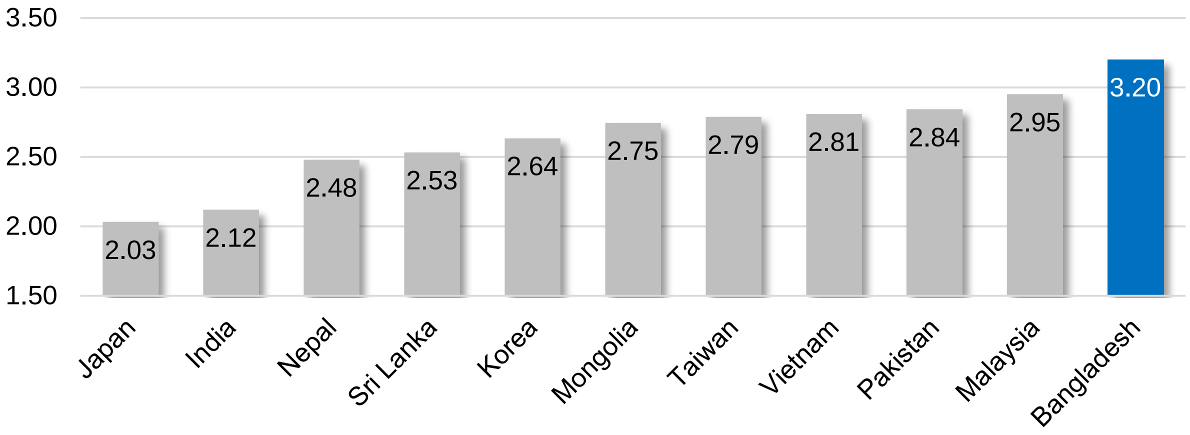


Figure 4-5-10. Average point of Q9 of Bangladesh

Q10. **Having to balance work and life (marriage and child care) is a handicap for women.**

Asked if childbirth and child-rearing work can affect women's social participation, the respondents in Bangladesh scored an average of 3.75, near the overall average scores of the 11 countries. By age, those in their 20s and 30s showed average scores of 3.74 and 4.00, respectively, showing an upward trend. Meanwhile, scientists scored an average of 4.00, but engineers and medical professionals scored only 3.43 and 3.35, suggesting a higher burden among scientists in rearing children. Compared to the respondents without children, those with one child reported direct awareness of childcare burdens, showing a relatively higher average.

Table 4-5-12. Comparative survey result of Q10 in age, occupation and marital status in Bangladesh

		N	Average	Standard deviation	F	*p*
	Total	104	3.75	1.205		
Age	20s or younger	90	3.74	1.147	1.32	.271
	30s	10	4.00	1.414		
	40s	1	5.00			
	50s or older	3	2.67	2.082		
Occupation	Scientist	24	4.00	1.063	1.52	.180
	Engineer	7	3.43	0.787		
	Professional medical staff	23	3.35	1.526		
	Professional researcher	11	3.82	1.079		
	Student	20	4.25	0.910		
	Manager	12	3.33	1.435		
	Others	3	3.67	1.155		
Marital status	Single	71	3.75	1.130	0.54	.582
	Married	32	3.72	1.373		
	Divorced	1	5.00			
No. of children	None	81	3.75	1.135	1.89	.136
	1	16	4.13	1.147		
	2	3	2.67	2.082		
	3 or more	4	3.00	1.826		

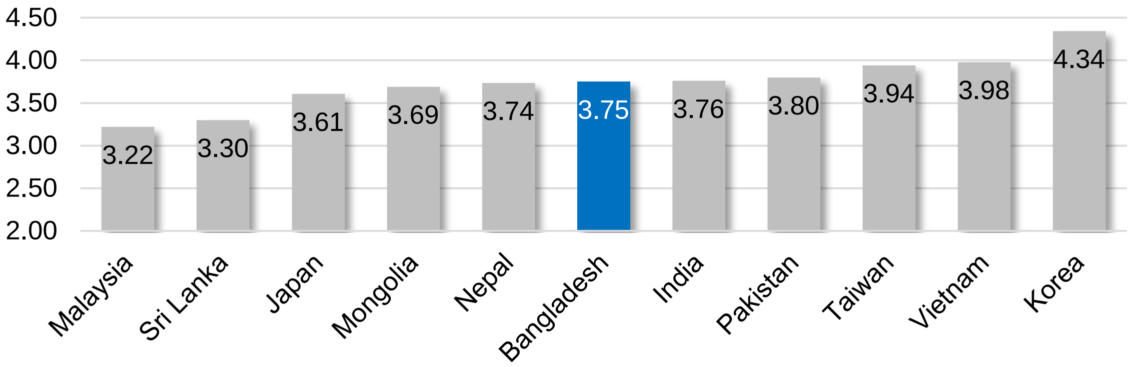


Figure 4-5-11. Average point of Q10 of Bangladesh

Q11. **It is crucial to have policy support that ensures equal opportunity in order to solve the gender inequality in science.**

The average among those in their 20s was significantly higher at 4.28 than the average score of 3.70 among those in their 30s, indicating much stronger need among the younger generation for policy consideration. By occupational group, scientists marked the highest average score of 4.75, followed by engineers (4.29) and medical professionals (4.09). The lower need for policy consideration identified among medical professionals was commonly observed in many countries. Unusually, the average among the single respondents was statistically significantly higher at 4.34 than the average score of 3.78 among the married respondents. In addition, whereas the score of childless respondents was 4.40, those with one child scored 3.63, demonstrating an unusually lower average with statistical significance among the respondents with children.

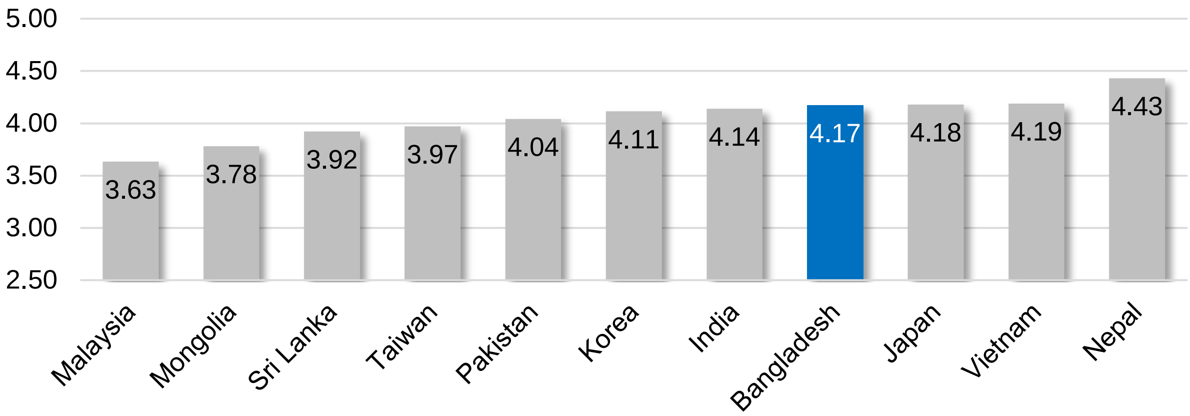


Figure 4-5-12. Average point of Q11 of Bangladesh

Table 4-5-13. Comparative survey result of Q11 in age, occupation and marital status in Bangladesh

		N	Average	Standard deviation	F	*p*
	Total	104	4.17	1.110		
Age	20s or younger	90	4.28	0.995	4.15	.008
	30s	10	3.70	1.494		
	40s	1	5.00			
	50s or older	3	2.33	1.528		
Occupation	Scientist	24	4.75	0.532	4.56	.000
	Engineer	7	4.29	0.756		
	Professional medical staff	23	3.35	1.335		
	Professional researcher	11	4.09	1.375		
	Student	20	4.55	0.686		
	Manager	12	4.25	1.055		
	Others	3	3.33	2.082		
Marital status	Single	71	4.34	0.909	3.19	.046
	Married	32	3.78	1.408		
	Divorced	1	5.00			
No. of children	None	81	4.40	0.918	6.65	.000
	1	16	3.63	1.310		
	2	3	2.67	1.155		
	3 or more	4	3.00	1.826		

4.2.5 Vietnam

A total of 100 respondents participated in the survey in Vietnam. The respondents were evenly distributed across all groups, with 9 respondents in their 20s, 34 in their 30s, 41 in their 40s, and 16 in their 50s, and such makeup was suitable to the theme of identifying the glass-ceiling phenomenon. However, since the number of those in their 20s was only nine, which makes it difficult to generalize the results, the results from the youngest group was included in the overall statistics, but excluded from the analysis for each question. By occupation, most participants (87 respondents) disproportionately belonged to the group of engineers, and the numbers of medical professionals and scientists were only 12 and 1, respectively. Since it was hard for the results of the analysis by occupation to bear a significant implication, analysis based on sub-categories was conducted only for the comparison between engineers and medical professionals.

Table 4-6-1. Status of survey participants in Vietnam

		N	%
Age	20s or younger	9	9.0
	30s	34	34.0
	40s	41	41.0
	50s or older	16	16.0
Occupation	Scientist	1	1.0
	Engineer	87	87.0
	Professional medical staff	12	12.0
Job	Professor/teacher	5	5.0
	Researcher	6	6.0
	Manager	16	16.0
	Professional medical staff	9	9.0
	Engineer	64	64.0
Marital status	Single	14	14.0
	Married	70	70.0
	Divorced	16	16.0
No. of children	None	20	20.0
	1	31	31.0
	2	39	39.0
	3 or more	10	10.0
		100	100.0

Categorized based on marital status, the number of single and married respondents was 14 and 70, respectively, and that of divorced respondents numbered 16. The number of respondents without children was 20; numbers of respondents with one and two children were 31 and 39, respectively. The remaining ten respondents had three or more children.

Vietnam had an overall average score of 3.64, ranking 11th of all 11 countries. Out of the 11 question, Vietnam scored a statistically significant higher average in eight questions than the remaining ten countries did, except for Q7, for which Vietnam had a statistically relevant lower average.

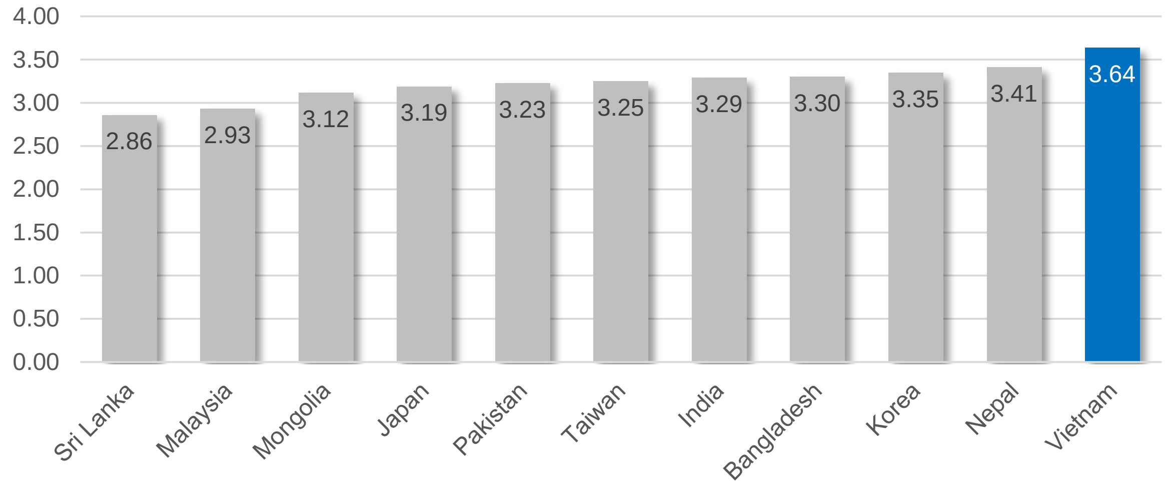


Figure 4-6-1. Average value in Vietnam

Table 4-6-2. Comparison of average value in Vietnam

	Question	Vietnam	Except Vietnam	t	*(p)*
Q1	Women in science and technology face more limits in succeeding in the science sector than men do.	3.65	3.20	4.49	0.000
Q2	Science is a department more advantageous to men than to women.	3.67	3.15	5.42	0.000
Q3	Women face more difficulties or require a longer time than men do when completing a master’s or doctoral program and acquiring a degree.	3.69	2.70	8.94	0.000
Q4	I have experienced a disadvantage in leading or participating in a major research project, because I am a woman.	3.66	2.81	9.10	0.000
Q5	I have experienced a disadvantage in receiving research funds or scholarships, because I am a woman.	3.15	2.41	7.22	0.000
Q6	I believe that it is more difficult for women to become professors, major managers, or project managers.	3.84	3.18	7.09	0.000
Q7	In the area I am working in, more men than women have a career level the same as or higher than mine.	3.32	3.73	-3.68	0.000
Q8	Women university students newly joining science and engineering departments will study in a better environment than I did.	4.11	3.73	3.98	0.000
Q9	Men and women have differences in capabilities necessary for science (e.g. mathematics, analytical ability, logical thinking).	2.81	2.62	1.91	0.058
Q10	The responsibility for marriage and child-rearing works as a handicap for women.	3.98	3.76	2.47	0.015
Q11	In order to eliminate gender inequalities in science, policy consideration to ensure equal opportunities for women is necessary.	4.19	4.06	1.31	0.190
	N	100	949		

Q1. **Female scientists are limited in how much they can succeed in science compared to male scientists.**

No statistically significant difference was found in the survey results by age group and occupation. By marital status, the single, married, and divorced respondents had average scores of 3.14, 3.70, and 3.88, respectively. As a result of comparing the independent sample's average, a statistically significant difference was observed between the group of single respondents and the group of those who have ever been married (married and divorced together).

Table 4-6-3. Comparative survey result of Q1 by age, occupation and marital status in Vietnam

		N	Average	Standard deviation	F	*p*
	Total	100	3.65	0.93		
Age	20s or younger	9	3.11	1.27	1.83	.147
	30s	34	3.65	0.81		
	40s	41	3.63	0.94		
	50s or older	16	4.00	0.82		
Occupation	Scientist	1	5.00		1.10	.337
	Engineer	87	3.64	0.90		
	Professional medical staff	12	3.58	1.08		
Marital status	Single	14	3.14	1.099	2.77	.067
	Married	70	3.70	0.906		
	Divorced	16	3.88	0.719		
No. of children	None	20	3.40	0.995	1.52	.214
	1	31	3.52	0.962		
	2	39	3.79	0.833		
	3 or more	10	4.00	0.943		

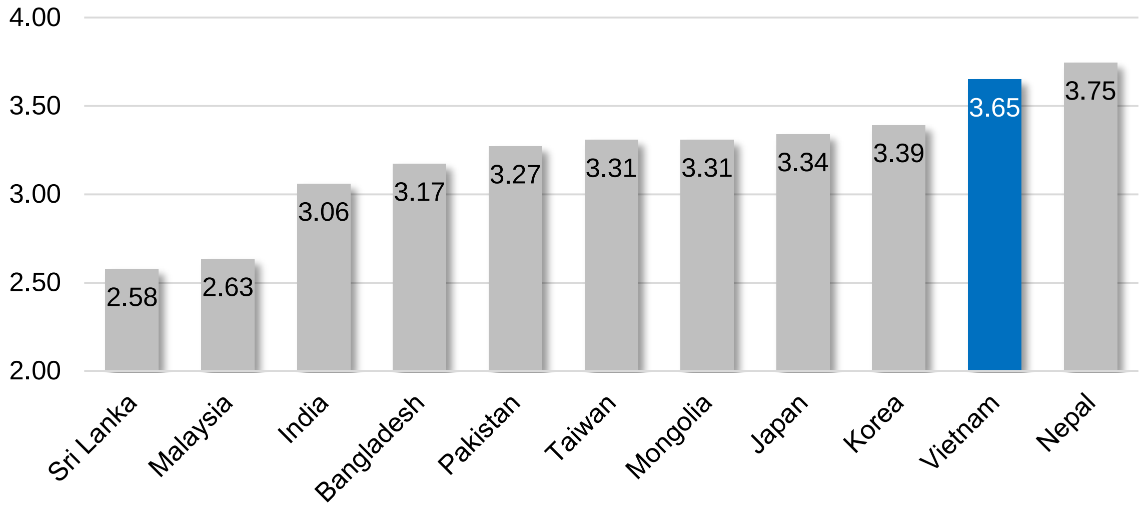


Figure 4-6-2. Average point of Q1 of Vietnam

Q2. **Men have an advantage over women in Science.**

Identical to the case of Q1, single respondents marked a lower average score of 3.29, compared to married (3.67) and divorced (4.00) respondents.

Table 4-6-4. Comparative survey result of Q2 by age, occupation and marital status in Vietnam

		N	Average	Standard deviation	F	*p*
	Total	100	3.67	0.88		
Age	20s or younger	9	3.22	0.83	0.87	.461
	30s	34	3.71	0.91		
	40s	41	3.71	0.90		
	50s or older	16	3.75	0.77		
Occupation	Scientist	1	5.00		2.14	.123
	Engineer	87	3.70	0.88		
	Professional medical staff	12	3.33	0.78		
Marital status	Single	14	3.29	0.914	2.56	.083
	Married	70	3.67	0.896		
	Divorced	16	4.00	0.632		
No. of children	None	20	3.45	0.826	2.14	.100
	1	31	3.48	0.926		
	2	39	3.82	0.790		
	3 or more	10	4.10	0.994		

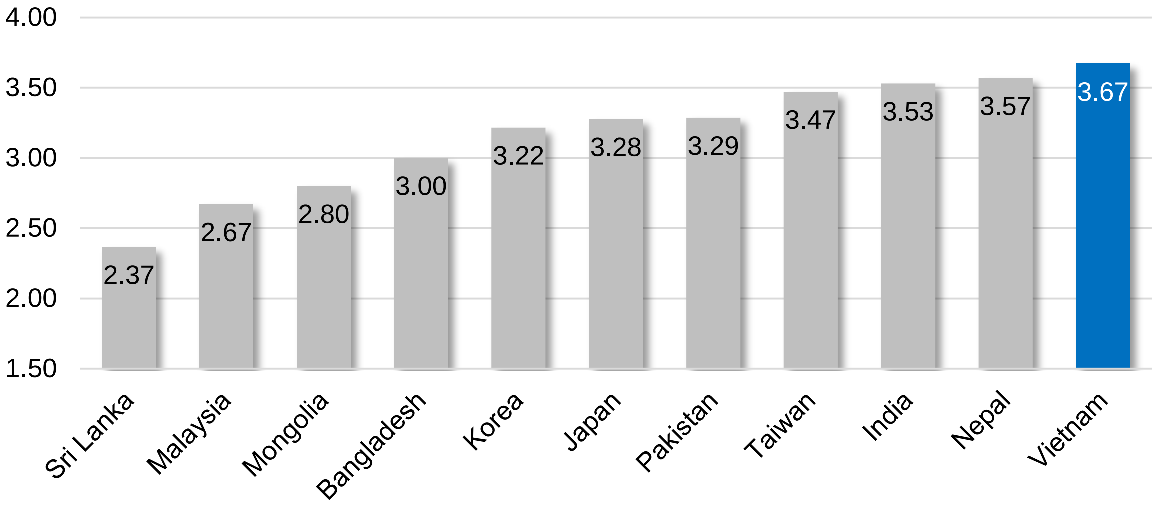


Figure 4-6-3. Average point of Q2 of Vietnam

Q3. **To attain a masters or doctoral degree, women should work harder and take longer time to finish their studies than men.**

Whereas the group of engineers scored 3.74, the group of medical professionals had an average score of 3.25, implying weaker gender discrimination experienced. However, this difference was not statistically significant. As observed in the results of Q1, the single respondents scored 3.14, while married and divorced respondents had average scores of 3.77 and 3.81, respectively, showing statistically significant higher scores among those who had ever been married (married and divorced together). Considering the results based on different age groups, it can be concluded that married women tend to face more disadvantage than single women in the course of obtaining a degree. According to the number of children, the average tended to rise when the number of children was two or more, with statistical significance proven; this result is consistent with the results from Q1.

Table 4-6-5. Comparative survey result of Q3 by age, occupation and marital status in Vietnam

		N	Average	Standard deviation	F	*p*
	Total	100	3.69	1.04		
Age	20s or younger	9	3.44	1.01	0.47	.706
	30s	34	3.76	0.89		
	40s	41	3.61	1.24		
	50s or older	16	3.88	0.81		
Occupation	Scientist	1	5.00		1.98	.143
	Engineer	87	3.74	0.99		
	Professional medical staff	12	3.25	1.29		
Marital status	Single	14	3.14	1.027	2.32	.104
	Married	70	3.77	1.066		
	Divorced	16	3.81	0.834		
No. of children	None	20	3.45	1.050	1.31	.277
	1	31	3.52	0.926		
	2	39	3.90	1.071		
	3 or more	10	3.90	1.197		

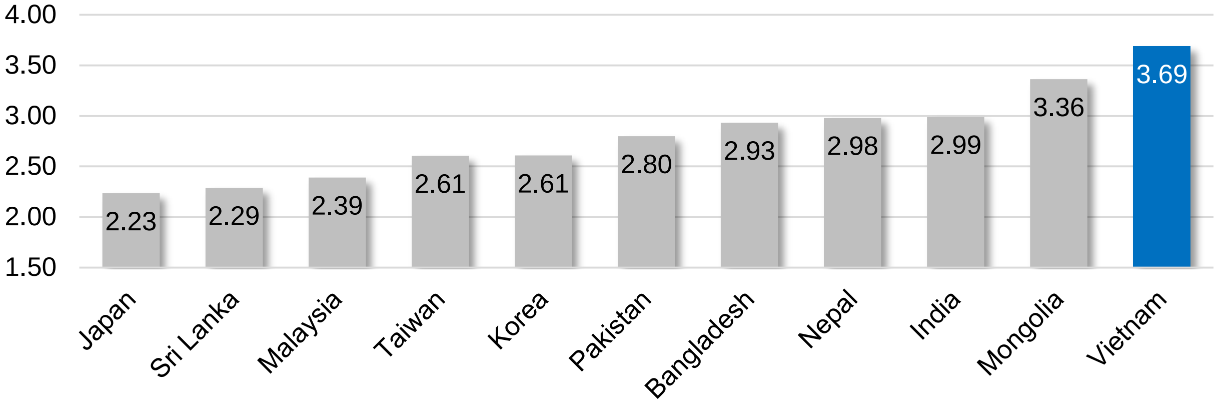


Figure 4-6-4. Average point of Q3 of Vietnam

Q4. **I have experienced some disadvantages to lead or participate in a research project because I am a woman.**

Table 4-6-6. Comparative survey result of Q4 by age, occupation and marital status in Vietnam

		N	Average	Standard deviation	F	*p*
	Total	100	3.66	0.86		
Age	20s or younger	9	3.56	0.53	0.92	.434
	30s	34	3.71	0.97		
	40s	41	3.54	0.81		
	50s or older	16	3.94	0.85		
Occupation	Scientist	1	5.00		1.25	.291
	Engineer	87	3.64	0.86		
	Professional medical staff	12	3.67	0.78		
Marital status	Single	14	3.50	0.519	0.76	.470
	Married	70	3.64	0.901		
	Divorced	16	3.88	0.885		
No. of children	None	20	3.65	0.489	0.13	.944
	1	31	3.68	0.979		
	2	39	3.62	0.877		
	3 or more	10	3.80	1.033		

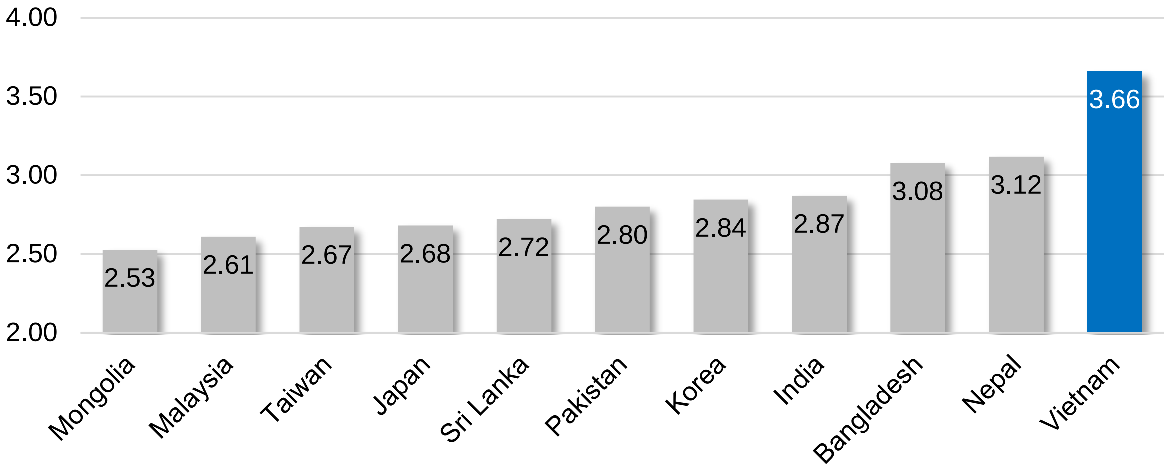


Figure 4-6-5. Average value of Q4 in Vietnam

Q5. **I have experienced some disadvantages in research funding or scholarships because I am a woman.**

Asked if discrimination exists in accessibility to research funds, the respondents in their 50s displayed a statistically significant higher average score of 3.63, compared to those in their 30s and 40s with scores of 2.97 and 3.12, respectively. A relatively high average among the Vietnamese respondents in their 50s was found in Q9, Q10, and Q11, in addition to Q5.

Table 4-6-7. Comparative survey result of Q5 by age, occupation and marital status in Vietnam

		N	Average	Standard deviation	F	*p*
	Total	100	3.15	0.97		
Age	20s or younger	9	3.11	1.05	1.73	.167
	30s	34	2.97	0.90		
	40s	41	3.12	1.00		
	50s or older	16	3.63	0.89		
Occupation	Scientist	1	3.00		0.18	.839
	Engineer	87	3.17	0.95		
	Professional medical staff	12	3.00	1.13		
Marital status	Single	14	2.93	0.917	1.47	.234
	Married	70	3.11	0.986		
	Divorced	16	3.50	0.894		
No. of children	None	20	3.10	0.912	1.12	.344
	1	31	2.94	0.854		
	2	39	3.26	1.069		
	3 or more	10	3.50	0.972		

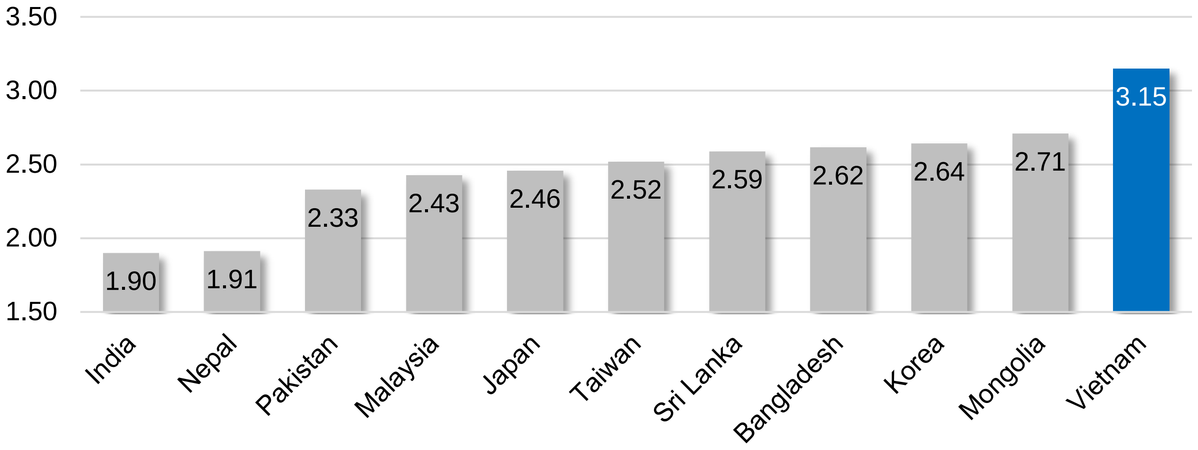


Figure 4-6-6. Average point of Q5 of Vietnam

Q6. Becoming a tenured professor, being promoted or becoming a principal investigator is more difficult for female scientists than for male scientists.

By occupation, engineers had the highest average score of 3.91, whereas the average among medical professionals only stood at 3.33. Although not statistically significant, there seems to be more discrimination perceived in promotion within an organization among the engineering sector than others. By marital status, a statistically significant difference was observed, in Q1 and Q3, between single respondents and those who have ever been married (married and divorced together).

Table 4-6-8. Comparative survey result of Q6 by age, occupation and marital status in Vietnam

		N	Average	Standard deviation	F	*p*
	Total	100	3.84	0.86		
Age	20s or younger	9	3.67	1.22	1.87	.141
	30s	34	4.06	0.81		
	40s	41	3.63	0.77		
	50s or older	16	4.00	0.89		
Occupation	Scientist	1	4.00		2.43	.093
	Engineer	87	3.91	0.84		
	Professional medical staff	12	3.33	0.89		
Marital status	Single	14	3.43	1.089	2.01	.139
	Married	70	3.89	0.860		
	Divorced	16	4.00	0.516		
No. of children	None	20	3.60	0.940	1.79	.155
	1	31	3.71	0.902		
	2	39	4.08	0.774		
	3 or more	10	3.80	0.789		

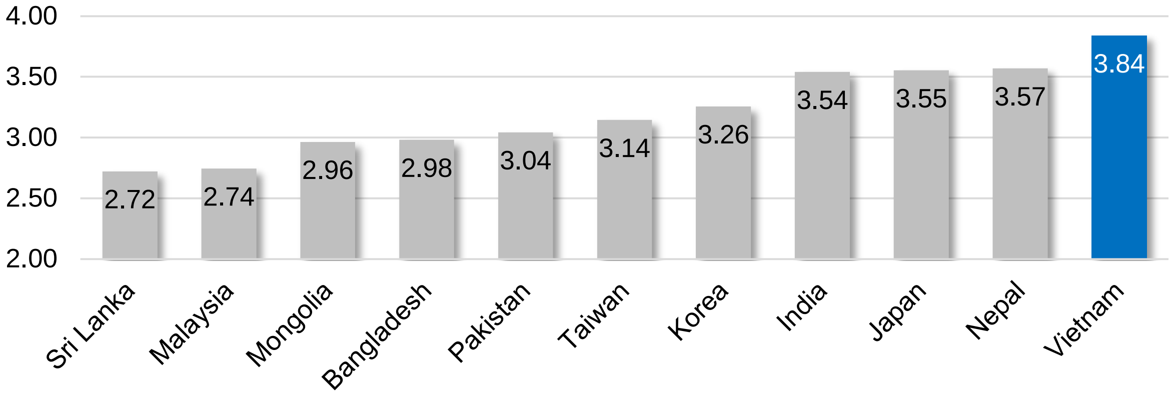


Figure 4-6-7. Average point of Q6 of Vietnam

Q7. **There are more men than women among those with similar or more professional experience than mine.**

Whereas the average among engineers was 3.44, that among medical professionals was far lower at 2.75, indicating that gender inequality among engineers is more seriously perceived, with statistical significance. Interestingly, the average score among single respondents was 3.71, while that of married respondents was lower at 3.2.

Table 4-6-9. Comparative survey result of Q7 by age, occupation and marital status in Vietnam

		N	Average	Standard deviation	F	*p*
	Total	100	3.32	0.86		
Age	20s or younger	9	3.89	0.93	1.73	.165
	30s	34	3.24	0.74		
	40s	41	3.22	0.94		
	50s or older	16	3.44	0.81		
Occupation	Scientist	1	3.00		3.22	.044
	Engineer	87	3.40	0.84		
	Professional medical staff	12	2.75	0.87		
Marital status	Single	14	3.71	0.994	1.79	.173
	Married	70	3.27	0.850		
	Divorced	16	3.19	0.750		
No. of children	None	20	3.55	0.945	1.39	.251
	1	31	3.10	0.831		
	2	39	3.41	0.818		
	3 or more	10	3.20	0.919		

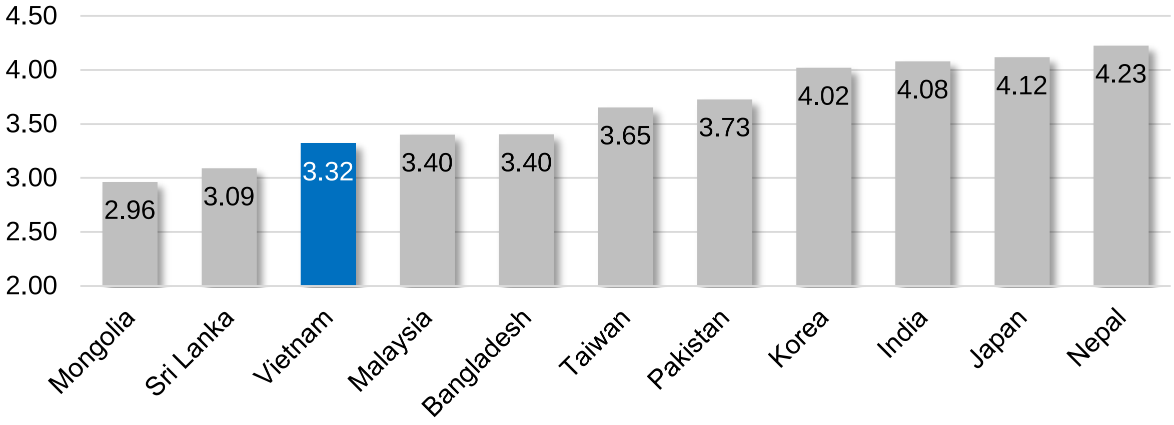


Figure 4-6-8. Average point of Q7 of Vietnam

Q8. Girls who are entering college today will be studying in a better (more gender equal) environment than I did.

Table 4-6-10. Comparative survey result of Q8 by age, occupation and marital status in Vietnam

		N	Average	Standard deviation	F	*p*
	Total	100	4.11	0.76		
Age	20s or younger	9	3.67	0.87	1.20	.314
	30s	34	4.21	0.81		
	40s	41	4.12	0.71		
	50s or older	16	4.13	0.72		
Occupation	Scientist	1	3.00		1.08	.342
	Engineer	87	4.13	0.77		
	Professional medical staff	12	4.08	0.67		
Marital status	Single	14	3.79	0.893	1.51	.227
	Married	70	4.17	0.761		
	Divorced	16	4.13	0.619		
No. of children	None	20	3.90	0.788	1.21	.310
	1	31	4.29	0.588		
	2	39	4.05	0.857		
	3 or more	10	4.20	0.789		

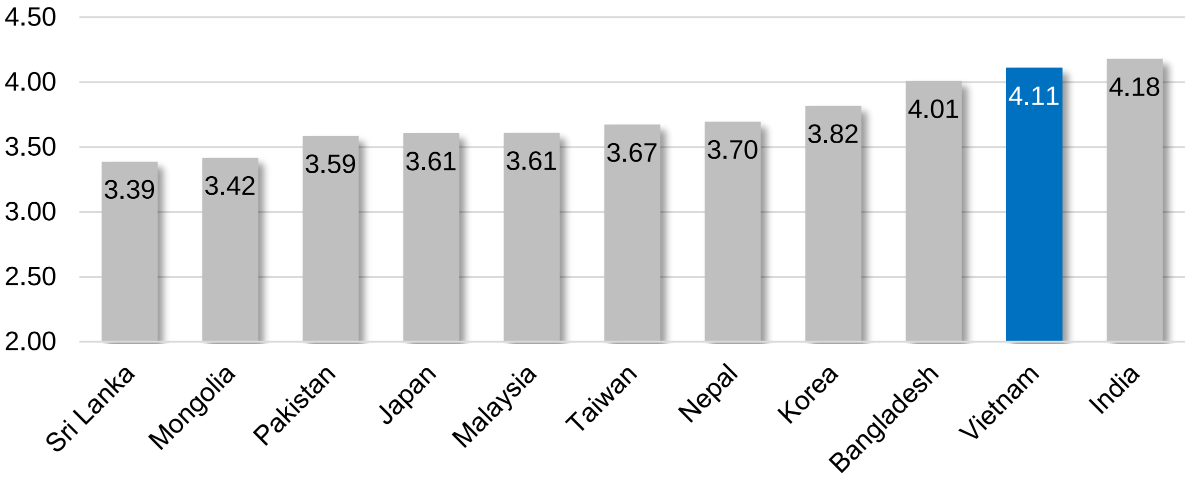


Figure 4-6-9. Average point of Q8 of Vietnam

Q9. There is difference in ability (math, analytical skills, logical thinking, etc) that needs to be acquired in science for men and women.

The perception that there is gender-based difference in abilities required in science was observed to be higher among those in their 50s, compared to other age groups. This difference was also verified by one-on-one ex-post analysis to have statistical significance.

Table 4-6-11. Comparative survey result of Q9 by age, occupation and marital status in Vietnam

		N	Average	Standard deviation	F	*p*
	Total	100	2.81	0.91		
Age	20s or younger	9	2.89	1.05	2.46	.068
	30s	34	2.59	0.82		
	40s	41	2.78	0.85		
	50s or older	16	3.31	1.01		
Occupation	Scientist	1	4.00		0.89	.415
	Engineer	87	2.80	0.93		
	Professional medical staff	12	2.75	0.75		
Marital status	Single	14	2.71	0.914	0.31	.731
	Married	70	2.86	0.905		
	Divorced	16	2.69	0.946		
No. of children	None	20	2.85	0.875	0.76	.518
	1	31	2.61	0.882		
	2	39	2.90	0.940		
	3 or more	10	3.00	0.943		

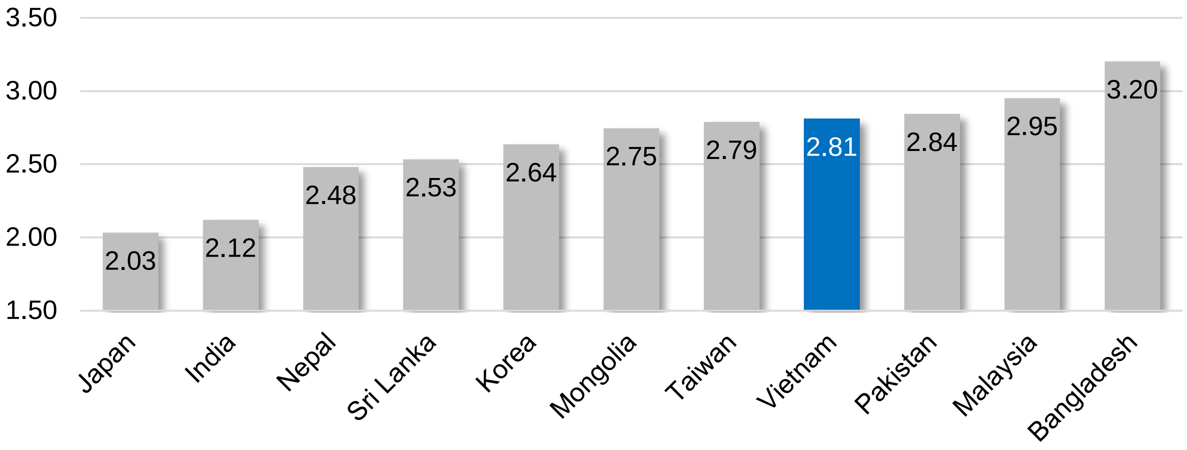


Figure 4-6-10. Average point of Q9 of Vietnam

Q10. **Having to balance work and life (marriage and child care) is a handicap for women.**

The burden from marriage and child-rearing was realized more among the oldest group than among any other age groups. In addition, single respondents marked a statistically significant lower average than their married counterparts (married and divorced together). The respondents without children also had a lower average with statistical significance, compared to those with children.

Table 4-6-12. Comparative survey result of Q10 by age, occupation and marital status in Vietnam

		N	Average	Standard deviation	F	*p*
	Total	100	3.98	0.82		
Age	20s or younger	9	3.11	0.78	5.30	.002
	30s	34	4.03	0.72		
	40s	41	3.98	0.82		
	50s or older	16	4.38	0.72		
Occupation	Scientist	1	5.00		0.92	.402
	Engineer	87	3.95	0.82		
	Professional medical staff	12	4.08	0.79		
Marital status	Single	14	3.14	0.663	10.52	.000
	Married	70	4.09	0.812		
	Divorced	16	4.25	0.447		
No. of children	None	20	3.40	0.754	5.07	.003
	1	31	4.03	0.752		
	2	39	4.15	0.779		
	3 or more	10	4.30	0.823		

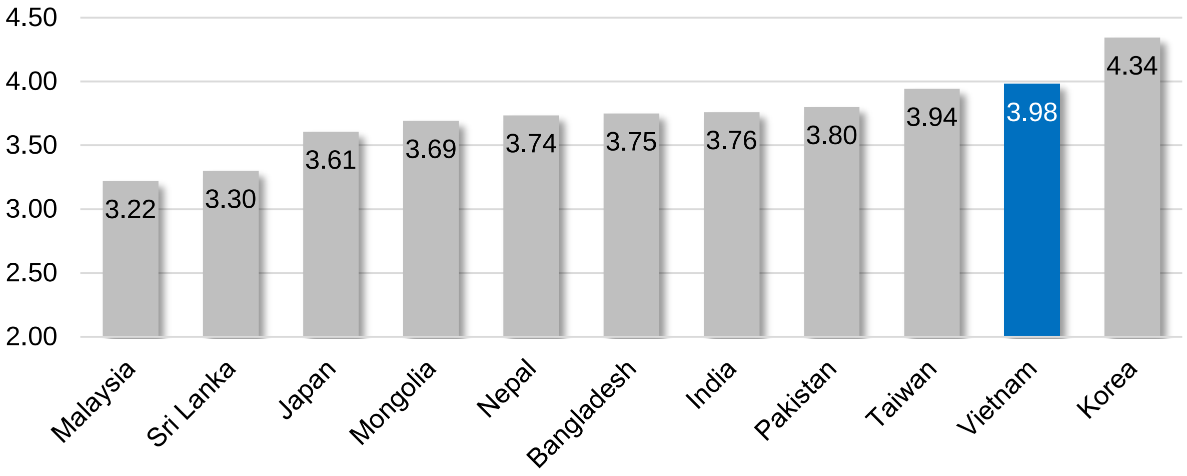


Figure 4-6-11. Average point of Q10 of Vietnam

Q11. It is crucial to have policy support that ensures equal opportunity in order to solve the gender inequality in science.

Asked about the necessity of policy consideration in order to address gender inequality, the respondents in their 50s showed a particularly higher average than other age groups; this difference was statistically verified as well. Other variants such as occupation, marital status, and the number of children, however, did not produce significant differences.

Table 4-6-13. Comparative survey result of Q11 by age, occupation and marital status in Vietnam

		N	Average	Standard deviation	F	*p*
	Total	100	4.19	0.71		
Age	20s or younger	9	3.89	0.93	4.85	.003
	30s	34	4.06	0.65		
	40s	41	4.15	0.69		
	50s or older	16	4.75	0.45		
Occupation	Scientist	1	5.00		0.72	.488
	Engineer	87	4.17	0.72		
	Professional medical staff	12	4.25	0.62		
Marital status	Single	14	3.93	0.829	1.35	.263
	Married	70	4.26	0.674		
	Divorced	16	4.13	0.719		
No. of children	None	20	4.05	0.759	2.27	.085
	1	31	4.00	0.730		
	2	39	4.33	0.577		
	3 or more	10	4.50	0.850		

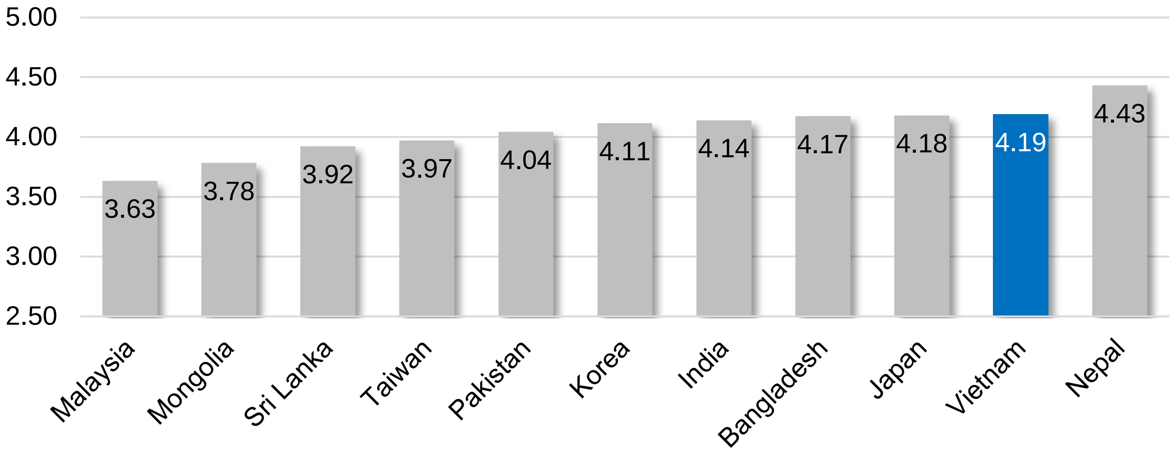


Figure 4-6-12. Average point of Q11 of Vietnam

4.2.6 Sri Lanka

The number of respondents in Sri Lanka was 90 in total, evenly distributed in all age groups, with 28 in their 20s (31%), 32 in their 30s (36%), 10 in their 40s (11%), and 20 in their 50s (22%). By occupation, the respondents in Sri Lanka belonged to different groups based on similar ratios, with 34 scientists (38%), 19 engineers (21%), and 26 medical professionals (29%).

Table 4-7-1. Status of Survey participants in Sri Lanka

		N	%
Age	20s or younger	28	31.1
	30s	32	35.6
	40s	10	11.1
	50s or older	20	22.2
Occupation	Scientist	34	37.8
	Engineer	19	21.1
	Professional medical staff	26	28.9
	Student	1	1.1
	Others	10	11.1
Job	Student	22	24.4
	Professor/teacher	5	5.6
	Researcher	16	17.8
	Manager	10	11.1
	Professional medical staff	18	20.0
	Technician	11	12.2
	Other	8	8.9
Marital status	Single	29	32.2
	Married	53	58.9
	Divorced	7	7.8
	Other	1	1.1
No. of children	None	45	50.0
	1	21	23.3
	2	15	16.7
	3 or more	9	10.0
Total		90	100

By marital status, the number of single and married respondents was 29 (32%) and 53 (59%), respectively. The number of respondents without children was 45, accounting to 50%, and the number of respondents with one, two, and three or more children was 21 (23%), 15 (17%), and 9 (10%), respectively.

The overall average scores of Sri Lanka in the 11 questions stood at 2.86, showing a favorable result among the 11 surveyed countries. According to the Global Gender Gap Report, published by the World Economic Forum, Sri Lanka was among the top 20 countries out of over 120 countries until 2010; however, after 2010, the ranking plummeted to 79th in 2014, largely due to the rapid fall in scores of women's political participation. However, the country still has relatively high scores in other evaluation items.

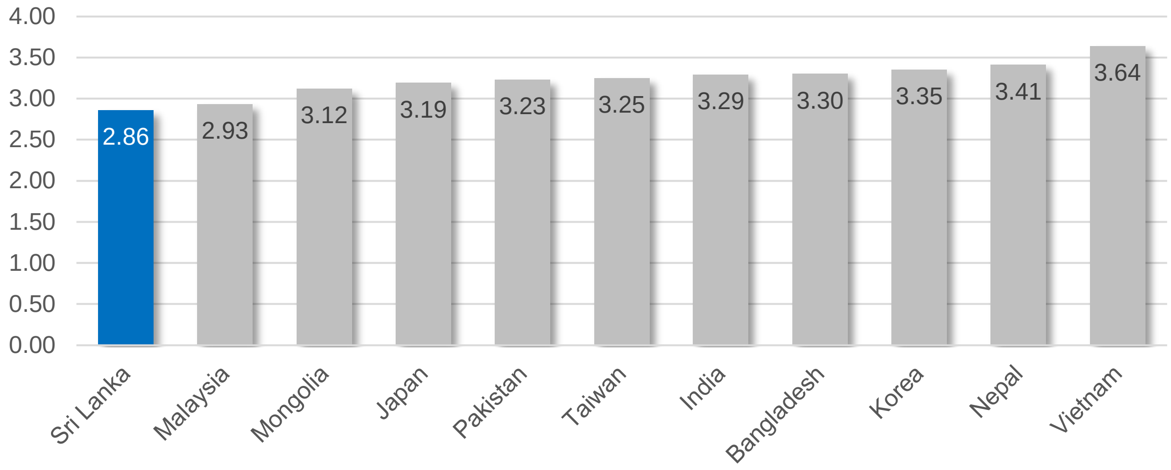


Figure 4-7-1. Average point in Sri Lanka

When the average scores of Sri Lanka and those of the ten other countries were compared for each question, Sri Lanka was confirmed to have statistically significant lower averages in all questions, except Q4 (limited accessibility to leading and participating in research projects), Q5 (limited access to financial resources), and Q9 (perception that there is a gender difference in terms of scientific abilities).

Table 4-7-2. Comparison of average value in Sri Lanka

	Question	Sri Lanka	Except Sri Lanka	t	*(p)*
Q1	Women in science and technology face more limits in succeeding in the science sector than men do.	2.58	3.31	-5.41	0.000
Q2	Science is a department more advantageous to men than to women.	2.37	3.28	-7.19	0.000
Q3	Women face more difficulties or require a longer time than men do when completing a master's or doctoral program and acquiring a degree.	2.29	2.84	-4.58	0.000
Q4	I have experienced a disadvantage in leading or participating in a major research project, because I am a woman.	2.72	2.91	-1.51	0.132
Q5	I have experienced a disadvantage in receiving research funds or scholarships, because I am a woman.	2.59	2.47	1.09	0.274
Q6	I believe that it is more difficult for women to become professors, major managers, or project managers.	2.72	3.29	-4.78	0.000
Q7	In the area I am working in, more men than women have a career level the same as or higher than mine.	3.09	3.74	-5.71	0.000
Q8	Women university students newly joining science and engineering departments will study in a better environment than I did.	3.39	3.80	-4.08	0.000
Q9	Men and women have differences in capabilities necessary for science (e.g. mathematics, analytical ability, logical thinking).	2.53	2.65	-0.95	0.343
Q10	The responsibility for marriage and child-rearing works as a handicap for women.	3.30	3.83	-3.96	0.000
Q11	In order to eliminate gender inequalities in science, policy consideration to ensure equal opportunities for women is necessary.	3.92	4.09	-1.68	0.094
N		90	959		

Demographic factors did not statistically show significant differences in most questions. With regard to the analysis of each item, all statistically significant differences or noteworthy comments will be discussed in the following section.

Q1. **Female scientists are limited in how much they can succeed in science compared to male scientists.**

Table 4-7-3. Comparative survey result of Q1 by age, occupation and marital status in Sri Lanka

		N	Average	Standard deviation	F	*p*
	Total	90	2.58	1.227		
Age	20s or younger	28	2.75	1.378	1.00	0.395
	30s	32	2.47	1.244		
	40s	10	3.00	1.155		
	50s or older	20	2.30	0.979		
Occupation	Scientist	34	2.56	1.284	1.28	0.286
	Engineer	19	3.00	1.333		
	Professional medical staff	26	2.35	1.129		
	Student	1	4.00			
	Others	10	2.30	0.949		
Marital status	Single	29	2.62	1.374	1.30	0.279
	Married	53	2.62	1.180		
	Divorced	7	1.86	0.690		
	Other	1	4.00			
No. of children	None	45	2.64	1.33	0.34	0.797
	1	21	2.43	1.248		
	2	15	2.73	0.961		
	3 or more	9	2.33	1.118		

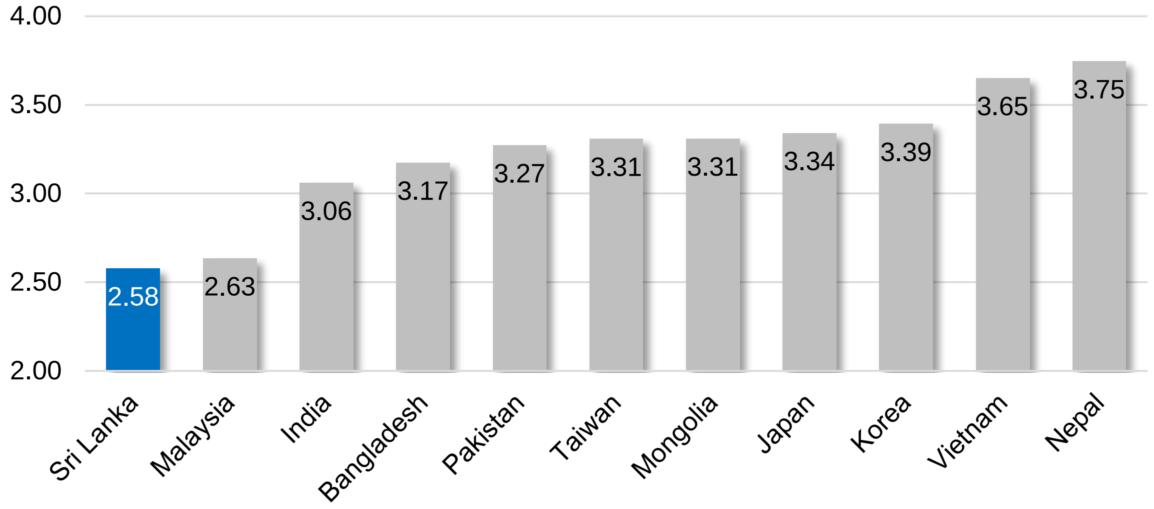


Figure 4-7-2. Average point of Q1 of Sri Lanka

Q2. **Men have an advantage over women in Science.**

Table 4-7-4. Comparative survey result of Q2 by age, occupation and marital status in Sri Lanka

		N	Average	Standard deviation	F	*p*
	Total	90	2.37	1.136		
Age	20s or younger	28	2.61	1.257	0.78	0.507
	30s	32	2.22	1.070		
	40s	10	2.50	1.354		
	50s or older	20	2.20	0.951		
Occupation	Scientist	34	2.47	1.161	0.53	0.712
	Engineer	19	2.58	1.387		
	Professional medical staff	26	2.15	0.967		
	Student	1	2.00			
	Others	10	2.20	1.033		
Marital status	Single	29	2.34	1.203	2.56	0.060
	Married	53	2.47	1.085		
	Divorced	7	1.43	0.787		
	Other	1	4.00			
No. of children	None	45	2.33	1.15	0.05	0.985
	1	21	2.43	1.207		
	2	15	2.33	0.976		
	3 or more	9	2.44	1.333		

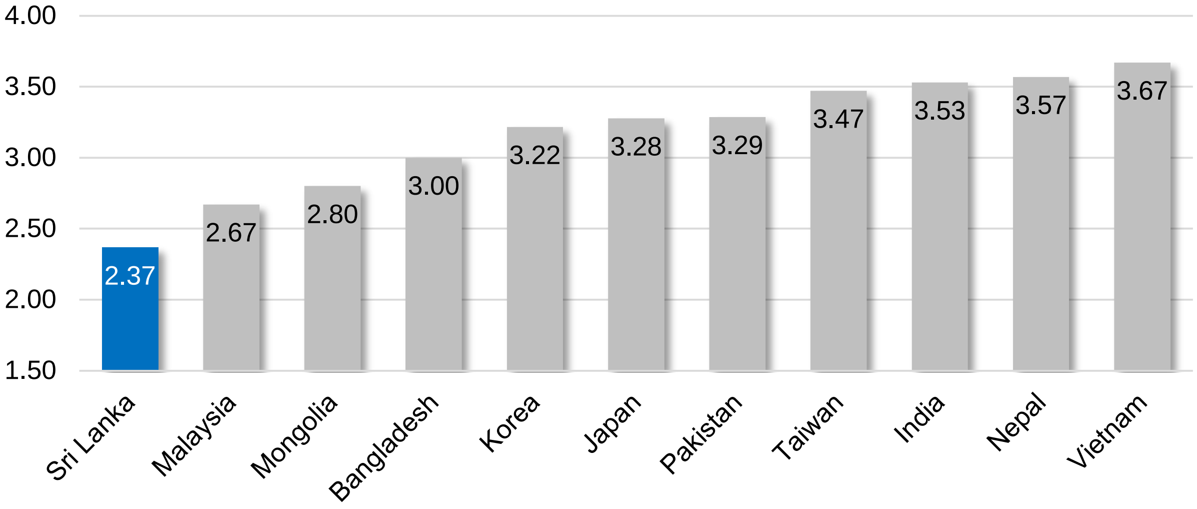


Figure 4-7-3. Average point of Q2 of Sri Lanka

Q3. **To attain a masters or doctoral degree, women should work harder and take longer time to finish their studies than men.**

For Q3, asking if women face discriminatory treatment in the course of studying and pursuing a degree, Sri Lanka scored an average of 2.29, ranking second among 11 countries. By occupation, scientists showed an average score of 2.76, a statistically significant higher score compared to engineers (2.00) and medical professionals (2.04). This result suggests that, compared to the engineering and medicine, scientists experience higher gender discrimination. By marital status, the ANOVA analysis observed no statistically significant difference overall, but the average among married respondents (2.42) was still higher than that among single respondents (2.14). The survey results did not show particular influence from the number of children.

Table 4-7-5. Comparative survey result of Q3 by age, occupation and marital status in Sri Lanka

		N	Average	Standard deviation	F	*p*
	Total	90	2.29	1.073		
Age	20s or younger	28	2.29	1.213	0.73	0.535
	30s	32	2.41	0.946		
	40s	10	2.50	1.434		
	50s or older	20	2.00	0.858		
Occupation	Scientist	34	2.76	1.130	2.95	0.024
	Engineer	19	2.00	0.882		
	Professional medical staff	26	2.04	0.916		
	Student	1	2.00			
	Others	10	1.90	1.197		
Marital status	Single	29	2.14	1.093	2.02	0.117
	Married	53	2.42	1.064		
	Divorced	7	1.71	0.756		
	Other	1	4.00			
No. of children	None	45	2.31	1.08	0.94	0.423
	1	21	2.29	1.102		
	2	15	2.53	1.246		
	3 or more	9	1.78	0.441		

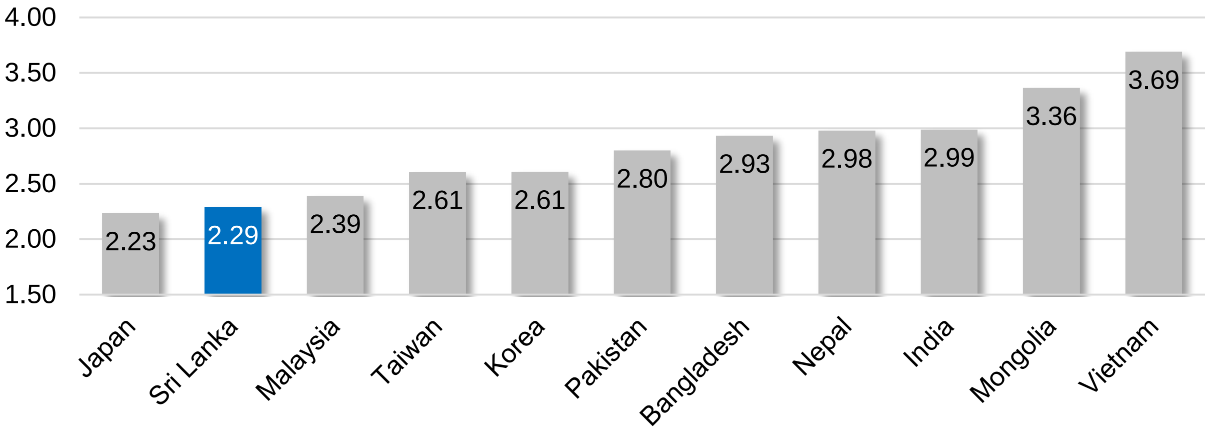


Figure 4-7-4. Average point of Q3 of Sri Lanka

Q4. **I have experienced some disadvantages to lead or participate in a research project because I am a woman.**

Asked if they had limited access to leading or participating in research projects, the respondents in Sri Lanka recorded an overall average score of 2.72, ranking fifth. By age, an increasing tendency of experiencing disadvantage was found among older age groups, with an average score of 2.50 among the respondents in their 20s, 2.81 for those in their 30s, and 3.30 for those in their 40s. It is worth noting, however, that those in their 50s, who had the longest careers, scored an average of 2.60, lower than the average among those a decade younger. By occupation, engineers had a relatively higher average score of 3.11 than scientists (2.44) and medical professionals (2.65). By marital status, whereas the average among single respondents was 2.41, a higher average score of 2.85 among married respondents was verified to have statistical significance as a result of one-on-one ex-post analysis. No significant difference in results was observed according to the number of children.

Table 4-7-6. Comparative survey result of Q4 by age, occupation and marital status in Sri Lanka

		N	Average	Standard deviation	F	*p*
	Total	90	2.72	1.006		
Age	20s or younger	28	2.50	0.962	1.79	0.156
	30s	32	2.81	1.148		
	40s	10	3.30	0.675		
	50s or older	20	2.60	0.883		
Occupation	Scientist	34	2.44	1.078	1.82	0.133
	Engineer	19	3.11	0.937		
	Professional medical staff	26	2.65	0.892		
	Student	1	3.00			
	Others	10	3.10	0.994		
Marital status	Single	29	2.41	0.983	1.82	0.150
	Married	53	2.85	1.008		
	Divorced	7	2.86	0.900		
	Other	1	4.00			
No. of children	None	45	2.76	1.05	0.27	0.848
	1	21	2.62	0.973		
	2	15	2.87	0.990		
	3 or more	9	2.56	1.014		

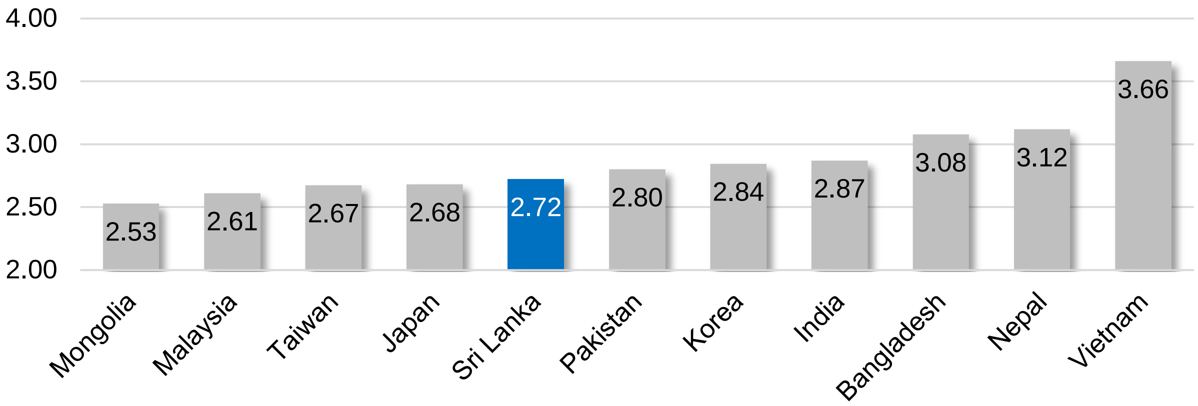


Figure 4-7-5. Average point of Q4 of Sri Lanka

Q5. I have experienced some disadvantages in research funding or scholarships because I am a woman.

In regard to discrimination in terms of access to financial resources, such as research funds or scholarships, the respondents in Sri Lanka showed an average score of 2.59, being 7th out of the 11 surveyed countries. By age, those in their 40s had the highest average score of 3.10. According to the occupational category, engineers scored an average of 3.05, higher than any other occupational group. By marital status, married respondents had a higher average score of 2.66 compared to single respondents with 2.38, but no statistical significance was verified. The number of children did not exhibit a particular influence.

Table 4-7-7. Comparative survey result of Q5 by age, occupation and marital status in Sri Lanka

		N	Average	Standard deviation	F	*p*
	Total	90	2.59	0.898		
Age	20s or younger	28	2.54	0.922	1.32	0.274
	30s	32	2.47	0.842		
	40s	10	3.10	0.738		
	50s or older	20	2.60	0.995		
Occupation	Scientist	34	2.41	0.783	1.99	0.103
	Engineer	19	3.05	0.970		
	Professional medical staff	26	2.58	0.987		
	Student	1	3.00			
	Others	10	2.30	0.675		
Marital status	Single	29	2.38	0.820	0.91	0.438
	Married	53	2.66	0.939		
	Divorced	7	2.86	0.900		
	Other	1	3.00			
No. of children	None	45	2.47	0.79	2.50	0.065
	1	21	2.52	0.814		
	2	15	2.60	0.986		
	3 or more	9	3.33	1.225		

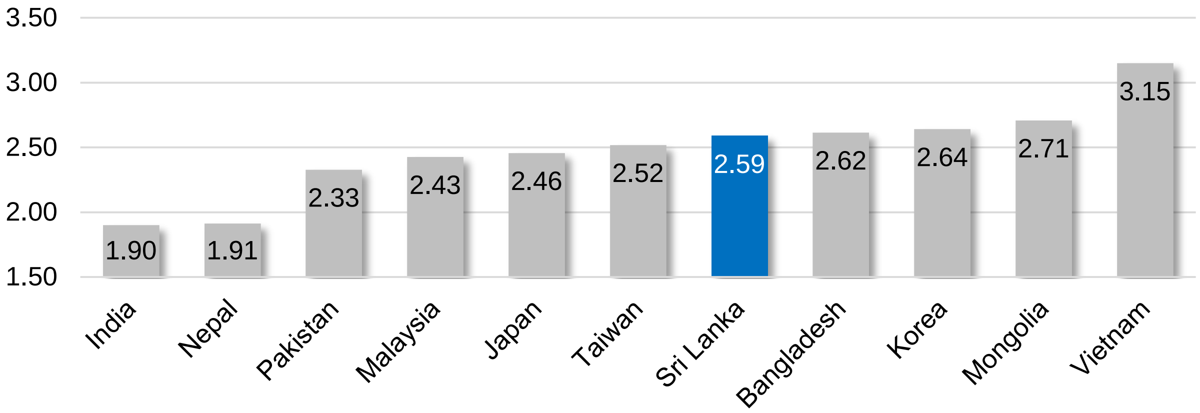


Figure 4-7-6. Average point of Q5 of Sri Lanka

Q6. **Becoming a tenured professor, being promoted or becoming a principal investigator is more difficult for female scientists than for male scientists.**

With regard to the response on discrimination of promotions within the organizational hierarchy, the factors of age, marital status, and the number of children were all not associated with statistically significance differences. By occupation, scientists, engineers, and medical professionals scored an average of 2.82, 3.05, and 2.46, respectively. A relatively lower average in the medical sector is commonly observed in many countries.

Table 4-7-8. Comparative survey result of Q6 by age, occupation and marital status in Sri Lanka

		N	Average	Standard deviation	F	*p*
	Total	90	2.72	0.779		
Age	20s or younger	28	2.79	0.738	0.74	0.529
	30s	32	2.81	0.780		
	40s	10	2.70	0.949		
	50s or older	20	2.50	0.761		
Occupation	Scientist	34	2.82	0.797	2.26	0.069
	Engineer	19	3.05	0.705		
	Professional medical staff	26	2.46	0.706		
	Student	1	2.00			
	Others	10	2.50	0.850		
Marital status	Single	29	2.66	0.721	1.90	0.136
	Married	53	2.79	0.793		
	Divorced	7	2.29	0.756		
	Other	1	4.00			
No. of children	None	45	2.58	0.75	1.60	0.196
	1	21	3.00	0.775		
	2	15	2.67	0.816		
	3 or more	9	2.89	0.782		

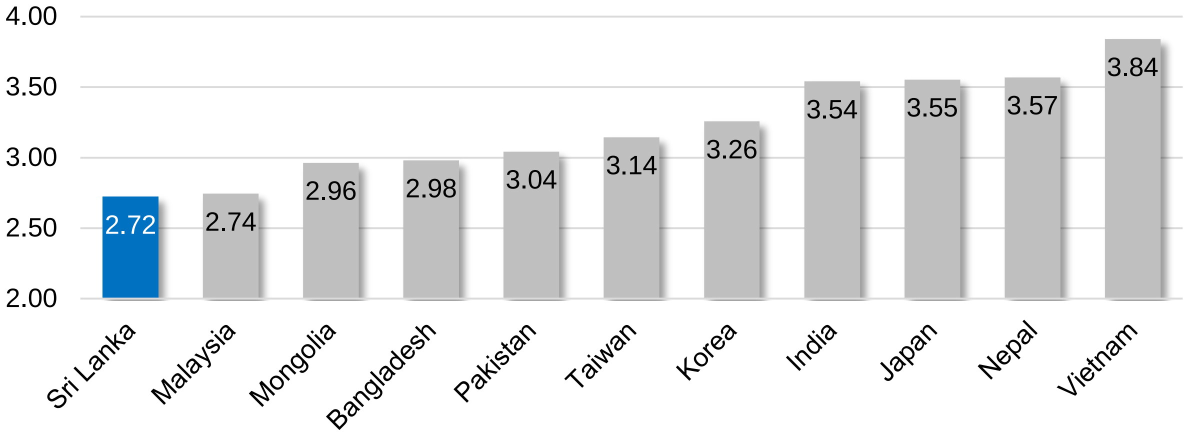


Figure 4-7-7. Average point of Q6 of Sri Lanka

Q7. **There are more men than women among those with similar or more professional experience than mine.**

Whereas the respondents in the youngest group scored 2.71, those in their 30s, 40s, and 50s had higher average scores of 3.34, 3.00, and 3.25, respectively, indicating that older generations tend to witness gender imbalance at workplaces. By occupation, engineers marked a higher average score of 3.89, with statistical significance, than scientists (2.97) and medical professionals (2.73), a phenomenon observed in many other countries as well. Meanwhile, married respondents recorded an average score of 3.26, higher than the average score of 2.66 among single respondents, but this difference resulted more directly from age difference, than from different marital status. The same interpretation can be made with regard to the number of children.

Table 4-7-9. Comparative survey result of Q7 by age, occupation and marital status in Sri Lanka

		N	Average	Standard deviation	F	*p*
	Total	90	3.09	1.224		
Age	20s or younger	28	2.71	1.357	1.49	0.222
	30s	32	3.34	1.181		
	40s	10	3.00	1.247		
	50s or older	20	3.25	1.020		
Occupation	Scientist	34	2.97	1.087	3.28	0.015
	Engineer	19	3.89	1.100		
	Professional medical staff	26	2.73	1.218		
	Student	1	4.00			
	Others	10	2.80	1.398		
Marital status	Single	29	2.66	1.471	2.01	0.119
	Married	53	3.26	1.041		
	Divorced	7	3.57	1.134		
	Other	1	3.00			
No. of children	None	45	2.84	1.36	1.50	0.220
	1	21	3.24	1.091		
	2	15	3.27	0.961		
	3 or more	9	3.67	1.000		

Compared to other countries, Sri Lanka had an average score of 3.09, being 2nd highest point among the 11 countries surveyed in this study. When compared to the average scores of the other ten countries, Sri Lanka's score was found to be statistically significantly lower, which implies that the country is among those that have the narrowest gender gap perceived in areas where women in science and technology are working.

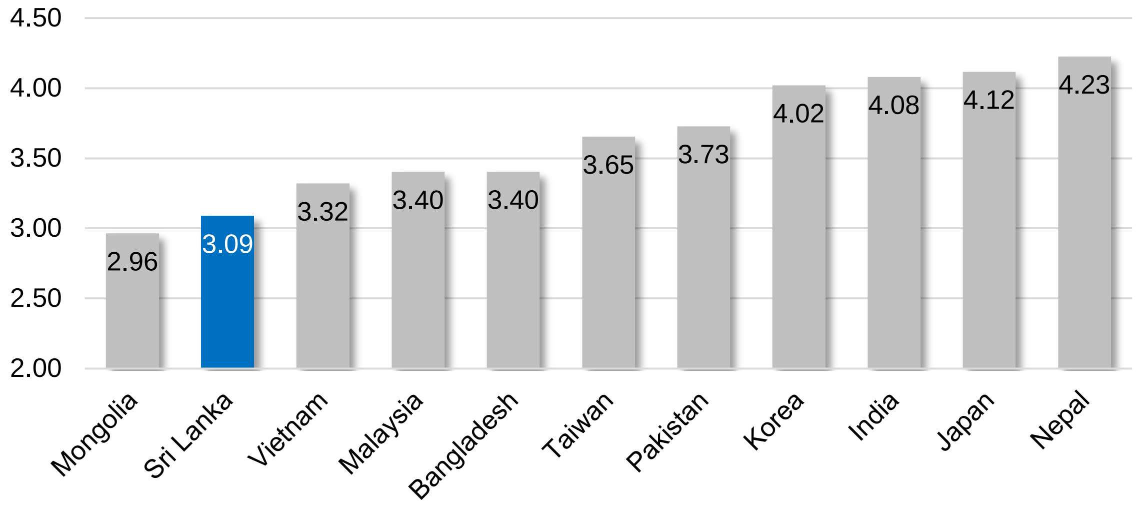


Figure 4-7-8. Average point of Q7 of Sri Lanka

Q8. **Girls who are entering college today will be studying in a better (more gender equal) environment than I did.**

When asked if they believed gender inequality and the gender gap would improve in the future, the respondents in Sri Lanka scored an average of 3.39, ranking the top among the 11 countries. As a result of the independent sample t test to compare the country's average with those of the ten other countries, a statistically significant difference was observed. The noteworthy result of age-based analysis is that the averages among the respondents in their 40s and 50s were at 4.10 and 3.60, showing a statistically significant higher trend compared to those among the younger respondents in their 20s (3.29) and 30s (3.13). Meanwhile, no significant difference resulted from the groups categorized by occupation and marital status. Finally, the respondents with children tended to express higher expectation than those without children did.

Table 4-7-10. Comparative survey result of Q8 by age, occupation and marital status in Sri Lanka

		N	Average	Standard deviation	F	*p*
	Total	90	3.39	0.944		
Age	20s or younger	28	3.29	0.976	3.43	0.021
	30s	32	3.13	0.976		
	40s	10	4.10	1.101		
	50s or older	20	3.60	0.503		
Occupation	Scientist	34	3.29	0.970	0.30	0.878
	Engineer	19	3.42	0.961		
	Professional medical staff	26	3.50	0.812		
	Student	1	4.00			
	Others	10	3.30	1.252		
Marital status	Single	29	3.10	0.976	1.78	0.158
	Married	53	3.47	0.932		
	Divorced	7	3.86	0.690		
	Other	1	4.00			
No. of children	None	45	3.20	0.97	1.26	0.292
	1	21	3.52	0.928		
	2	15	3.60	0.986		
	3 or more	9	3.67	0.707		

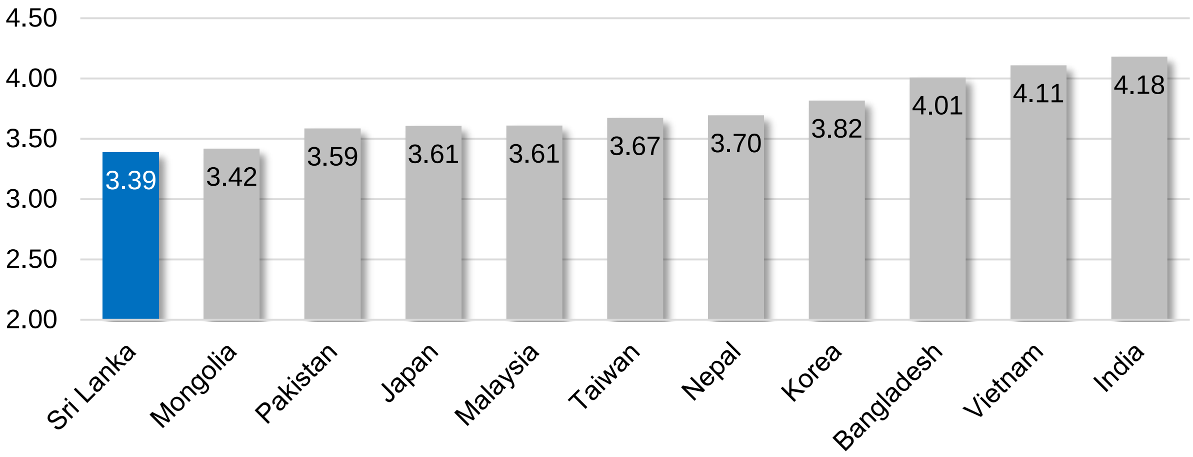


Figure 4-7-9. Average point of Q8 of Sri Lanka

Q9. **There is a difference in ability (math, analytical skills, logical thinking, etc) that needs to be acquired in science for men and women.**

With regard to gender difference in terms of abilities required in the science sector, the factors of age and the number of children were not associated with notable differences. However, the group of medical professionals (2.19) showed weaker perception that there is a difference in abilities of men and women, compared to scientists (2.62) and engineers (2.63). Meanwhile, the higher average among the married respondents (2.77) than that among the single respondents (2.17) suggests a stronger perception that there is a gender-based difference.

Table 4-7-11. Comparative survey result of Q9 by age, occupation and marital status in Sri Lanka

		N	Average	Standard deviation	F	*p*
	Total	90	2.53	1.229		
Age	20s or younger	28	2.57	1.399	0.38	0.765
	30s	32	2.66	1.153		
	40s	10	2.20	1.398		
	50s or older	20	2.45	1.050		
Occupation	Scientist	34	2.62	1.326	1.05	0.388
	Engineer	19	2.63	1.065		
	Professional medical staff	26	2.19	1.096		
	Student	1	4.00			
	Others	10	2.80	1.476		
Marital status	Single	29	2.17	1.167	3.91	0.011
	Married	53	2.77	1.187		
	Divorced	7	1.86	1.069		
	Other	1	5.00			
No. of children	None	45	2.40	1.32	0.35	0.793
	1	21	2.67	1.065		
	2	15	2.67	1.291		
	3 or more	9	2.67	1.118		

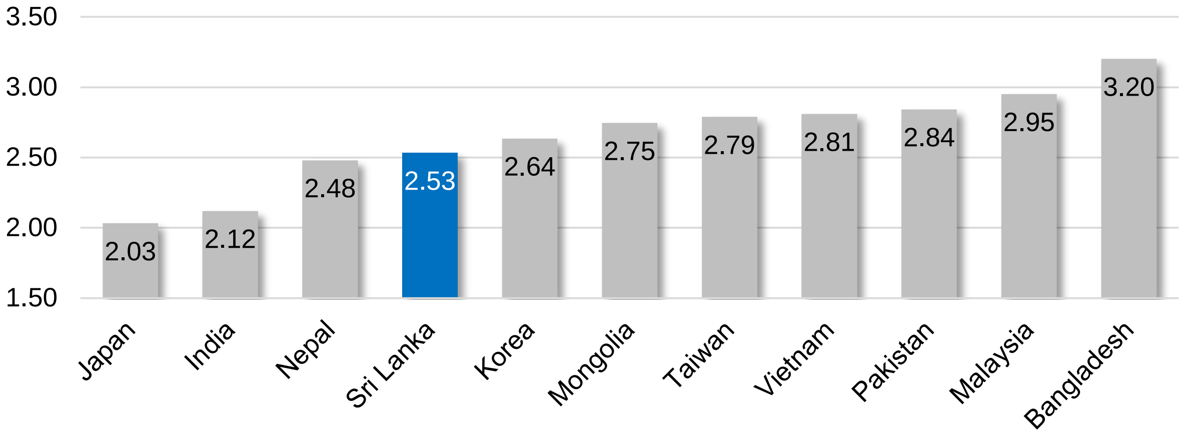


Figure 4-7-10. Average point of Q9 of Sri Lanka

Q10. **Having to balance work and life (marriage and child care) is a handicap for women.**

Table 4-7-12. Comparative survey result of Q12 by age, occupation and marital status in Sri Lanka

		N	Average	Standard deviation	F	*p*
	Total	90	3.30	1.222		
Age	20s or younger	28	3.25	1.143	1.32	0.273
	30s	32	3.25	1.320		
	40s	10	2.80	1.398		
	50s or older	20	3.70	1.031		
Occupation	Scientist	34	3.21	1.200	0.79	0.535
	Engineer	19	3.58	1.305		
	Professional medical staff	26	3.42	1.238		
	Student	1	3.00			
	Others	10	2.80	1.135		
Marital status	Single	29	3.55	1.152	0.66	0.576
	Married	53	3.21	1.261		
	Divorced	7	3.00	1.291		
	Other	1	3.00			
No. of children	None	45	3.40	1.12	0.30	0.828
	1	21	3.10	1.338		
	2	15	3.27	1.438		
	3 or more	9	3.33	1.225		

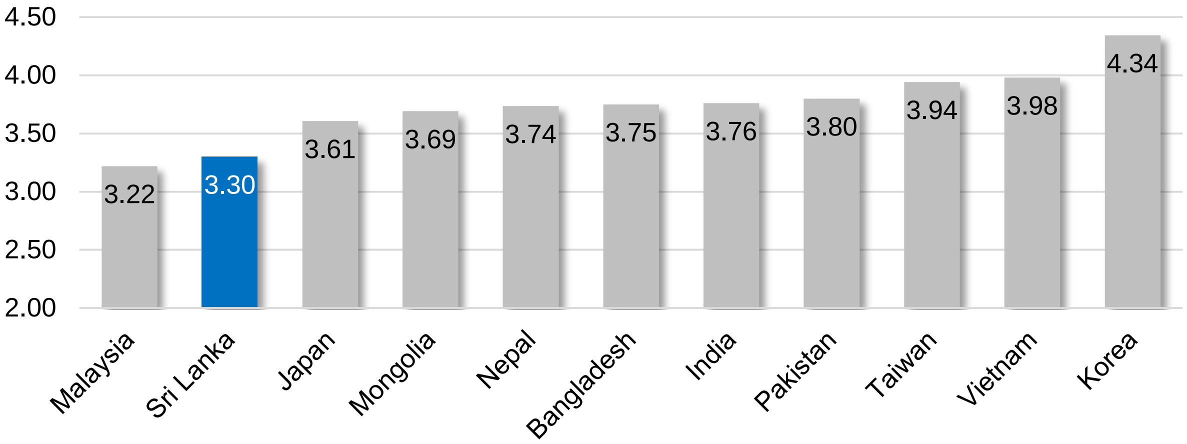


Figure 4-7-11. Average point of Q10 of Sri Lanka

Q11. **It is crucial to have policy support that ensures equal opportunity in order to solve the gender inequality in science.**

It is noteworthy that engineers had a particularly higher average score of 4.21 in this question about the need for policy consideration.

Table 4-7-13. Comparative survey result of Q11 by age, occupation and marital status in Sri Lanka

		N	Average	Standard deviation	F	*p*
	Total	90	3.92	0.997		
Age	20s or younger	28	3.86	0.932	1.45	0.235
	30s	32	4.06	1.076		
	40s	10	4.30	1.059		
	50s or older	20	3.60	0.883		
Occupation	Scientist	34	3.85	1.019	0.74	0.564
	Engineer	19	4.21	0.976		
	Professional medical staff	26	3.81	0.981		
	Student	1	3.00			
	Others	10	4.00	1.054		
Marital status	Single	29	3.76	1.091	1.98	0.123
	Married	53	4.00	0.941		
	Divorced	7	4.29	0.756		
	Other	1	2.00			
No. of children	None	45	3.82	1.09	0.88	0.454
	1	21	4.19	0.680		
	2	15	4.00	1.000		
	3 or more	9	3.67	1.118		

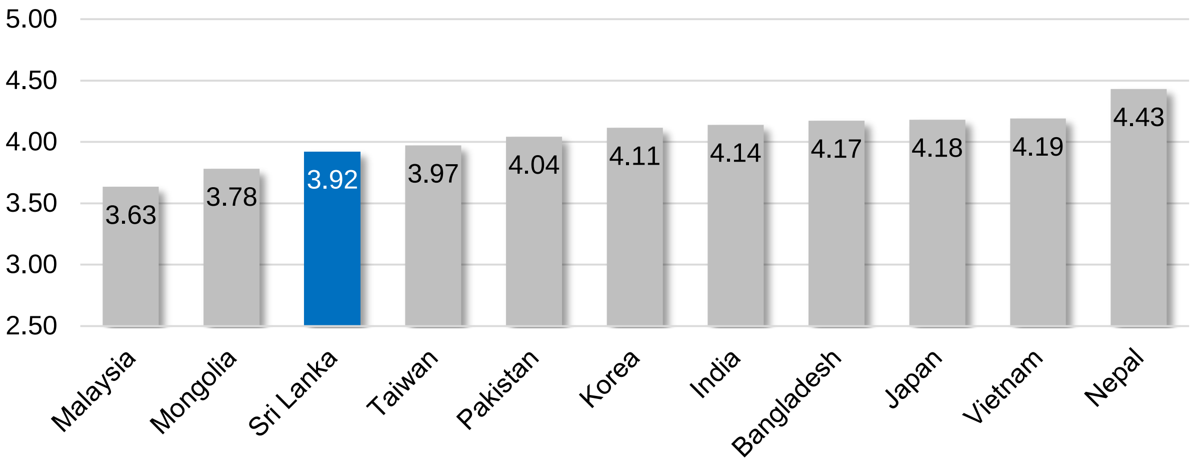


Figure 4-7-12. Average point of Q11 of Sri Lanka

4.2.7 India

A total of 100 participants in India responded to the survey. The respondents came from all age groups: 19 in their 20s, 38 in their 30s, 34 in their 40s, and 9 in their 50s. By occupation, the numbers of scientists, engineers, and medical professionals were 29, 40, and 14, respectively, ensuring balanced responses from all occupational areas. By marital status, those who were married (72) outnumbered those who were unmarried (27). A total of 34 respondents had no children, and 42 and 22 respondents had one child and two children, respectively. Overall, the average score was 3.29, ranking seventh out of the 11 countries.

Table 4-8-1. Status of survey participants in India

Group	Sub-group	N	%
Age	20s or younger	19	19.0
	30s	38	38.0
	40s	34	34.0
	50s or older	9	9.0
Occupation	Scientist	29	29.0
	Engineer	40	40.0
	Professional medical staff	14	14.0
	Professional researcher	17	17.0
Job	Student	4	4.0
	Professor/teacher	33	33.0
	Researcher	32	32.0
	Manager	1	1.0
	Professional medical staff	2	2.0
	Engineer	27	27.0
	Other	1	1.0
Marital status	Single	27	27.0
	Married	72	72.0
	Divorced	1	1.0
No. of children	None	34	34.0
	1	42	42.0
	2	22	22.0
	3 or more	2	2.0
Total		100	100.0

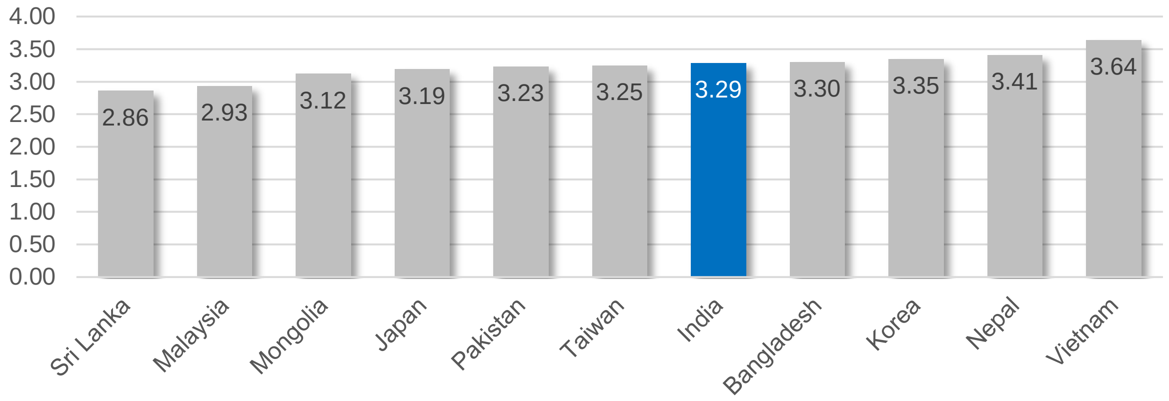


Figure 4-8-1. Average value in India

Compared to the ten other countries, India recorded a statistically significant lower score in Q5 (access to research funds) and Q9 (perception that there is a gender difference in abilities). However, the scores obtained by India were statistically significantly higher in Q2, Q6, Q7, and Q8.

Table 4-8-2. Comparison of average value in India

	Question	India	Except India	t	*(p)*
Q1	Women in science and technology face more limits in succeeding in the science sector than men do.	3.06	3.26	-1.30	0.195
Q2	Science is a department more advantageous to men than to women.	3.53	3.17	3.05	0.003
Q3	Women face more difficulties or require a longer time than men do when completing a master’s or doctoral program and acquiring a degree.	2.99	2.77	1.54	0.125
Q4	I have experienced a disadvantage in leading or participating in a major research project, because I am a woman.	2.87	2.90	-0.21	0.833
Q5	I have experienced a disadvantage in receiving research funds or scholarships, because I am a woman.	1.90	2.54	-8.24	0.000
Q6	I believe that it is more difficult for women to become professors, major managers, or project managers.	3.54	3.21	2.88	0.004
Q7	In the area I am working in, more men than women have a career level the same as or higher than mine.	4.08	3.65	6.39	0.000
Q8	Women university students newly joining science and engineering departments will study in a better environment than I did.	4.18	3.72	4.80	0.000
Q9	Men and women have differences in capabilities necessary for science (e.g. mathematics, analytical ability, logical thinking).	2.12	2.70	-5.52	0.000
Q10	The responsibility for marriage and child-rearing works as a handicap for women.	3.76	3.78	-0.22	0.827
Q11	In order to eliminate gender inequalities in science, policy consideration to ensure equal opportunities for women is necessary.	4.14	4.07	0.73	0.463
N		100	949		

Q1. **Female scientists are limited in how much they can succeed in science compared to male scientists.**

By age, whereas the average among those in their 20s was 3.74, the score gradually decreased to 3.18, 2.88, and 1.78 when the age of respondents became older. This suggests a tendency of lower scores among older respondents and also a statistically significant difference. Considering that older age groups tended to have higher average scores in most other countries, the entirely opposite trend in India is noteworthy. The results by marital status and the number of children did not show statistically significant differences, but the general pattern was again opposite to that in other countries. In India, single respondents had a higher average score than their married counterparts, and those without children marked a higher score than those with children. Among the 11 countries, India scored an average of 3.06, ranking third.

Table 4-8-3. Comparative survey result of Q1 by age, occupation and marital status in India

		N	Average	Standard deviation	F	*p*
	Total	100	3.06	1.51		
Age	20s or younger	19	3.74	1.19	4.02	.010
	30s	38	3.18	1.56		
	40s	34	2.88	1.59		
	50s or older	9	1.78	0.44		
Occupation	Scientist	29	3.10	1.68	0.13	.941
	Engineer	40	2.95	1.48		
	Professional medical staff	14	3.21	1.42		
	Professional researcher	17	3.12	1.45		
Marital status	Single	27	3.52	1.282	1.73	.182
	Married	72	2.89	1.570		
	Divorced	1	3.00			
No. of children	None	34	3.47	1.285	2.01	.118
	1	42	2.98	1.689		
	2	22	2.73	1.386		
	3 or more	2	1.50	0.707		

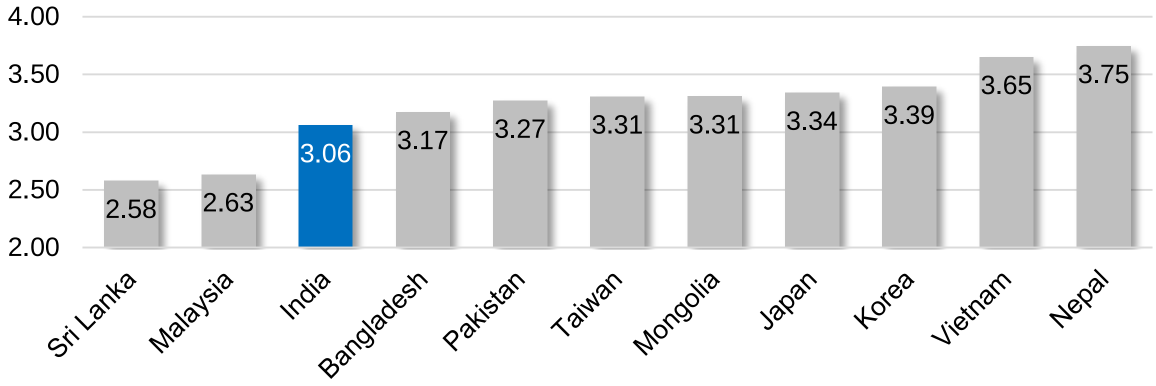


Figure 4-8-2. Average point of Q1 of India

Q2. **Men have an advantage over women in Science.**

Identical to Q1, the results from Q2 showed a pattern different from that in most other countries surveyed. By age, the average among the youngest respondents in their 20s was 4.00, and it gradually fell as the groups grew older, with scores of 3.63, 3.35, and 2.79. This difference was confirmed to have statistical significance. By occupation, whereas the averages among the scientists and engineers were 3.28 and 3.38, respectively, medical professionals had a considerably higher average score of 4.00, demonstrating a tendency in contrast to the generally low averages among medical professionals in other countries. Meanwhile, single respondents had an average score of 3.93, higher than the score of 3.38 among married respondents. In addition, the childless respondents scored 3.94, higher than the scores of 3.64 and 2.77 among those with one and two children, respectively, indicating a statistically significant difference. This result also shows a pattern opposite to that in other countries.

Table 4-8-4. Comparative survey result of Q2 by age, occupation and marital status in India

		N	Average	Standard deviation	F	*p*
	Total	100	3.53	1.13		
Age	20s or younger	19	4.00	0.67	2.96	.036
	30s	38	3.63	0.94		
	40s	34	3.35	1.39		
	50s or older	9	2.78	1.20		
Occupation	Scientist	29	3.28	1.49	2.38	.074
	Engineer	40	3.38	1.05		
	Professional medical staff	14	4.00	0.68		
	Professional researcher	17	3.94	0.66		
Marital status	Single	27	3.93	0.730	2.48	.089
	Married	72	3.38	1.227		
	Divorced	1	4.00			
No. of children	None	34	3.94	0.649	6.35	.001
	1	42	3.64	0.983		
	2	22	2.77	1.510		
	3 or more	2	2.50	2.121		

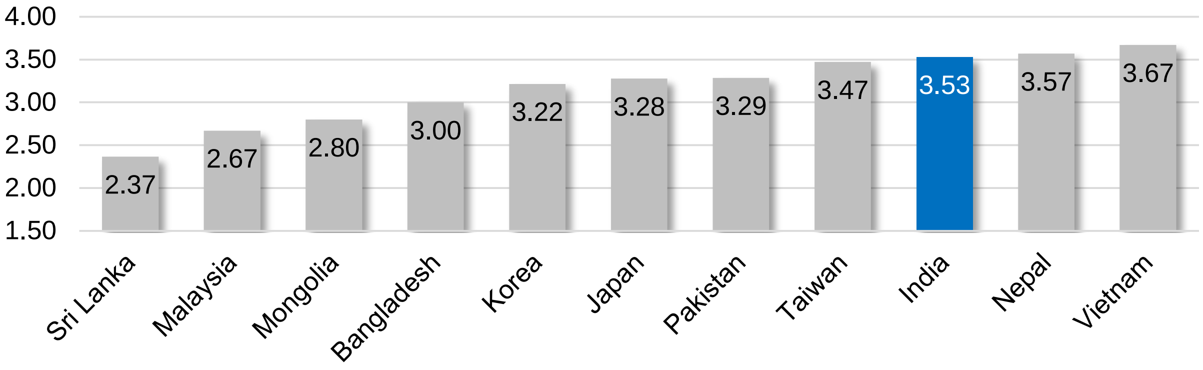


Figure 4-8-3. Average point of Q2 of India

Q3. **To attain a masters or doctoral degree, women should work harder and take longer time to finish their studies than men.**

Asked whether women faced more disadvantages in the course of earning a degree, the respondents in India scored an average of 2.99. The scores among those in their 20s, 30s, and 40s increased from 2.37 to 2.89 to 3.53, indicating that older generations experienced more discrimination in their course of study; this result is consistent with the situations in other countries. By occupation, the group of engineers had the highest average (3.38), followed by medical professionals (3.07) and scientists (2.59). Whereas single respondents' average only stood at 2.33, those who were married showed a much higher average score of 3.22, with a statistically significant difference. In terms of the number of children, those with no children had an average score of 2.50; the scores among those with one and two children were 3.48 and 2.82, respectively, suggesting that those with one child reported the most difficult experience in their degree program.

Table 4-8-5. Comparative survey result of Q3 by age, occupation and marital status in India

		N	Average	Standard deviation	F	*p*
	Total	100	2.99	1.37		
Age	20s or younger	19	2.37	1.21	3.52	.018
	30s	38	2.89	1.29		
	40s	34	3.53	1.48		
	50s or older	9	2.67	1.00		
Occupation	Scientist	29	2.59	1.35	2.22	.091
	Engineer	40	3.38	1.31		
	Professional medical staff	14	3.07	1.49		
	Professional researcher	17	2.71	1.31		
Marital status	Single	27	2.33	1.177	4.71	.011
	Married	72	3.22	1.376		
	Divorced	1	4.00			
No. of children	None	34	2.50	1.187	3.56	.017
	1	42	3.48	1.292		
	2	22	2.82	1.563		
	3 or more	2	3.00	1.414		

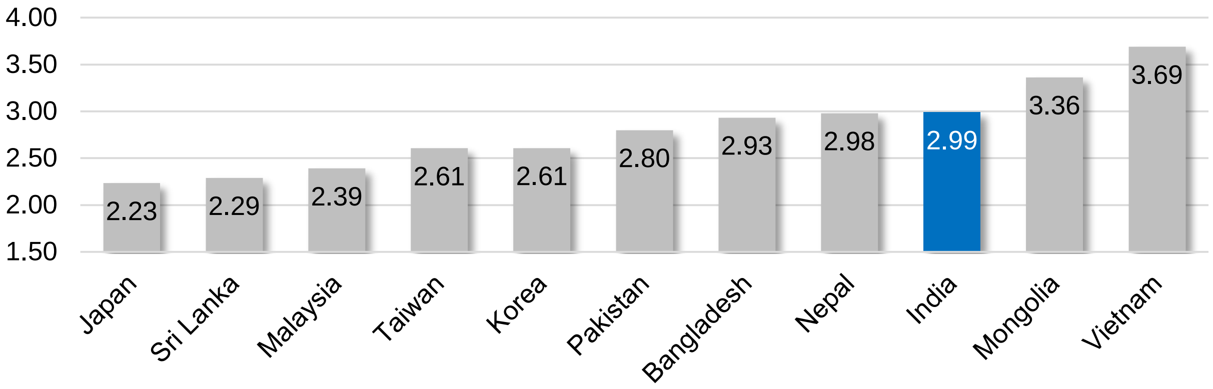


Figure 4-8-4. Average point of Q3 of India

Q4. **I have experienced some disadvantages to lead or participate in a research project because I am a woman.**

This question was about any gender imbalance due to the ability of women to lead or participate in major research projects; the average score was the highest at 3.41 among those in their 40s, revealing a statistically significant difference from the scores among other age groups. Compared to others, the group of professional researchers had the highest average at 3.59, but whether professional researchers can be categorized into a single group with homogenous qualities can be debatable. No particular differences were observed between scientists, engineers, and medical professionals. The factors of marital status and the number of children did not suggest any statistically significant difference.

Table 4-8-6. Comparative survey result of Q4 by age, occupation and marital status in India

		N	Average	Standard deviation	F	*p*
	Total	100	2.87	1.21		
Age	20s or younger	19	2.63	0.90	4.11	.009
	30s	38	2.66	1.12		
	40s	34	3.41	1.40		
	50s or older	9	2.22	0.67		
Occupation	Scientist	29	2.55	1.40	2.90	.039
	Engineer	40	2.85	1.19		
	Professional medical staff	14	2.71	0.91		
	Professional researcher	17	3.59	0.87		
Marital status	Single	27	2.63	0.884	0.72	.487
	Married	72	2.96	1.316		
	Divorced	1	3.00			
No. of children	None	34	2.53	0.825	2.61	.056
	1	42	2.93	1.218		
	2	22	3.36	1.529		
	3 or more	2	2.00	1.414		

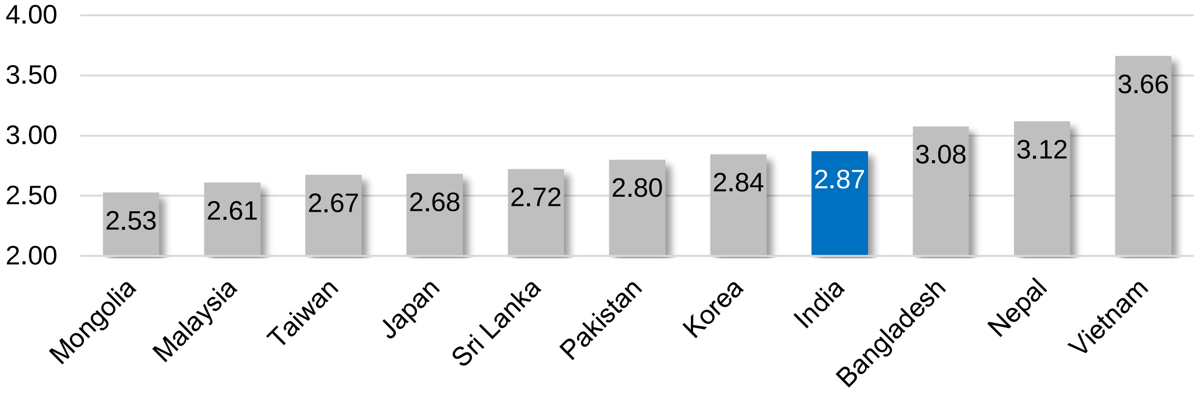


Figure 4-8-5. Average point of Q4 of India

Q5. **I have experienced some disadvantages in research funding or scholarships because I am a woman.**

Table 4-8-7. Comparative survey result of Q5 by age, occupation and marital status in India

		N	Average	Standard deviation	F	*p*
	Total	100	1.90	0.70		
Age	20s or younger	19	1.68	0.67	4.11	.009
	30s	38	2.05	0.70		
	40s	34	1.85	0.74		
	50s or older	9	1.89	0.60		
Occupation	Scientist	29	1.69	0.60	2.37	.075
	Engineer	40	2.00	0.72		
	Professional medical staff	14	2.21	0.97		
	Professional researcher	17	1.76	0.44		
Marital status	Single	27	1.85	0.770	1.29	.279
	Married	72	1.90	0.675		
	Divorced	1	3.00			
No. of children	None	34	2.00	0.816	2.22	.091
	1	42	2.00	0.625		
	2	22	1.59	0.590		
	3 or more	2	1.50	0.707		

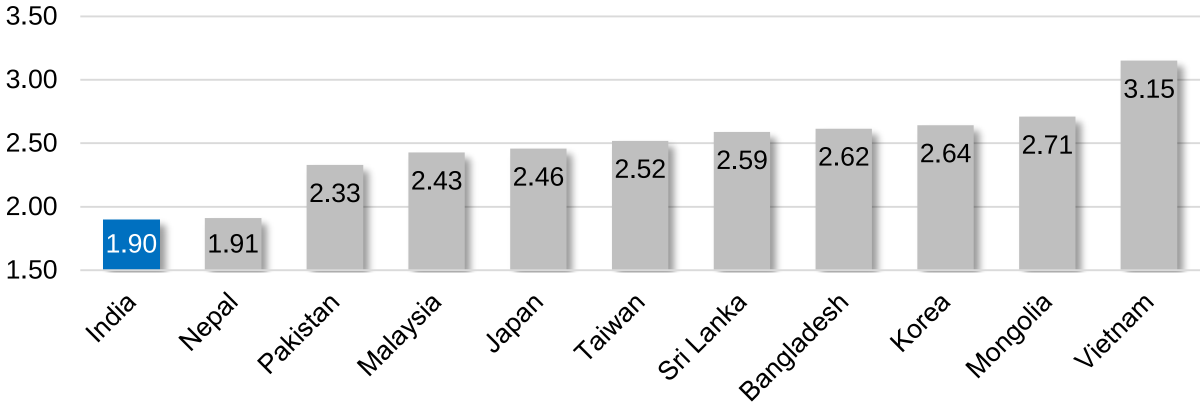


Figure 4-8-6. Average point of Q5 of India

Q6. **Becoming a tenured professor, being promoted or becoming a principal investigator is more difficult for female scientists than for male scientists.**

Asked if women in science and technology were subject to discrimination against promotion within an organization, the respondents in their 20s and 30s had scores of 3.89 and 3.71 on average, respectively, while the average scores among those in their 40s and 50s were 3.38 and 2.67, respectively. The score among those in their 40s, the group with the highest practical possibility for promotion, was lower than that among the younger groups, with statistical significance; this result was not observed in most other countries. A similar result was found in terms of the number of children. Whereas the respondents without children had an average score of 3.79, those with one and two children had scores of 3.50 and 3.41, respectively, indicating a statistically significant trend of those with more children reporting less gender discrimination against promotion.

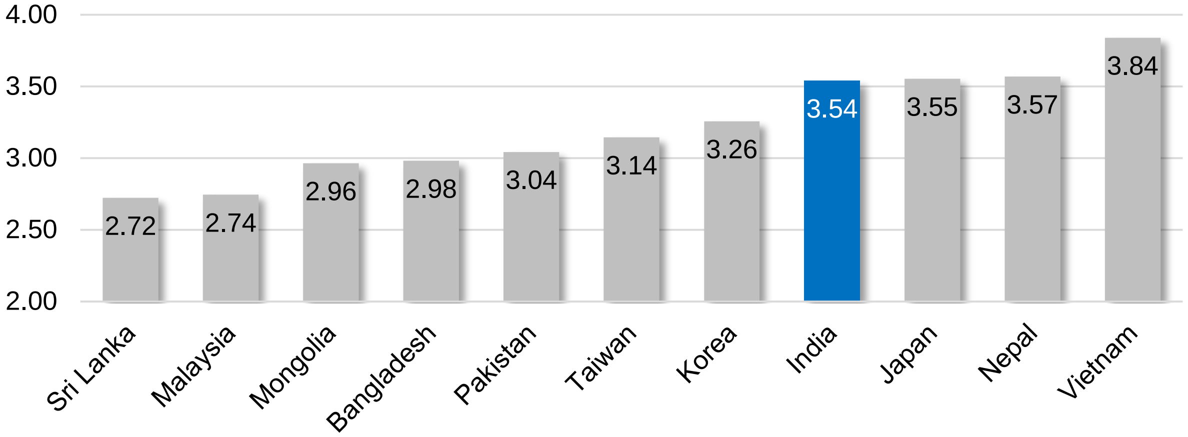


Figure 4-8-7. Average point of Q6 of India

Table 4-8-8. Comparative survey result of Q6 by age, occupation and marital status in India

		N	Average	Standard deviation	F	*p*
	Total	100	3.54	1.11		
Age	20s or younger	19	3.89	0.74	3.21	.026
	30s	38	3.71	0.96		
	40s	34	3.38	1.28		
	50s or older	9	2.67	1.32		
Occupation	Scientist	29	3.38	1.40	0.48	.700
	Engineer	40	3.53	1.11		
	Professional medical staff	14	3.79	0.80		
	Professional researcher	17	3.65	0.79		
Marital status	Single	27	3.85	0.662	1.54	.220
	Married	72	3.43	1.231		
	Divorced	1	3.00			
No. of children	None	34	3.79	0.687	3.14	.029
	1	42	3.50	1.088		
	2	22	3.41	1.501		
	3 or more	2	1.50	0.707		

Q7. **There are more men than women among those with similar or more professional experience than mine**.

Asked if they saw gender inequalities at their rank within the organization, the respondents in India showed a result consistent with that in other countries. Because the average among those in their 20s, 30s, and 40s increased from 3.79 to 4.16 to 4.24, respectively, it is understood that older generations are more likely to feel gender inequalities within their organization; this result also showed a statistically significant difference. By marital status, the single respondents scored 3.85, while those who were married marked a higher average score of 4.18. Whereas the average scores of those without children was 3.91, that of those with one and two children grew even higher to 4.14 and 4.27, respectively. It cannot be concluded that marital status and the number of children exert influence over gender inequalities within an organization. Therefore, the result may be attributable to the fact that older respondents were more likely to be married and have children.

Table 4-8-9. Comparative survey result of Q7 by age, occupation and marital status in India

		N	Average	Standard deviation	F	*p*
	Total	100	4.08	0.58		
Age	20s or younger	19	3.79	0.79	3.72	.014
	30s	38	4.16	0.49		
	40s	34	4.24	0.50		
	50s or older	9	3.78	0.44		
Occupation	Scientist	29	4.24	0.58	1.82	.149
	Engineer	40	4.10	0.55		
	Professional medical staff	14	3.86	0.66		
	Professional researcher	17	3.94	0.56		
Marital status	Single	27	3.85	0.718	5.32	.006
	Married	72	4.18	0.484		
	Divorced	1	3.00			
No. of children	None	34	3.91	0.712	2.73	.048
	1	42	4.14	0.354		
	2	22	4.27	0.631		
	3 or more	2	3.50	0.707		

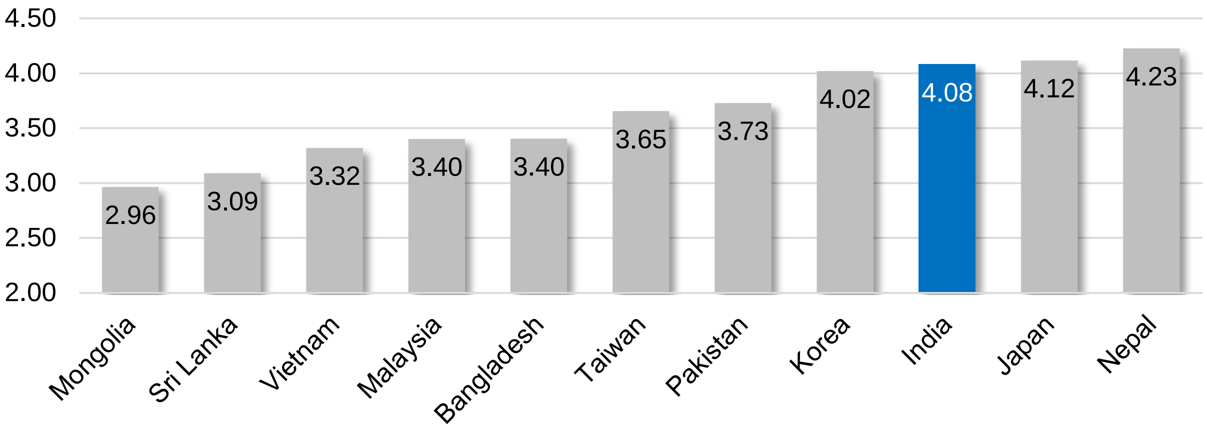


Figure 4-8-8. Average point of Q7 of India

Q8. **Girls who are entering college today will be studying in a better (more gender equal) environment than I did.**

Table 4-8-10. Comparative survey result of Q10 by age, occupation and marital status in India

		N	Average	Standard deviation	F	*p*
	Total	100	4.18	1.01		
Age	20s or younger	19	4.58	0.77	1.89	.137
	30s	38	3.95	1.21		
	40s	34	4.26	0.86		
	50s or older	9	4.00	0.87		
Occupation	Scientist	29	3.97	1.30	1.48	.226
	Engineer	40	4.13	0.94		
	Professional medical staff	14	4.29	0.91		
	Professional researcher	17	4.59	0.51		
Marital status	Single	27	4.37	0.839	0.66	.519
	Married	72	4.11	1.069		
	Divorced	1	4.00			
No. of children	None	34	4.26	0.790	0.52	.668
	1	42	4.21	1.025		
	2	22	3.95	1.290		
	3 or more	2	4.50	0.707		

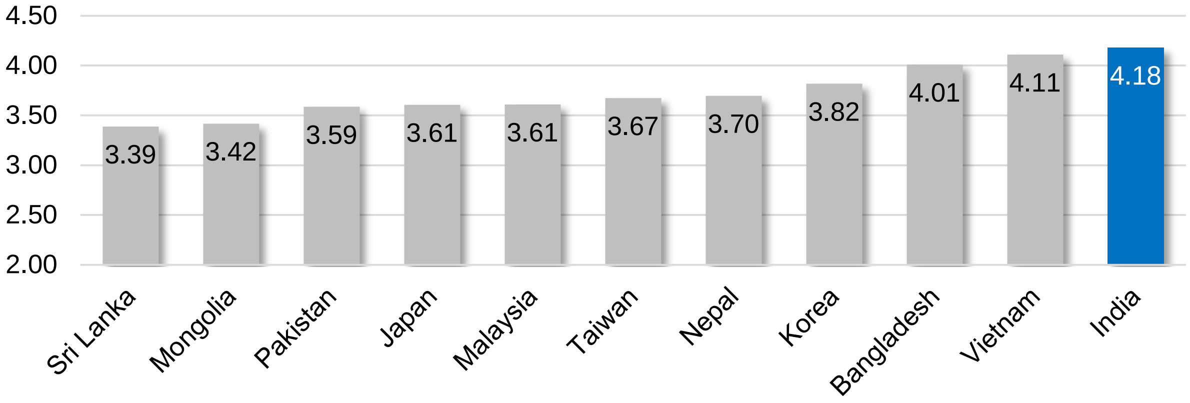


Figure 4-8-9. Average point of Q8 of India

Q9. **There is a difference in ability (math, analytical skills, logical thinking, etc) that needs to be acquired in science for men and women.**

Asked about the perception that there is a gender difference in abilities required in the science sector, the respondents in India scored an average of 2.12, ranking second among the 11th countries. India shows to be one of those countries with the least gender imbalance perceived among the survey participants. Whereas the averages among those in their 20s and 30s were 2.26 and 2.53, respectively, the score among those in their 40s was even lower at 1.62, demonstrating a statistically significant difference. By occupation, the groups of scientists and engineers had average scores of 1.79 and 1.98, respectively, but the group of medical professionals revealed a considerably higher level of gender imbalance perceived with an average score of 2.43. Since this result is not consistent with that in other countries, further study is required to identify if India has unique circumstances or if this difference resulted from faulty representability of the samples.

Table 4-8-11. Comparative survey result of Q9 by age, occupation and marital status in India

		N	Average	Standard deviation	F	*p*
	Total	100	2.12	0.98		
Age	20s or younger	19	2.26	0.56	6.21	.001
	30s	38	2.53	1.18		
	40s	34	1.62	0.82		
	50s or older	9	2.00	0.00		
Occupation	Scientist	29	1.79	0.77	4.80	.004
	Engineer	40	1.98	0.92		
	Professional medical staff	14	2.43	0.76		
	Professional researcher	17	2.76	1.25		
Marital status	Single	27	2.22	0.751	2.21	.116
	Married	72	2.06	1.033		
	Divorced	1	4.00			
No. of children	None	34	2.29	0.871	2.48	.066
	1	42	2.24	1.100		
	2	22	1.64	0.790		
	3 or more	2	2.00	0.000		

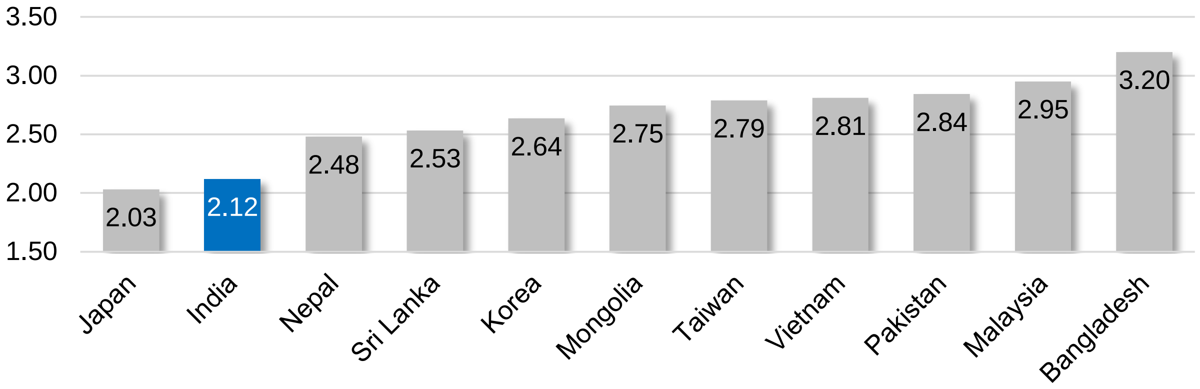


Figure 4-8-10. Average point of Q9 of India

Q10. **Having to balance work and life (marriage and child care) is a handicap for women.**

Asked whether marriage and child-rearing are factors discouraging women's professional careers, the respondents in their 20s scored an average of 3.00, which is significantly lower than the scores of 3.95 and 3.91 obtained among the groups in their 30s and 40s, respectively. Verified to have statistical significance, this difference seems to be a result between the generations that actually experienced child-rearing issues and the generation that did not, and the tendency is consistent in other nations. The average among single respondents was 3.37, but that among those who were married was higher at 3.90. Likewise, the average among those with two children (4.45) showed a statistically significant difference compared to the scores among those without children (3.56) and with one child (3.55), indicating that the burden dramatically increases in cases of parenting two children.

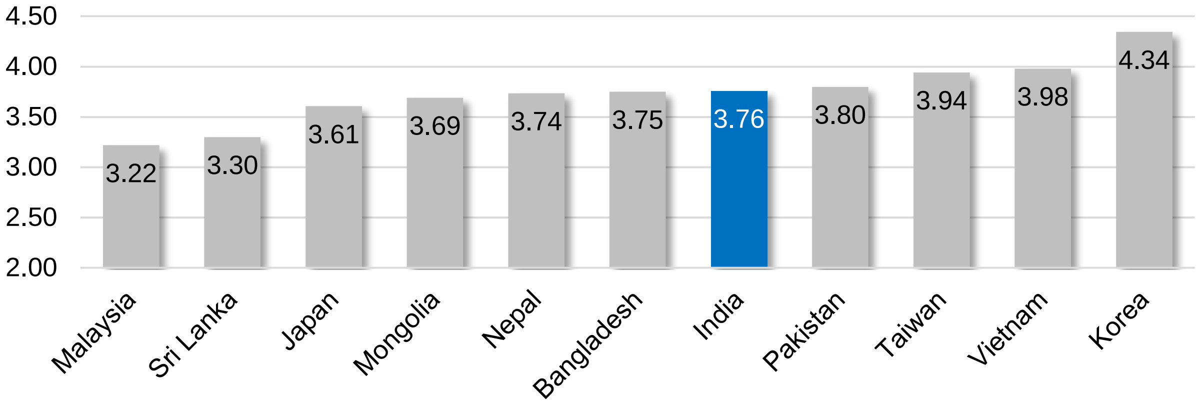


Figure 4-8-11. Average point of Q10 of India

Table 4-8-12. Comparative survey result of Q10 by age, occupation and marital status in India

		N	Average	Standard deviation	F	*p*
	Total	100	3.76	0.99		
Age	20s or younger	19	3.00	1.25	5.27	.002
	30s	38	3.95	0.66		
	40s	34	3.91	1.08		
	50s or older	9	4.00	0.00		
Occupation	Scientist	29	3.93	0.88	1.47	.227
	Engineer	40	3.58	1.06		
	Professional medical staff	14	3.57	1.34		
	Professional researcher	17	4.06	0.43		
Marital status	Single	27	3.37	1.214	3.01	.054
	Married	72	3.90	0.858		
	Divorced	1	4.00			
No. of children	None	34	3.56	1.160	5.45	.002
	1	42	3.55	0.889		
	2	22	4.45	0.510		
	3 or more	2	4.00	0.000		

Q11. **It is crucial to have policy support that ensures equal opportunity in order to solve the gender inequality in science.**

With regard to the question about the necessity of policy consideration, India demonstrated a result similar to that in other countries. Compared to the relatively lower average score of 3.68 among those in their 20s, the higher scores among the older respondents in their 30s (4.39) and 40s (4.32) suggest the stronger necessity of policy concerns; this result was confirmed to have a statistically significant difference. Meanwhile, the score among those who were married (4.29) was statistically significantly higher than the average score of 3.78 among single respondents. Whereas the average among those without children was 3.82, it increased to 4.43 and 4.23 in cases of having one and two children, respectively, with a statistically significant difference. This result is consistent with that from Q10, realistically reflecting the request for policy consideration in favor of childbirth and child-rearing.

Table 4-8-13. Comparative survey result of Q11 by age, occupation and marital status in India

		N	Average	Standard deviation	F	*p*
	Total	100	4.14	0.93		
Age	20s or younger	19	3.68	0.89	5.91	.001
	30s	38	4.39	0.64		
	40s	34	4.32	0.91		
	50s or older	9	3.33	1.41		
Occupation	Scientist	29	4.14	1.06	1.01	.390
	Engineer	40	4.00	0.93		
	Professional medical staff	14	4.14	0.77		
	Professional researcher	17	4.47	0.80		
Marital status	Single	27	3.78	0.847	3.96	.022
	Married	72	4.29	0.926		
	Divorced	1	3.00			
No. of children	None	34	3.82	0.904	5.41	.002
	1	42	4.43	0.668		
	2	22	4.23	1.066		
	3 or more	2	2.50	2.121		

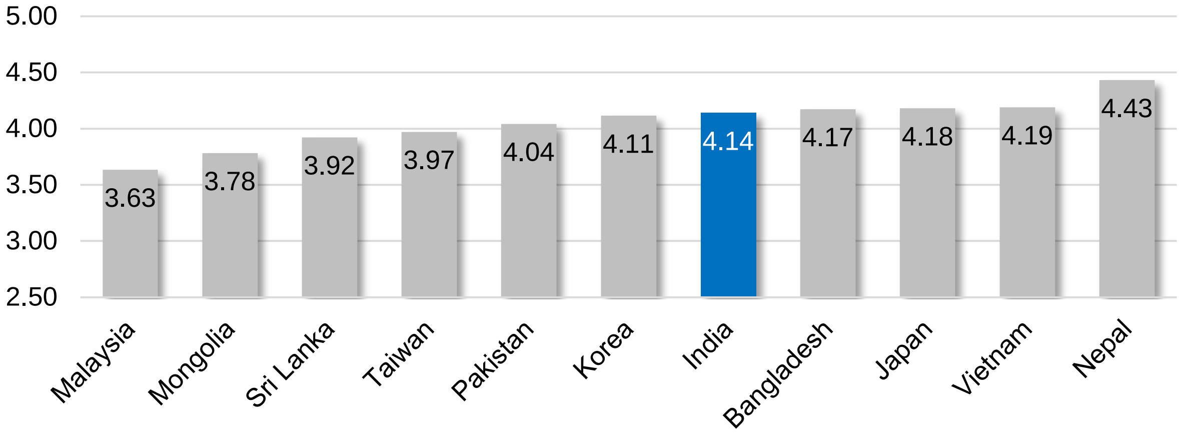


Figure 4-8-12. Average point of Q11 of India

4.2.8 Japan

In Japan, a total of 94 respondents participated in the survey: 4 in their 20s (4.3%), 16 in their 30s (17%), 21 in their 40s (22%), and 53 in their 50s (56%), taking up more than half the entire sample. By occupation, the group of scientists (51 respondents, 54%) and engineers (40 respondents, 43%) was the majority.

Table 4-9-1. Status of survey participants in Japan

		N	%
Age	20s or younger	4	4.26
	30s	16	17.02
	40s	21	22.34
	50s or older	53	56.38
Occupation	Scientist	51	54.26
	Engineer	40	42.55
	Professional medical staff	2	2.13
	Others	1	1.06
Job	Student	2	2.13
	Professor/teacher	38	40.43
	Researcher	21	22.34
	Manager	7	7.45
	Professional medical staff	3	3.19
	Engineer	18	19.15
	Other	5	5.32
Marital status	Single	26	27.66
	Married	62	65.96
	Divorced	4	4.26
	Other	2	2.13
No. of children	None	47	50.00
	1	19	20.21
	2	22	23.40
	3 or more	6	6.38
Total		94	100.00

Since the numbers of medical professionals and in other occupations were merely two and one, respectively, these two occupational groups were not sufficient to produce representative results. In terms of marital status, whereas 26 respondents (28%) reported themselves as single, the number of those who were married was 62 (66%), which may be related to the high ratio of older respondents. The number of those without children and with children was 47 (50%) each; 19 respondents had one and 22 respondents had two children.

Compared to the ten other countries surveyed, Japan recorded an overall average score of 3.19, ranking fourth. This indicates that Japanese women perceive themselves as having a relatively favorable environment in terms of the glass ceiling.

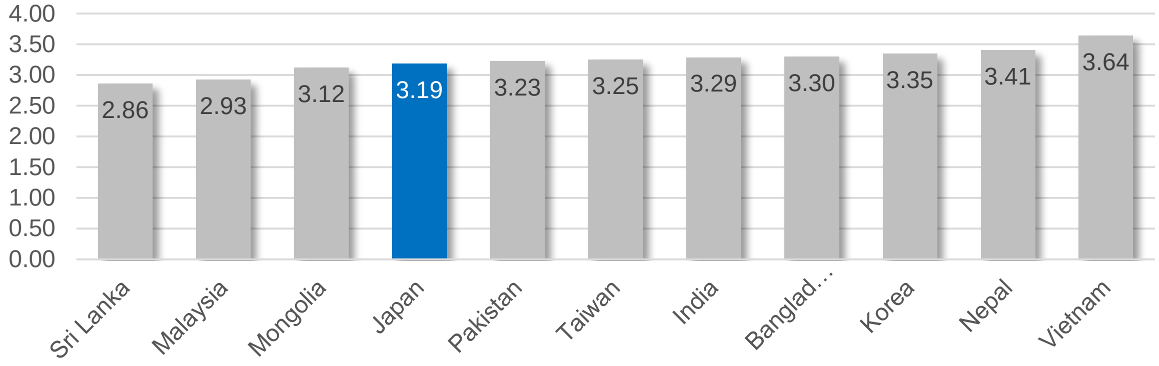


Figure 4-9-1. Average value of Japan

Table 4-9-2. Comparison of average value in Japan

	Question	Japan	Except Japan	t	*(p)*
Q1	Female scientists are limited in how much they can succeed in science compared to male scientists.	3.34	3.23	0.86	0.392
Q2	Men have an advantage over women in Science.	3.28	3.19	0.60	0.550
Q3	To attain a masters or doctoral degree, women should work harder and take longer time to finish their studies than men.	2.23	2.85	-5.53	0.000
Q4	I have experienced some disadvantages to lead or participate in a research project because I am a woman.	2.68	2.92	-1.68	0.096
Q5	I have experienced some disadvantages in research funding or scholarships because I am a woman.	2.46	2.48	-0.19	0.853
Q6	Becoming a tenured professor, being promoted or becoming a principal investigator is more difficult for female scientists than for male scientists.	3.55	3.21	2.91	0.004
Q7	There are more men than women among those with similar or more professional experience than mine.	4.12	3.65	4.71	0.000
Q8	Girls who are entering college today will be studying in a better (more gender equal) environment than I did.	3.61	3.78	-1.75	0.081
Q9	There is a difference in ability (math, analytical skills, logical thinking, etc) that needs to be acquired in science for men and women.	2.03	2.70	-5.59	0.000
Q10	Having to balance work and life (marriage and child care) is a handicap for women.	3.61	3.80	-1.71	0.088
Q11	It is crucial to have policy support that ensures equal opportunity in order to solve the gender inequality in science.	4.18	4.07	1.17	0.244
N		94	955		

When the average scores of Japan were compared with those of the ten other countries for each question, Japan was found to have lower scores in Q3 (gender discrimination in degree programs) and Q9 (perception that there is a gender difference in scientific abilities), indicating more favorable results, with statistical significance. On the contrary, the country had statistically significant higher average scores in Q6 (discrimination against promotion within an organization) and Q7 (gender inequality in the organizational makeup).

Q1. **Female scientists are limited in how much they can succeed in science compared to male scientists.**

Table 4-9-3. Comparative survey result of Q1 by age, occupation and marital status in Japan

		N	Average	Standard deviation	F	*p*
	Total	94	3.34	1.151		
Age	20s or younger	4	3.00	0.816	1.84	0.146
	30s	16	2.88	1.204		
	40s	21	3.19	1.327		
	50s or older	53	3.57	1.047		
Occupation	Scientist	51	3.37	1.199	0.30	0.827
	Engineer	40	3.28	1.132		
	Professional medical staff	2	4.00	0.000		
	Others	1	3.00			
Marital status	Single	26	3.12	1.033	1.10	0.350
	Married	62	3.45	1.210		
	Divorced	4	2.75	0.957		
	Other	2	4.00	0.000		
No. of children	None	47	3.15	1.197	1.22	0.308
	1	19	3.63	1.012		
	2	22	3.36	1.177		
	3 or more	6	3.83	0.983		

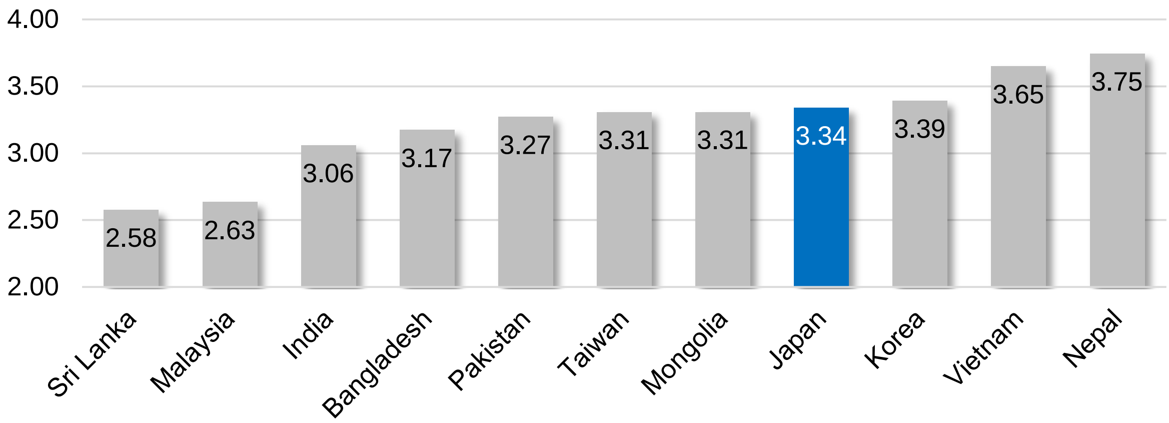


Figure 4-9-2. Average point of Q1 of Japan

Q2. **Men have an advantage over women in Science.**

Although the ANOVA analysis failed to identify a statistically significant difference from the demographic factors, the difference found as a result of the one-on-one ex-post analysis indicates that older respondents tended to believe that men had more advantage. The tendency was particularly strong among those in their 40s and 50s, which is consistent with the situations in other nations. Whereas the single respondents scored 2.73, those who were married had an average score of 3.48, suggesting that married women in the science and technology sectors are more likely to believe that women face greater disadvantage than men do in their occupational area. In the meantime, the average among those without children was 2.98, while the score jumped to 3.63 among those with one child before slightly falling to 3.36 again among those with two children. This result reveals that women engaged in child-rearing tend to realize more the disadvantages against women

Table 4-9-4. Comparative survey result of Q2 by age, occupation and marital status in Japan

		N	Average	Standard deviation	F	*p*
	Total	94	3.28	1.307		
Age	20s or younger	4	2.50	0.577	1.96	0.125
	30s	16	2.75	1.238		
	40s	21	3.24	1.411		
	50s or older	53	3.51	1.280		
Occupation	Scientist	51	3.29	1.238	1.41	0.246
	Engineer	40	3.15	1.388		
	Professional medical staff	2	5.00	0.000		
	Others	1	4.00			
Marital status	Single	26	2.73	1.218	2.33	0.079
	Married	62	3.48	1.327		
	Divorced	4	3.25	0.957		
	Other	2	4.00	0.000		
No. of children	None	47	2.98	1.359	2.34	0.079
	1	19	3.63	1.116		
	2	22	3.36	1.329		
	3 or more	6	4.17	0.753		

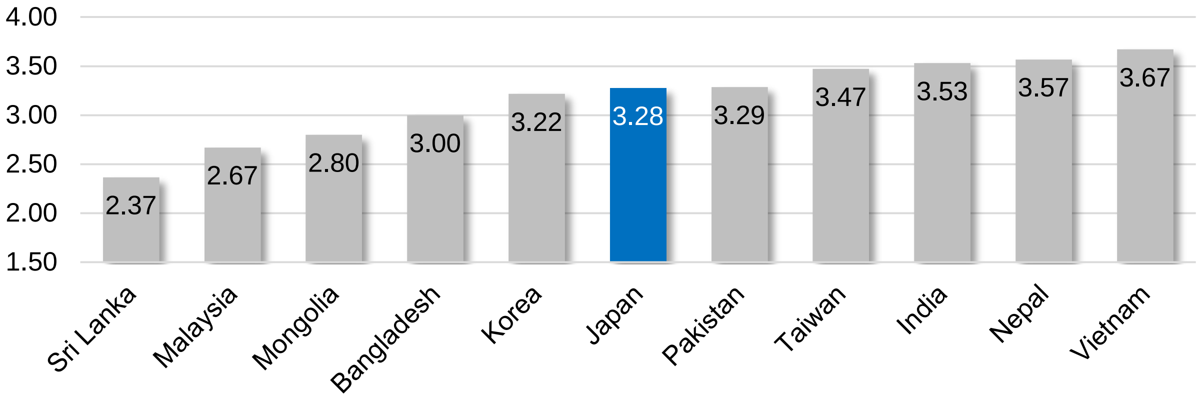


Figure 4-9-3. Average point of Q2 of Japan

Q3. **To attain a masters or doctoral degree, women should work harder and take longer time to finish their studies than men.**

Asked whether they experienced any gender discrimination in the course of earning a degree, the respondents in Japan scored an average of 2.23, showing the most favorable circumstance among the 11 countries. This result was also verified by the independent sample t test that compared the average scores of Japan with those of the ten other countries. However, no statistically significant difference from demographic factors was observed between sub-divided groups.

Table 4-9-5. Comparative survey result of Q3 by age, occupation and marital status in Japan

		N	Average	Standard deviation	F	*p*
	Total	94	2.23	0.999		
Age	20s or younger	4	1.75	0.957	1.52	0.214
	30s	16	1.94	0.772		
	40s	21	2.10	1.091		
	50s or older	53	2.42	1.008		
Occupation	Scientist	51	2.37	1.113	0.84	0.475
	Engineer	40	2.05	0.783		
	Professional medical staff	2	2.50	2.121		
	Others	1	2.00			
Marital status	Single	26	2.12	0.864	0.94	0.424
	Married	62	2.24	1.066		
	Divorced	4	3.00	0.816		
	Other	2	2.00	0.000		
No. of children	None	47	2.09	0.880	1.04	0.380
	1	19	2.42	1.121		
	2	22	2.45	1.101		
	3 or more	6	2.00	1.095		

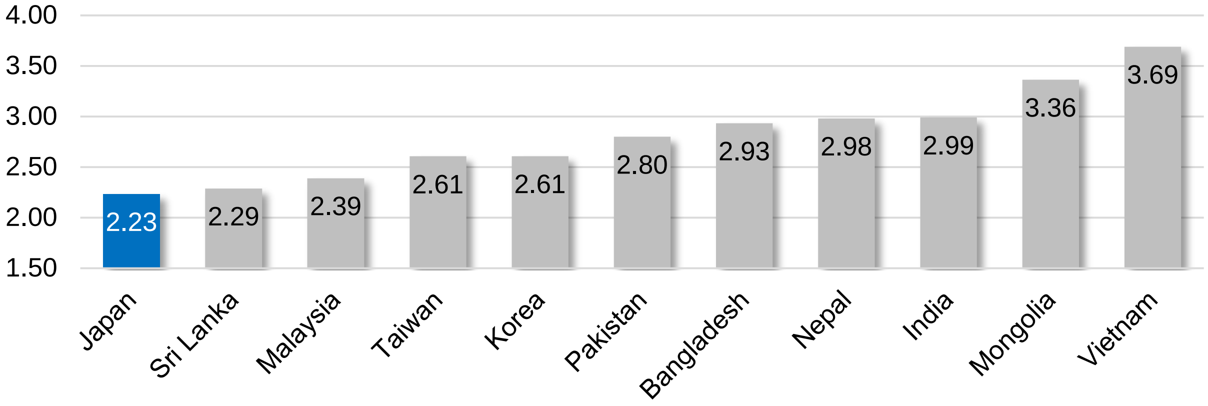


Figure 4-9-4. Average point of Q3 of Japan

Q4. **I have experienced some disadvantages to lead or participate in a research project because I am a woman.**

With regard to accessibility, older groups showed higher tendency of experiencing restrictions on the ability to lead or access research projects. No statistically significant difference between the groups of scientists and engineers was observed. In terms of marital status, the average scores of those who were married (2.89) was statistically significantly higher than the score of single respondents (2.23), which was also verified by one-on-one ex-post analysis. Additionally, the score among those with children was higher than that among those without children. The international comparison found that Japan ranked fourth with an average score of 2.68, but the difference of the average compared to that of other countries did not reveal statistical significance.

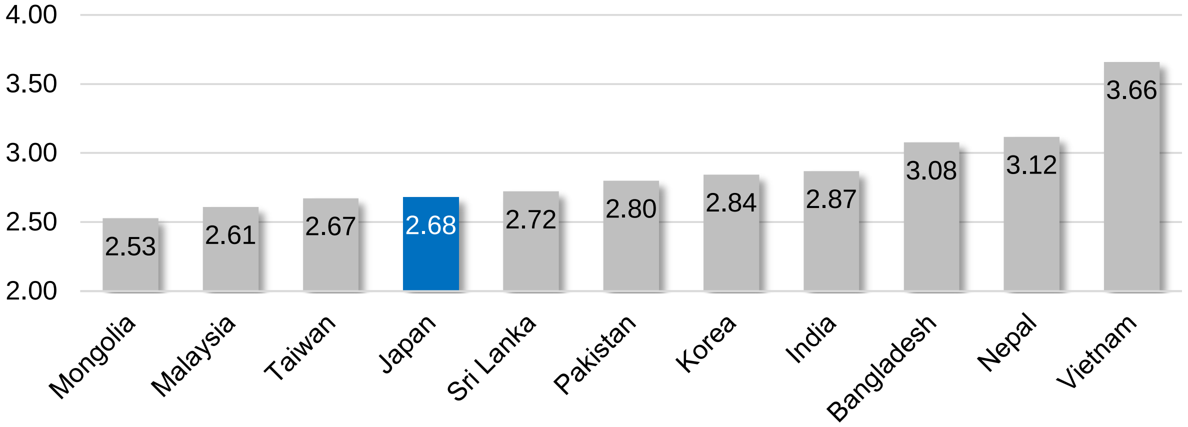


Figure 4-9-5. Average point of Q4 of Japan

Table 4-9-6. Comparative survey result of Q4 by age, occupation and marital status in Japan

		N	Average	Standard deviation	F	*p*
	Total	94	2.68	1.305		
Age	20s or younger	4	1.00	0.000	4.78	0.004
	30s	16	2.19	1.328		
	40s	21	2.52	1.401		
	50s or older	53	3.02	1.168		
Occupation	Scientist	51	2.51	1.286	1.28	0.286
	Engineer	40	2.33	1.023		
	Professional medical staff	2	3.50	0.707		
	Others	1	3.00			
Marital status	Single	26	2.23	1.275	1.78	0.158
	Married	62	2.89	1.282		
	Divorced	4	2.25	1.500		
	Other	2	3.00	1.414		
No. of children	None	47	2.34	1.290	2.27	0.086
	1	19	3.05	1.311		
	2	22	2.95	1.253		
	3 or more	6	3.17	1.169		

Q5. **I have experienced some disadvantages in research funding or scholarships because I am a woman.**

The result of Q5 about accessibility to financial resources including research funds or scholarships showed the identical pattern with Q4. More specifically, older groups tended to experience more restrictions on accessing financial resources; this result was verified to have statistical significance. By occupation, the group of scientists had an average score of 3.71 and the group of engineers scored 3.28, suggesting stronger restrictions among the scientists. Meanwhile, whereas the average among single respondents was 2.00, the score among those who were married was higher at 2.68. Also, the average was higher among those with children.

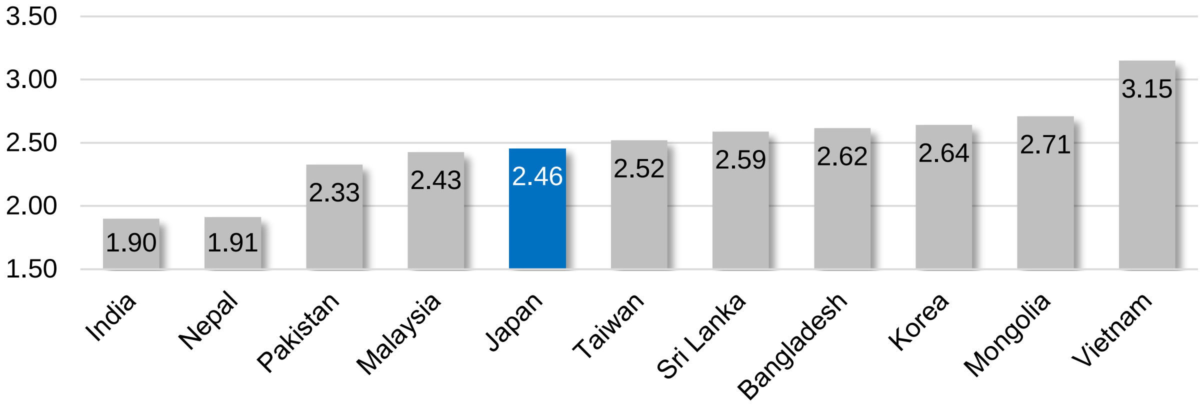


Figure 4-9-6. Average point of Q5 of Japan

Table 4-9-7. Comparative survey result of Q5 by age, occupation and marital status in Japan

		N	Average	Standard deviation	F	*p*
	Total	94	2.46	1.170		
Age	20s or younger	4	1.00	0.000	4.13	0.009
	30s	16	2.06	1.063		
	40s	21	2.33	1.065		
	50s or older	53	2.74	1.179		
Occupation	Scientist	51	3.71	1.119	0.80	0.497
	Engineer	40	3.28	1.301		
	Professional medical staff	2	5.00	0.000		
	Others	1	4.00			
Marital status	Single	26	2.00	1.058	2.29	0.084
	Married	62	2.68	1.184		
	Divorced	4	2.25	0.957		
	Other	2	2.00	1.414		
No. of children	None	47	2.21	1.122	1.56	0.206
	1	19	2.84	1.214		
	2	22	2.59	1.260		
	3 or more	6	2.67	0.816		

Q6. **Becoming a tenured professor, being promoted or becoming a principal investigator is more difficult for female scientists than for male scientists.**

Table 4-9-8. Comparative survey result of Q6 by age, occupation and marital status in Japan

		N	Average	Standard deviation	F	*p*
	Total	94	3.55	1.215		
Age	20s or younger	4	3.75	0.500	2.11	0.104
	30s	16	2.88	1.408		
	40s	21	3.76	1.179		
	50s or older	53	3.66	1.159		
Occupation	Scientist	51	3.71	1.119	2.02	0.116
	Engineer	40	3.28	1.301		
	Professional medical staff	2	5.00	0.000		
	Others	1	4.00			
Marital status	Single	26	3.31	1.225	0.85	0.472
	Married	62	3.69	1.223		
	Divorced	4	3.25	0.957		
	Other	2	3.00	1.414		
No. of children	None	47	3.38	1.226	1.59	0.197
	1	19	3.58	1.121		
	2	22	3.64	1.293		
	3 or more	6	4.50	0.837		

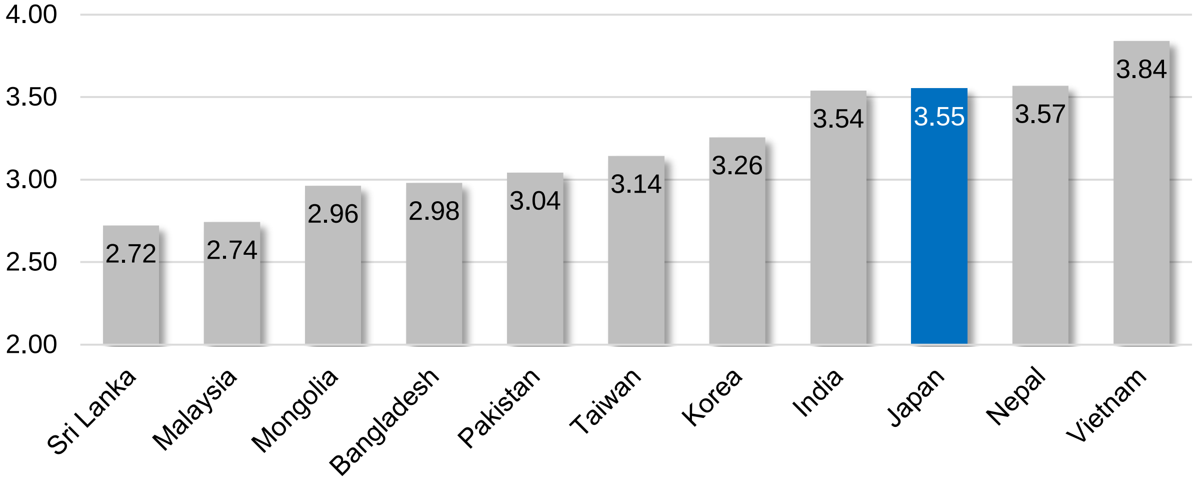


Figure 4-9-7. Average point of Q6 of Japan

Q7. **There are more men than women among those with similar or more professional experience than mine.**

Table 4-9-9. Comparative survey result of Q7 by age, occupation and marital status in Japan

		N	Average	Standard deviation	F	*p*
	Total	94	4.12	0.914		
Age	20s or younger	4	4.50	0.577	0.49	0.692
	30s	16	4.00	1.095		
	40s	21	4.00	0.894		
	50s or older	53	4.17	0.893		
Occupation	Scientist	51	4.00	0.938	0.68	0.569
	Engineer	40	4.25	0.899		
	Professional medical staff	2	4.50	0.707		
	Others	1	4.00			
Marital status	Single	26	4.19	0.981	0.28	0.841
	Married	62	4.11	0.907		
	Divorced	4	3.75	0.500		
	Other	2	4.00	1.414		
No. of children	None	47	4.15	0.978	0.11	0.956
	1	19	4.16	0.688		
	2	22	4.05	1.046		
	3 or more	6	4.00	0.632		

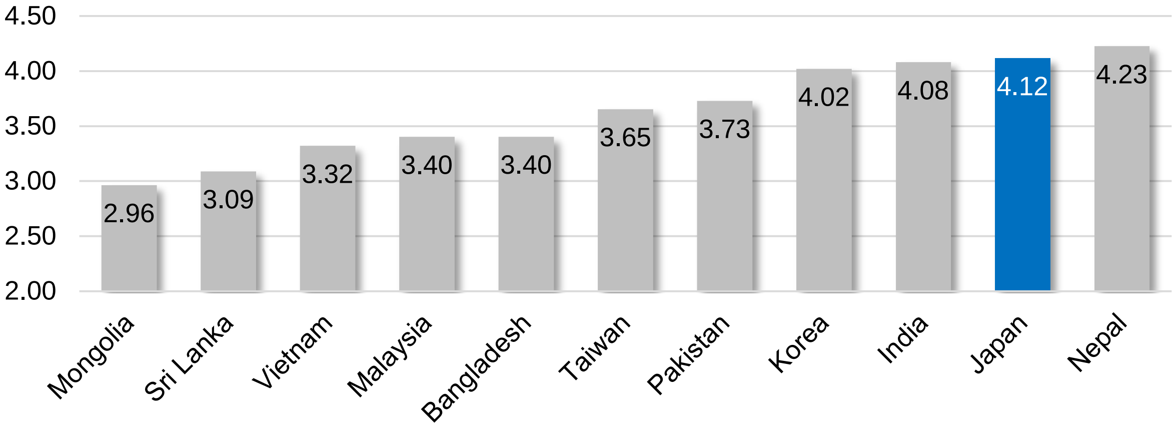


Figure 4-9-8. Average point of Q7 of Japan

Q8. **Girls who are entering college today will be studying in a better (more gender equal) environment than I did.**

Table 4-9-10. Comparative survey result of Q8 by age, occupation and marital status in Japan

		N	Average	Standard deviation	F	*p*
	Total	94	3.61	0.907		
Age	20s or younger	4	3.75	1.258	1.10	0.353
	30s	16	3.31	0.946		
	40s	21	3.48	0.928		
	50s or older	53	3.74	0.858		
Occupation	Scientist	51	3.53	0.946	1.54	0.210
	Engineer	40	3.75	0.840		
	Professional medical staff	2	2.50	0.707		
	Others	1	4.00			
Marital status	Single	26	3.54	0.948	0.10	0.959
	Married	62	3.63	0.910		
	Divorced	4	3.75	0.957		
	Other	2	3.50	0.707		
No. of children	None	47	3.64	0.987	0.97	0.411
	1	19	3.63	0.761		
	2	22	3.68	0.839		
	3 or more	6	3.00	0.894		

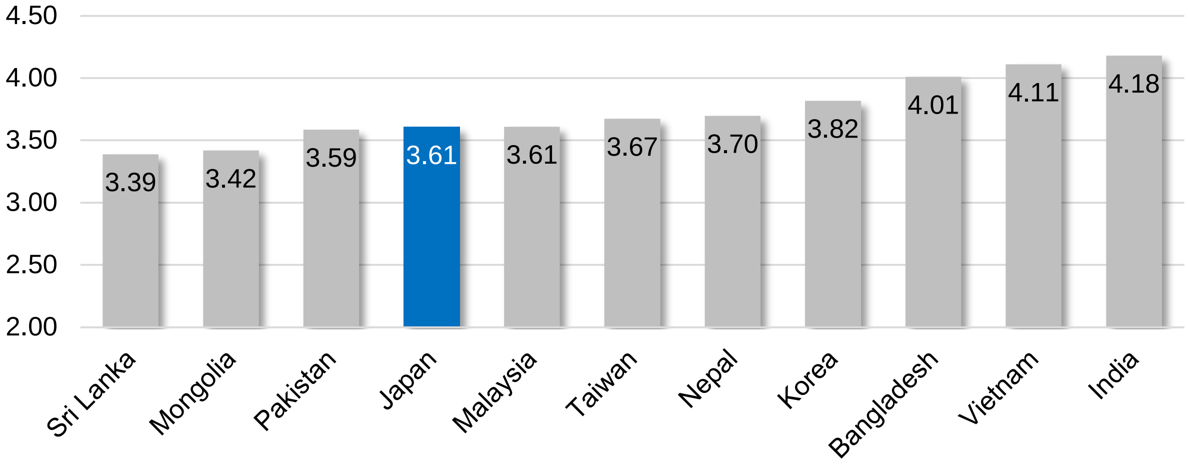


Figure 4-9-9. Average point of Q8 of Japan

Q9. **There is a difference in ability (math, analytical skills, logical thinking, etc) that needs to be acquired in science for men and women.**

When asked if any gender difference existed in terms of ability required in the science sector, the respondents in Japan scored an average of 2.03, showing the lowest level among the 11 countries surveyed.

Table 4-9-11. Comparative survey result of Q6 by age, occupation and marital status in Japan

		N	Average	Standard deviation	F	*p*
	Total	94	2.03	1.072		
Age	20s or younger	4	2.50	1.732	0.84	0.476
	30s	16	2.19	1.047		
	40s	21	2.19	1.123		
	50s or older	53	1.89	1.013		
Occupation	Scientist	51	2.10	1.082	0.69	0.562
	Engineer	40	2.00	1.086		
	Professional medical staff	2	1.00	0.000		
	Others	1	2.00			
Marital status	Single	26	1.81	0.981	0.80	0.498
	Married	62	2.08	1.106		
	Divorced	4	2.50	1.291		
	Other	2	2.50	0.707		
No. of children	None	47	1.98	1.132	0.82	0.485
	1	19	2.37	1.165		
	2	22	1.91	0.921		
	3 or more	6	1.83	0.753		

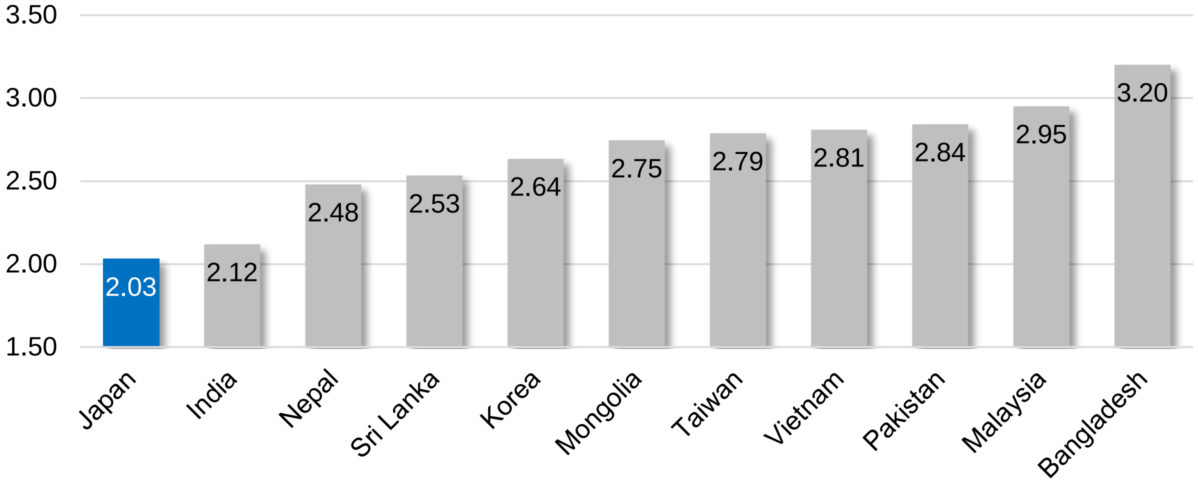


Figure 4-9-10. Average point of Q9 of Japan

Q10. **Having to balance work and life (marriage and child care) is a handicap for women.**

With regard to Q10 about the impact of marriage, childbirth, and child-rearing on women's professional lives, it is worth paying attention to differences between varying occupational areas. Whereas the average among scientists was 3.76, that among engineers stood only at 3.35.

Table 4-9-12. Comparative survey result of Q10 by age, occupation and marital status in Japan

		N	Average	Standard deviation	F	*p*
	Total	94	3.61	1.080		
Age	20s or younger	4	3.25	0.957	2.01	0.119
	30s	16	3.06	1.124		
	40s	21	3.67	1.017		
	50s or older	53	3.77	1.068		
Occupation	Scientist	51	3.76	1.012	2.44	0.069
	Engineer	40	3.35	1.122		
	Professional medical staff	2	5.00	0.000		
	Others	1	3.00			
Marital status	Single	26	3.46	0.989	2.01	0.119
	Married	62	3.69	1.110		
	Divorced	4	4.00	0.816		
	Other	2	2.00	0.000		
No. of children	None	47	3.47	1.139	1.27	0.289
	1	19	3.58	0.902		
	2	22	3.73	1.032		
	3 or more	6	4.33	1.211		

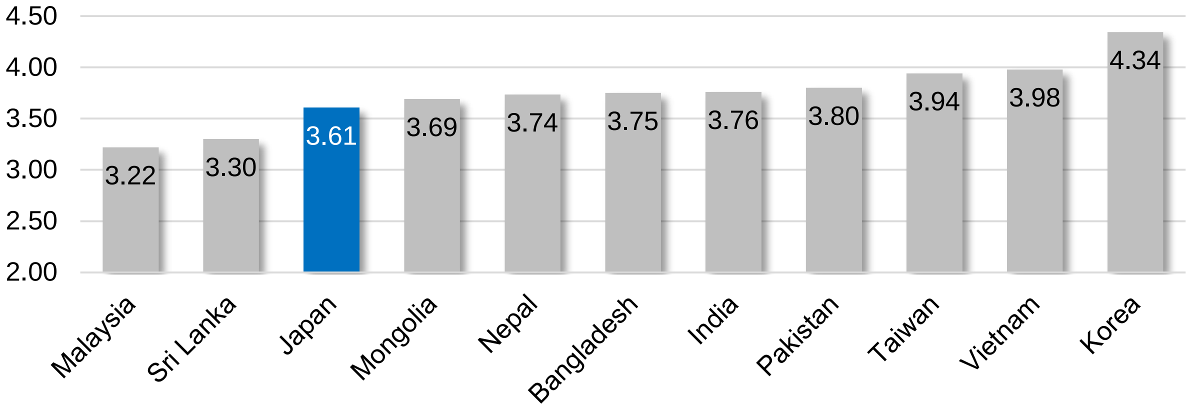


Figure 4-9-11. Average point of Q10 of Japan

Q11. **It is crucial to have policy support that ensures equal opportunity in order to solve the gender inequality in science.**

Table 4-9-13. Comparative survey result of Q11 by age, occupation and marital status in Japan

		N	Average	Standard deviation	F	*p*
	Total	94	4.18	0.842		
Age	20s or younger	4	4.25	0.500	0.80	0.495
	30s	16	4.13	0.806		
	40s	21	3.95	0.973		
	50s or older	53	4.28	0.818		
Occupation	Scientist	51	4.12	0.952	0.77	0.512
	Engineer	40	4.23	0.698		
	Professional medical staff	2	5.00	0.000		
	Others	1	4.00			
Marital status	Single	26	4.23	0.710	0.47	0.706
	Married	62	4.18	0.915		
	Divorced	4	4.25	0.500		
	Other	2	3.50	0.707		
No. of children	None	47	4.26	0.675	0.91	0.437
	1	19	3.95	1.026		
	2	22	4.14	1.037		
	3 or more	6	4.50	0.548		

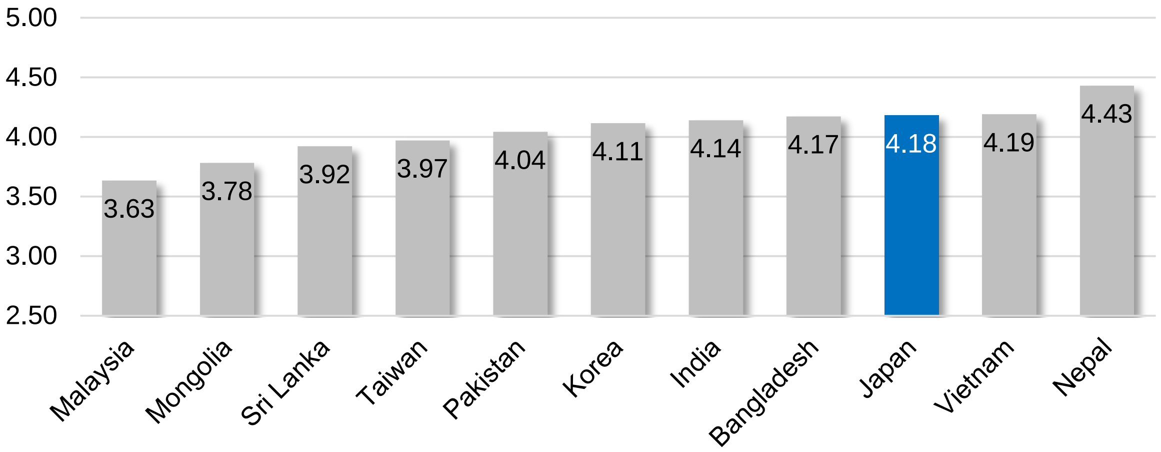


Figure 4-9-12. Average point of Q11 of Japan

4.2.9 Taiwan

In Taiwan, a total of 104 women working in the science sector participated in the survey. The respondents were categorized as 22 in their 20s (21%), 16 in their 30s (15%), 21 in their 40s (20%), and 45 in their 50s (43%). By occupation, the majority were scientists comprising of 60 (58%), followed by 14 engineers (14%), 12 medical professionals (12%), and 18 in other occupational groups (17%). The last group of those with other occupations could not be considered a homogenous community and therefore was not considered as a sub-group in the statistical analysis

Table 4-10-1. Status of survey participants in Taiwan

		N	%
Age	20s or younger	22	21.2
	30s	16	15.4
	40s	21	20.2
	50s or older	45	43.3
Occupation	Scientist	60	57.7
	Engineer	14	13.5
	Professional medical staff	12	11.5
	Others	18	17.3
Job	Student	18	17.3
	Professor/teacher	48	46.2
	Researcher	13	12.5
	Manager	8	7.7
	Professional medical staff	4	3.8
	Engineer	11	10.6
	Other	2	1.9
Marital status	Single	39	37.5
	Married	56	53.8
	Divorced	8	7.7
	Other	1	1.0
No. of children	None	53	51.0
	1	16	15.4
	2	29	27.9
	3 or more	6	5.8
		104	100.0

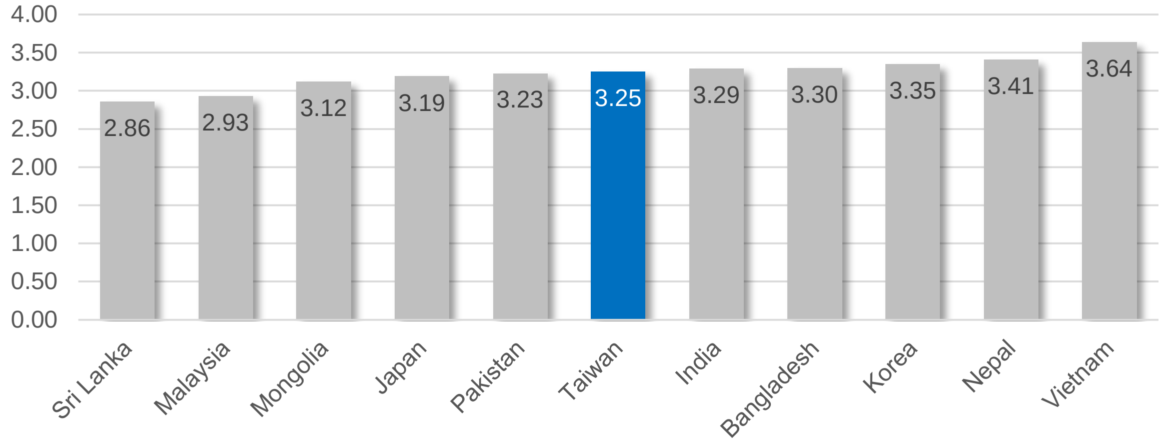


Figure 4-10-1. Average value of Taiwan

In terms of marital status, 39 respondents were single (38%) and 56 married (54%). The number of respondents without children was 53 (51%); numbers of those with one, two, and three or more children were 16 (15%), 29 (28%), and 6 (6%), respectively. The international comparison revealed that Taiwan ranked sixth among the 11 countries surveyed, with an average score of 3.25 for the total of 11 questions.

Among the 11 questions, Taiwan recorded a statistically significant higher average score of 3.47 in Q2, which asked if women face more difficulties in the science field, compared to the average score of 3.17 among the ten other countries. However, Taiwan's average score of 2.67 in Q4 about gender discrimination against leading and participating in major research projects suggested a more favorable situation compared to the average score of 2.92 among the ten other countries; this result was statistically verified as well.

Table 4-10-2. Comparison of average value in Taiwan

	Question	Taiwan	Except Taiwan	t	*(p)*
Q1	Female scientists are limited in how much they can succeed in science compared to male scientists.	3.31	3.24	0.70	0.488
Q2	Men have an advantage over women in Science.	3.47	3.17	2.48	0.013
Q3	To attain a masters or doctoral degree, women should work harder and take longer time to finish their studies than men.	2.61	2.81	-1.87	0.063
Q4	I have experienced some disadvantages to lead or participate in a research project because I am a woman.	2.67	2.92	-2.47	0.015
Q5	I have experienced some disadvantages in research funding or scholarships because I am a woman.	2.52	2.47	0.44	0.663
Q6	Becoming a tenured professor, being promoted or becoming a principal investigator is more difficult for female scientists than for male scientists.	3.14	3.25	-0.96	0.335
Q7	There are more men than women among those with similar or more professional experience than mine.	3.65	3.69	-0.34	0.733
Q8	Girls who are entering college today will be studying in a better (more gender equal) environment than I did.	3.67	3.77	-1.07	0.286
Q9	There is a difference in ability (math, analytical skills, logical thinking, etc) that needs to be acquired in science for men and women.	2.79	2.62	1.54	0.126
Q10	Having to balance work and life (marriage and child care) is a handicap for women.	3.94	3.76	1.84	0.068
Q11	It is crucial to have policy support that ensures equal opportunity in order to solve the gender inequality in science.	3.97	4.09	-1.24	0.216
N		104	945		

Q1. **Female scientists are limited in how much they can succeed in science compared to male scientists.**

Table 4-10-3. Comparative survey result of Q6 by age, occupation and marital status in Taiwan

		N	Average	Standard deviation	F	*p*
	Total	104	3.31	0.98		
Age	20s or younger	22	3.32	0.95	0.09	.966
	30s	16	3.25	1.13		
	40s	21	3.24	0.89		
	50s or older	45	3.36	1.00		
Occupation	Scientist	60	3.27	1.01	0.49	.690
	Engineer	14	3.50	1.02		
	Professional medical staff	12	3.50	0.90		
	Others	18	3.17	0.92		
Marital status	Single	39	3.38	0.935	0.52	.673
	Married	56	3.21	0.986		
	Divorced	8	3.50	1.195		
	Other	1	4.00			
No. of children	None	53	3.45	0.932	0.87	.459
	1	16	3.25	1.000		
	2	29	3.10	1.047		
	3 or more	6	3.17	0.983		

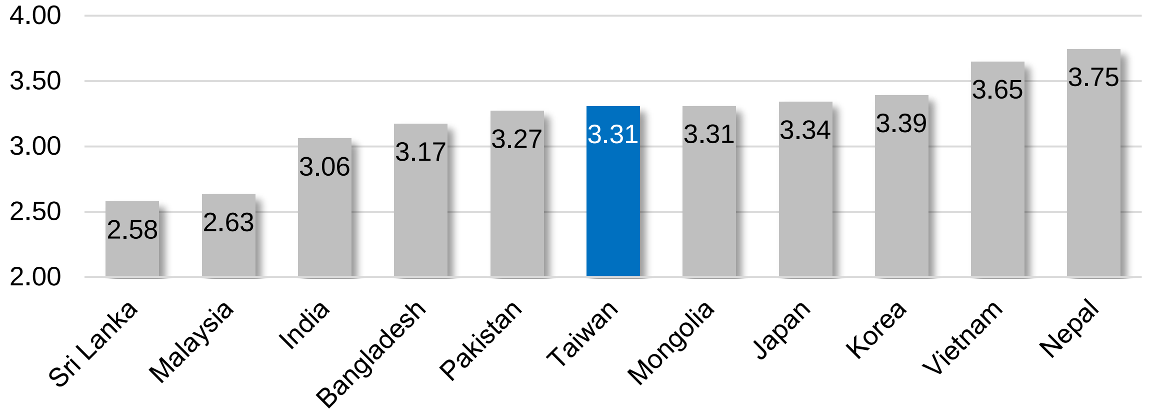


Figure 4-10-2. Average point of Q1 of Taiwan

Q2. **Men have an advantage over women in Science.**

Whereas those in their 20s and 30s scored 3.14 and 2.94, respectively, the respondents in their 40s and 50s recorded average scores of 3.81 and 3.67, respectively, showing a difference with statistical significance.

Table 4-10-4. Comparative survey result of Q2 by age, occupation and marital status in Taiwan

		N	Average	Standard deviation	F	*p*
	Total	104	3.47	1.11		
Age	20s or younger	22	3.14	1.08	3.18	.027
	30s	16	2.94	1.48		
	40s	21	3.81	0.93		
	50s or older	45	3.67	0.98		
Occupation	Scientist	60	3.53	1.08	0.16	.924
	Engineer	14	3.43	1.02		
	Professional medical staff	12	3.33	1.23		
	Others	18	3.39	1.29		
Marital status	Single	39	3.21	1.174	1.59	.195
	Married	56	3.57	1.076		
	Divorced	8	4.00	0.926		
	Other	1	4.00			
No. of children	None	53	3.34	1.208	0.99	.399
	1	16	3.88	1.088		
	2	29	3.52	0.911		
	3 or more	6	3.33	1.211		

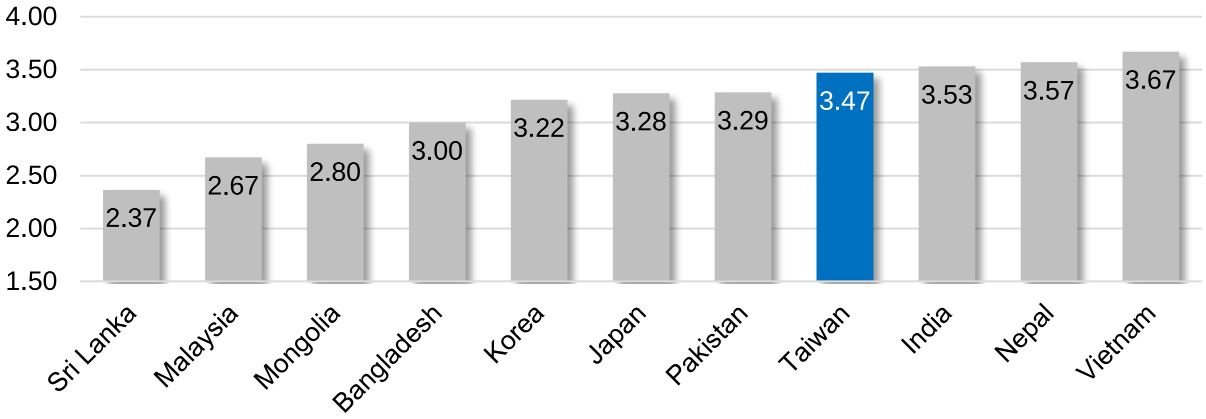


Figure 4-10-3. Average point of Q2 of Taiwan

Q3. **To attain a masters or doctoral degree, women should work harder and take longer time to finish their studies than men.**

The average scores among those in their 20s and 30s were 2.18 and 2.38, respectively; among the older groups in their 40s and 50s scores were 3.00 and 2.71, respectively, indicating a statistically significant difference between the two younger generations and the remaining two age groups.

Table 4-10-5. Comparative survey result of Q3 by age, occupation and marital status in Taiwan

		N	Average	Standard deviation	F	*p*
	Total	104	2.61	1.04		
Age	20s or younger	22	2.18	0.85	2.79	.044
	30s	16	2.38	1.09		
	40s	21	3.00	1.14		
	50s or older	45	2.71	0.99		
Occupation	Scientist	60	2.65	1.04	0.83	.480
	Engineer	14	2.64	1.01		
	Professional medical staff	12	2.83	1.11		
	Others	18	2.28	1.02		
Marital status	Single	39	2.44	1.071	0.78	.508
	Married	56	2.70	1.025		
	Divorced	8	2.88	0.991		
	Other	1	2.00			
No. of children	None	53	2.47	1.067	0.61	.608
	1	16	2.75	1.000		
	2	29	2.72	0.996		
	3 or more	6	2.83	1.169		

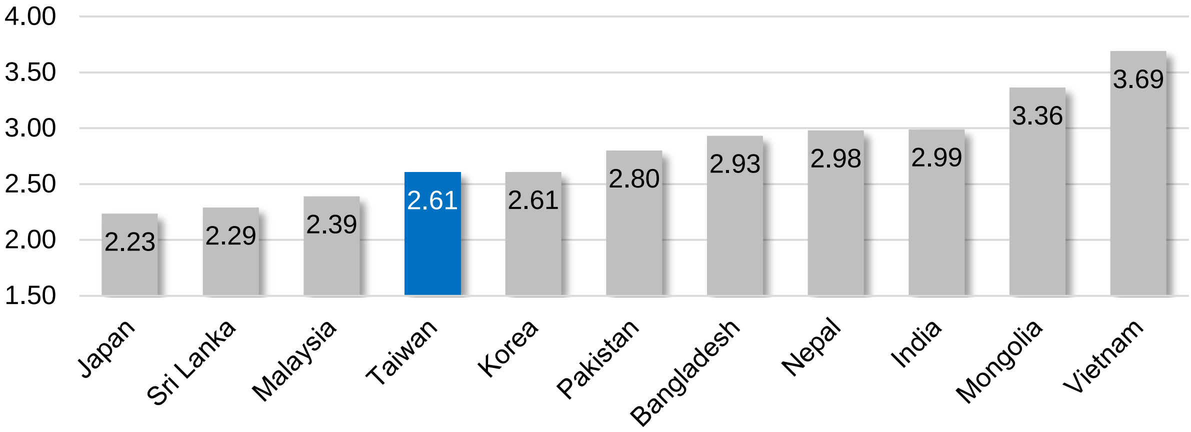


Figure 4-10-4. Average point of Q3 of Taiwan

Q4. **I have experienced some disadvantages to lead or participate in a research project because I am a woman.**

Table 4-10-6. Comparative survey result of Q4 by age, occupation and marital status in Taiwan

		N	Average	Standard deviation	F	*p*
	Total	104	2.67	0.94		
Age	20s or younger	22	2.36	0.90	1.34	.266
	30s	16	2.56	0.81		
	40s	21	2.86	0.96		
	50s or older	45	2.78	0.97		
Occupation	Scientist	60	2.72	1.01	2.51	.063
	Engineer	14	3.14	0.86		
	Professional medical staff	12	2.50	0.67		
	Others	18	2.28	0.75		
Marital status	Single	39	2.56	0.968	0.37	.777
	Married	56	2.71	0.889		
	Divorced	8	2.88	1.246		
	Other	1	3.00			
No. of children	None	53	2.60	0.947	0.68	.568
	1	16	2.88	0.957		
	2	29	2.76	0.912		
	3 or more	6	2.33	1.033		

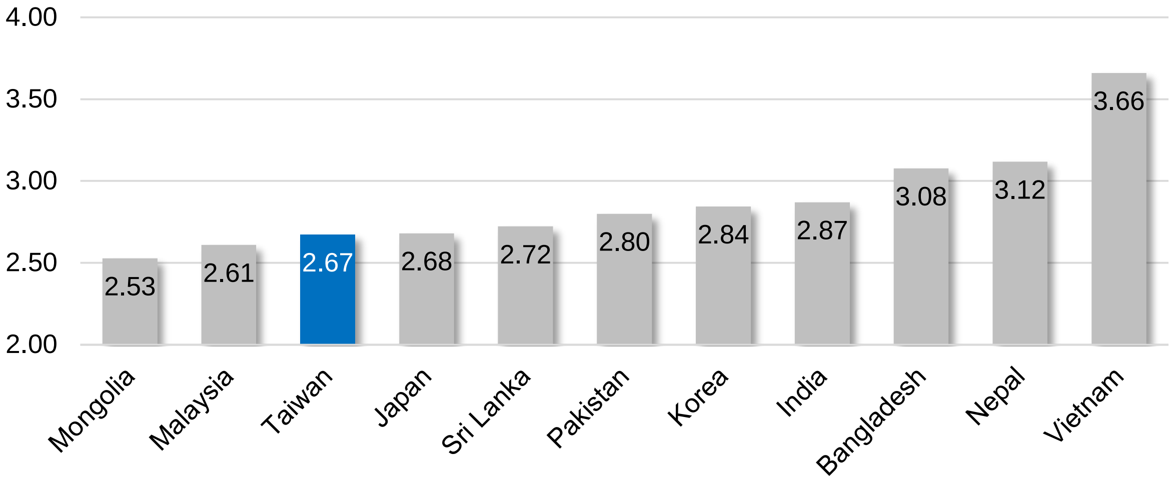


Figure 4-10-5. Average point of Q4 of Taiwan

Q5. **I have experienced some disadvantages in research funding or scholarships because I am a woman.**

Asked if they had limited access to financial resources such as research funds and scholarships, the single respondents scored 2.18, but those who were married had a higher average score of 2.68, with statistical significance.

Table 4-10-7. Comparative survey result of Q5 by age, occupation and marital status in Taiwan

		N	Average	Standard deviation	F	*p*
	Total	104	2.52	1.01		
Age	20s or younger	22	2.23	0.92	1.03	.383
	30s	16	2.50	1.15		
	40s	21	2.76	0.89		
	50s or older	45	2.56	1.06		
Occupation	Scientist	60	2.62	1.09	1.16	.329
	Engineer	14	2.71	0.99		
	Professional medical staff	12	2.25	0.87		
	Others	18	2.22	0.81		
Marital status	Single	39	2.18	0.823	3.14	.029
	Married	56	2.68	1.011		
	Divorced	8	3.13	1.458		
	Other	1	2.00			
No. of children	None	53	2.36	0.963	1.79	.154
	1	16	3.00	1.211		
	2	29	2.59	0.983		
	3 or more	6	2.33	0.816		

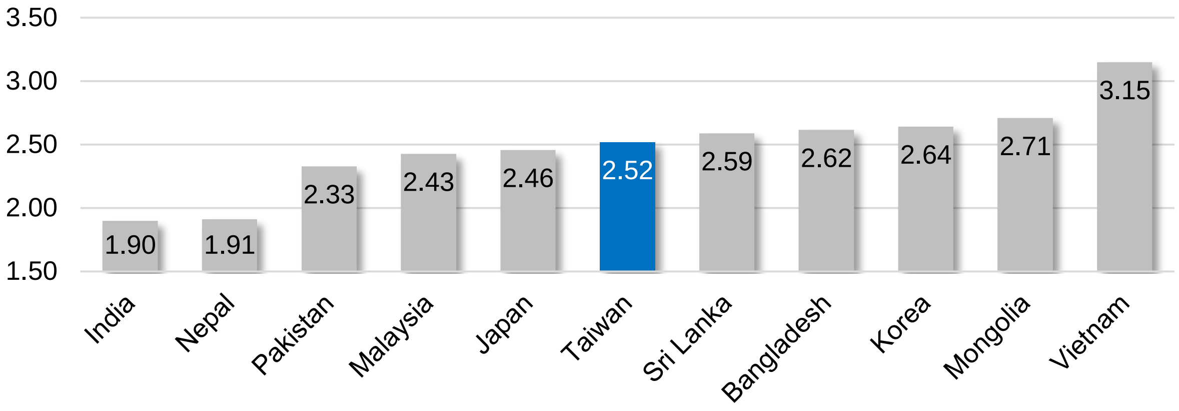


Figure 4-10-6. Average point of Q5 of Taiwan

Q6. **Becoming a tenured professor, being promoted or becoming a principal investigator is more difficult for female scientists than for male scientists**.

Table 4-10-8. Comparative survey result of Q6 by age, occupation and marital status in Taiwan

		N	Average	Standard deviation	F	*p*
	Total	104	3.14	1.00		
Age	20s or younger	22	3.00	1.02	0.46	.710
	30s	16	3.38	1.09		
	40s	21	3.19	0.87		
	50s or older	45	3.11	1.03		
Occupation	Scientist	60	3.23	1.09	0.62	.602
	Engineer	14	3.21	0.89		
	Professional medical staff	12	2.92	0.90		
	Others	18	2.94	0.80		
Marital status	Single	39	3.08	0.984	0.68	.564
	Married	56	3.13	0.992		
	Divorced	8	3.63	1.188		
	Other	1	3.00			
No. of children	None	53	3.21	1.007	0.37	.777
	1	16	3.25	1.000		
	2	29	3.00	1.035		
	3 or more	6	3.00	0.894		

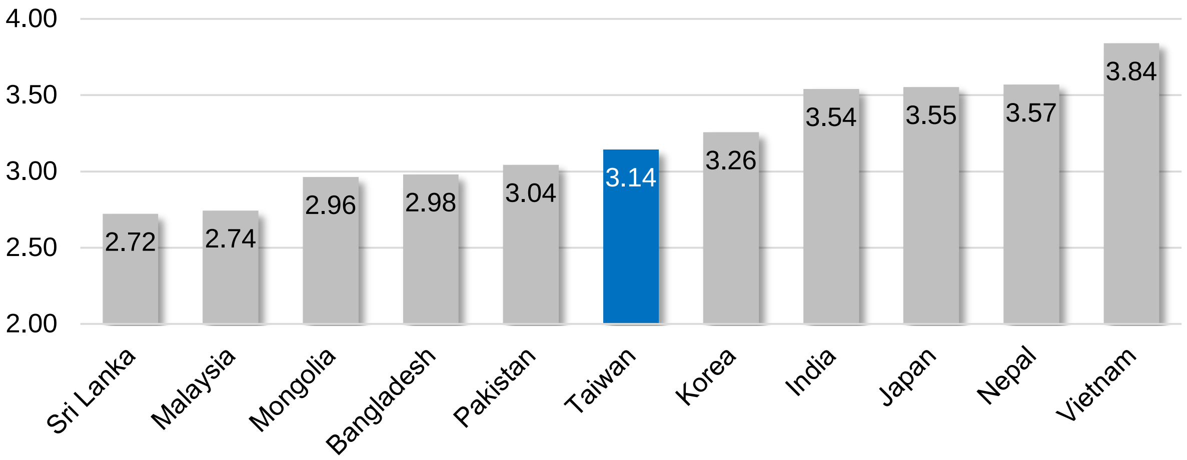


Figure 4-10-7. Average point of Q6 of Taiwan

Q7. **There are more men than women among those with similar or more professional experience than mine.**

Table 4-10-9. Comparative survey result of Q7 by age, occupation and marital status in Taiwan

		N	Average	Standard deviation	F	*p*
	Total	104	3.65	0.95		
Age	20s or younger	22	3.55	1.06	0.44	.723
	30s	16	3.56	0.89		
	40s	21	3.57	0.87		
	50s or older	45	3.78	0.97		
Occupation	Scientist	60	3.72	0.94	0.56	.641
	Engineer	14	3.71	1.14		
	Professional medical staff	12	3.67	0.89		
	Others	18	3.39	0.92		
Marital status	Single	39	3.62	0.963	1.39	.249
	Married	56	3.66	0.978		
	Divorced	8	4.00	0.535		
	Other	1	2.00			
No. of children	None	53	3.60	0.947	0.41	.748
	1	16	3.56	1.153		
	2	29	3.72	0.922		
	3 or more	6	4.00	0.632		

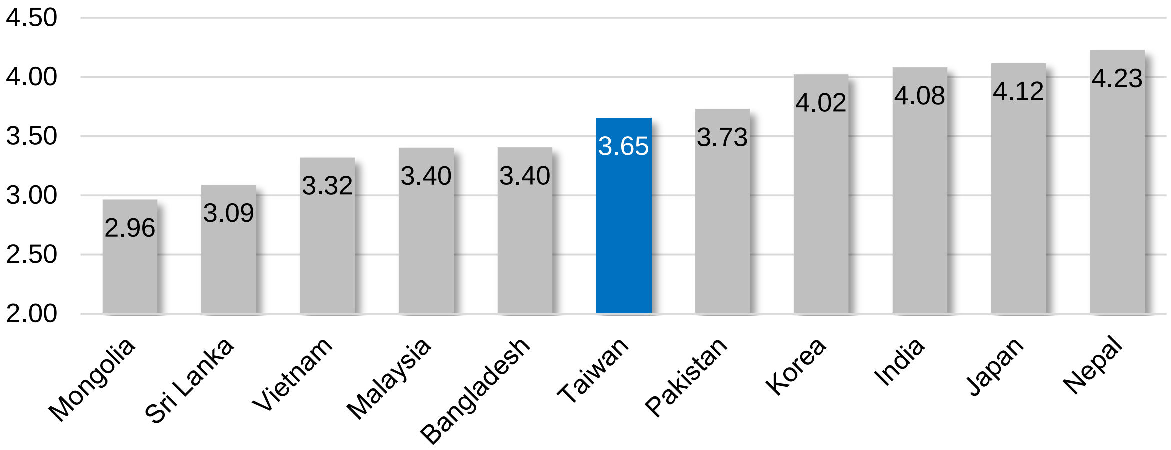


Figure 4-10-8. Average point of Q7 of Taiwan

Q8**. Girls who are entering college today will be studying in a better (more gender equal) environment than I did.**

This question was designed to identify the level of expectation for improvement of gender inequalities, but the results obtained in Taiwan did not suggest any statistically significant difference in average scores for the demographic factors such as age, marital status, and the number of children. By occupation, the group of engineers produced an average score of 3.93, compared to a lower average among scientists (3.53) and medical professionals (3.50); this difference was found to have statistical significance.

Table 4-10-10. Comparative survey result of Q8 by age, occupation and marital status in Taiwan

		N	Average	Standard deviation	F	*p*
	Total	104	3.67	0.78		
Age	20s or younger	22	3.59	0.85	1.23	.305
	30s	16	3.38	1.02		
	40s	21	3.76	0.62		
	50s or older	45	3.78	0.70		
Occupation	Scientist	60	3.53	0.79	2.93	.037
	Engineer	14	3.93	0.62		
	Professional medical staff	12	3.50	1.00		
	Others	18	4.06	0.54		
Marital status	Single	39	3.62	0.747	1.22	.305
	Married	56	3.66	0.837		
	Divorced	8	3.88	0.354		
	Other	1	5.00			
No. of children	None	53	3.58	0.819	0.69	.562
	1	16	3.69	0.946		
	2	29	3.76	0.636		
	3 or more	6	4.00	0.632		

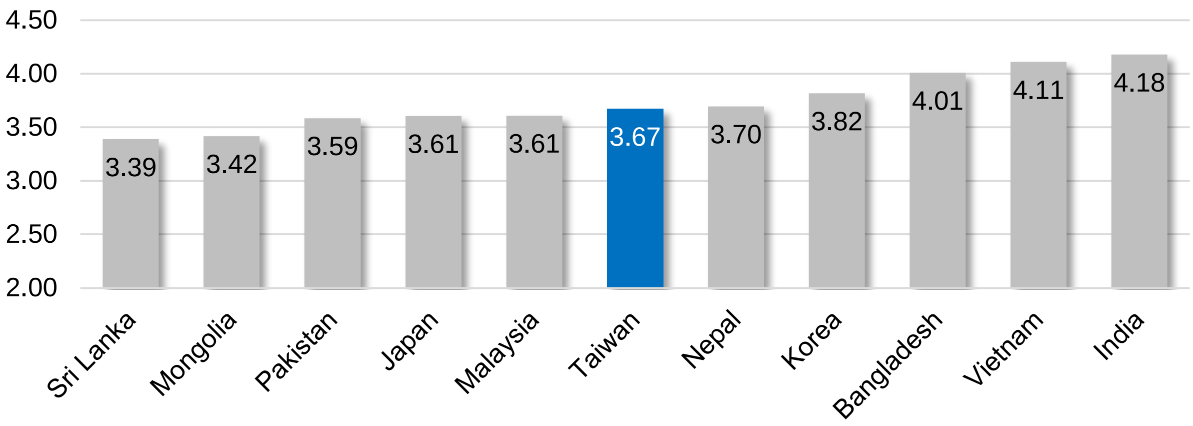


Figure 4-10-9. Average point of Q8 of Taiwan

Q9. **There is a difference in ability (math, analytical skills, logical thinking, etc) that needs to be acquired in science for men and women.**

Asked if men and women had different levels of abilities in science, the respondents without children showed the highest average score of 3.04, compared to average scores of 2.50 and 2.66 among those with one and two children, respectively.

Table 4-10-11. Comparative survey result of Q9 by age, occupation and marital status in Taiwan

		N	Average	Standard deviation	F	*p*
	Total	104	2.79	1.02		
Age	20s or younger	22	3.00	0.98	1.77	.159
	30s	16	3.06	0.93		
	40s	21	2.90	0.89		
	50s or older	45	2.53	1.10		
Occupation	Scientist	60	2.73	1.10	1.03	.381
	Engineer	14	2.64	1.01		
	Professional medical staff	12	2.67	0.98		
	Others	18	3.17	0.71		
Marital status	Single	39	2.87	0.923	0.31	.819
	Married	56	2.75	1.049		
	Divorced	8	2.75	1.389		
	Other	1	2.00			
No. of children	None	53	3.04	0.999	3.00	.034
	1	16	2.50	1.033		
	2	29	2.66	0.974		
	3 or more	6	2.00	0.894		

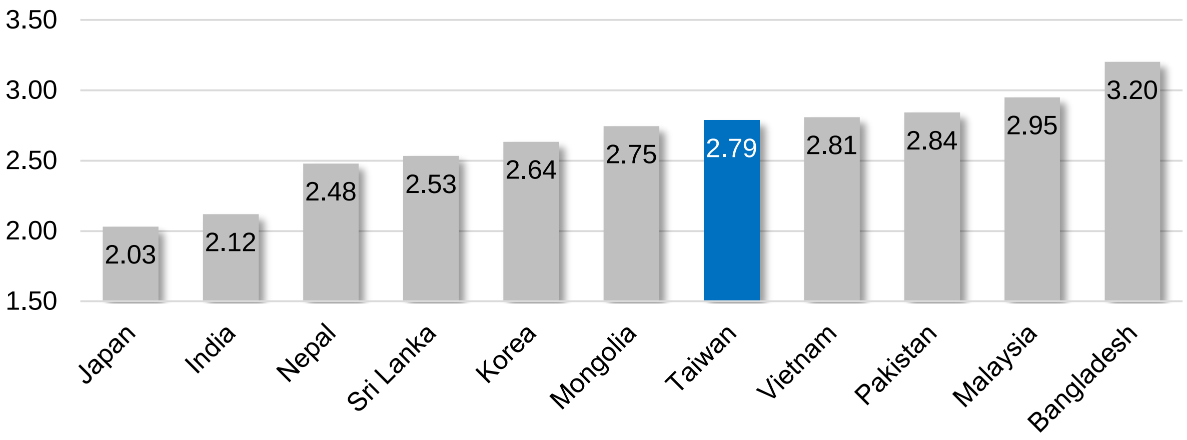


Figure 4-10-10. Average point of Q9 of Taiwan

Q10. **Having to balance work and life (marriage and child care) is a handicap for women.**

Table 4-10-12. Comparative survey result of Q10 by age, occupation and marital status in Taiwan

		N	Average	Standard deviation	F	*p*
	Total	104	3.94	0.92		
Age	20s or younger	22	4.00	1.02	0.06	.982
	30s	16	3.88	1.15		
	40s	21	3.95	0.74		
	50s or older	45	3.93	0.89		
Occupation	Scientist	60	3.95	0.96	0.18	.913
	Engineer	14	4.07	0.83		
	Professional medical staff	12	3.92	0.90		
	Others	18	3.83	0.92		
Marital status	Single	39	3.82	0.970	0.74	.529
	Married	56	4.00	0.915		
	Divorced	8	4.00	0.756		
	Other	1	5.00			
No. of children	None	53	3.92	0.978	1.88	.137
	1	16	4.19	0.655		
	2	29	4.00	0.802		
	3 or more	6	3.17	1.329		

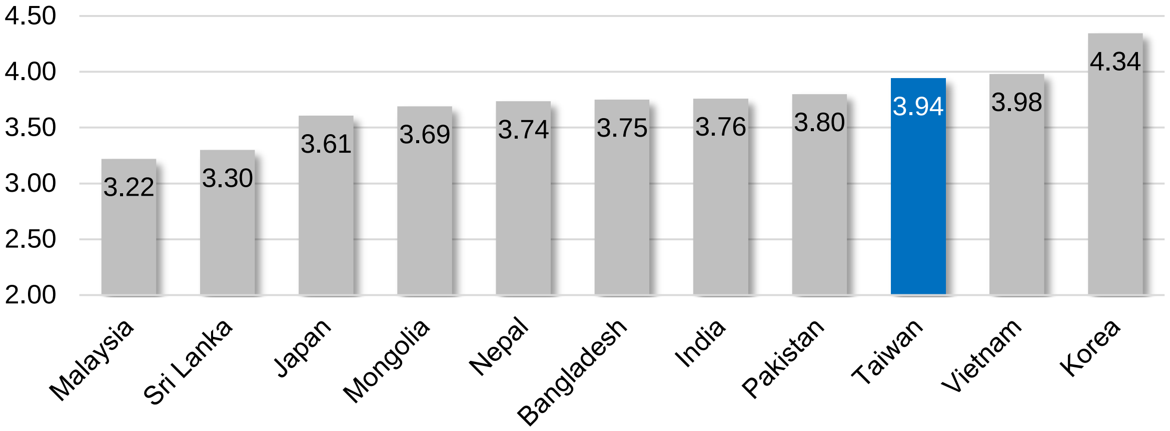


Figure 4-10-11. Average point of Q10 of Taiwan

Q11. **It is crucial to have policy support that ensures equal opportunity in order to solve the gender inequality in science.**

Table 4-10-13. Comparative survey result of Q11 by age, occupation and marital status in Taiwan

		N	Average	Standard deviation	F	*p*
	Total	104	3.97	0.83		
Age	20s or younger	22	4.00	0.82	0.54	.657
	30s	16	3.75	1.06		
	40s	21	4.10	0.89		
	50s or older	45	3.98	0.72		
Occupation	Scientist	60	3.88	0.83	0.97	.409
	Engineer	14	4.29	0.73		
	Professional medical staff	12	3.92	1.00		
	Others	18	4.06	0.80		
Marital status	Single	39	3.92	0.839	0.64	.590
	Married	56	3.96	0.830		
	Divorced	8	4.13	0.835		
	Other	1	5.00			
No. of children	None	53	3.98	0.971	0.09	.968
	1	16	3.88	0.719		
	2	29	4.00	0.655		
	3 or more	6	4.00	0.632		

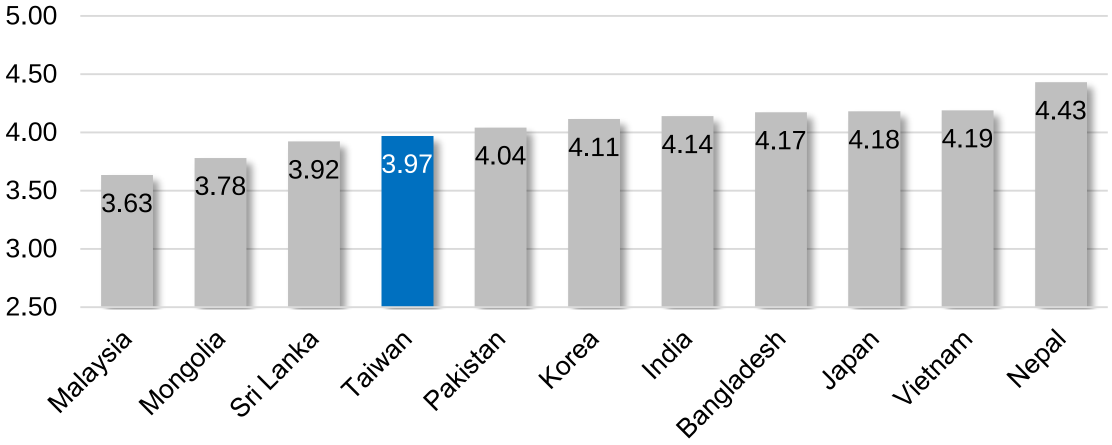


Figure 4-10-12. Average point of Q11 of Taiwan

4.2.10 Pakistan

A total of 70 respondents participated in the survey in Pakistan. The number of respondents by age was 28 in their 20s (40%), 27 in their 30s (39%), 4 in their 40s (6%), and 11 in their 50s (16%).

Table 4-11-1. Status of survey participants in Pakistan

		N	%
Age	20s or younger	28	40.00
	30s	27	38.57
	40s	4	5.71
	50s or older	11	15.71
Occupation	Scientist	19	27.14
	Engineer	29	41.43
	Professional medical staff	15	21.43
	Professional researcher	2	2.86
	Manager	1	1.43
	Others	4	5.71
Job	Student	7	10.00
	Professor/teacher	28	40.00
	Researcher	19	27.14
	Manager	5	7.14
	Professional medical staff	5	7.14
	Engineer	4	5.71
	Other	2	2.86
Marital status	Single	25	35.71
	Married	42	60.00
	Divorced	2	2.86
	Other	1	1.43
No. of children	None	39	55.71
	1	4	5.71
	2	18	25.71
	3 or more	9	12.86
Total		70	100.00

By occupation, 19 scientists (27%), 29 engineers (41%), and 15 medical professionals (21%) responded to the survey, showing a well distributed makeup. The number of single respondents was 25 (36%); the number of those who were married was 42 (60%). In terms of the number of children, the number of those without children was 39 (56%), and the numbers of those with one, two, and three or more children were 4 (6%), 18 (26%), and 9 (13%), respectively. Compared to other countries, Pakistan scored an average of 3.23, ranking fifth of all 11 nations.

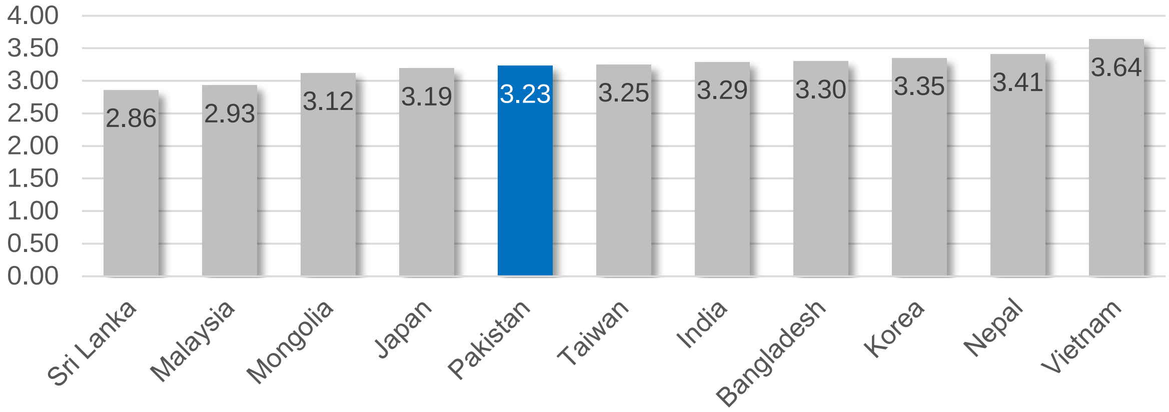


Figure 4-11-1. Average value in Pakistan

As a result of conducting an independent sample t test to compare Pakistan's average with those of other nations, no question demonstrated a statistically significant difference. In other words, Pakistan had results close to the overall average for all questions.

Table 4-11-2. Comparison of average value in Pakistan

	Question	Pakistan	Except Pakistan	t	*(p)*
Q1	Female scientists are limited in how much they can succeed in science compared to male scientists.	3.27	3.24	0.21	0.833
Q2	Men have an advantage over women in Science.	3.29	3.19	0.63	0.529
Q3	To attain a masters or doctoral degree, women should work harder and take longer time to finish their studies than men.	2.80	2.79	0.07	0.945
Q4	I have experienced some disadvantages to lead or participate in a research project because I am a woman.	2.80	2.90	-0.72	0.471
Q5	I have experienced some disadvantages in research funding or scholarships because I am a woman.	2.33	2.49	-1.64	0.105
Q6	Becoming a tenured professor, being promoted or becoming a principal investigator is more difficult for female scientists than for male scientists.	3.04	3.26	-1.58	0.114
Q7	There are more men than women among those with similar or more professional experience than mine.	3.73	3.68	0.34	0.735
Q8	Girls who are entering college today will be studying in a better (more gender equal) environment than I did.	3.59	3.78	-1.69	0.092
Q9	There is a difference in ability (math, analytical skills, logical thinking, etc) that needs to be acquired in science for men and women.	2.84	2.63	1.56	0.119
Q10	Having to balance work and life (marriage and child care) is a handicap for women.	3.80	3.78	0.15	0.880
Q11	It is crucial to have policy support that ensures equal opportunity in order to solve the gender inequality in science.	4.04	4.08	-0.32	0.751
N		70	979		

Q1. **Female scientists are limited in how much they can succeed in science compared to male scientists.**

Table 4-11-3. Comparative survey result of Q1 by age, occupation and marital status in Pakistan

		N	Average	Standard deviation	F	*P*
	Total	70	3.27	0.992		
Age	20s or younger	28	3.25	1.041	0.34	0.79
	30s	27	3.19	1.001		
	40s	4	3.25	1.5		
	50s or older	11	3.55	0.688		
Occupation	Scientist	19	3.47	0.841	0.91	0.46
	Engineer	29	3.03	1.117		
	Professional medical staff	15	3.33	0.976		
	Student	5	3.40	0.894		
	Others	29	3.03	1.117		
Marital status	Single	25	3.20	1.155	0.67	0.57
	Married	42	3.33	0.902		
	Divorced	2	2.50	0.707		
	Other	1	4.00			
No. of children	None	39	3.26	1.019	0.13	0.94
	1	4	3.00	1.155		
	2	18	3.33	0.840		
	3 or more	9	3.33	1.225		

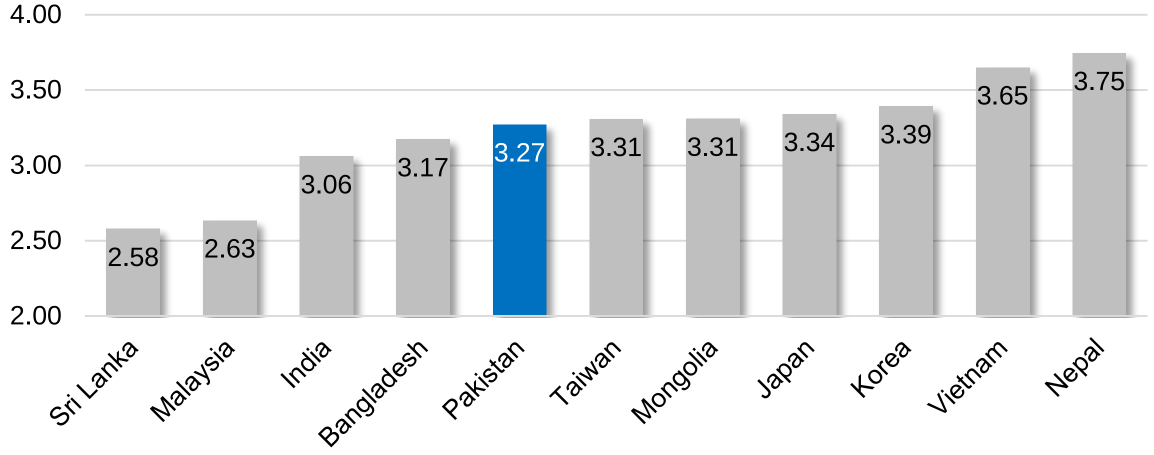


Figure 4-11-2. Average point of Q1 of Pakistan

Q2. **Men have an advantage over women in Science.**

The tendency of believing that women face greater disadvantage in the science sector resulted in an average score of 4.00 among scientists, revealing a statistically significant difference compared to scores of 2.97 among engineers and 3.07 among medical professionals.

Table 4-11-4. Comparative survey result of Q2 by age, occupation and marital status in Pakistan

		N	Average	Standard deviation	F	*P*
	Total	70	3.29	1.079		
Age	20s or younger	28	3.18	1.156	0.42	0.74
	30s	27	3.26	0.984		
	40s	4	3.75	1.258		
	50s or older	11	3.45	1.128		
Occupation	Scientist	19	4.00	0.667	3.91	0.01
	Engineer	29	2.97	1.180		
	Professional medical staff	15	3.07	0.961		
	Student	2	4.00	0.000		
	Others	5	2.80	1.095		
Marital status	Single	25	3.48	1.085	1.13	0.34
	Married	42	3.24	1.031		
	Divorced	2	2.50	2.121		
	Other	1	2.00			
No. of children	None	39	3.33	1.084	0.41	0.75
	1	4	3.50	1.000		
	2	18	3.06	1.056		
	3 or more	9	3.44	1.236		

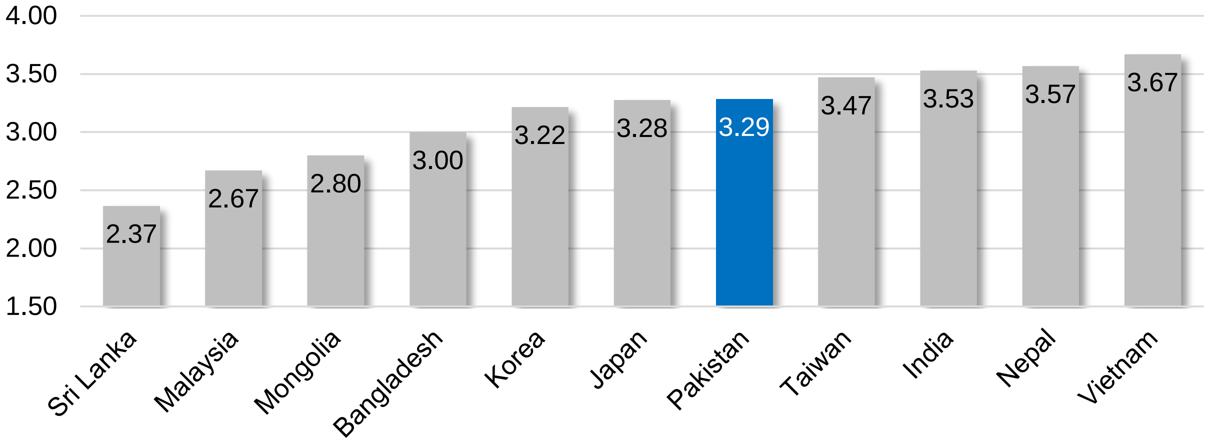


Figure 4-11-3. Average point of Q2 of Pakistan

Q3. **To attain a masters or doctoral degree, women should work harder and take longer time to finish their studies than men.**

Table 4-11-5. Comparative survey result of Q3 by age, occupation and marital status in Pakistan

		N	Average	Standard deviation	F	*p*
	Total	70	2.80	1.246		
Age	20s or younger	28	2.79	1.424	0.01	1.00
	30s	27	2.81	1.210		
	40s	4	2.75	1.258		
	50s or older	11	2.82	0.982		
Occupation	Scientist	19	2.74	1.098	0.97	0.43
	Engineer	29	2.72	1.412		
	Professional medical staff	15	2.80	1.082		
	Student	2	4.50	0.707		
	Others	5	2.80	1.304		
Marital status	Single	25	2.60	1.354	0.59	0.62
	Married	42	2.88	1.194		
	Divorced	2	3.00	1.414		
	Other	1	4.00			
No. of children	None	39	2.77	1.347	0.54	0.66
	1	4	3.50	1.000		
	2	18	2.83	1.200		
	3 or more	9	2.56	1.014		

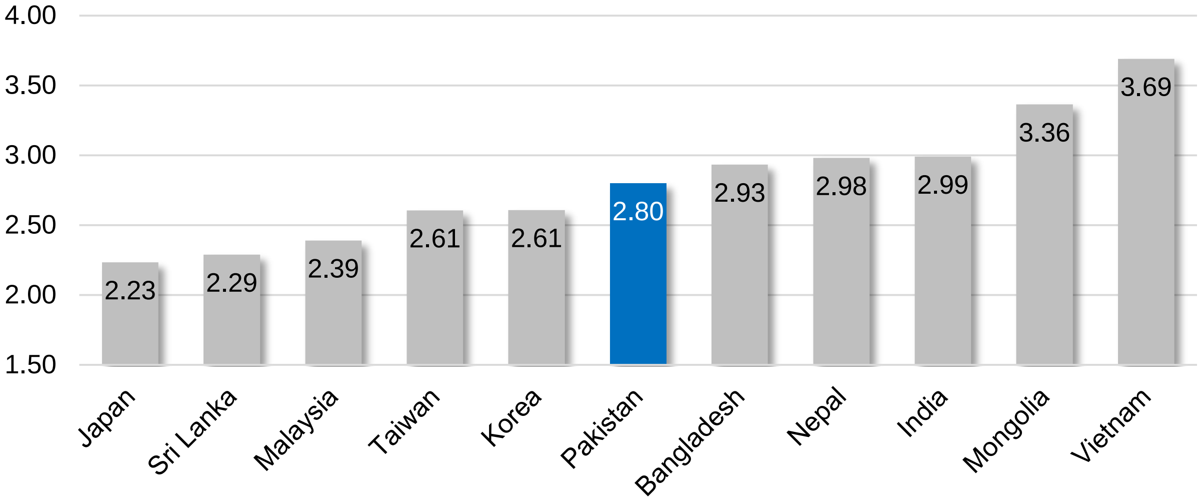


Figure 4-11-4. Average point of Q3 of Pakistan

Q4. **I have experienced some disadvantages to lead or participate in a research project because I am a woman.**

Table 4-11-6. Comparative survey result of Q4 by age, occupation and marital status in Pakistan

		N	Average	Standard deviation	F	*p*
	Total	70	2.80	1.016		
Age	20s or younger	28	2.89	0.994	0.46	0.71
	30s	27	2.78	1.013		
	40s	4	2.25	1.258		
	50s or older	11	2.82	1.079		
Occupation	Scientist	19	2.89	0.737	2.00	0.10
	Engineer	29	3.03	1.149		
	Professional medical staff	15	2.33	0.900		
	Student	2	3.50	2.121		
	Others	5	2.20	0.447		
Marital status	Single	25	3.00	1.000	0.84	0.48
	Married	42	2.71	1.043		
	Divorced	2	2.00	0.000		
	Other	1	3.00			
No. of children	None	39	2.97	0.932	1.18	0.33
	1	4	2.50	0.577		
	2	18	2.72	1.227		
	3 or more	9	2.33	1.000		

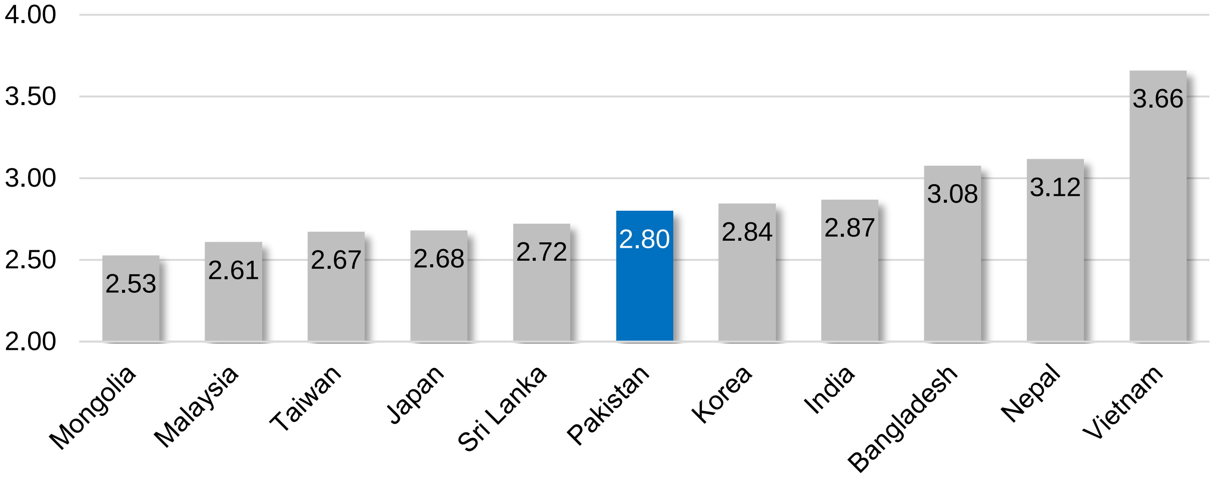


Figure 4-11-5. Average point of Q4 of Pakistan

Q5. **I have experienced some disadvantages in research funding or scholarships because I am a woman.**

Asked if they had experienced gender discrimination in terms of accessibility to financial resources such as research funds and scholarships, the respondents in Pakistan scored 2.33, showing a relatively favorable circumstance. Sub-groups divided by demographic factors, however, demonstrate statistically significant differences. Whereas the average scores of those in their 20s was 2.00, the score climbed to 2.48 and 2.82 among those in their 30s and 50s, respectively, indicating a higher chance of experiencing discrimination among older groups. Considering the age brackets, it can be concluded that those who have the most need to take the lead in securing financial resources for research projects have most likely experienced gender discrimination. By occupation, scientists scored an average of 2.74, while engineers and medical professionals had lower averages of 2.00 and 2.40, respectively. Compared to engineers and medical professionals who have to distribute resources according to clear objectives of their organization, the group of scientists seems to have more arbitrary distribution of resources and more discrimination against women. The difference resulting from marital status and the number of children did not reveal statistical significance.

Table 4-11-7. Comparative survey result of Q5 by age, occupation and marital status in Pakistan

		N	Average	Standard deviation	F	*p*
	Total	70	2.33	0.775		
Age	20s or younger	28	2.00	0.471	3.96	0.01
	30s	27	2.48	0.802		
	40s	4	2.25	1.258		
	50s or older	11	2.82	0.874		
Occupation	Scientist	19	2.74	0.806	3.00	0.02
	Engineer	29	2.00	0.655		
	Professional medical staff	15	2.40	0.737		
	Student	2	2.50	0.707		
	Others	5	2.40	0.894		
Marital status	Single	25	2.24	0.663	1.87	0.14
	Married	42	2.36	0.821		
	Divorced	2	2.00	0.000		
	Other	1	4.00			
No. of children	None	39	2.31	0.731	0.59	0.62
	1	4	2.00	0.816		
	2	18	2.50	0.857		
	3 or more	9	2.22	0.833		

Compared to the ten other countries, Pakistan scored an average of 2.33, ranking third, but the difference between the average scores of Pakistan and those of the ten other countries did not indicate any statistical significance

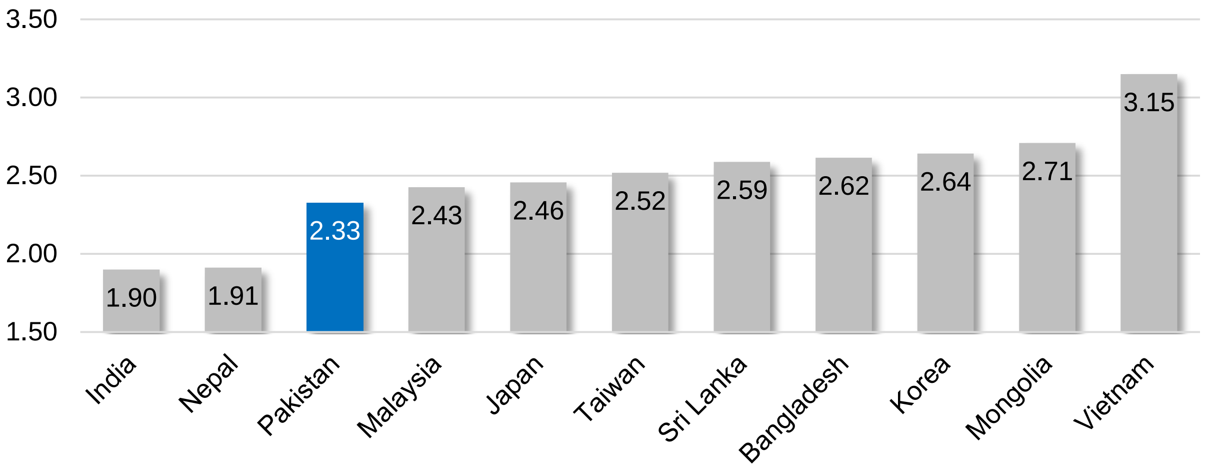


Figure 4-11-6. Average point of Q5 of Pakistan

Q6. **Becoming a tenured professor, being promoted or becoming a principal investigator is more difficult for female scientists than for male scientists.**.

Table 4-11-8. Comparative survey result of Q6 by age, occupation and marital status in Pakistan

		N	Average	Standard deviation	F	*p*
	Total	70	3.04	1.055		
Age	20s or younger	28	2.75	0.967	1.89	0.14
	30s	27	3.19	1.145		
	40s	4	2.75	1.500		
	50s or older	11	3.55	0.688		
Occupation	Scientist	19	3.26	1.098	0.83	0.51
	Engineer	29	2.93	0.961		
	Professional medical staff	15	2.80	1.207		
	Student	2	3.00	1.414		
	Others	5	3.60	0.894		
Marital status	Single	25	3.04	1.060	0.93	0.43
	Married	42	3.07	1.068		
	Divorced	2	2.00	0.000		
	Other	1	4.00			
No. of children	None	39	3.05	1.025	0.85	0.47
	1	4	3.50	0.577		
	2	18	2.78	1.114		
	3 or more	9	3.33	1.225		

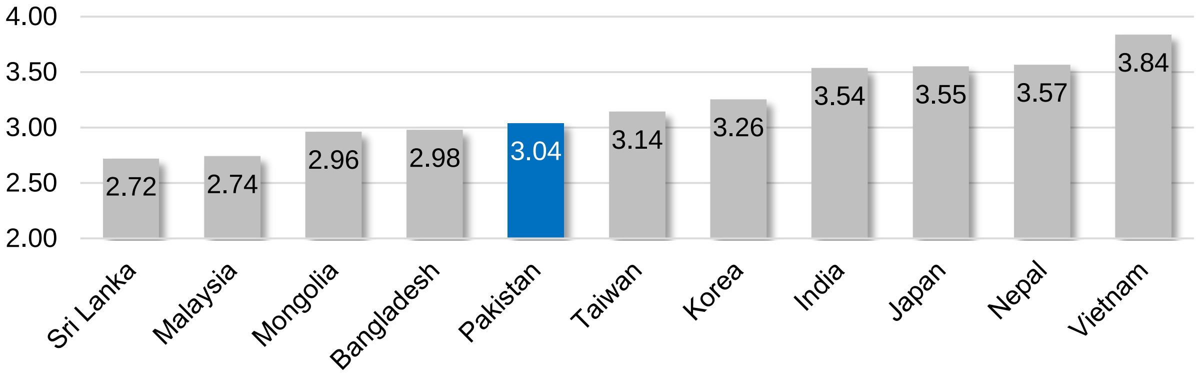


Figure 4-11-7. Average point of Q6 of Pakistan

Q7. **There are more men than women among those with similar or more professional experience than mine.**

Asked if they saw any gender difference in the makeup of the organization they were working in, the Pakistani respondents scored an average of 3.73, ranking seventh out of the 11 countries and belonging to the mid-range group. By occupation, the score among scientists was 3.68, while scores among engineers and medical professionals were 4.17 and 3.13, respectively. The tendency of organizations of engineers (presumably corporations) to have the highest averages and organizations of medical professionals (medical institutions) to have the lowest averages is a commonly observed one in many countries surveyed. Demographic factors such as age, marital status, and the number of children did not suggest a statistically significant difference.

Table 4-11-9. Comparative survey result of Q7 by age, occupation and marital status in Pakistan

		N	Average	Standard deviation	F	*p*
	Total	70	3.73	0.977		
Age	20s or younger	28	4.07	0.813	2.64	0.06
	30s	27	3.52	1.051		
	40s	4	4.00	0.000		
	50s or older	11	3.27	1.104		
Occupation	Scientist	19	3.68	0.885	5.69	0.00
	Engineer	29	4.17	0.658		
	Professional medical staff	15	3.13	1.125		
	Student	2	2.00	0.000		
	Others	5	3.80	1.095		
Marital status	Single	25	3.88	1.013	0.36	0.78
	Married	42	3.64	0.983		
	Divorced	2	3.50	0.707		
	Other	1	4.00			
No. of children	None	39	3.87	0.923	0.68	0.57
	1	4	3.50	1.000		
	2	18	3.50	1.098		
	3 or more	9	3.67	1.000		

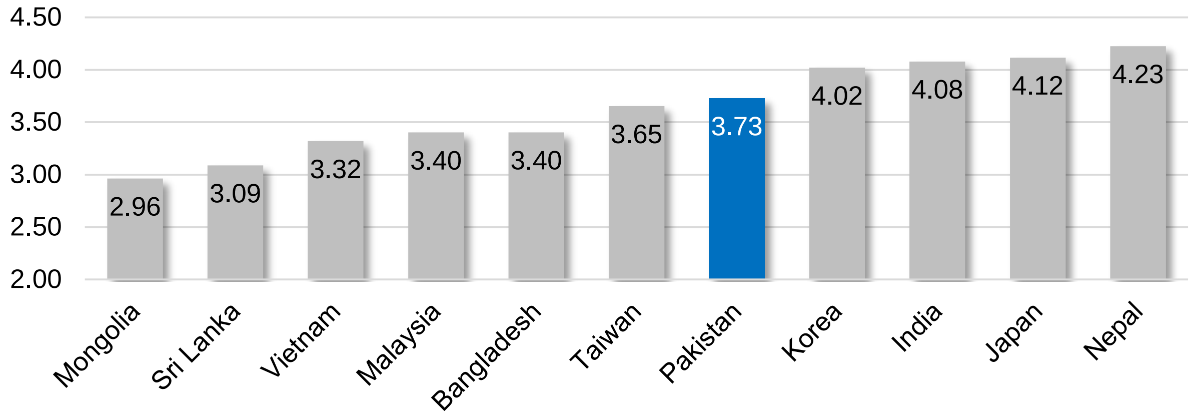


Figure 4-11-8. Average point of Q7 of Pakistan

Q8. **Girls who are entering college today will be studying in a better (more gender equal) environment than I did.**

Table 4-11-10. Comparative survey result of Q8 by age, occupation and marital status in Pakistan

		N	Average	Standard deviation	F	*p*
	Total	70	3.59	0.860		
Age	20s or younger	28	3.46	0.881	0.35	0.79
	30s	27	3.63	0.926		
	40s	4	3.75	0.500		
	50s or older	11	3.73	0.786		
Occupation	Scientist	19	3.74	0.806	2.18	0.08
	Engineer	29	3.59	0.825		
	Professional medical staff	15	3.13	0.990		
	Student	2	4.50	0.707		
	Others	5	4.00	0.000		
Marital status	Single	25	3.60	0.957	0.25	0.86
	Married	42	3.55	0.832		
	Divorced	2	4.00	0.000		
	Other	1	4.00			
No. of children	None	39	3.64	0.843	1.30	0.28
	1	4	4.00	0.000		
	2	18	3.28	0.958		
	3 or more	9	3.78	0.833		

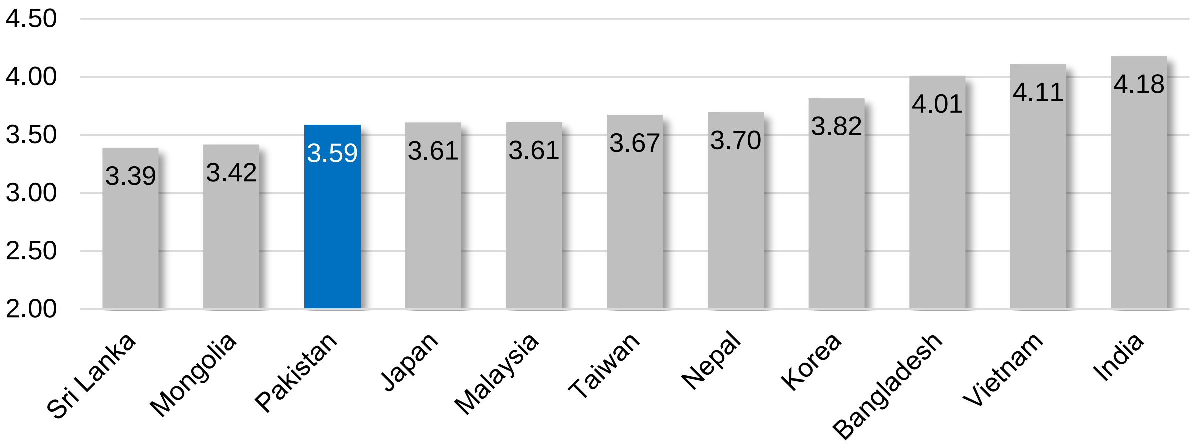


Figure 4-11-9. Average point of Q8 of Pakistan

Q9. **There is a difference in ability (math, analytical skills, logical thinking, etc) that needs to be acquired in science for men and women.**

Table 4-11-11. Comparative survey result of Q9 by age, occupation and marital status in Pakistan

		N	Average	Standard deviation	F	*p*
	Total	70	2.84	1.072		
Age	20s or younger	28	2.75	1.041	0.44	0.72
	30s	27	2.81	1.178		
	40s	4	2.75	0.957		
	50s or older	11	3.18	0.982		
Occupation	Scientist	19	3.05	0.970	0.62	0.65
	Engineer	29	2.76	1.023		
	Professional medical staff	15	2.80	1.207		
	Student	2	3.50	2.121		
	Others	5	2.40	1.140		
Marital status	Single	25	2.72	1.100	0.52	0.67
	Married	42	2.88	1.064		
	Divorced	2	3.00	1.414		
	Other	1	4.00			
No. of children	None	39	2.90	1.046	0.14	0.93
	1	4	3.00	1.155		
	2	18	2.72	1.127		
	3 or more	9	2.78	1.202		

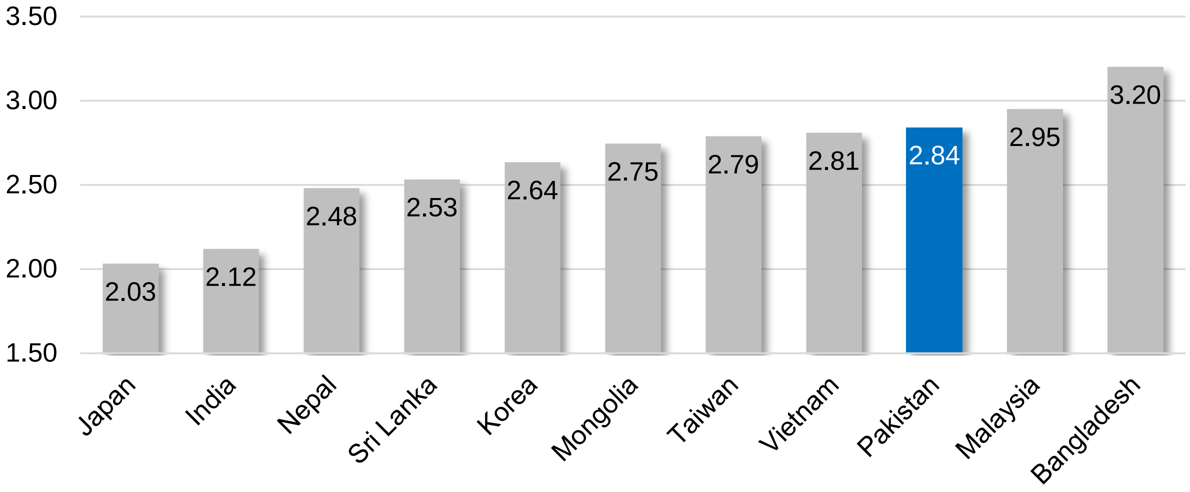


Figure 4-11-10. Average point of Q9 of Pakistan

Q10. **Having to balance work and life (marriage and child care) is a handicap for women.**

Table 4-11-12. Comparative survey result of Q10 by age, occupation and marital status in Pakistan

		N	Average	Standard deviation	F	*p*
	Total	70	3.80	0.942		
Age	20s or younger	28	3.64	0.870	1.25	0.30
	30s	27	4.00	0.832		
	40s	4	4.25	0.500		
	50s or older	11	3.55	1.368		
Occupation	Scientist	19	3.95	0.780	0.22	0.93
	Engineer	29	3.76	0.988		
	Professional medical staff	15	3.67	1.113		
	Student	2	4.00	0.000		
	Others	5	3.80	1.095		
Marital status	Single	25	3.72	0.792	1.44	0.24
	Married	42	3.88	1.017		
	Divorced	2	4.00	0.000		
	Other	1	2.00			
No. of children	None	39	3.67	0.838	1.30	0.28
	1	4	4.00	0.816		
	2	18	3.78	1.215		
	3 or more	9	4.33	0.707		

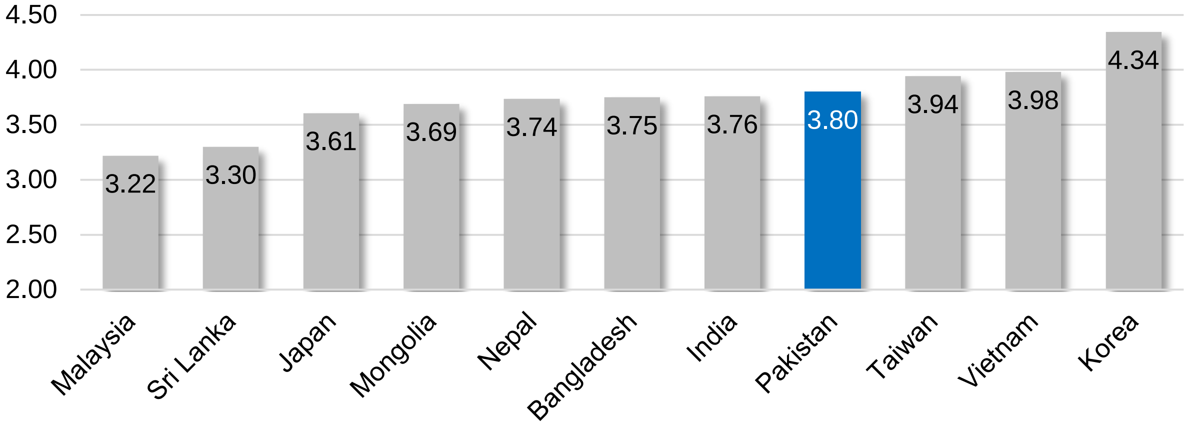


Figure 4-11-11. Average point of Q10 of Pakistan

Q11. **It is crucial to have policy support that ensures equal opportunity in order to solve the gender inequality in science.**

Table 4-11-13. Comparative survey result of Q11 by age, occupation and marital status in Pakistan

		N	Average	Standard deviation	F	*p*
	Total	70	4.04	0.824		
Age	20s or younger	28	3.71	0.937	3.08	0.03
	30s	27	4.22	0.698		
	40s	4	4.00	0.816		
	50s or older	11	4.45	0.522		
Occupation	Scientist	19	4.11	0.737	0.32	0.86
	Engineer	29	3.97	0.906		
	Professional medical staff	15	4.20	0.676		
	Student	2	4.00	1.414		
	Others	5	3.80	1.095		
Marital status	Single	25	3.84	0.898	0.82	0.49
	Married	42	4.17	0.794		
	Divorced	2	4.00	0.000		
	Other	1	4.00			
No. of children	None	39	3.85	0.844	2.51	0.07
	1	4	4.50	0.577		
	2	18	4.11	0.832		
	3 or more	9	4.56	0.527		

In regard to the question about the need for policy consideration to relieve gender discrimination, Pakistan recorded an average score of 4.04, the 5th among the 11 countries, close to the total mean value. By age group, whereas those in their 20s scored 3.71, those in their 30s and 50s scored 4.22 and 4.45, respectively, showing greater need for policy among older age groups. This result also indicated a statistically significant difference. No particular difference in average scores was found in terms of occupation and marital status. In addition, whereas the average among those without children was 3.85, the average scores rose to 4.50 and 4.56 among those with one and three or more children, respectively, implying that parents feel greater need for policy consideration.

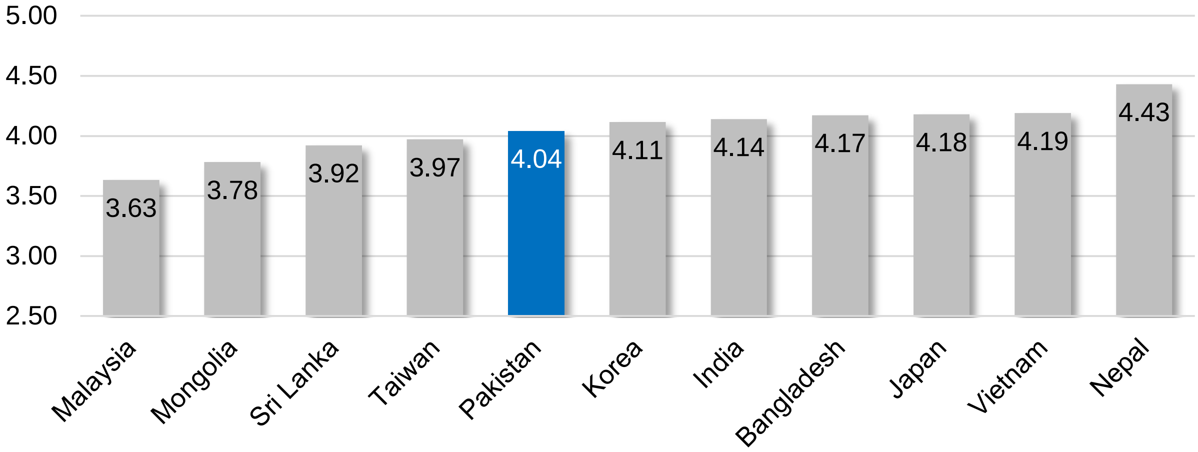


Figure 4-11-12. Average point of Q11 of Pakistan

4.2.11 Republic of Korea

A total of 148 respondents participated in the survey in Republic of Korea. Unlike the survey conducted in 2014, 30 professionals in medicine, nursing, and health science participated in the survey, enabling this study to reflect a wider scope of opinions. Except for the five respondents in their 20s, the number of participants in other age groups was proportionately distributed, with 40 in their 30s, 55 in their 40s, and 48 in their 50s.

Table 4-12-1. Status of survey participants in Republic of Korea

		N	%
Age	20s or younger	5	3.4
	30s	40	27.0
	40s	55	37.2
	50s or older	48	32.4
Occupation	Scientist	98	66.2
	Engineer	20	13.5
	Professional medical staff	30	20.3
Job	Student	1	.7
	Professor/teacher	60	40.5
	Researcher	74	50.0
	Manager	8	5.4
	Professional medical staff	2	1.4
	Engineer	1	.7
	Other	2	1.4
Marital status	Single	40	27.0
	Married	104	70.3
	Divorced	2	1.4
	Other	2	1.4
No. of children	None	64	43.2
	1	27	18.2
	2	50	33.8
	3 or more	7	4.7
Total		148	100

Considering the topic of glass ceiling for women in science and technology, the makeup of the sample in terms of age was suitable to satisfy the purpose of the research. By occupation, the number of scientists was the most at 98 (66.2%), followed by 20 engineers (13.5%), and 30 medical professionals (20.3%); the dominant ratio of scientists reflects the fact that the majority of participants in the survey were members of the Association of Korean Woman Scientists and Engineers (KWSE).

By specific job category, 60 professors (40.5%) and 74 professional researchers (50%) took the largest shares; 8 managers (5.4%) and 2 medical practitioners also took part in the survey. The two medical professionals had majored in professional medical disciplines and were working as medical professionals, not as professors or researchers. The majority of respondents were married (104 respondents, 70.3%); the number of single respondents stood at only 40, or 27%. In terms of the number of children, one of the most influential factors when it comes to women's social participation, 64 respondents (43.2%) reported that they did not have children; the numbers of those with one, two, and three or more children were 27 (18.2%), 50 (33.8%), and 7 (4.7%), respectively.

Compared to the average score of 3.25 of the ten other countries, Republic of Korea recorded a higher average score of 3.35 for all 11 questions. This difference alone may not be sufficient to conclusively say that Korean women working in the science and technology fields face a stronger glass ceiling than do those in other countries. This is because this study was based on a wider aspect of the glass ceiling phenomenon, meaning that it was based on their level of personal expectation. If the level of expectation is high, the degree of dissatisfaction in reality may be expressed as relatively greater (Oliver, 1977). According to a number of studies on the elimination of discrimination, when a country with severe racial, gender, or religious discrimination and extremely limited social participation of a particular population group finally begins to institutionally guarantee equal social participation through legal, policy, social, or cultural reforms, the level of dissatisfaction among the group of people subject to restricted social participation rapidly drops as a result of their comparing their current liberty to the past. After a certain period, however, they gradually compare themselves to the current privileged class, experiencing an increasing degree of dissatisfaction. Since each question in this survey reflects such psychological factors, simply comparing the results for different countries may be in fact of no particular significance. However, it is still noteworthy that Korean participants responded with a higher score than women from the other 10 countries. A follow up study may be able to reveal more interesting interpretations on these facts.

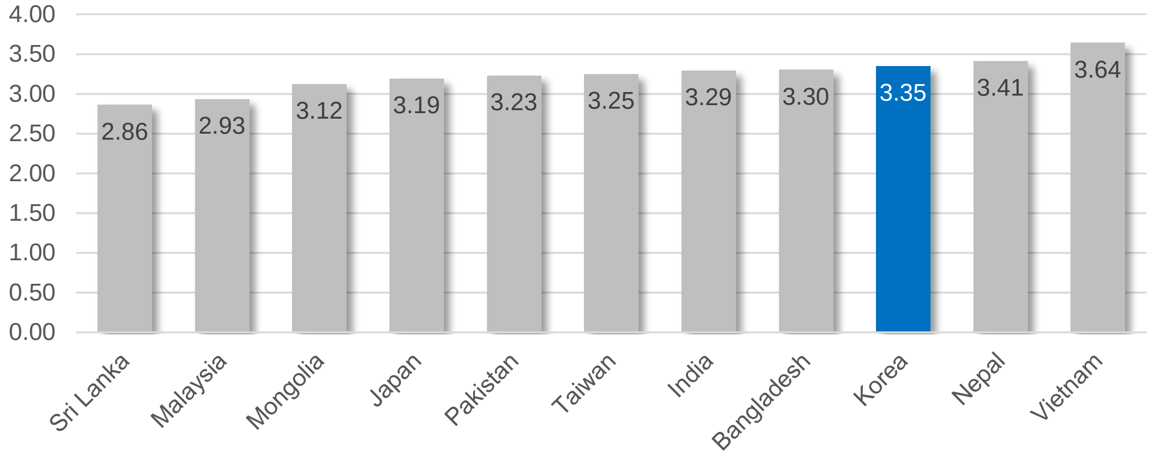


Figure 4-12-1. Average point of Republic of Korea

Out of the 11 questions, statistically significant differences were observed for four questions with other countries. In the case of Q3 about discrimination against women in the course of earning a degree, Republic of Korea showed a lower average compared to those of other countries, suggesting more equal competition between the two genders in university education, including doctoral programs.

On the other hand, asked in Q5 if gender discrimination existed in terms of financial support such as scholarships and research funds, the respondents in the Republic of Korea scored a higher average than their counterparts did, with a statistically significant difference. Additionally, asked in Q7 whether they had more men than women at their rank of employment, the Korean respondents scored higher again. Among the entire set of 11 questions, the largest difference was found in Q10, asking if childbirth and child-rearing restricted women's professional careers. The average scores of Republic of Korea stood at 4.34, quite higher than the average scores of 3.69 of the ten other countries. This implies that the social environment in Republic of Korea needs improvement to support women's childbirth and subsequent child-rearing, and therefore the country needs to devise better policy measures to, for instance, improve the world's lowest birthrate.

Table 4-12-2. Comparison of average value in Republic of Korea

	Question	Republic of Korea	Except Republic of Korea	t	*(p)*
Q1	Female scientists are limited in how much they can succeed in science compared to male scientists.	3.39	3.22	1.849	.066
Q2	Men have an advantage over women in Science.	3.22	3.20	.179	.858
Q3	To attain a masters or doctoral degree, women should work harder and take longer time to finish their studies than men.	2.61	2.82	-2.196	**.029**
Q4	I have experienced some disadvantages to lead or participate in a research project because I am a woman.	2.84	2.90	-.575	.566
Q5	I have experienced some disadvantages in research funding or scholarships because I am a woman.	2.64	2.45	2.146	**.032**
Q6	Becoming a tenured professor, being promoted or becoming a principal investigator is more difficult for female scientists than for male scientists.	3.26	3.24	.176	.860
Q7	There are more men than women among those with similar or more professional experience than mine.	4.02	3.63	4.177	**.000**
Q8	Girls who are entering college today will be studying in a better (more gender equal) environment than I did.	3.82	3.76	.757	.449
Q9	There is a difference in ability (math, analytical skills, logical thinking, etc) that needs to be acquired in science for men and women.	2.64	2.64	-.064	.949
Q10	Having to balance work and life (marriage and child care) is a handicap for women.	4.34	3.69	7.240	**.000**
Q11	It is crucial to have policy support that ensures equal opportunity in order to solve the gender inequality in science.	4.11	4.07	.555	.579

Q1. **Female scientists are limited in how much they can succeed in science compared to male scientists.**

As a result of age-wise analysis, the respondents in their 30s recorded the lowest score of 3.20; those in their 40s had the highest at 3.69. The widest gap between those in their 30s, who have just reached the mid-rank within their organization, and those in their 40s, who now have to climb toward the top rank, clearly indicates the existence of a glass ceiling. The ANOVA analysis of age-wise differences found a result slightly short of the 95% significance level, which suggests statistical significance, but the ex-post analysis of averages between those in their 30s and 40s resulted in a statistically significant difference.

Table 4-12-3. Comparative survey result of Q1 by age, occupation and marital status in Republic of Korea

		N	Average	Standard deviation	F	*p*
	Total	148	3.39	1.03		
Age	20s or younger	5	3.40	0.55	2.58	.056
	30s	40	3.20	0.94		
	40s	55	3.69	1.07		
	50s or older	48	3.21	1.05		
Occupation	Scientist	98	3.42	1.04	1.15	.319
	Engineer	20	3.60	1.10		
	Professional medical staff	30	3.17	0.95		
Marital status	Single	40	3.10	1.128	2.14	.098
	Married	104	3.52	0.965		
	Divorced	2	3.50	2.121		
	Other	2	2.50	0.707		
No. of children	None	64	3.25	1.024	1.59	.194
	1	27	3.74	0.984		
	2	50	3.42	1.012		
	3 or more	7	3.14	1.345		

Whereas the 98 scientists scored an average of 3.42, the group of engineers—which field tends to have far fewer women than men—scored 3.60. Also, the lowest average score of 3.17 was obtained among the 30 professionals in medicine, a field known to have the least level of gender discrimination and narrowest gap between the ratio of men and women. By marital status, the single respondents recorded an average score of 3.10, but those who were married scored higher at 3.52. This result suggests that the burden of married women to take care of both their professional career and household affairs works against promotion within their organization, which is also supported by the results of other questions. The ANOVA analysis did not find a statistically significant difference, but the one-on-one ex-post analysis confirmed a statistically significant difference at the significance level of 95% between single and married respondents.

In terms of the number of children, which is considered one of the biggest obstacle to women's professional career, whereas those without children (64 respondents) scored an average of 3.25, the score obtained by those with one child was much higher at 3.74. The one-on-one ex-post analysis also verified a statistically significant difference between those two groups of respondents. The average score fell again to 3.42 and 3.14 among those with two and three or more children, respectively. This can be interpreted in two ways: first, when women who already experienced child-rearing give birth to a second child, the burden of rearing the second child may be felt less strongly because of familiarity and previous experience of child-rearing; otherwise, it can be concluded that women for whom child-rearing is not a great burden in their career (e.g. those who have a supportive environment) are more likely to have a second child.
In an international comparison, Republic of Korea ranked ninth out of 11 countries (lower scores meaning weaker glass ceiling), the same place in the overall average among all nations surveyed. Only Vietnam (3.65) and Nepal (3.75) recorded higher glass-ceiling scores than that of Republic of Korea. However, the independent sample t test that compared Korea's average with the average scores of the ten other countries did not find any statistically significant difference at the 95% significance level, with a significance probability of 6.6%.

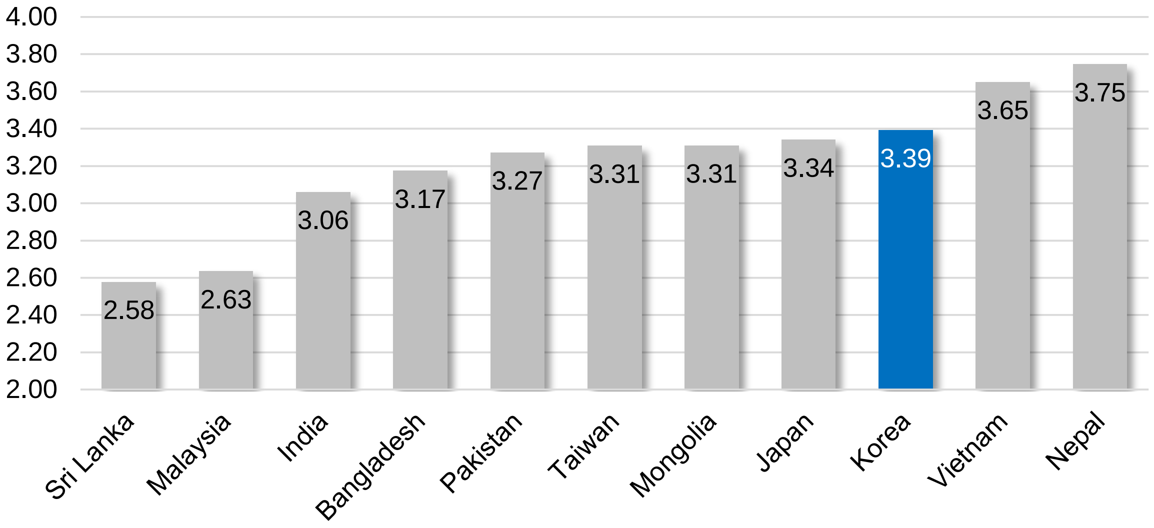


Figure 4-12-2. Average point of Q1 of Republic of Korea

Q2. **Men have an advantage over women in Science.**

Asked in Q2 if men have greater advantage than women in science, the respondents in Republic of Korea did not show considerable differences among sub-groups; the ANOVA analysis also did not observe a statistically significant difference at the significance level of 95%. Whereas those in their 30s scored 3.08, those in their 40s recorded an average score of 3.31, suggesting that the conditions for competition of women in science improved over the past decade. The ANOVA analysis of all age groups did not find a statistically significant difference, but an ex-post analysis comparing those in their 30s and 40s confirmed a statistically significant difference at the 95% significance level. Since only five participants in their 20s responded to the survey, it is difficult to expect meaningful analysis results concerning this age group. By occupation, the groups of scientists and engineers scored 3.14 and 3.15, respectively, without showing particular difference, but medical professionals had a higher average score of 3.50. However, the ANOVA analysis did not observe a statistically significant difference; one-on-one ex-post analysis did not either. The sub-groups divided by marital status and the number of children did not demonstrate a significant difference in average scores or a statistically significant difference.

Table 4-12-4. Comparative survey result of Q2 by age, occupation and marital status in Republic of Korea

		N	Average	Standard deviation	F	*p*
	Total	148	3.22	1.08		
Age	20s or younger	5	3.40	0.89	0.41	.747
	30s	40	3.08	0.94		
	40s	55	3.31	1.14		
	50s or older	48	3.21	1.15		
Occupation	Scientist	98	3.14	1.18	1.31	.274
	Engineer	20	3.15	1.04		
	Professional medical staff	30	3.50	0.68		
Marital status	Single	40	3.15	1.145	1.30	.276
	Married	104	3.23	1.054		
	Divorced	2	4.50	0.707		
	Other	2	2.50	0.707		
No. of children	None	64	3.28	1.061	0.21	.887
	1	27	3.22	1.155		
	2	50	3.16	1.057		
	3 or more	7	3.00	1.291		

For Q2, Republic of Korea showed an average score of 3.22, similar to the average score of 3.20 of the ten other countries; no statistically significant difference was observed. When the 11 countries' averages were compared with each other, Republic of Korea ranked fifth, reaching closer to the mean value compared to the country's values for other questions.

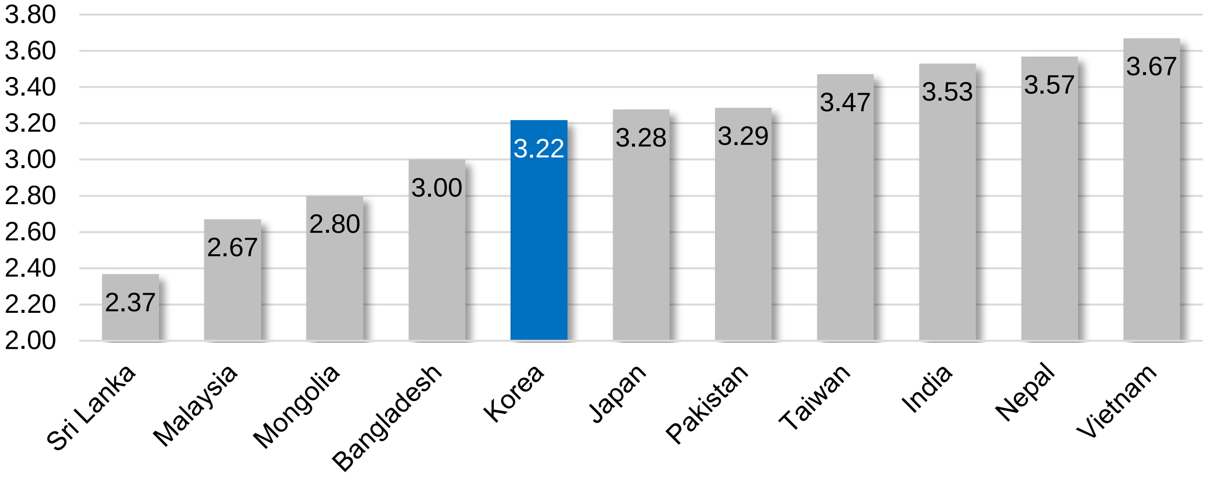


Figure 4-12-3 Average point of Q2 of Republic of Korea

Q3. **To attain a masters or doctoral degree, women should work harder and take longer time to finish their studies than men.**

Asked about gender difference in the course of earning a degree, the Korean respondents scored 2.61, indicating no particular difference between the two genders in the degree-earning process after choosing the track of science and technology.

By age, whereas those in their 30s and 40s had similar average scores of 2.55 and 2.45, respectively, those in their 50s had a relatively higher score of 2.75. However, neither ANOVA analysis no ex-post analysis found any statistically significant difference.

The average scores among the different occupational groups did not show any considerable difference. The groups of scientists, engineers, and medical professionals scored 2.63, 2.50, and 2.60, respectively, with no particular statistical difference.

Table 4-12-5. Comparative survey result of Q3 by age, occupation and marital status in Republic of Korea

		N	Average	Standard deviation	F	*p*
	Total	148	2.61	1.06		
Age	20s or younger	5	3.40	0.89	1.66	.178
	30s	40	2.55	0.99		
	40s	55	2.45	0.98		
	50s or older	48	2.75	1.19		
Occupation	Scientist	98	2.63	1.12	0.13	.879
	Engineer	20	2.50	1.05		
	Professional medical staff	30	2.60	0.89		
Marital status	Single	40	2.23	0.920	4.91	.003
	Married	104	2.73	1.063		
	Divorced	2	4.50	0.707		
	Other	2	2.00	0.000		
No. of children	None	64	2.39	0.953	1.85	.141
	1	27	2.85	1.167		
	2	50	2.70	1.074		
	3 or more	7	3.00	1.291		

The results based on marital status demonstrated a clearly visible difference. Whereas single respondents showed a low level of gender gap in the degree-earning process, with an average score of 2.23, those who were married scored higher at 2.73, with a statistically significant difference at the 95% significance level. Considering the insignificant difference among various age groups, the difference between the single and married respondents does not suggest that single women who recently earned a degree had a more favorable environment than married respondents did, based on age difference. The more plausible explanation is that marital status worked as a decisive variant in obtaining a degree. In other words, marriage brings a social and psychological obstacle in having to deal with study and household affairs at the same time. This is also shown by the results based on the number of children, in Q3, and once again in Q10 about whether marriage, pregnancy, childbirth, and child-rearing served as obstacles to women's professional careers. Those with and without children demonstrated a remarkable difference in average scores. Whereas the respondents without children scored 2.39, those with one, two, and three or more children scored 2.85, 2.70, and 3.00, respectively, indicating higher scores among the respondents who are mothers, regardless of the number of children. When the independent sample t test was conducted to compare the groups of those with and those without children, a statistically significant difference was observed at the 95% significance level.

Compared to the overall average score of 2.82, Republic of Korea scored an average of 2.61, ranking fifth. The independent sample t test to compare Korea's average and the average scores of the ten other countries showed a statistically significant difference.

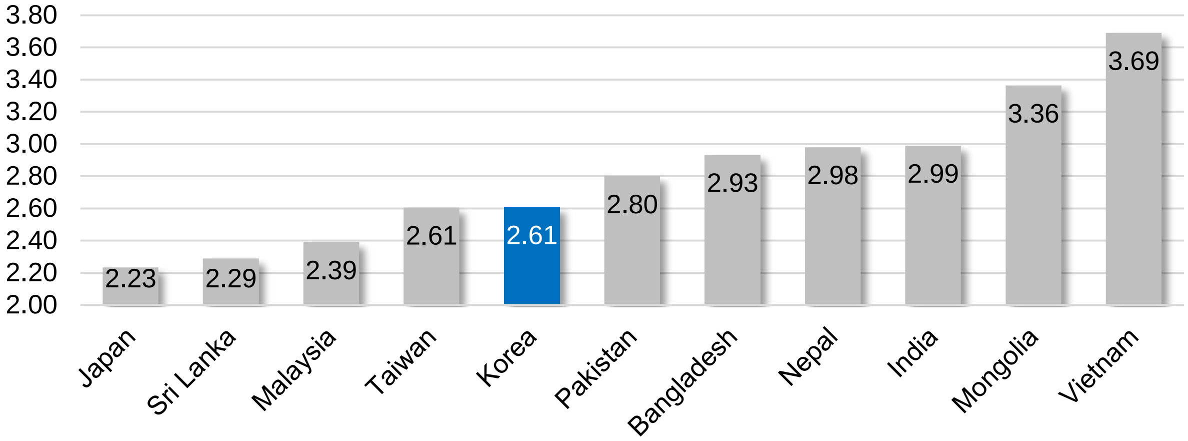


Figure 4-12-4. Average point of Q4 of Republic of Korea

Q4. **I have experienced some disadvantages to lead or participate in a research project because I am a woman.**

Asked whether they had experienced discrimination in terms of leading or accessing research projects central to their work as women scientists or engineers, the 148 respondents in Republic of Korea responded a favorable average score of 2.84.

Overall, Korea had an average below the mean value of 3.0, but older age groups tended to mark higher average scores. Those in their 30s and 40s scored 2.58 and 2.87, respectively, and those in their 50s, the generation that obtained a degree three decades ago, scored 3.13, indicating an experience of considerable discrimination while leading and participating in research projects. Both ANOVA analysis and ex-post analysis confirmed a statistically significant difference between those in their 50s and other age groups.

By occupation, whereas the group of scientists and medical professionals scored 2.81 and 2.80, respectively, engineers had a higher average score of 3.10. In other words, although those in science and medicine, the fields with relatively higher ratios of women, reported less discrimination in participating in research projects, engineers tended to acknowledge a certain level of discrimination. This difference was, however, observed to have no statistical significance as a result of ANOVA and ex-post analysis. Marital status and the number of children did not exert substantial influence over discrimination in women’s leading or participating in research projects. The average scores of single and married respondents were 2.78 and 2.87, respectively, and it is difficult to draw a meaningful conclusion from divorced respondents and those categorized as other since the number of them was only two each. Average scores were not significantly different between those with and without children, or among those with a different number of children.

Table 4-12-6. Comparative survey result of Q4 by age, occupation and marital status in Republic of Korea

		N	Average	Standard deviation	F	*p*
	Total	148	2.84	1.12		
Age	20s or younger	5	2.00	0.00	2.85	.039
	30s	40	2.58	1.06		
	40s	55	2.87	1.17		
	50s or older	48	3.13	1.08		
Occupation	Scientist	98	2.81	1.13	0.60	.549
	Engineer	20	3.10	0.97		
	Professional medical staff	30	2.80	1.19		
Marital status	Single	40	2.78	1.187	2.57	.056
	Married	104	2.87	1.071		
	Divorced	2	4.50	0.707		
	Other	2	1.50	0.707		
No. of children	None	64	2.80	1.250	0.27	.844
	1	27	2.78	1.086		
	2	50	2.90	0.953		
	3 or more	7	3.14	1.215		

Meanwhile, Republic of Korea had an average score of 2.84, similar to the average score of 2.90 of the ten other countries. The country placed seventh out of the 11 countries; no statistically significant difference was observed.

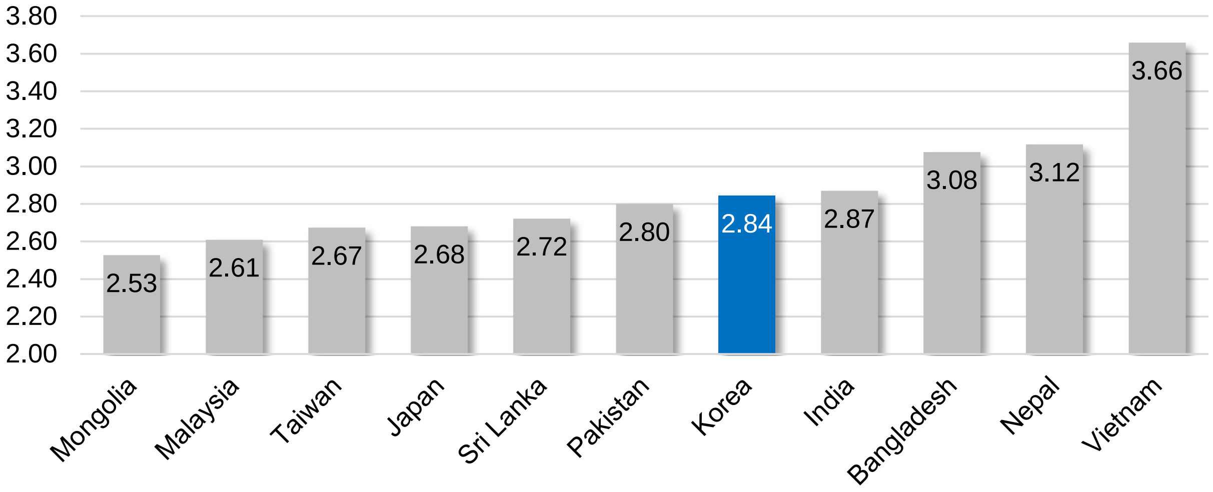


Figure 4-12-5. Average point of Q4 of Republic of Korea

Q5. **I have experienced some disadvantages in research funding or scholarships because I am a woman.**

This question asked about disadvantages in accessing financial resources such as research funds or scholarships, which is a factor reported in the United States, Europe, and other developed countries to have direct influence over research performance of women in science and technology. Republic of Korea had an overall average score of 2.64 with relatively favorable results, but the score was slightly higher than the average score of 2.45 among the ten other countries. This difference was found to have statistical significance as a result of an independent sample t test for average comparison. In terms of age difference, whereas those in their 30s and 40s scored similarly at 2.58 and 2.53, respectively, those in their 50s had a relatively higher average score of 2.88. However, neither ANOVA nor one-on-one ex-post analysis found a statistically significant difference. By occupation, the group of scientists, engineers, and medical professionals scored 2.65, 2.50, and 2.70, respectively, revealing no significant difference, and statistical analysis supported the result. The difference of perception resulting from marital status was analyzed and found to have statistical significance. Whereas single respondents scored only 2.38, those who were married showed a clearly higher average score of 2.75. According to the number of children, whereas those without children scored 2.47, the respondents with one, two, and three or more children scored 2.79, 2.76, and 2.86, respectively. The average score of those with children stood at 2.77, higher than that among childless respondents; this difference was confirmed to have statistical significance at the 95% significance level as a result of an independent sample t test.

Table 4-12-7. Comparative survey result of Q5 by age, occupation and marital status in Republic of Korea

		N	Average	Standard deviation	F	*p*
	Total	148	2.64	0.97		
Age	20s or younger	5	2.20	0.45	1.61	.189
	30s	40	2.58	0.96		
	40s	55	2.53	1.02		
	50s or older	48	2.88	0.94		
Occupation	Scientist	98	2.65	0.94	0.27	.762
	Engineer	20	2.50	0.83		
	Professional medical staff	30	2.70	1.15		
Marital status	Single	40	2.38	0.807	3.01	.032
	Married	104	2.75	1.002		
	Divorced	2	3.50	0.707		
	Other	2	1.50	0.707		
No. of children	None	64	2.47	0.925	1.23	.302
	1	27	2.78	1.050		
	2	50	2.76	0.916		
	3 or more	7	2.86	1.345		

Among the 11 countries, Republic of Korea ranked ninth, indicating a relatively lower accessibility of women to research funds.

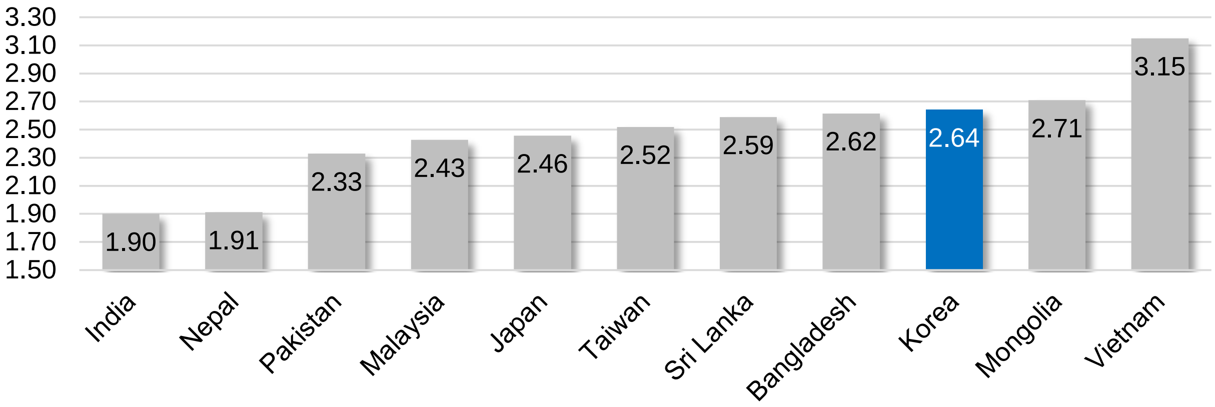


Figure 4-12-6. Average point of Q5 of Republic of Korea

Q6. **Becoming a tenured professor, being promoted or becoming a principal investigator is more difficult for female scientists than for male scientists.**

Asked if they saw an obstacle to reaching higher within their organization's hierarchy, the respondents in Republic of Korea scored an average of 3.26, similar to the average score of 3.24 of the ten other countries. By age, older respondents tended to report more difficulty in promotion, with average scores of 3.1, 3.29, and 3.38 among those in their 30s, 40s, and 50s, respectively. This result can be interpreted in two ways. First, as the awareness regarding gender equality and the glass ceiling has gradually improved across society, women who have recently begun professional careers are likely to have less experience of the glass-ceiling phenomenon. Second, it can be concluded that older women tend to be more sensitive to opportunities in promotion in an organizational hierarchy and more clearly perceive the invisible obstacles. Nevertheless, both ANOVA and one-on-one ex-post analysis failed to observe a statistically significant difference. By occupation, whereas scientists and engineers scored 3.36 and 3.25, respectively, medical professionals had a lower average score of 2.93. One of the reasons the group of medical professionals, which has the least gender makeup difference and discrimination among the three groups, had the lowest average score is probably that many participants were from the nursing department, in which the ratio of women tends to be much higher than that of men. Overall, neither ANOVA nor one-on-one ex-post analysis found a statistically significant difference, as was the case in terms of age group. By marital status, whereas single respondents scored 3.03, those who were married had a higher average at 3.36. However, no statistically significant difference was observed as a result of ANOVA or one-on-one ex-post analysis.

In terms of the number of children, those without children scored 3.19, while those with one, two, and three or more children scored 3.37, 3.22, and 3.71, respectively, but no statistically significant difference was observed.

Table 4-12-8. Comparative survey result of Q6 by age, occupation and marital status in Republic of Korea

		N	Average	Standard deviation	F	*p*
	Total	148	3.26	1.09		
Age	20s or younger	5	3.00	0.71	0.57	.635
	30s	40	3.10	0.98		
	40s	55	3.29	1.26		
	50s or older	48	3.38	1.00		
Occupation	Scientist	98	3.36	1.07	1.76	.176
	Engineer	20	3.25	1.12		
	Professional medical staff	30	2.93	1.11		
Marital status	Single	40	3.03	1.025	2.14	.098
	Married	104	3.36	1.105		
	Divorced	2	4.00	0.000		
	Other	2	2.00	0.000		
No. of children	None	64	3.19	1.052	0.61	.609
	1	27	3.37	1.043		
	2	50	3.22	1.130		
	3 or more	7	3.71	1.380		

Regarding this question, Republic of Korea’s average was seventh place out of 11 countries.

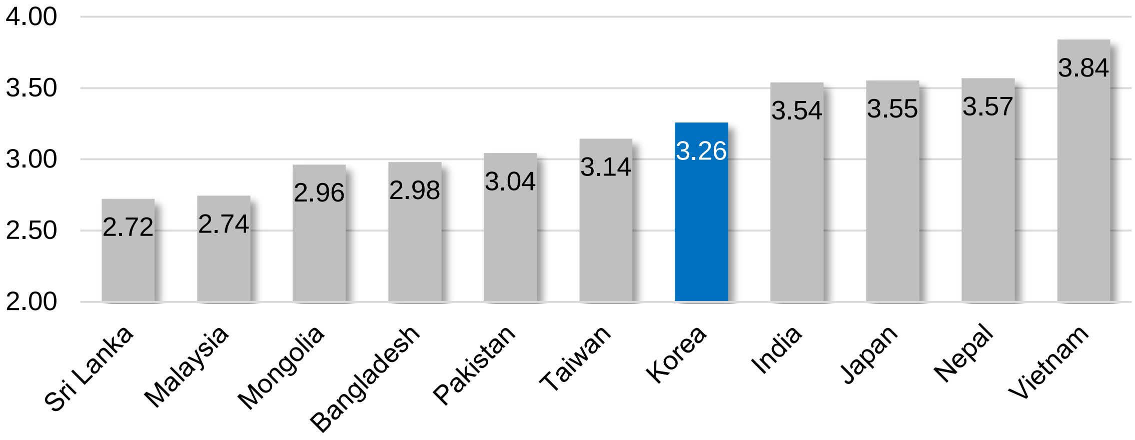


Figure 4-12-7. Average point of Q6 of Republic of Korea

Q7. **There are more men than women among those with similar or more professional experience than mine.**

Asked if they saw a different gender makeup at their workplace, the respondents in Republic of Korea scored an average of 4.02, higher than the ten-country average scores of 3.63; this result was confirmed to show a statistically significant difference.
By age, the average scores did not reveal considerable difference, with values of 3.90, 4.11, and 4.02 among those in their 30s, 40s, and 50s, respectively; no statistical significance was observed. By occupation, whereas the groups of scientists and engineers scored 4.11 and 4.60, respectively, medical professionals had a much lower average score of 3.13, indicating that the different ratios of men and women were dependent not on age difference, but on occupational areas. Occupational difference was also found to have statistical significance.
Marital status and the number of children did not reveal a statistically significant difference.

Table 4-12-9. Comparative survey result of Q7 by age, occupation and marital status in Republic of Korea

		N	Average	Standard deviation	F	*p*
	Total	148	4.02	1.12		
Age	20s or younger	5	4.00	0.71	0.26	.851
	30s	40	3.90	1.13		
	40s	55	4.11	1.20		
	50s or older	48	4.02	1.08		
Occupation	Scientist	98	4.17	0.95	15.53	.000
	Engineer	20	4.60	0.75		
	Professional medical staff	30	3.13	1.36		
Marital status	Single	40	3.93	1.269	2.49	.063
	Married	104	4.10	1.038		
	Divorced	2	4.00	1.414		
	Other	2	2.00	0.000		
No. of children	None	64	3.98	1.148	0.98	.403
	1	27	4.33	0.877		
	2	50	3.94	1.132		
	3 or more	7	3.71	1.604		

As a result of international comparison, Republic of Korea was ninth among 11 countries.

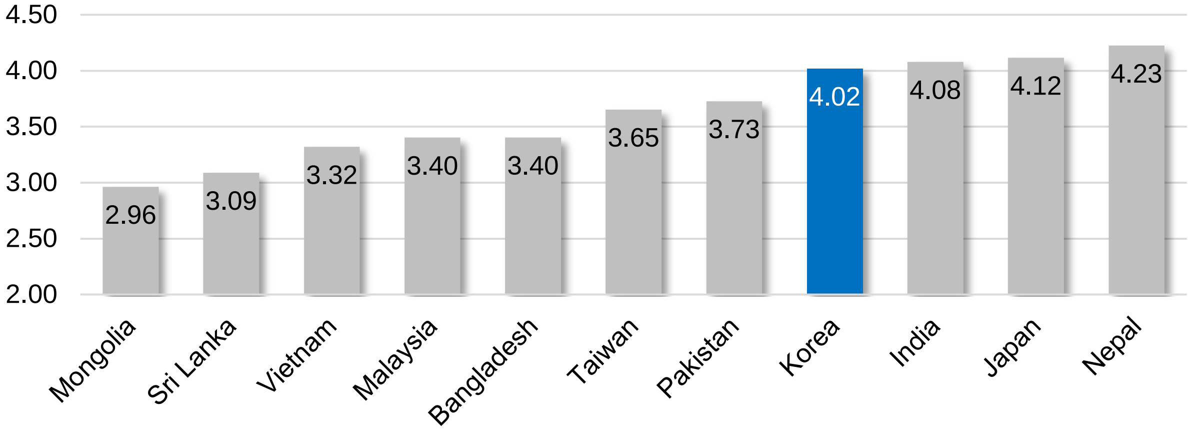


Figure 4-12-8. Average point of Q7 of Republic of Korea

Q8. **Girls who are entering college today will be studying in a better (more gender equal) environment than I did.**

Regarding the question about any environmental improvement in terms of glass ceiling, Republic of Korea reported an average score of 3.82, showing no substantial difference from the average score of 3.76 of the ten other countries; no statistically significant difference was observed.

By age, the average tended to increase among older generations, with scores of 3.45, 3.80, and 4.17 among those in their 30s, 40s, and 50s, respectively. This result implies that those who graduated from college a long time ago are more likely to expect that the current learning environment will improve in the future, and this age-wise result was analyzed and found to have a statistically significant difference. Among different occupational groups, scientists had the highest average score of 3.90, followed by engineers (3.70) and medical professionals (3.63), suggesting that scientists have more realistic experience of an improved learning environment. Although the ANOVA analysis comparing three groups at the same time did not reveal any statistically significant difference, one-on-one ex-post analysis confirmed a statistically significant difference between medical professionals and other groups.

Marital status and the number of children did not result in remarkably different averages. In other words, improvement regarding the glass ceiling in terms of gender gap and equality is mainly affected by different occupational areas.

Table 4-12-10. Comparative survey result of Q8 by age, occupation and marital status in Republic of Korea

		N	Average	Standard deviation	F	*p*
	Total	148	3.82	0.74		
Age	20s or younger	5	3.60	0.55	8.06	.000
	30s	40	3.45	0.68		
	40s	55	3.80	0.80		
	50s or older	48	4.17	0.56		
Occupation	Scientist	98	3.90	0.77	1.79	.171
	Engineer	20	3.70	0.47		
	Professional medical staff	30	3.63	0.76		
Marital status	Single	40	3.75	0.670	0.72	.539
	Married	104	3.83	0.769		
	Divorced	2	4.50	0.707		
	Other	2	4.00	0.000		
No. of children	None	64	3.83	0.747	0.17	.914
	1	27	3.89	0.641		
	2	50	3.78	0.815		
	3 or more	7	3.71	0.488		

Compared to the ten other countries surveyed, Republic of Korea scored an average of 3.82, ranking eighth. This implies that the Korean respondents are more likely to realize the level of environmental improvement concerning the glass-ceiling phenomenon.

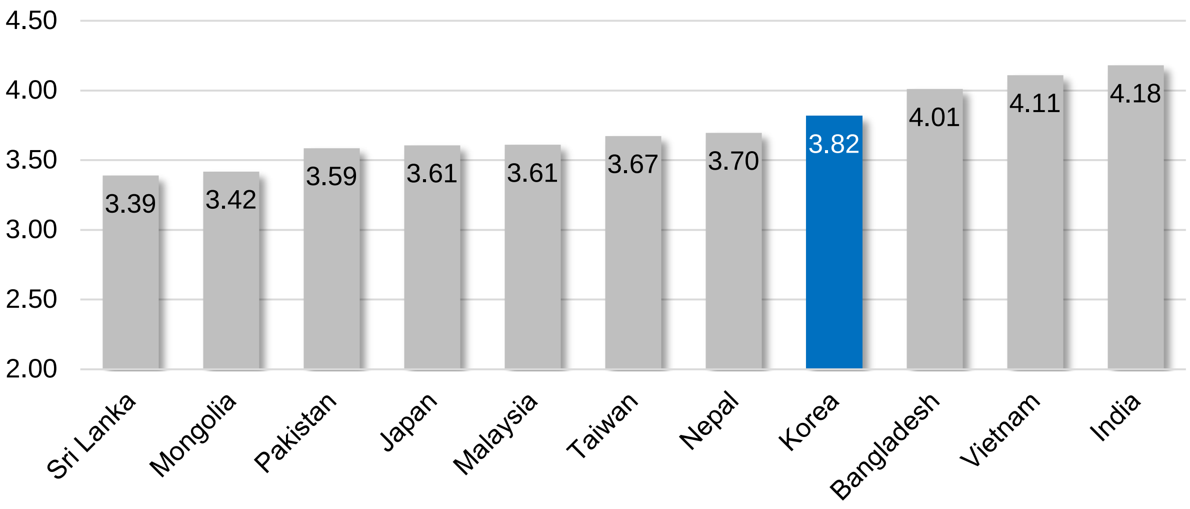


Figure 4-12-9. Average point of Q8 of Republic of Korea

Q9. **There is a difference in ability (math, analytical skills, logical thinking, etc) that needs to be acquired in science for men and women.**

One of the largest obstacles to women’s choosing a science or engineering major could be the perception that men have superior mathematical, analytical, and logical abilities. In fact, this belief has sparked controversy in a number of countries, and a range of studies on the glass ceiling against women in science and technology has verified that this perception was among the indirect obstacles that prevented outstanding women from joining the science and technology fields. For Q9, the women in science and technology in Republic of Korea who actually majored in science or engineering disciplines scored an average of 2.64, the same as the average among the ten other countries. This result suggests that the respondents did not experience considerable gender gaps in terms of scientific abilities.

By age, it was clearly observed that older respondents were more likely to report narrower gender gaps, as supported by the decreasing average scores of 2.95, 2.62, and 2.31 among those in their 30s, 40s, and 50s. This difference was proved to have statistical significance in the ANOVA analysis.

In other words, those who majored in science or engineering and had longer careers tended to experience less gender gap in terms of professional abilities. By occupation, the groups of scientists (2.60), engineers (2.55), and medical professionals (2.80) did not reveal considerable differences; statistical analysis did not find any significant difference either. Meanwhile, as single and married respondents had similar average scores of 2.50 and 2.70, respectively, the two groups did not show a statistically significant difference.

An interesting result is that a statistically significant difference was observed between those without children (2.61) and those with one child (3.11). One explanation for this result is that gender gap perceived in terms of scientific abilities, which can affect young girls’ choosing a major the most, resurfaces when women working in the science field get married and their children go to school. More interesting yet is that those with two and three or more children had an average score lower than that of those without children at 2.46 and 2.29, respectively, indicating that gender gap perception was mitigated rapidly. In other words, it can be interpreted that those with two or more children tend to realize that different levels of ability required in the science field are not dependent on gender, but simply on the aptitude of each individual.

Table 4-12-11. Comparative survey result of Q9 by age, occupation and marital status in Republic of Korea

		N	Average	Standard deviation	F	*p*
	Total	148	2.64	0.97		
Age	20s or younger	5	3.40	0.89	4.52	.005
	30s	40	2.95	0.81		
	40s	55	2.62	0.99		
	50s or older	48	2.31	0.97		
Occupation	Scientist	98	2.60	0.96	0.56	.570
	Engineer	20	2.55	0.94		
	Professional medical staff	30	2.80	1.03		
Marital status	Single	40	2.50	1.062	1.44	.233
	Married	104	2.70	0.934		
	Divorced	2	1.50	0.707		
	Other	2	3.00	0.000		
No. of children	None	64	2.61	1.002	3.16	.027
	1	27	3.11	0.801		
	2	50	2.46	0.930		
	3 or more	7	2.29	1.113		

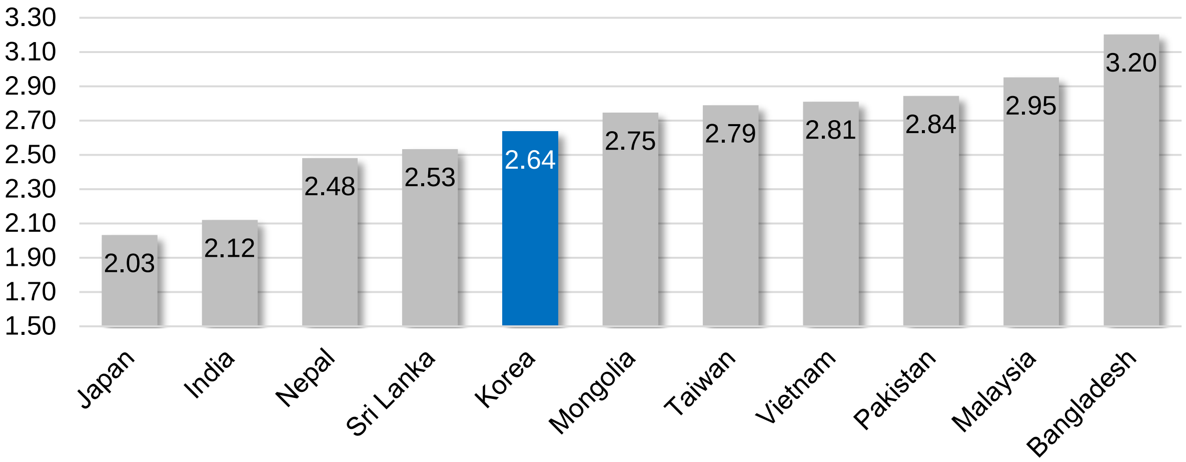


Figure 4-12-10. Average point of Q10 of Republic of Korea

Q10. **Having to balance work and life (marriage and child care) is a handicap for women.**

Marriage, childbirth, and child-rearing have generally been regarded as the biggest obstacle to women's social participation and career life. Most countries had a relatively high score for this question, but Republic of Korean respondents particularly scored high at 4.34, much higher than the average score of 3.64 among ten other countries. Age-wise analysis for this question seems completely irrelevant since the respondents from all age groups had almost the same scores: 4.35, 4.36, and 4.31 among those in their 30s, 40s, and 50s. This suggests that respondents of all age brackets reported that marriage and child-rearing aggravated the balance between work and family. By occupation, whereas scientists and engineers scored 4.50 and 4.20, respectively, medical professionals had a distinctively lower average score of 3.93, revealing a visible difference among occupational groups. This difference was also verified by the ANOVA analysis to have statistical significance. Medical professionals seem to have the lowest score because the field requires an official license to practice and therefore it is relatively easier for them to return to their former workplaces or to seek jobs elsewhere, even if they have a career break due to childbirth or child-rearing.

The level of difference resulting from marital status was not high, with average scores of 4.30 among single respondents and 4.38 among those who were married. The ANOVA analysis found this to be a statistically significant difference, however, because those from the group categorized as "other" had an extreme outlier value of 3.0. Still, this does not imply a significant result as the number of these respondents was only two. In the meantime, no significant difference was observed between those without children (4.30) and those with children (4.41 for one child, 4.34 for two children, and 4.57 for three or more children).

Table 4-12-12. Comparative survey result of Q10 by age, occupation and marital status in Republic of Korea

		N	Average	Standard deviation	F	*p*
	Total	148	4.34	0.69		
Age	20s or younger	5	4.40	0.89	0.06	.981
	30s	40	4.35	0.66		
	40s	55	4.36	0.73		
	50s or older	48	4.31	0.66		
Occupation	Scientist	98	4.50	0.58	9.25	.000
	Engineer	20	4.20	0.95		
	Professional medical staff	30	3.93	0.64		
Marital status	Single	40	4.30	0.791	2.86	.039
	Married	104	4.38	0.612		
	Divorced	2	4.50	0.707		
	Other	2	3.00	1.414		
No. of children	None	64	4.30	0.728	0.43	.733
	1	27	4.41	0.636		
	2	50	4.34	0.688		
	3 or more	7	4.57	0.535		

As mentioned earlier, Republic of Korea had the highest average among the 11 countries surveyed, with a score of 4.34 for the question about the impact of marriage, childbirth, and child-rearing on women's professional careers in science and technology. The average score was even higher than that of Vietnam (3.98), which ranked tenth. This result reveals that Korea could be lacking the infrastructure to take the burden of childbirth and child-rearing off the shoulders of women working in the science and technology field, which may also be related to the country's world-lowest level of birth rate. Without policy and institutional consideration to address the issue, the country will continue to face limitations in utilizing professional women in science and technology at a national level.

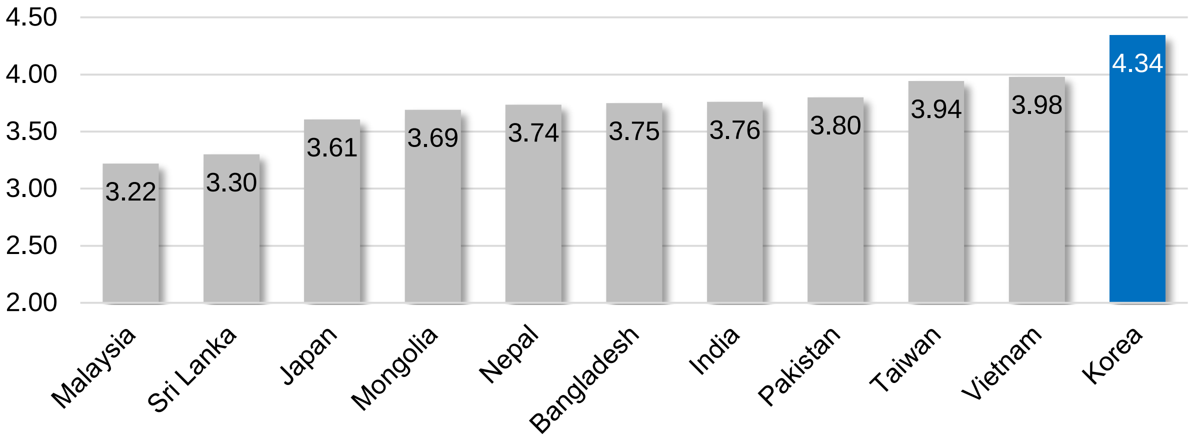


Figure 4-12-11. Average point of Q10 of Republic of Korea

Q11. **It is crucial to have policy support that ensures equal opportunity in order to solve the gender inequality in science.**

Asked about the need for government policy consideration to address the glass-ceiling phenomenon and gender inequalities, the respondents in Republic of Korea scored 4.11, similar to the average score of 4.04 of the other ten countries. By age, the respondents of all age groups recorded similar average scores of 4.08, 4.16, and 4.15 among those in their 30s, 40s, and 50s; no statistically significant difference was observed. Whereas scientists and engineers had similar average scores of 4.16 and 4.30, respectively, medical professionals scored considerably lower at 3.83. As shown by the results of Q10, since the medical profession requires a license and therefore medical professionals have more stable employment, they tend to feel less need for policy consideration. No statistically significant difference was found from the results depending on marital status and the number of children.

Table 4-12-13. Comparative survey result of Q11 by age, occupation and marital status in Republic of Korea

		N	Average	Standard deviation	F	*p*
	Total	148	4.11	0.81		
Age	20s or younger	5	3.60	0.55	0.79	.503
	30s	40	4.08	0.76		
	40s	55	4.16	0.88		
	50s or older	48	4.15	0.80		
Occupation	Scientist	98	4.16	0.83	2.55	.082
	Engineer	20	4.30	0.80		
	Professional medical staff	30	3.83	0.70		
Marital status	Single	40	4.08	0.797	1.39	.248
	Married	104	4.15	0.810		
	Divorced	2	4.00	0.000		
	Other	2	3.00	1.414		
No. of children	None	64	4.11	0.779	1.36	.257
	1	27	4.37	0.688		
	2	50	3.98	0.915		
	3 or more	7	4.14	0.690		

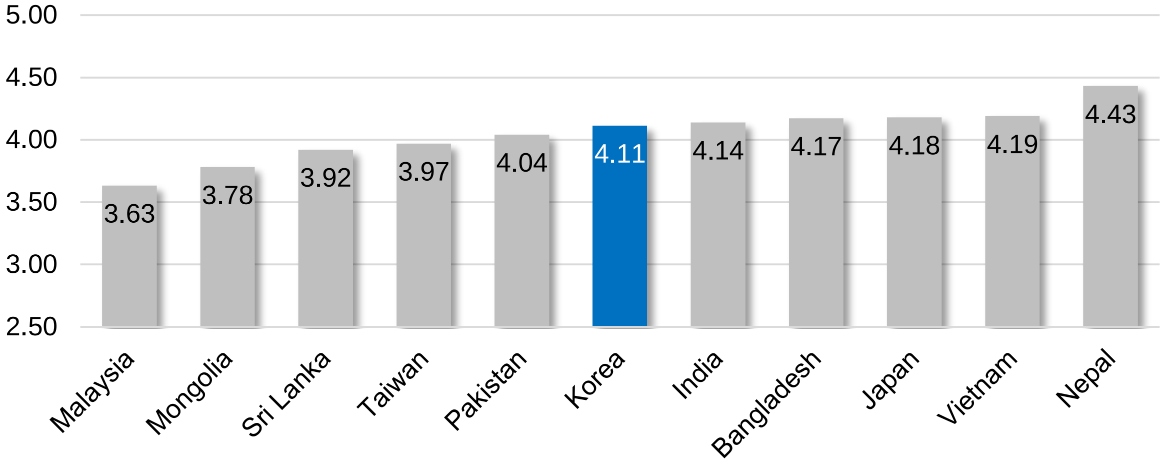
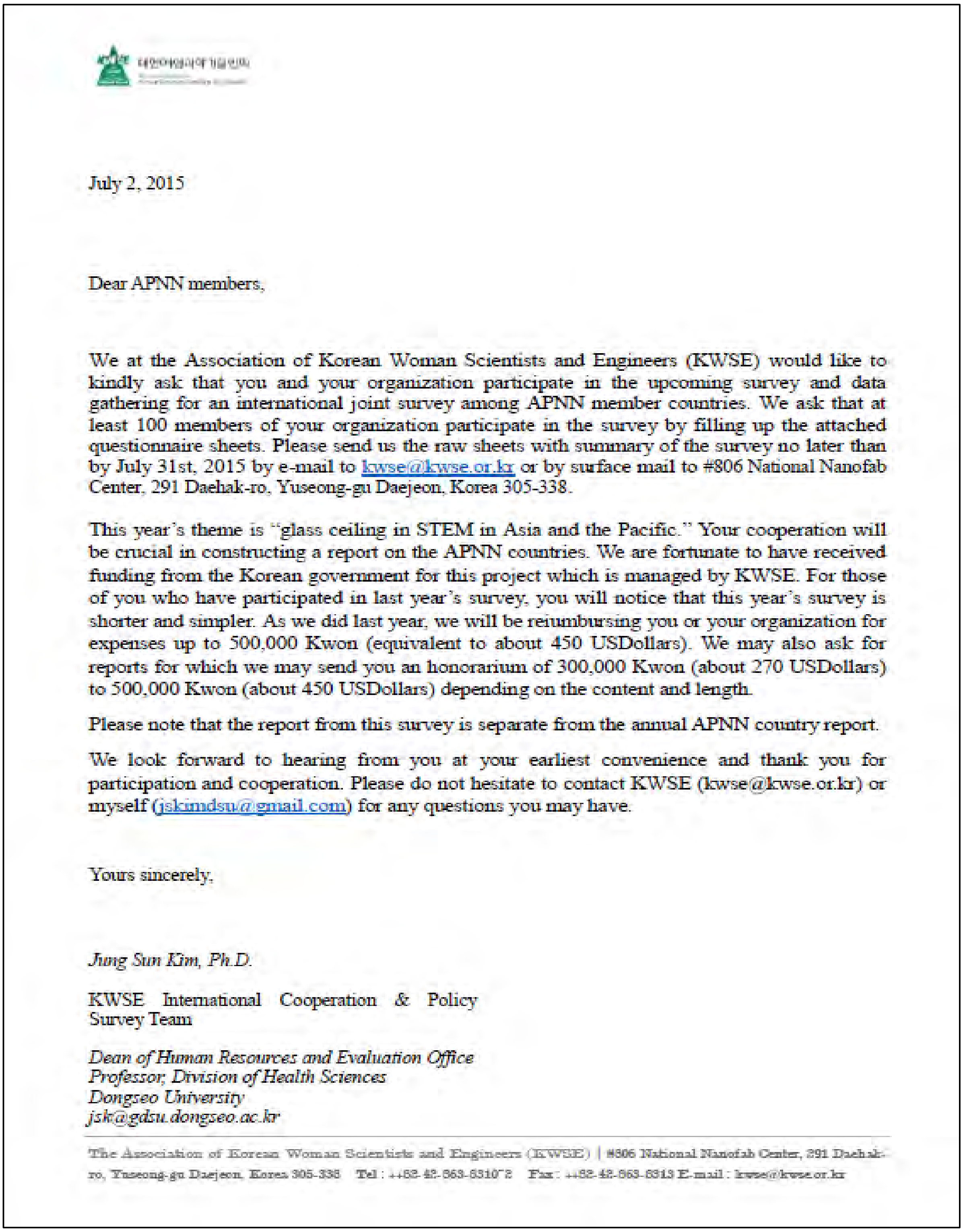


Figure 4-12-12. Average point of Q11 of Republic of Korea

Appendix

5.1. Survey Form and Send email regarding this survey



July 2, 2015

Dear APNN members,

We at the Association of Korean Woman Scientists and Engineers (KWSE) would like to kindly ask that you and your organization participate in the upcoming survey and data gathering for an international joint survey among APNN member countries. We ask that at least 100 members of your organization participate in the survey by filling up the attached questionnaire sheets. Please send us the raw sheets with summary of the survey no later than by July 31st, 2015 by e-mail to kwse@kwse.or.kr or by surface mail to #806 National Nanofab Center, 291 Daehak-ro, Yuseong-gu Daejeon, Korea 305-338.

This year's theme is "glass ceiling in STEM in Asia and the Pacific." Your cooperation will be crucial in constructing a report on the APNN countries. We are fortunate to have received funding from the Korean government for this project which is managed by KWSE. For those of you who have participated in last year's survey, you will notice that this year's survey is shorter and simpler. As we did last year, we will be reiumbursing you or your organization for expenses up to 500,000 Kwon (equivalent to about 450 USDollars). We may also ask for reports for which we may send you an honorarium of 300,000 Kwon (about 270 USDollars) to 500,000 Kwon (about 450 USDollars) depending on the content and length.

Please note that the report from this survey is separate from the annual APNN country report.

We look forward to hearing from you at your earliest convenience and thank you for participation and cooperation. Please do not hesitate to contact KWSE (kwse@kwse.or.kr) or myself (jskimdsu@gmail.com) for any questions you may have.

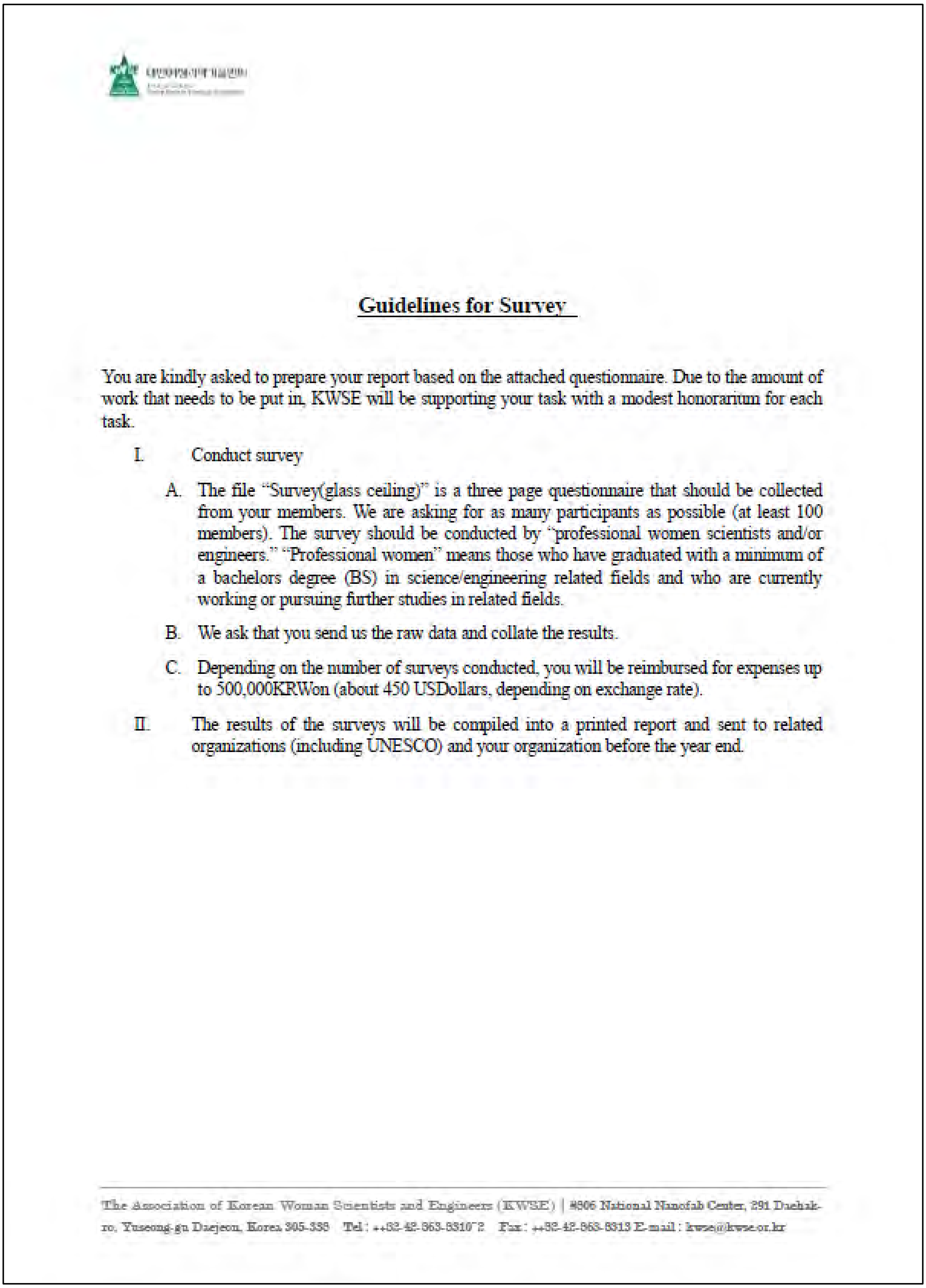
Yours sincerely,

Jung Sun Kim, Ph.D.

KWSE International Cooperation & Policy
Survey Team

Dean of Human Resources and Evaluation Office
Professor, Division of Health Sciences
Dongseo University
jsk@gdsu.dongseo.ac.kr

The Association of Korean Woman Scientists and Engineers (KWSE) | #806 National Nanofab Center, 291 Daehak-ro, Yuseong-gu Daejeon, Korea 305-338 Tel : ++82-42-863-6310~2 Fax : ++82-42-863-6313 E-mail : kwse@kwse.or.kr



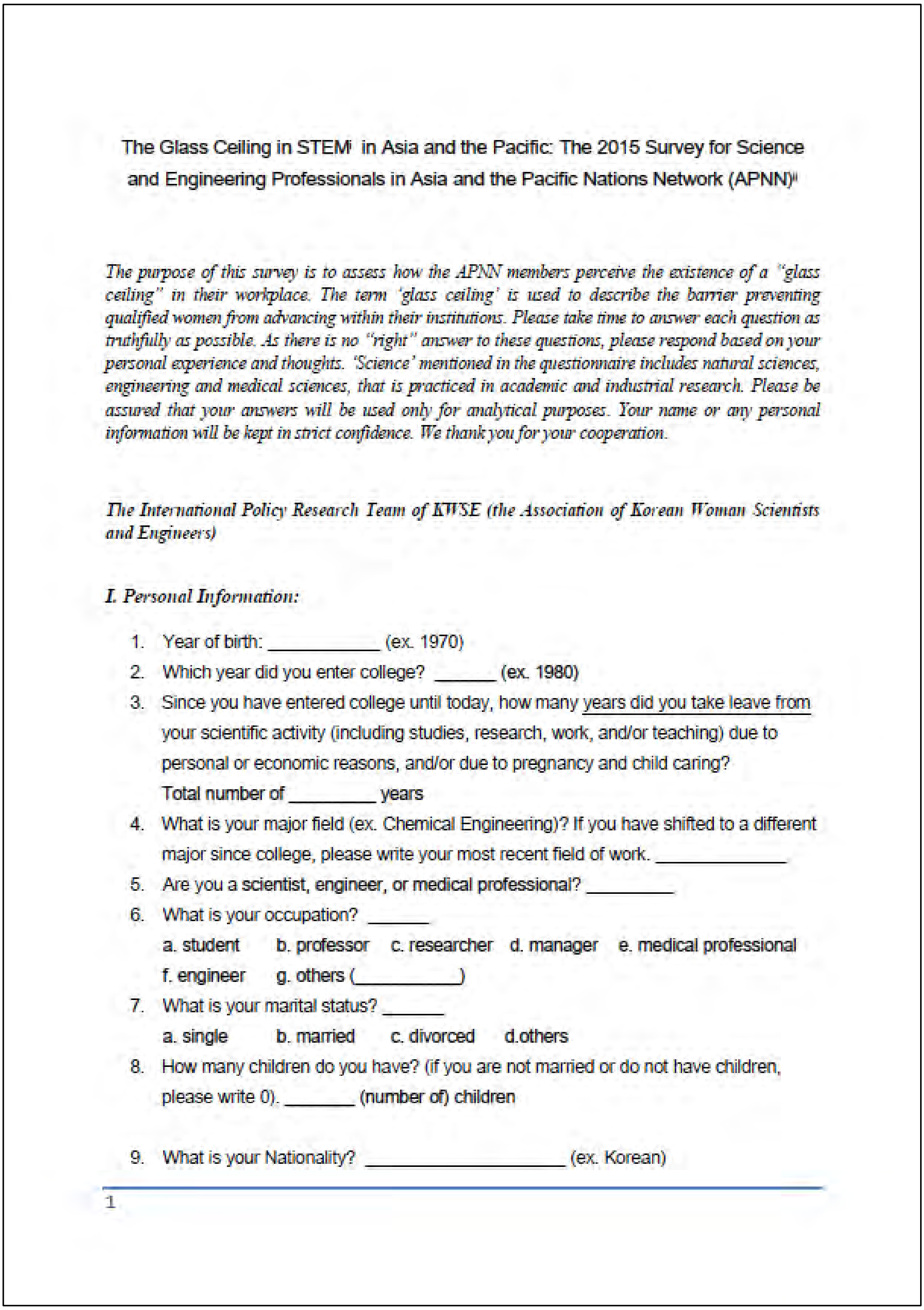
Guidelines for Survey

You are kindly asked to prepare your report based on the attached questionnaire. Due to the amount of work that needs to be put in, KWSE will be supporting your task with a modest honorarium for each task.

I. Conduct survey
   A. The file “Survey(glass ceiling)” is a three page questionnaire that should be collected from your members. We are asking for as many participants as possible (at least 100 members). The survey should be conducted by “professional women scientists and/or engineers.” “Professional women” means those who have graduated with a minimum of a bachelors degree (BS) in science/engineering related fields and who are currently working or pursuing further studies in related fields.
   B. We ask that you send us the raw data and collate the results.
   C. Depending on the number of surveys conducted, you will be reimbursed for expenses up to 500,000KRWon (about 450 USDollars, depending on exchange rate).

II. The results of the surveys will be compiled into a printed report and sent to related organizations (including UNESCO) and your organization before the year end.

The Association of Korean Woman Scientists and Engineers (KWSE) | #806 National Nanofab Center, 291 Daehak-ro, Yuseong-gu Daejeon, Korea 305-338 Tel : ++82-42-863-8310~2 Fax : ++82-42-863-8313 E-mail : kwse@kwse.or.kr



The Glass Ceiling in STEM[i] in Asia and the Pacific: The 2015 Survey for Science and Engineering Professionals in Asia and the Pacific Nations Network (APNN)[ii]

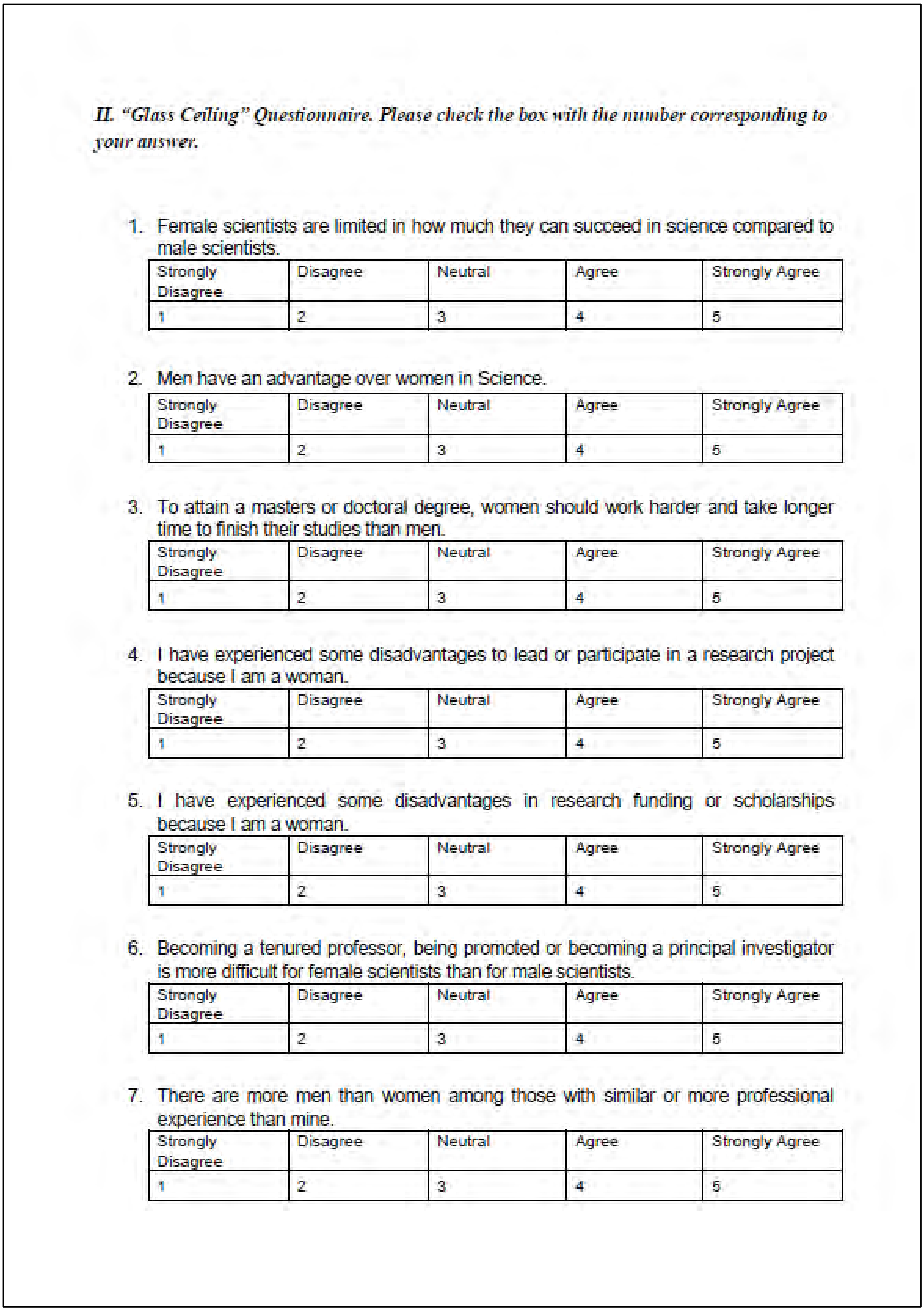
The purpose of this survey is to assess how the APNN members perceive the existence of a "glass ceiling" in their workplace. The term 'glass ceiling' is used to describe the barrier preventing qualified women from advancing within their institutions. Please take time to answer each question as truthfully as possible. As there is no "right" answer to these questions, please respond based on your personal experience and thoughts. 'Science' mentioned in the questionnaire includes natural sciences, engineering and medical sciences, that is practiced in academic and industrial research. Please be assured that your answers will be used only for analytical purposes. Your name or any personal information will be kept in strict confidence. We thank you for your cooperation.

The International Policy Research Team of KWSE (the Association of Korean Woman Scientists and Engineers)

I. Personal Information:

1. Year of birth: ___________ (ex. 1970)
2. Which year did you enter college? ______ (ex. 1980)
3. Since you have entered college until today, how many years did you take leave from your scientific activity (including studies, research, work, and/or teaching) due to personal or economic reasons, and/or due to pregnancy and child caring?
   Total number of _________ years
4. What is your major field (ex. Chemical Engineering)? If you have shifted to a different major since college, please write your most recent field of work. _____________
5. Are you a scientist, engineer, or medical professional? _________
6. What is your occupation? ______
   a. student b. professor c. researcher d. manager e. medical professional
   f. engineer g. others (___________)
7. What is your marital status? ______
   a. single b. married c. divorced d.others
8. How many children do you have? (if you are not married or do not have children, please write 0). _______ (number of) children

9. What is your Nationality? ___________________ (ex. Korean)



II. "Glass Ceiling" Questionnaire. Please check the box with the number corresponding to your answer.

1. Female scientists are limited in how much they can succeed in science compared to male scientists.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

2. Men have an advantage over women in Science.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

3. To attain a masters or doctoral degree, women should work harder and take longer time to finish their studies than men.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

4. I have experienced some disadvantages to lead or participate in a research project because I am a woman.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

5. I have experienced some disadvantages in research funding or scholarships because I am a woman.

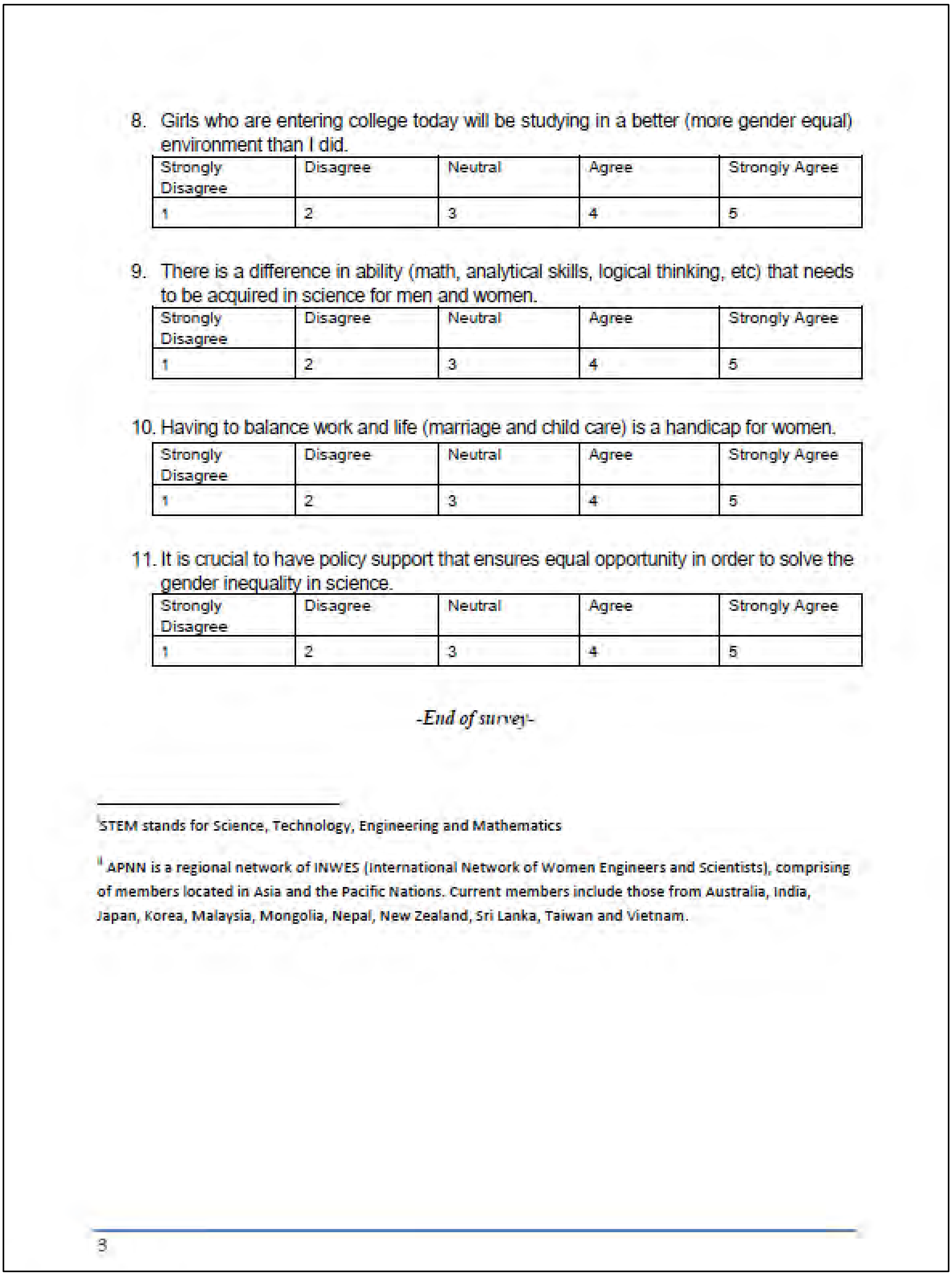
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

6. Becoming a tenured professor, being promoted or becoming a principal investigator is more difficult for female scientists than for male scientists.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

7. There are more men than women among those with similar or more professional experience than mine.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5



8. Girls who are entering college today will be studying in a better (more gender equal) environment than I did.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

9. There is a difference in ability (math, analytical skills, logical thinking, etc) that needs to be acquired in science for men and women.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

10. Having to balance work and life (marriage and child care) is a handicap for women.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

11. It is crucial to have policy support that ensures equal opportunity in order to solve the gender inequality in science.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

-End of survey-

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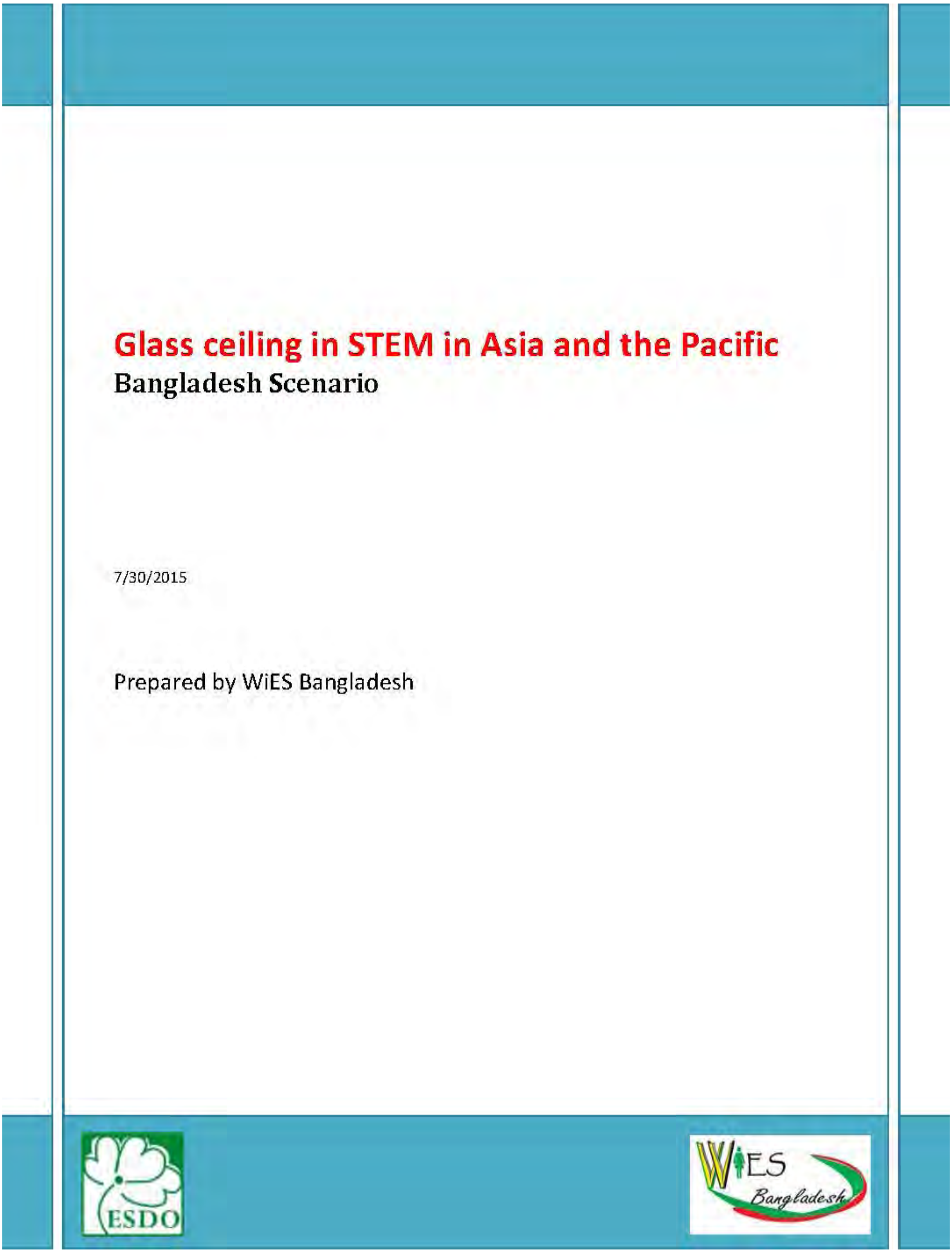
[i] STEM stands for Science, Technology, Engineering and Mathematics

[ii] APNN is a regional network of INWES (International Network of Women Engineers and Scientists), comprising of members located in Asia and the Pacific Nations. Current members include those from Australia, India, Japan, Korea, Malaysia, Mongolia, Nepal, New Zealand, Sri Lanka, Taiwan and Vietnam.

5.2. Report of Bangladesh



Glass ceiling in STEM in Asia and the Pacific

Bangladesh Scenario

7/30/2015

Prepared by WiES Bangladesh

ESDO
WiES Bangladesh

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1. Introduction

Women comprise 49.35 percent of the total population of Bangladesh. Yet, the contribution of women in science, technology, medicine, engineering and ICT sectors is not noticed significantly comparing to their male counterparts. These sectors, especially ICT can play a role of powerful catalyst for political and social empowerment of women and the promotion of gender equality, according to United Nations. Thus, deprived women in the rural areas can be greatly benefitted. Although women carry disproportionately an over burden in the workforce, they are not paid enough. A large disparity has been found in the budget allocation and implantation in case of science and information technology education for women in the recent years in Bangladesh. As a consequence, WiES Bangladesh was formed to encourage women participation and restore women's rights in science, engineering, entrepreneurship in 2014.

2. Formation of WiES Bangladesh

WiES Bangladesh has been created to become the voice of women in science, technology, engineering, entrepreneurship and mathematics in order to develop, promote and disseminate knowledge about women's roles in society and economic trends in Bangladesh. Environment and Social Development Organization- ESDO has taken the initiative to form WiES Bangladesh in June, 2014.

The Convening Committee of WiES Bangladesh

WiES Bangladesh focuses on **three pillars** (mentioned below) to build better future worldwide through full and effective participation of women and girls in all aspects of Science, Technology, Engineering, and Mathematics. through organizational and individual transformation. These three pillars are;

- Women's Leadership Development
- Policy Advocacy
- Women's Empowerment.

3. Activities

For arranging gatherings for similar minded women who have been in quest of sharing their views and opinions on this issue of women in science and technology for years in Bangladesh, ESDO has conducted several campaigns in Bangladesh. They wanted more opportunities in the fields of both study and career based on science and technology. So, WiES Bangladesh members have met the representatives of WIES India and INWES (International Network for Women Engineers and Scientists) in September and November in 2014 in India and in Bangladesh respectively.

WISE India President (Sangeeta Wij) (M) met **WiES Bangladesh** President (R), Siddika Sultana. September, 2014. India

Members, the President and Advisor of **WiES Bangladesh** meeting Dillip Pattnaik, the Vice President of WISE India. November, 2014. Dhaka

3.1. Meeting with INWES representatives

The members and the president and founder of WiES Bangladesh, Ms. Siddika Sultana and Dr. Shahriar Hossain respectively met Mr. Dillip Pattanaik, Vice-President of WISE India and representative of INWES in Dhaka on November 15, 2014. They discussed on submission of the bid to host the regional conference of INWES in Dhaka in 2015 (next year) to promote women in science in engineering regionally and globally. Shortly after this meeting, this consultation was held in Dhaka with eighteen interested women. All of them filled out the membership forms and agreed to be committed members of WiES Bangladesh.

3.2. Consultation

Shortly after the meeting with WISE India representatives, WiES Bangladesh conducted its first consultation meeting on 29th November, 2014 in Dhaka with the slogan '*LEAD, INSPIRE, EMPOWER*'. A large group of women who are interested, studying or are specialists in science, technology, engineering, entrepreneurship and mathematics attended. WiES Bangladesh has started spreading its messages and incorporating members through this consultation program more vigorously. This consultation aimed at:

- To spread the news of existence of WiES Bangladesh
- Create more membership opportunities
- Collect constructive feedback of the prominent women from science and engineering in order to enhance the scope of WiES Bangladesh

The consultation consisted of four parts: a short presentation, a documentary, a speech delivered by the President and the founder leading to an open discussion. The presentation informed the participants about the objectives, mission, vision, major focuses and the proposed activities of WiES Bangladesh. The documentary demonstrated how female engineers designed and developed toys for girls which can make them interested in engineering fields. In the open discussion the participants shared personal stories of how they broke the barriers to reach up to the current position. They discussed how women are shaped to be typical girls in Bangladesh who always concern about their beauty but the qualifications. They discussed on how to break the barriers created in different phases of their societies which deprive them of getting engaged to fields related to science and engineering in order to compete with their male counterparts.

Several prominent newspapers like the Daily Observer covered this news.

dailyobserver

Initiatives of women in WIES Bangladesh

Women's Own Desk

4. The Glass Ceiling in STEM[1] in Asia and the Pacific: The 2015 Survey for Science and Engineering Professionals in (APNN)[2]

In response to the survey and data gathering for an international survey jointly with APNN member countries by Association of Korean Woman Scientists and Engineers (KWSE), ESDO has conducted this survey. Over 100 members of WiES Bangladesh promptly responded to this activity.

This year's theme is "Glass ceiling in STEM in Asia and the Pacific." The opinions provided by the members of WiES Bangladesh via filling up this survey are very informative.

---

[1] STEM stands for Science, Technology, Engineering and Mathematics

[2] APNN stands for Asia and the Pacific Nations Network. APNN is a regional network of INWES (International Network of Women Engineers and Scientists), comprising of members located in Asia and the Pacific Nations. Current members include those from Australia, India, Japan, Korea, Malaysia, Mongolia, Nepal, New Zealand, Sri Lanka, Taiwan and Vietnam.

This survey aims at finding out how "glass ceiling" emerges at the workplaces of women in Bangladesh. In other words, it is to find out the reasons why there is no advancement of the qualified women professionals.

4.1. Findings of the Survey

4.1.1. Participants

WiES Bangladesh not only includes female scientists and engineers, but also social scientists and entrepreneurs. Therefore, the participants of this survey are from Management, Hotel and Tourisms, Sociology, Literature apart from Geography and Environment, Civil Engineering, Computer Sciences, Electrical & Electronic, Dentistry, Environmental Sciences, Environmental Chemistry, Chemistry, Botany, Medical Science, Physics, Physical Geography, Geographical Information System (GIS), Health care, Soil Sciences, Mathematics, Zoology, Architect, Medicine, and Pharmacology.

Many of WiES Bangladesh members could not be reached since they are on Eid[3] vacation at this moment. Therefore, a few more than hundred members could participate actively and fill up the survey questionnaire. Around half of the participants are college students at their senior years, nineteen percent of them are medical professionals, fourteen percent of them are researchers, and four participants are at teaching profession, whereas three of them are engineers. The rest of them are GIS analysts, government service holders, managers at non-government organization, and architects. Thirty four percent of the respondents are married and the number of respondents who have taken any leave from their academic or professional career due to personal, economic, pregnancy or child caring is 37 percent. Taking leaves from study or career in Bangladesh is getting rarer day by day. Girls now tend to get married and have children in between they finish higher education and starts their careers.

Opportunities offered by the government and many non-governmental organizations nourish female students up to high school. For example, since 1980s, Bangladesh government has been providing free schooling and stipend for female student up to 12th class. [4] However, the number of male students at the college level in Bangladesh is three forth than that of female students. [5]

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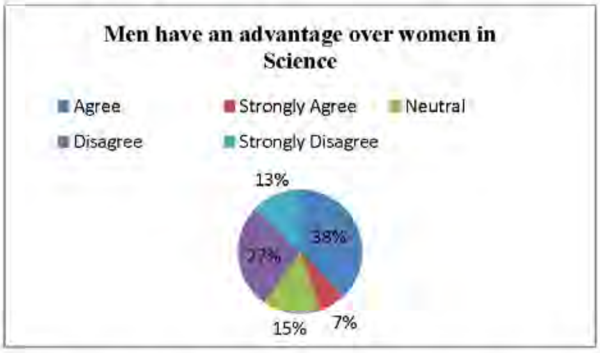
[3] The largest Islamic celebration in Bangladesh

[4] http://www.dshe.gov.bd/history.html

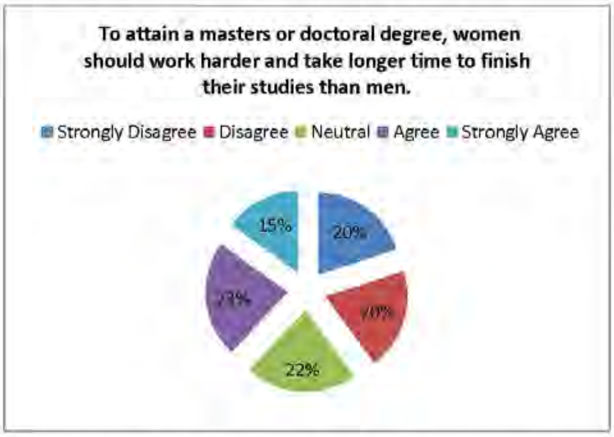
[5] Basic Education Data and Indicators in Bangladesh- CAMPE.pdf

4.1.2. Responses to the Survey Questionnaires

While responding to the first question in *"Glass Ceiling" Questionnaire*, forty percent women either agreed or strongly agreed and thirty five percent were neutral. Remaining Twenty five percent women disagreed or strongly disagreed on this issue. 'Men have an advantage over women in Science', while giving opinion on this, majority of the women which is thirty eight percent responded agreed and seven were strongly agreed.



Three forth of the responders either disagreed or strongly disagreed on that women should work harder and take longer time to finish their studies than men to attain a masters or doctoral degree since women don't want to lag behind the men in getting qualified. The probable reason stated by the participants was caused by the religious and cultural barrier, as women in Bangladesh tend to get married after their Undergraduation degree.



Thirty five percent women filled up the survey forms have experienced disadvantages at some extent while leading or participating in research project because of their gender. In Bangladesh women were not encouraged to study science, math or engineering, nor could they choose to be scientists, researcher, or engineers. This trend has changed recently; however, still the portion of women scientists or engineer is very negligible. It is because of the existing gender discrimination. Women are considered to be engaged in family management, bearing and raring children. Though accepting medical professions by women has increased, it is not very significant.

More than half of the women opposed that they experienced some sorts of disadvantages in receiving any research funding of scholarships because they are women whereas one fourth of the responders remained neutral. It implies that there are no or lesser discrimination against women for granting any research fund or reward. In addition to that, post-graduate or doctoral candidates are selected on the basis of merit for scholarships offered in Bangladesh by foreign institutions. Often, female candidates are preferred over the males. Also, scholarships for female students in the public universities in Bangladesh are available. The private universities are also encouraging female students to apply for undergrad program through offering scholarships. For example, Asian University for Women, international private universities grant full free scholarships not only for education but also for meal, accommodation, and IT facility.

A little less than half of the respondents agreed and strongly that to become a tenured professor, being promoted or becoming a principal invigilator is more difficult for female scientists than for male scientists. Again, such opinion arises from the socio-cultural and economic scenario of Bangladesh. The portion of the female students who complete higher study in Bangladesh still is very low, thereby, there are more tenured professors found at the universities. Also, the qualified female candidates in these areas often have to sacrifice their careers as because they have to give more emphasize on family life. In the patriarchal society of Bangladesh, settling down in life is more important to women than pursuing a professional career in many families.[6]

There are more men than women among those with similar or more professional experiences, said more than half of the respondents while conducting the survey, one fifth was neutral and the rest disagreed at this.

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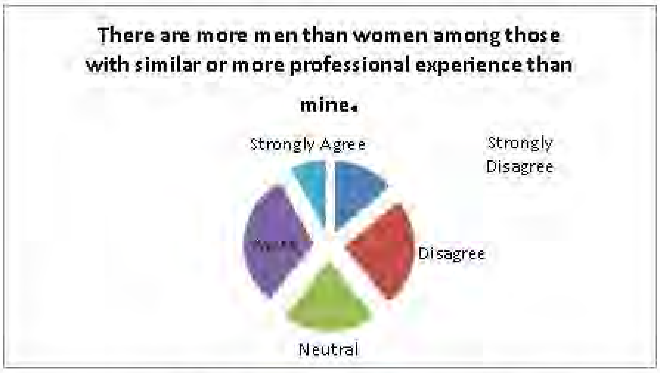
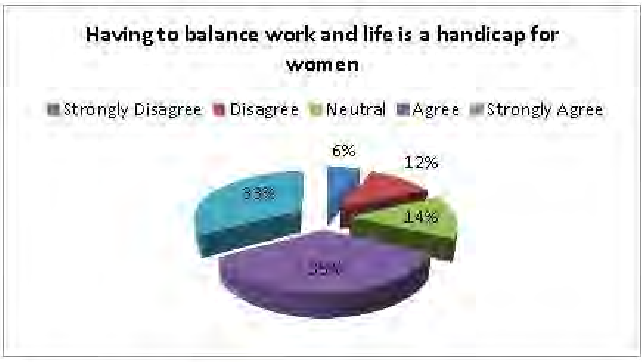
[6] http://www.thedailystar.net/social-hurdles-stand-in-womens-way-22481



Also, newer opportunities are and will be created; women are breaking all social barriers. Therefore, women will attain better educational environment, said ninety percent of the female respondents. While figuring out one of the major obstacles for women, seventy percent was agreed that having a balance work and life (marriage and child care) is a handicap for women.



While answering the final question, ninety seven percent women agreed that to solve the gender inequality in Bangladesh, and to ensure equal opportunity for men and women, government needs to enforce laws in Bangladesh.

5. Conclusion

Inevitably, this survey prepared by the Association of Korean Women Scientists and Engineers (KWSE) has well revealed the perceptions of women in Bangladesh engaged in science, engineering, medical professions, management, dentistry, teaching and entrepreneurships. The findings will depict the current status of women professionals; hence, they will weave newer paths for them to get out of the existing obstacle present in Bangladesh.

5.3. Report of Vietnam

Summary

The Glass Ceiling in STEM in Asia and the Pacific: The 2015 Survey for Science and Engineering Professionals in Viet

No	Questions	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)
1	Female scientists are limited in how much they can succeed in science compared to male scientists.	0	10	36	33	21
2	Men have an advantage over women in Science.	0	11	27	46	16
3	To attain a masters or doctoral degree, women should work harder and take longer time to finish their studies than men.	2	14	20	41	23
4	I have experienced some disadvantages to lead or participate in a research project because I am a woman.	0	9	32	43	16
5	I have experienced some disadvantages in research funding or scholarships because I am a woman.	1	30	29	33	7
6	Becoming a tenured professor, being promoted or becoming a principal investigator is more difficult for female scientists than for male scientists.	0	8	22	47	23
7	There are more men than women among those with similar or more professional experience than mine.	1	16	40	36	7
8	Girls who are entering college today will be studying in a better (more gender equal) environment than I did.	0	1	21	44	34
9	There is a difference in ability (math, analytical skills, logical thinking, etc) that needs to be acquired in science for men and women.	7	29	42	20	2
10	Having to balance work and life (marriage and child care) is a handicap for women.	0	3	25	43	29

11	It is crucial to have policy support that ensures equal opportunity in order to solve the gender inequality in science.	0	0	17	47	36

In Vietnam, Gender Equality is an important issue which people are much more concerned about. Each year, the Government of Vietnam in coordination with the competent bodies design and implement many programs and solutions to ensure equal rights for Vietnamese women with the aim of encouraging the capability and affirming position of women in society. This survey is conducted in order to reflect partially the gender equality condition in Vietnam.

The survey is conducted with the participation of 100 women in the age between 25 and 60. They work in different fields of science which in Vietnam are often thought for men, such as mathematical engineer, mechanical engineer, chemical engineer, automation engineer,… The participants answer 11 multiple choice questions about Gender equality in the field of science. The results received mostly are Neutral or Agree. It indicates that there is still inequality between men and women in Vietnam's society.

As the results of questions number 1, 2, 3, 6 and 7, which are about the general situation in science field, most of women agree that they are limited in how much they can succeed in science compared to male scientists, men have an advantage over women and there are more men than women among those with similar or more professional experience in Science. Women should work harder and take longer time to finish their studies for a masters or doctoral degree. In addition, 34% of the participants agree that they have experienced some disadvantages to lead or participate in a research project and 33% have experienced some disadvantages in research funding or scholarships because they are women. Although it cannot be denied the major success and contribution in Science of female scientists, there are 42% of participants who have a Neutral for the opinion that there is a difference in ability (math, analytical skills, logical thinking, etc) that needs to be acquired in science for men and women. It seems they are not confident about their ability, or the social constraints affect their thought. And most of them agree that having to balance work and life (marriage and child care) is a handicap for women with 43%, so it is crucial to have policy support that ensures equal opportunity in order to solve the gender inequality in science with 47%. Because of the efforts from the Government, however, 44% agree and 34% strongly agree that girls who are entering college today will be studying in a better (more gender equal) environment than they did. This is a good sign for the Gender equality condition in Vietnam.

For that achievement, there are attempts and efforts from the Government of Vietnam, the Vietnamese National Assembly in cooperation with the related Ministries, Departments and Organizations in the enactment and implementation of laws on gender equality. For example, in 2006 the Vietnamese National Assembly has enacted the Gender Equality Law with detailed and specific rules which mentions all areas of life such as economic, cultural, social, health, education, etc. In particular, the Articles number 14 and 15 of the Gender Equality Law are stipulated as following:

Article 14. Gender equality in the field of education and training

1. Men and women are equal in terms of school age, training and retraining.
2. Men and women are equal in choosing lines of study and training.
3. Men and women are equal in accessing and benefiting from policies on education, training, retraining and professional.
4. Female officials and public servants who participate in training and retraining carrying children under the age of thirty six months are supported as stipulated by the Government.

5. Measures to promote gender equality in the field of education and training include:
a) Regulation on proportions of men and women participates in learning and training;
b) Female workers in rural areas are supported vocational training as prescribed by law.

Article 15. Gender equality in the field of science and technology
1. Men and women are equal in accessing and applying science and technology.
2. Men and women are equal in accessing training courses in science and technology, dissemination of results of scientific research, technology and inventions, patents.

Furthermore, in 2008 the Government of Vietnam has issued the Decree No. 70/2008 / ND-CP on June 4, 2008 which regulates in detail the implementation of some articles of the Gender Equality Law. It identifies the responsibilities in State management on gender equality of the Ministries and the supporting institutions, and the coordination of State management for implementing gender equality in Vietnam.

However, the results from this survey indicate that there is still the gender inequality in Vietnam. Therefore, it is necessary for the Government to provide more realistic and thorough policies in order to create the fairness and equality for men and women, especially in the field of science and technology with high qualifications.

5.4. Presentation materials on Policy Forum

Special Lecture for balanced development of human resource for the future and Policy Forum

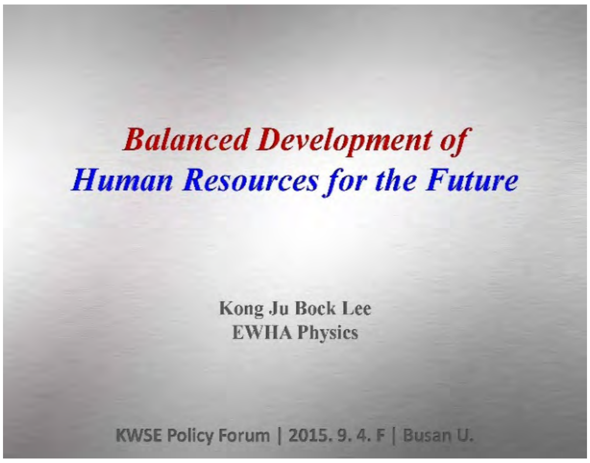
Date: 4th September (Fri.) 2015, 16:00 ~

Venue: #5304, Organic Material Building, Pusan National University

Program

Time	Content	Detail
~16:00	Registration	Registration
16:00~17:00	Special Lecture	**Professor, Kong-Ju-Bock Lee** (Ewha Womans University, Department of Physics)
17:00~17:30	Discussion	▪ **Professor, Yeol Choi** (Pusan National University, Department of Urban Engineering) ▪ **Professor, Seongsoo Song** **(**Pusan National University) ▪ **Dr. Haryoung Poo** (Principal Researcher, Korea Research Institute of Bioscience & Biotechnology) ▪ **Dr. Mihye Lee** (Busan Institute of Science & Technology Evaluation Planning)

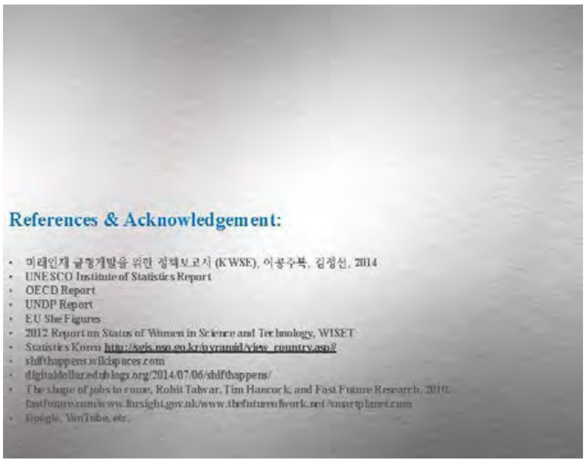
Presentation materials, Professor, Kong-Ju-Bock Lee



Balanced Development of
Human Resources for the Future

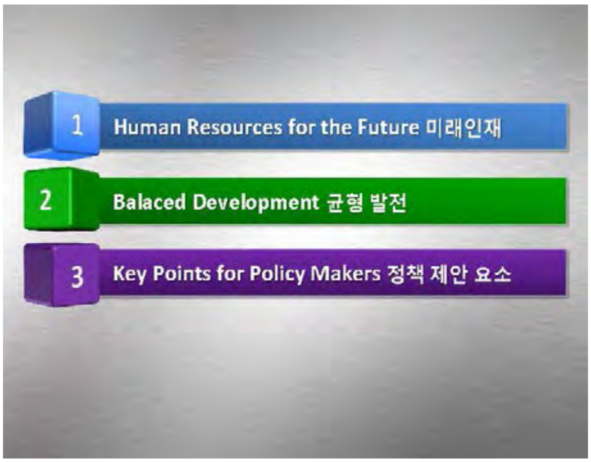
Kong Ju Bock Lee
EWHA Physics

KWSE Policy Forum | 2015. 9. 4. F | Busan U.

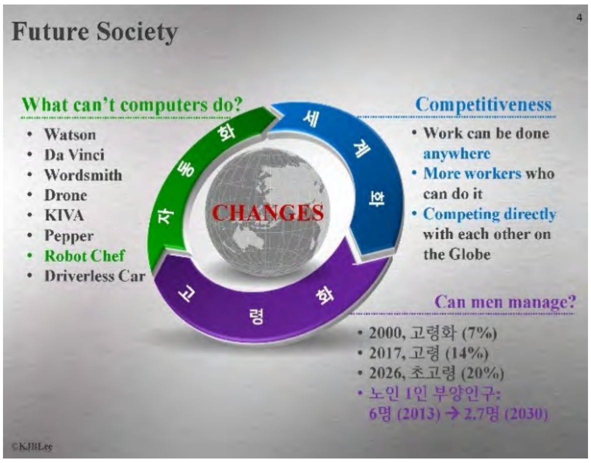


References & Acknowledgement:

- 미래인재 균형개발을 위한 정책보고서 (KWSE), 이공주복, 김정선, 2014
- UNESCO Institute of Statistics Report
- OECD Report
- UNDP Report
- EU She Figures
- 2012 Report on Status of Women in Science and Technology, WISET
- Statistics Korea http://sgis.nso.go.kr/pyramid/view_country.asp#
- shifthappens.wikispaces.com
- digitaldollar.edublogs.org/2014/07/06/shifthappens/
- The shape of jobs to come, Rohit Talwar, Tim Hancock, and Fast Future Research, 2010, fastfuture.com/www.foresight.gov.uk/www.thefutureofwork.net /smartplanet.com
- Google, YouTube, etc.



1 Human Resources for the Future 미래인재
2 Balaced Development 균형 발전
3 Key Points for Policy Makers 정책 제안 요소



Future Society

4

What can't computers do?

- Watson
- Da Vinci
- Wordsmith
- Drone
- KIVA
- Pepper
- Robot Chef
- Driverless Car

Competitiveness

- Work can be done anywhere
- More workers who can do it
- Competing directly with each other on the Globe

Can men manage?

- 2000, 고령화 (7%)
- 2017, 고령 (14%)
- 2026, 초고령 (20%)
- 노인 1인 부양인구: 6명 (2013) → 2.7명 (2030)

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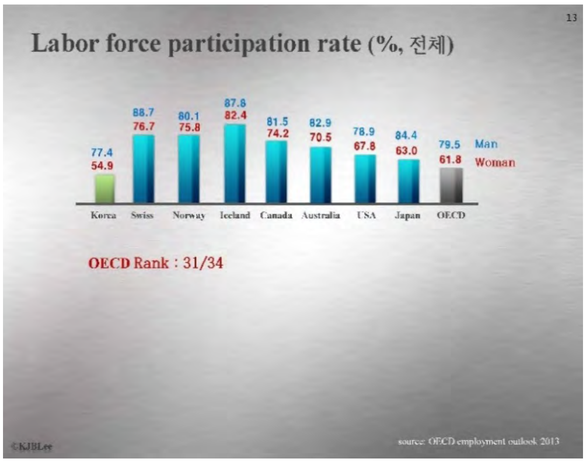


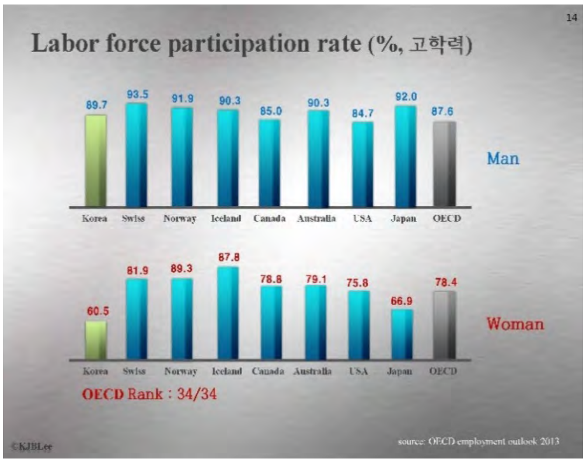
Labor force participation rate (%, 전체)

13

OECD Rank : 31/34

©KJBLee

source: OECD employment outlook 2013



Labor force participation rate (%, 고학력)

14

OECD Rank : 34/34

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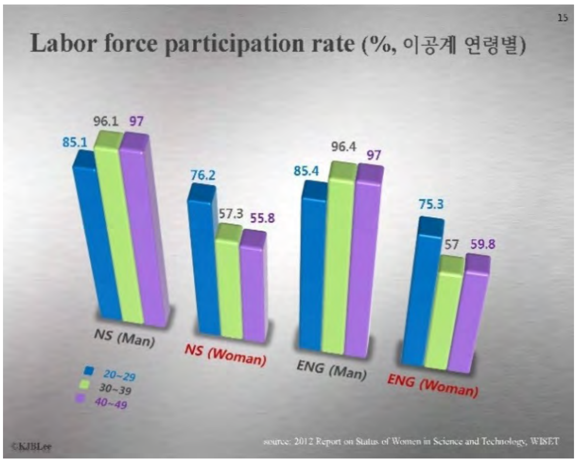
source: OECD employment outlook 2013



Labor force participation rate (%, 이공계 연령별)

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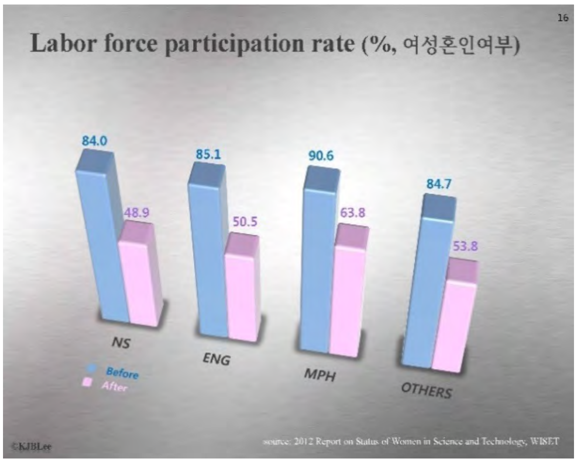
source: 2012 Report on Status of Women in Science and Technology, WISET



Labor force participation rate (%, 여성혼인여부)

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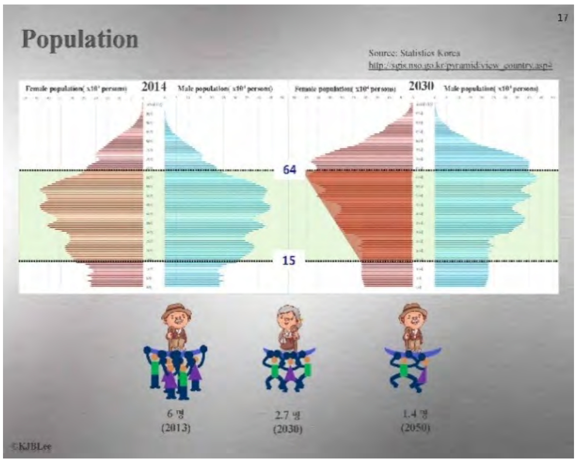
source: 2012 Report on Status of Women in Science and Technology, WISET



Population

Source: Statistics Korea
http://sgis.nso.go.kr/pyramid/view_country.asp

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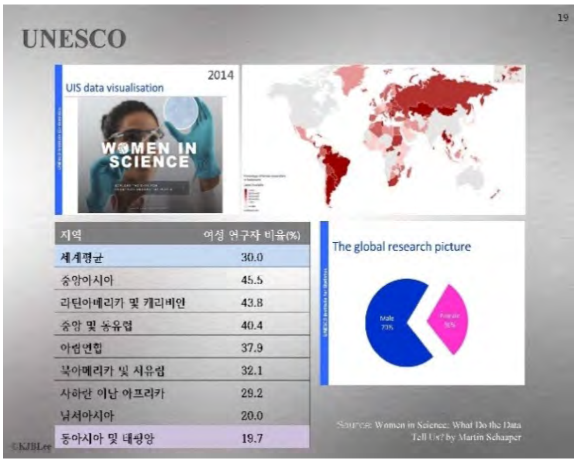

UNESCO

2014
UIS data visualisation
WOMEN IN SCIENCE
The global research picture
Male
70%
Female
30%

지역	여성 연구자 비율(%)
세계평균	30.0
중앙아시아	45.5
라틴아메리카 및 캐리비안	43.8
중앙 및 동유럽	40.4
아랍연합	37.9
북아메리카 및 서유럽	32.1
사하란 이남 아프리카	29.2
남서아시아	20.0
동아시아 및 태평양	19.7

Source: Women in Science: What Do the Data Tell Us? by Martin Schaaper

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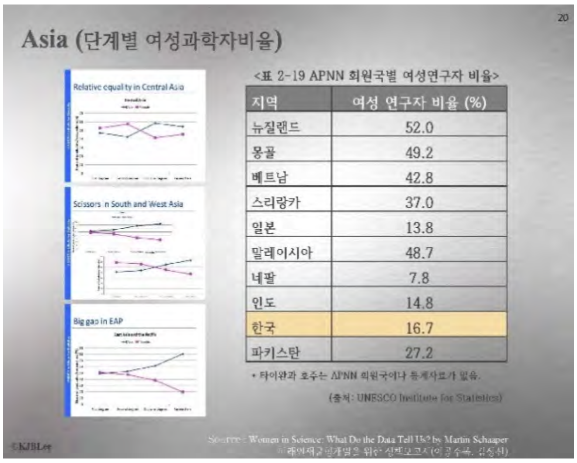

Asia (단계별 여성과학자비율)

Relative equality in Central Asia
Scissors in South and West Asia
Big gap in EAP

<표 2-19 APNN 회원국별 여성연구자 비율>

지역	여성 연구자 비율 (%)
뉴질랜드	52.0
몽골	49.2
베트남	42.8
스리랑카	37.0
일본	13.8
말레이시아	48.7
네팔	7.8
인도	14.8
한국	16.7
파키스탄	27.2

• 타이완과 호주는 APNN 회원국이나 통계자료가 없음.

(출처: UNESCO Institute for Statistics)

Source : Women in Science: What Do the Data Tell Us? by Martin Schaaper
미래인재균형개발을 위한 정책보고서(이공수곡, 김성신)

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UNDP 국제연합개발계획

- **HDI Human Development Index**
- **GDI Gender-related Development Index: GDI=[(여성 HDI)/(남성 HDI)-1]**
- **GII Gender Inequality Index**

<표 2-1 HDI 세부 지표 구성>

세부 지표	내용
기대 수명 (Life expectancy at birth)	태어났을 당시의 사망률이 유지된다는 가정 하에서의 기대 수명
평균 교육년수 (Mean years of schooling)	25세 이상 인구가 받은 평균 교육 기간
기대 교육년수 (Expected years of schooling)	학교에 처음 입학하는 어린이가 앞으로 받을 것으로 예측되는 교육 기간
1인당 실질국민소득 (Gross national income per capita)	구매력평가(Purchasing Power Parity, PPP) 기준으로 산정

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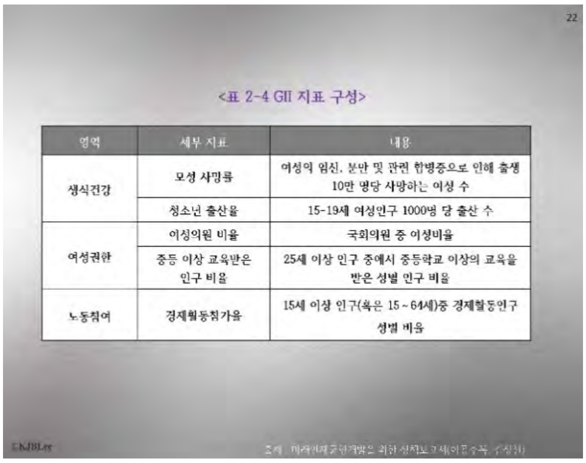
출처 : 미래인재균형개발을 위한 정책보고서(이공수곡, 김성신)



<표 2-4 GII 지표 구성>

영역	세부 지표	내용
생식건강	모성 사망률	여성의 임신, 분만 및 관련 합병증으로 인해 출생 10만 명당 사망하는 여성 수
	청소년 출산율	15-19세 여성인구 1000명 당 출산 수
여성권한	여성의원 비율	국회의원 중 여성비율
	중등 이상 교육받은 인구 비율	25세 이상 인구 중에서 중등학교 이상의 교육을 받은 성별 인구 비율
노동참여	경제활동참가율	15세 이상 인구(혹은 15~64세)중 경제활동인구 성별 비율

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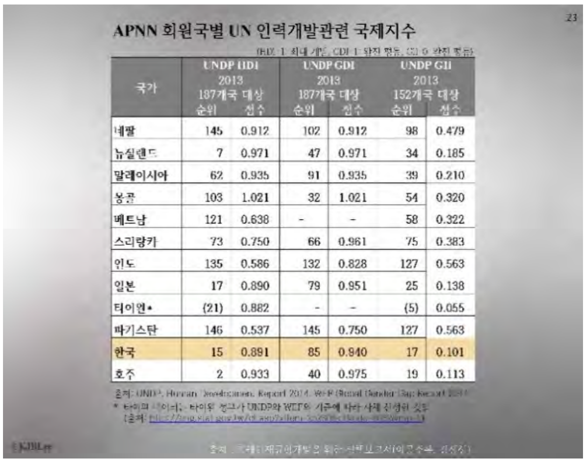
출처 : 미래인재공인개발을 위한 정책보고서(이공수록, 김성진)



APNN 회원국별 UN 인력개발관련 국제지수

(HDI: 1: 최대 개발, GDI: 1: 완전 평등, GII: 0: 완전 평등)

국가	UNDP HDI 2013 187개국 대상		UNDP GDI 2013 187개국 대상		UNDP GII 2013 152개국 대상	
	순위	점수	순위	점수	순위	점수
네팔	145	0.912	102	0.912	98	0.479
뉴질랜드	7	0.971	47	0.971	34	0.185
말레이시아	62	0.935	91	0.935	39	0.210
몽골	103	1.021	32	1.021	54	0.320
베트남	121	0.638	-	-	58	0.322
스리랑카	73	0.750	66	0.961	75	0.383
인도	135	0.586	132	0.828	127	0.563
일본	17	0.890	79	0.951	25	0.138
타이완*	(21)	0.882	-	-	(5)	0.055
파키스탄	146	0.537	145	0.750	127	0.563
한국	15	0.891	85	0.940	17	0.101
호주	2	0.933	40	0.975	19	0.113

출처: UNDP, Human Development Report 2014, WEF Global Gender Gap Report 2014

* 타이완 데이터는 타이완 정부가 UNDP와 WEF의 기준에 따라 자체 산정한 것임

(출처: [illegible])

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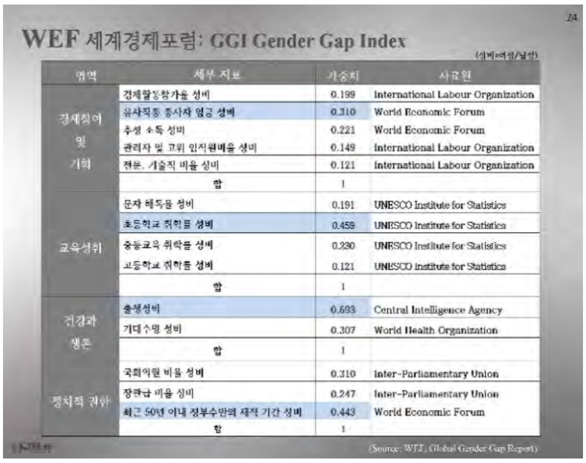
출처 : 미래인재공인개발을 위한 정책보고서(이공수록, 김성진)



WEF 세계경제포럼: GGI Gender Gap Index

(성비=여성/남성)

영역	세부 지표	가중치	사료원
경제참여 및 기회	경제활동참가율 성비	0.199	International Labour Organization
	유사직종 종사자 임금 성비	0.310	World Economic Forum
	추정 소득 성비	0.221	World Economic Forum
	관리자 및 고위 임직원비율 성비	0.149	International Labour Organization
	전문, 기술직 비율 성비	0.121	International Labour Organization
	합	1	
교육성취	문자 해독률 성비	0.191	UNESCO Institute for Statistics
	초등학교 취학률 성비	0.459	UNESCO Institute for Statistics
	중등교육 취학률 성비	0.230	UNESCO Institute for Statistics
	고등학교 취학률 성비	0.121	UNESCO Institute for Statistics
	합	1	
건강과 생존	출생성비	0.693	Central Intelligence Agency
	기대수명 성비	0.307	World Health Organization
	합	1	
정치적 권한	국회의원 비율 성비	0.310	Inter-Parliamentary Union
	장관급 비율 성비	0.247	Inter-Parliamentary Union
	최근 50년 이내 정부수반의 재직 기간 성비	0.443	World Economic Forum
	합	1	

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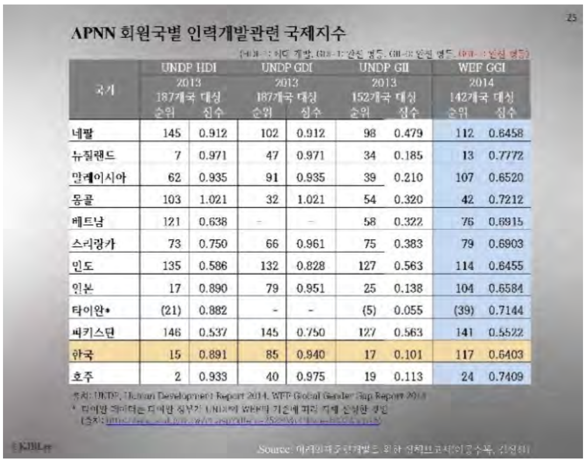
(Source: WEF, Global Gender Gap Report)



APNN 회원국별 인력개발관련 국제지수

(HDI-1: 최대 개발, GDI-1: 완전 평등, GII-0: 완전 평등, GGI-1: 완전 평등)

국가	UNDP HDI 2013 187개국 대상		UNDP GDI 2013 187개국 대상		UNDP GII 2013 152개국 대상		WEF GGI 2014 142개국 대상	
	순위	점수	순위	점수	순위	점수	순위	점수
네팔	145	0.912	102	0.912	98	0.479	112	0.6458
뉴질랜드	7	0.971	47	0.971	34	0.185	13	0.7772
말레이시아	62	0.935	91	0.935	39	0.210	107	0.6520
몽골	103	1.021	32	1.021	54	0.320	42	0.7212
베트남	121	0.638	-	-	58	0.322	76	0.6915
스리랑카	73	0.750	66	0.961	75	0.383	79	0.6903
인도	135	0.586	132	0.828	127	0.563	114	0.6455
일본	17	0.890	79	0.951	25	0.138	104	0.6584
타이완*	(21)	0.882	-	-	(5)	0.055	(39)	0.7144
파키스탄	146	0.537	145	0.750	127	0.563	141	0.5522
한국	15	0.891	85	0.940	17	0.101	117	0.6403
호주	2	0.933	40	0.975	19	0.113	24	0.7409

출처: UNDP, Human Development Report 2014, WEF Global Gender Gap Report 2014

* 타이완 데이터는 타이완 정부가 UNDP와 WEF의 기준에 따라 자체 산정한 것임

(출처: [illegible])

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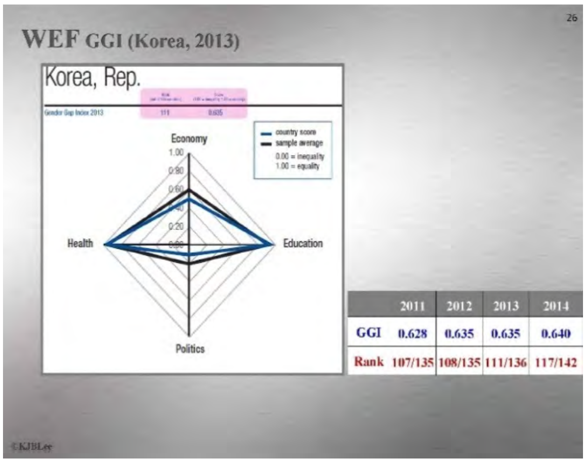
Source: 미래인재공인개발을 위한 정책보고서(이공수록, 김성진)



WEF GGI (Korea, 2013)

	2011	2012	2013	2014
GGI	0.628	0.635	0.635	0.640
Rank	107/135	108/135	111/136	117/142

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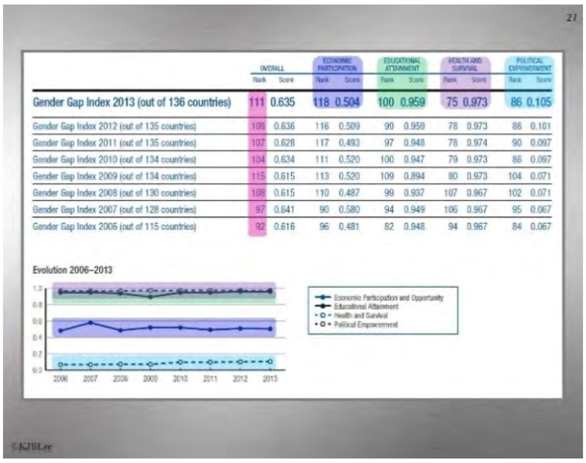

	OVERALL		ECONOMIC PARTICIPATION		EDUCATIONAL ATTAINMENT		HEALTH AND SURVIVAL		POLITICAL EMPOWERMENT	
	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
Gender Gap Index 2013 (out of 136 countries)	111	0.635	118	0.504	100	0.959	75	0.973	86	0.105
Gender Gap Index 2012 (out of 135 countries)	108	0.636	116	0.509	99	0.959	78	0.973	86	0.101
Gender Gap Index 2011 (out of 135 countries)	107	0.628	117	0.493	97	0.948	78	0.974	90	0.097
Gender Gap Index 2010 (out of 134 countries)	104	0.634	111	0.520	100	0.947	79	0.973	86	0.097
Gender Gap Index 2009 (out of 134 countries)	115	0.615	113	0.520	109	0.894	80	0.973	104	0.071
Gender Gap Index 2008 (out of 130 countries)	108	0.615	110	0.487	99	0.937	107	0.967	102	0.071
Gender Gap Index 2007 (out of 128 countries)	97	0.641	90	0.580	94	0.949	106	0.967	95	0.067
Gender Gap Index 2006 (out of 115 countries)	92	0.616	96	0.481	82	0.948	94	0.967	84	0.067

Evolution 2006–2013

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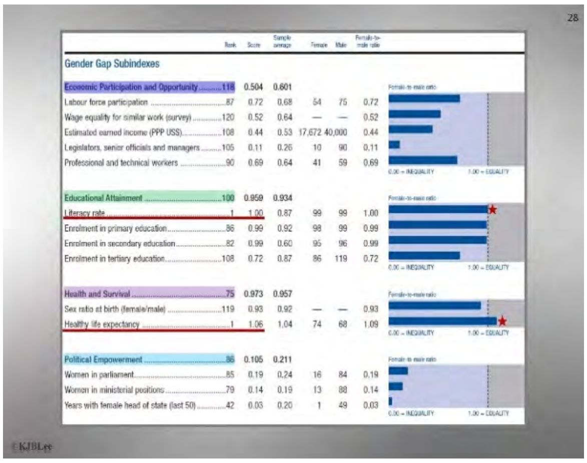

	Rank	Score	Sample average	Female	Male	Female-to-male ratio
Gender Gap Subindexes						
Economic Participation and Opportunity	118	0.504	0.601			
Labour force participation	87	0.72	0.68	54	75	0.72
Wage equality for similar work (survey)	120	0.52	0.64	—	—	0.52
Estimated earned income (PPP US$)	108	0.44	0.53	17,672	40,000	0.44
Legislators, senior officials and managers	105	0.11	0.26	10	90	0.11
Professional and technical workers	90	0.69	0.64	41	59	0.69
Educational Attainment	100	0.959	0.934			
Literacy rate	1	1.00	0.87	99	99	1.00
Enrolment in primary education	86	0.99	0.92	98	99	0.99
Enrolment in secondary education	82	0.99	0.60	95	96	0.99
Enrolment in tertiary education	108	0.72	0.87	86	119	0.72
Health and Survival	75	0.973	0.957			
Sex ratio at birth (female/male)	119	0.93	0.92	—	—	0.93
Healthy life expectancy	1	1.06	1.04	74	68	1.09
Political Empowerment	86	0.105	0.211			
Women in parliament	85	0.19	0.24	16	84	0.19
Women in ministerial positions	79	0.14	0.19	13	88	0.14
Years with female head of state (last 50)	42	0.03	0.20	1	49	0.03

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우리나라 여성은 남성대비

읽고 쓰는 능력이 전 세계 1위이고
수명도 전 세계 1위인데

경제활동 참여와 기회는 세계 꼴찌 수준이다!

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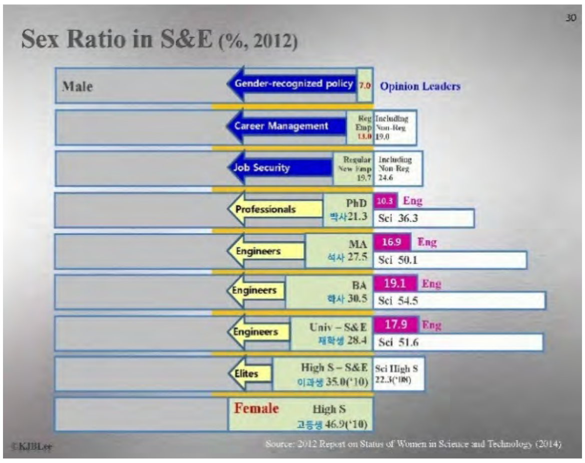
Sex Ratio in S&E (%, 2012)



Male

Gender-recognized policy 7.0 Opinion Leaders

Career Management Reg Emp 13.0 Including Non-Reg 19.0

Job Security Regular New Emp 19.7 Including Non-Reg 24.6

Professionals PhD 박사21.3 10.3 Eng Sci 36.3

Engineers MA 석사 27.5 16.9 Eng Sci 50.1

Engineers BA 학사 30.5 19.1 Eng Sci 54.5

Engineers Univ – S&E 재학생 28.4 17.9 Eng Sci 51.6

Elites High S – S&E 이과생 35.0('10) Sci High S 22.3('08)

Female High S 고등생 46.9('10)

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Source: 2012 Report on Status of Women in Science and Technology (2014)

National Statistics on WSE (2012)

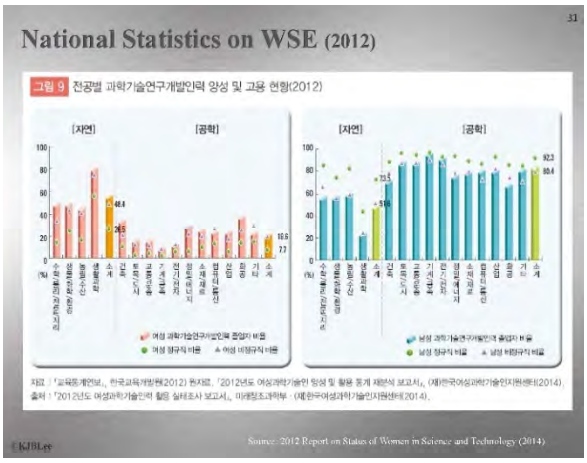

그림 9 전공별 과학기술연구개발인력 양성 및 고용 현황(2012)

자료 : 「교육통계연보」, 한국교육개발원(2012) 원자료. 「2012년도 여성과학기술인 양성 및 활용 통계 재분석 보고서」, (재)한국여성과학기술인지원센터(2014).
출처 : 「2012년도 여성과학기술인력 활용 실태조사 보고서」, 미래창조과학부 · (재)한국여성과학기술인지원센터(2014).

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Source: 2012 Report on Status of Women in Science and Technology (2014)

National Statistics on WSE (2012)

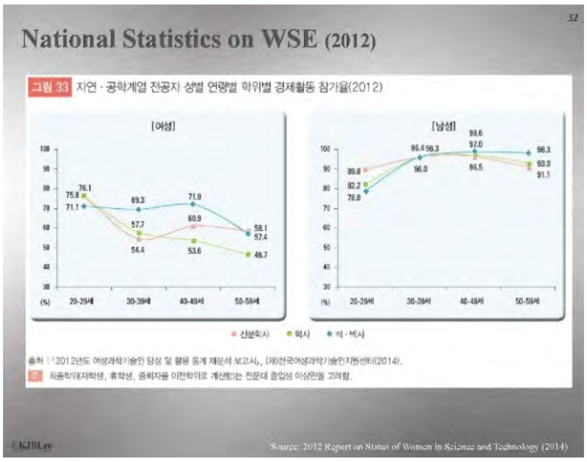

그림 33 자연 · 공학계열 전공자 성별 연령별 학위별 경제활동 참가율(2012)

출처 : 「2012년도 여성과학기술인 양성 및 활용 통계 재분석 보고서」, (재)한국여성과학기술인지원센터(2014).
주 최종학위(재학생, 휴학생, 중퇴자를 이전학위로 계산함)는 전문대 졸업생 이상만을 고려함.

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Source: 2012 Report on Status of Women in Science and Technology (2014)

National Statistics on WSE (2012)

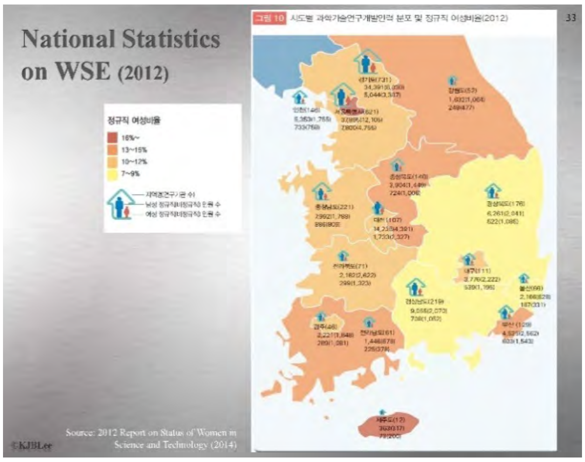

그림 10 시도별 과학기술연구개발인력 분포 및 정규직 여성비율(2012)

Source: 2012 Report on Status of Women in Science and Technology (2014)

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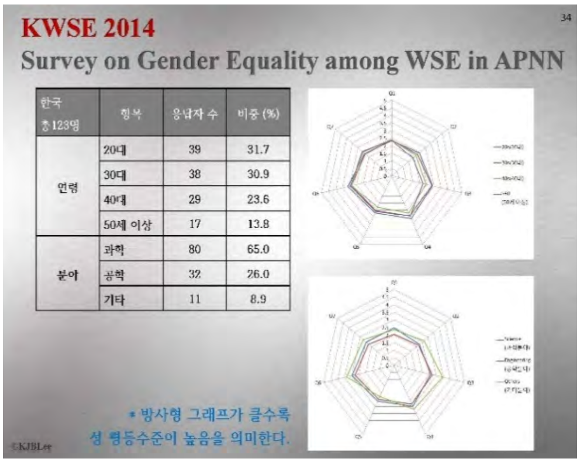

KWSE 2014
Survey on Gender Equality among WSE in APNN

한국 총123명	항목	응답자 수	비중 (%)
연령	20대	39	31.7
	30대	38	30.9
	40대	29	23.6
	50세 이상	17	13.8
분야	과학	80	65.0
	공학	32	26.0
	기타	11	8.9

* 방사형 그래프가 클수록 성 평등수준이 높음을 의미한다.

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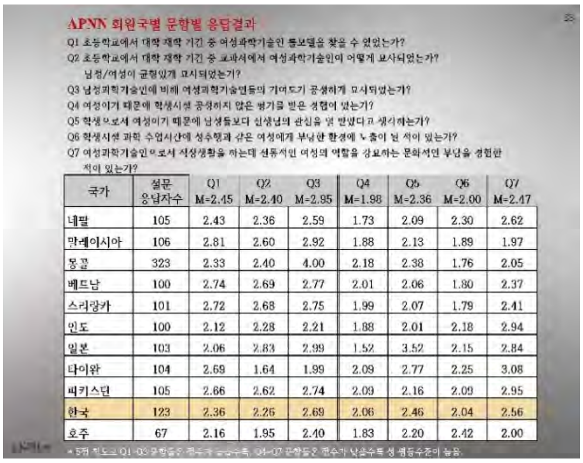

APNN 회원국별 문항별 응답결과

Q1 초등학교에서 대학 재학 기간 중 여성과학기술인 롤모델을 찾을 수 있었는가?
Q2 초등학교에서 대학 재학 기간 중 교과서에서 여성과학기술인이 어떻게 묘사되었는가? 남성/여성이 균형있게 묘사되었는가?
Q3 남성과학기술인에 비해 여성과학기술인들의 기여도가 공정하게 묘사되었는가?
Q4 여성이기 때문에 학생시절 공정하지 않은 평가를 받은 경험이 있는가?
Q5 학생으로서 여성이기 때문에 남성들보다 선생님의 관심을 덜 받았다고 생각하는가?
Q6 학생시절 과학 수업시간에 성추행과 같은 여성에게 부당한 환경에 노출이 된 적이 있는가?
Q7 여성과학기술인으로서 직장생활을 하는데 전통적인 여성의 역할을 강요하는 문화적인 부담을 경험한 적이 있는가?

국가	설문 응답자수	Q1 M=2.45	Q2 M=2.40	Q3 M=2.95	Q4 M=1.98	Q5 M=2.36	Q6 M=2.00	Q7 M=2.47
네팔	105	2.43	2.36	2.59	1.73	2.09	2.30	2.62
말레이시아	106	2.81	2.60	2.92	1.88	2.13	1.89	1.97
몽골	323	2.33	2.40	4.00	2.18	2.38	1.76	2.05
베트남	100	2.74	2.69	2.77	2.01	2.06	1.80	2.37
스리랑카	101	2.72	2.68	2.75	1.99	2.07	1.79	2.41
인도	100	2.12	2.28	2.21	1.88	2.01	2.18	2.94
일본	103	2.06	2.83	2.99	1.52	3.52	2.15	2.84
타이완	104	2.69	1.64	1.99	2.09	2.77	2.25	3.08
파키스탄	105	2.66	2.62	2.74	2.09	2.16	2.09	2.95
한국	123	2.36	2.26	2.69	2.06	2.46	2.04	2.56
호주	67	2.16	1.95	2.40	1.83	2.20	2.42	2.00

* 5점 척도로 Q1~Q3 문항들은 점수가 높을수록, Q4~Q7 문항들은 점수가 낮을수록 성 평등수준이 높음.

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Policies for Balanced Development

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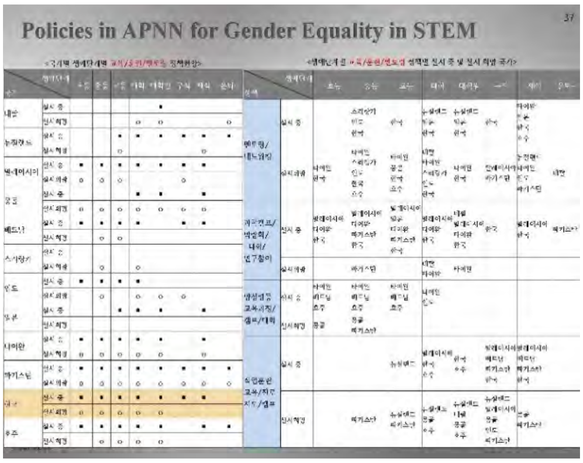
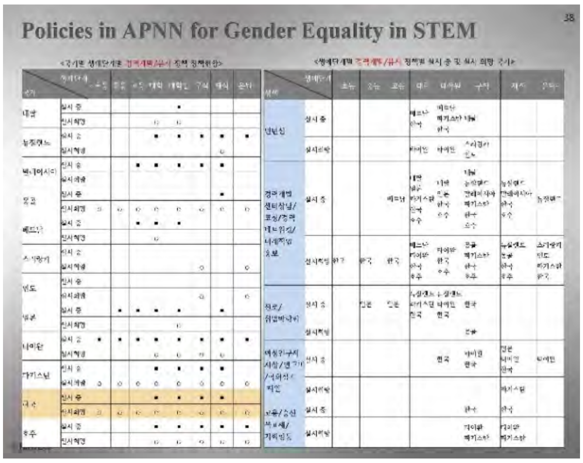
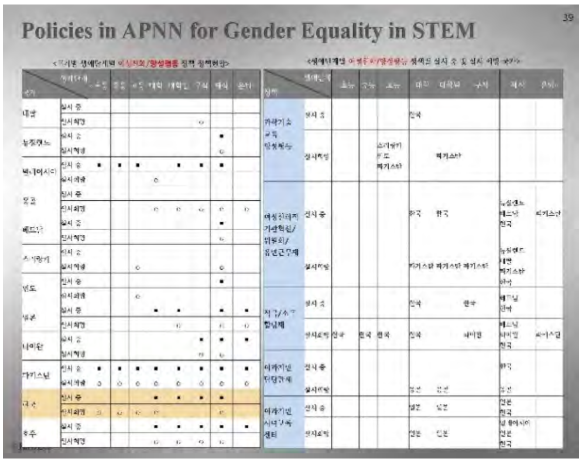


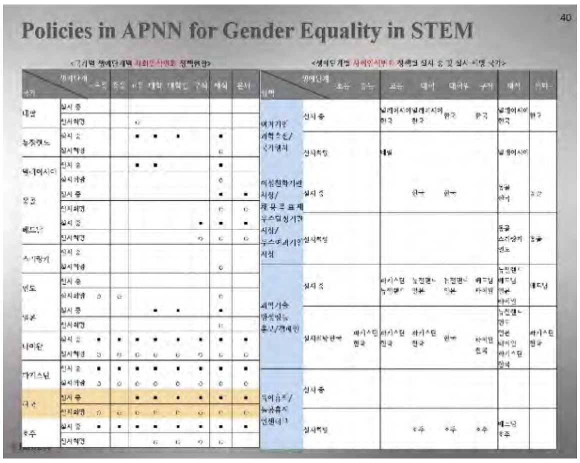
Policies in APNN for Gender Equality in STEM



Policies in APNN for Gender Equality in STEM



Policies in APNN for Gender Equality in STEM



Policies in APNN for Gender Equality in STEM

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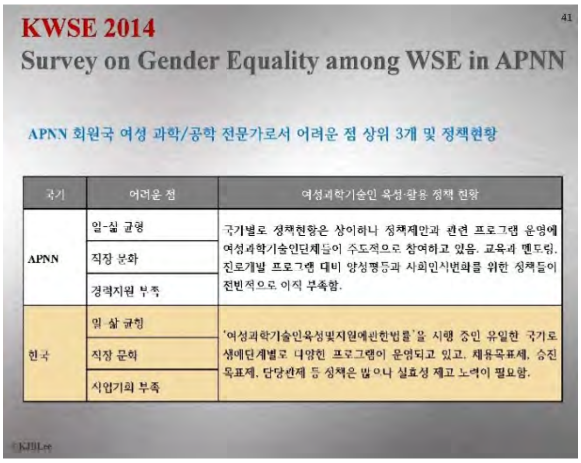

KWSE 2014
Survey on Gender Equality among WSE in APNN

APNN 회원국 여성 과학/공학 전문가로서 어려운 점 상위 3개 및 정책현황

국가	어려운 점	여성과학기술인 육성·활용 정책 현황
APNN	일-삶 균형	국가별로 정책현황은 상이하나 정책제안과 관련 프로그램 운영에 여성과학기술인단체들이 주도적으로 참여하고 있음. 교육과 멘토링, 진로개발 프로그램 대비 양성평등과 사회인식변화를 위한 정책들이 전반적으로 아직 부족함.
	직장 문화	
	경력지원 부족	
한국	일-삶 균형	'여성과학기술인육성및지원에관한법률'을 시행 중인 유일한 국가로 생애단계별로 다양한 프로그램이 운영되고 있고, 채용목표제, 승진목표제, 담당관제 등 정책은 많으나 실효성 제고 노력이 필요함.
	직장 문화	
	사업기회 부족	

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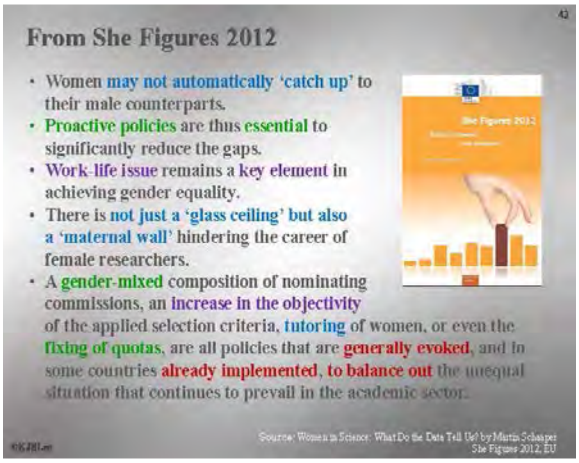

From She Figures 2012

- Women may not automatically 'catch up' to their male counterparts.
- Proactive policies are thus essential to significantly reduce the gaps.
- Work-life issue remains a key element in achieving gender equality.
- There is not just a 'glass ceiling' but also a 'maternal wall' hindering the career of female researchers.
- A gender-mixed composition of nominating commissions, an increase in the objectivity of the applied selection criteria, tutoring of women, or even the fixing of quotas, are all policies that are generally evoked, and in some countries already implemented, to balance out the unequal situation that continues to prevail in the academic sector.

Source: Women in Science: What Do the Data Tell Us? by Martin Schaaper
She Figures 2012, EU

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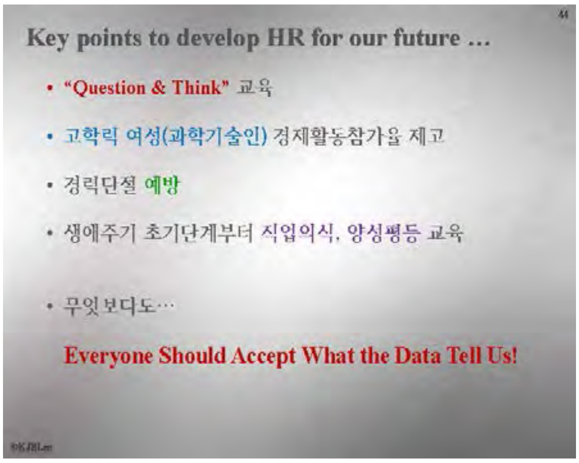

Key points to develop HR for our future …

- "Question & Think" 교육
- 고학력 여성(과학기술인) 경제활동참가율 제고
- 경력단절 예방
- 생애주기 초기단계부터 직업의식, 양성평등 교육
- 무엇보다도…

Everyone Should Accept What the Data Tell Us!

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