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Introduction

The discussions about and researches on *equality of educational opportunity* have much concentrated on the differences associated with class, socioeconomic status, region, ethnicity and race. Somewhat less attention has been given to research on gender differences in science than in mathematics achievement. Several years after the initial intervention programs in math, researchers have begun to examine the disparities in science achievement between girls and boys.

The low representation of women in professional scientific fields is a disturbing and an undisputable fact. This differential representation of men and women in the scientific fields is indicated by achievement patterns in the lower educational levels, elementary and secondary schools (Steinkamp and Maehr, 1984). The schools are sometimes

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blamed for this state of affairs. In this regard the following question can be addressed: Is there gender difference in science achievement?

Although the issue of why few women select science as a career and the issue of why male students perform better than female students are complex and very controversial, this paper aims at investigating differences in science achievement mainly based on international studies. To obtain a global picture of gender differences in science achievement, the data collected by the International Association for Evaluation of Education Achievement (IEA) studies of science and International Assessment of Educational Progress (IAEP) are used. Moreover, Ethiopian women in science and their choice of fields of study are also discussed.

Review of Related Literature

According to Walberg (1969), there is evidence for large gender differences in interest and learning in science. Another evidence also shows presence of small sex differences among 13-year olds (Hertel et al., 1981, cited in M.E. Zerga, et al., 1986). After age 10, sex differences in verbal ability are not large, but females do somewhat better in grammar, spelling and word fluency. Sex differences are insignificant in the early years, but by high school age (approximately 14), male students do better than female students at arithmetical reasoning.

Kahle and Meece (1994) examined factors underlying the differential participation of boys and girls in school science. They analyzed several research on mathematics and science achievement and found that the gender gap was closing in mathematics achievement but not in science, especially during the middle school years. Although most boys and girls were enrolled in similar courses during those years, Kahle and Meece found that the gender gap in science achievement increased from age 9 to 13; and they concluded that many girls did not have equal opportunities to learn science as boys did. These findings were supported by many other studies.

Due to pressure against female students in science in primary and junior high schools, Humrich (1988) suggested that girls were differentially not involved during the fun part of science such as laboratory experiences. Moreover, she pointed out that the manipulative process testing allowed girls to participate in the fun part of science. Therefore, teaching science via process tasks may be the way to encourage girls to study science. Rossi (1965) and Seear (1964) (cited in Steinkamp and Maehr, 1984) also suggested that females who might have chosen science careers feared hostility from male peers.

Although many females considered science appropriate for females in general, they were less likely than males to picture themselves in science based occupations (Butcher and Pont, 1968). This may possibly be as a result of the smallness of the number of female role models in those occupations (Walberg, 1969). Moreover, Beller and Gafni (1996) stated that participation in science courses and science-related extra curricular activities such as visiting science museums were the most important factors in science test performance. Boys, more than girls, expressed positive attitudes towards science by engaging in science-related extra curricular activities (Steinkamp, 1982).

A comprehensive literature search conducted by Steinkamp and Maehr (1984) showed that sex differences in attitude and achievement were smaller than generally assumed. When these differences did occur, with few exceptions, they tended to favor males. Girls' general motivational orientation in many areas of science was more positive than boys. However, where the science area was arguably more affected by extra-curricular experiences, the reverse seemed to be true (Steinkeamp and Maehr, 1984).

Small persistent gender differences in quantitative ability, visual-spatial ability and field articulation were found by Hude (1981) (cited in Steinkamp and Maehr, 1984); however, these differences may not be used as an explanation for gender differences. Moreover, Steinkamp and Maehr (1983) reported that girls' feeling about chemistry and biology subjects were more positive than boys'. This contrasts with the assertion that females do less well in the classroom and avoid careers in biology and chemistry because they are also less interested in these subjects than males are (Keeves, 1973).

Almost three decades ago, Husen et al. (1974) reported some of the results of IEA relating to the Swedish basic school. The IEA tests were administered to ten-year olds who in Sweden were usually to be found in grades 3 or 4, and to 14-year olds, most of whom in grades 7 or 8. It was found that boys scored better than girls on the tests in all science subjects and these differences were the highest in physics. It was also noted that boys outscored girls on the whole test starting from grade four to seven and that the differences widened as one went farther through the grades.

Similarly, the analysis of data collected from international science studies, shows that there were differences at every grade level and in every subject area in the written science achievement tests, in most of the time, favoring males. In the First International Science Study (FISS), conducted in 1970 - 1971, boys performed better than girls in all participating countries and the difference increased with students' age and grade level (IEA, 1988). In the Second International Science Study (SISS), differences between the scores of males and females were also observed; although the expectation was to find a smaller difference between the males and females in science achievement than had been found in the FISS. These differences existed at all grade levels and in all nations involved in the SISS. Out of 15 countries, it was found that the U.S. had the fourth largest science achievement differences between male and female grade 5 students (IEA, 1988).

Jacobson and Doran (1985) used the SISS data to study science achievement differences between gender in the U.S. They indicated that gender related differences increased from grade 5 to grade 9 and from grade 9 to grade 12. These findings were generally consistent with those reported in FISS. The SISS showed that fifth grade boys did better than girls on the items of the physical science in the U.S. However, the fifth grade girls did better than fifth grade boys on biology items. Humrich (1988) also conducted science subject manipulative process tests and found a difference of 5% between girls and boys at grade five in the U.S. The differences among ninth graders males and females were even greater than among fifth graders. However, Humrich (1988) found an increase of only 1% from the fifth grade level in manipulative process test. As observed at the fifth grade level, it was found that the items on which the females had higher scores were in biological science. On the 12th grade core test, boys did significantly better than girls on all items, especially on physics items.

Table 1: Standard Score Sex Difference[a] in Science

	Population		Population 3		
	1	2	Biology	Chemistry	Physics
Australia	.27	.26	.00	.47	.31
Canada (Eng.)	.27	.37	.38	.43	.56
Canada (Fr.)	.27	.47	.07	.16	.23
China	-	.54	-	-	-
England	.23	.37	.25	.31	.06
Finland	.31	.29	.28	.44	.60
Ghana	-	.28	.04	.00	.27
Hong Kong	.22	.34	-	-	-
Hong Kong (Form 6)	-	-	.24	.32	.45
Hong Kong (Form 7)	-	-	.12	.23	.44
Hungary	.13	.16	.20	.68	.39
Israel	.24	.46	-.19	-.52	.51
Italy	.17	-	.56	.11	.39
Italy (Grade 8)	-	.39	-	-	-
Italy (Grade 9)	-	.34	-	-	-
Japan	.12	.31	.25	.37	.26
Korea	.37	.43	.28	.37	.26
Netherlands	-	.52	-	-	-
Nigeria	.18	.29	-	-	-
Norway	.41	.39	.51	.51	.53
Papua New Guinea	-	.45	-	-	-
Philippines	.05	.16	-	-	-
Poland	.26	.36	.25	.55	.68
Singapore	.30	.41	.20	.13	.11
Sweden (Grade 3/7/12)	.14	.28	.23	.04	.46
Sweden (Grade 4/8)	.30	.41	-	-	-
Thailand	-	.32	.25	.32	.67
U.S.A[b]	.20	.25	.22	.26	.32
Zimbabwe	-	.29	-	-	-
Average	.23	.36	.24	.33	.40

[a] Standard score difference = $\frac{\text{Boys' score - girls' score}}{\text{Average sd for all countries}}$

The greater the value the greater is the difference between the sexes. A value of point .00 implies that there is no difference between the sexes. A negative value means that the difference is favoring the girls.

[b] The United States scores are based on core test scores only. All other scores are based on core plus two rotated tests for populations 1 and 2.

Source: The IEA Study of Science II: Science Achievement in Twenty-three Countries, Postlethwaite, T., and Wiley, D. (1992), P.77.

Table 1 above presents SISS standard score differences for boys and girls for three populations. Population 1 consists of mainly 10 years old students, that is, typically grades 4 or 5; population 2 consists of 14 years olds (grades 8 or 9) and population 3 consists of all science students in the final year of secondary school, that is, grade 12 or 13. For examination purposes students in population 3 were subdivided into three groups: students studying biology, chemistry and physics.

The average sex differences in overall science achievement in favor of boys increase from Population 1 to Population 2 level. Japan, Hungary, and Sweden (Grade 3) all have low sex difference at Population 1. At Population 2, China and Netherlands have very high gender differences in science achievement. Hungary and the Philippines have the least standard score difference, followed by U.S.A. and Australia.

At Population 3, biology was the only area where some girls did as well as or better than boys. The highest gender differences are in physics. There is a wide variation within each subject area. For example, in Israel, girls score higher than boys in biology and chemistry. In biology, there are no differences or very small differences between boys and girls in Australia, Canada (French), and Ghana. In chemistry, this is true in Ghana and Sweden. The only country with very small difference is England in physics. Countries with high differences between subjects favoring males are Finland, Hungary, Italy, and Poland. On the other hand, countries with similar differences among the subjects are Canada (English), Japan, Korea, Norway, Singapore, and the United States (Postlethwaite and Wiley, 1992).

Beller and Gafni (1996) analyzed gender differences as revealed by the second IAEP mathematics and science assessment of 9 and 13-year olds. They found that the gender effects for science across all participating countries were substantially larger than those for mathematics. This was due to the fact that a relatively greater effort was made by the various educational systems to narrow the gender gap in mathematics. In both age groups, (9 and 13-year olds), boys out-performed girls, but the gender-gap was larger for 13-years old students. In addition, the largest effect sizes were found for space sciences as well as physical sciences; the smallest effect was found for questions involving biological science. An examination of seven selected countries, Hungary, Ireland, Israel, Korea, Scotland, Spain and the United States, revealed the same trend: increased effect size with age in Hungary, Ireland, Scotland and the United States; in Israel and Spain the effect size for age 9 years was the same as that for age 13 years, and in Korea the effect size among 9-year olds was larger than that for 13-year olds.

In the following section, the case of female Ethiopian students and the choices of fields of study of those who completed high school will be considered.

Ethiopian Women and Science

The percentage of the number of Ethiopian women in science and technology related professions and fields of study is very low. For example, in 2000/01, civil servant women by fields of study constituted 8.5 percent in natural science and 7.34 percent in engineering. In the same year, permanent civil servant women employees in the country were highly concentrated in home economics, in commercial and business administration, and in teaching and education science services. About 80.13 percent of the civil servants trained in home economics were women; 53.11 percent trained in commercial and business administration and 30.07 percent of the workers trained in teaching and education were women. On the other hand, only 112 (7.34 percent) out of 1525 engineering workers, 829 (21.53 percent) out of 3850 trained in mathematics and computer science, 508 (8.50 percent) out of the 5978 trained in natural science, 109 (13.81 percent) out of 789 workers trained in law and jurisprudence were women (Federal Civil Service Commission, April 2002). However, data for employees in Afar, Somali and SNNPR States were not included. If the data of these regions were included the percentage of civil servants trained in the above fields of study would have decreased more, relatively favoring the non-science fields of studies.

According to the 1998/99-2000/02 (EMIS-MOE) data, female enrolment in degree programs was very low. This was specially observed in such disciplines as Veterinary Medicine (0.33%), Forestry (0.57%), Information Science (0.86%), Water technology (1.17%), Pharmacy (1.52%), Law (3.5%), Agriculture (5.56%), Medicine (8.13%) and Technology (9.44%). There were more female students in Education (13.11 percent), Natural Science (15.02%), Business and Economics (15.47 percent) and Social Sciences (25.27 percent).

Similarly, the averages of the enrolment of the three years period indicated that about 89.87 percent of the postgraduate students were enrolled in Addis Ababa University, 9.10 percent in Alemaya University and 1.03 percent in Debub University. Female students mostly concentrated in the fields of study such as Medicine (34.48 percent), Language (13.36 percent) and Natural Sciences (13.36 percent). There were no female postgraduate students in Pharmacy, Veterinary Medicine and Demography. There were about 0.86 percent of the total female students in Technology, 0.86 percent in Forestry, 3.88 percent in Agriculture, 4.74 percent in Social Science, 8.19 percent in Information Science, 8.19 in Education and 12.07 percent in Business and Economics. The higher rates of postgraduate female students enrolment in the medicine, language studies, and pedagogical fields as compared to some other fields of studies needed convincing explanations.

In 2001/02, female diploma applicants admitted into public higher learning institutes by choice indicated that 0% were in Building technology, 3.33% in Radiography, 4.64% in Laboratory technology, 8.33% in Environmental science and 9.17% in Pharmacy. On the other hand, the number of female students who choice to be admitted to the diploma fields of studies based on biological science was much greater than the number of those who chose to join the fields of studies that treated in great depth courses like physics and chemistry. In the same year, about 57.56% of the diploma students in Nursing, 33.67% in Commerce, 32.0% in Animal health, 29.33 in Forestry and 25.95% in Agriculture were female students (see Table 2 below).

Table 2: Regular Diploma Applicants Admitted into Public Institutions of Higher Education and GPA by Choice 1994 E.C (2001/02)

	3.0		2.8		<=2.6		Total		
Field and Choice	BS	F	BS	F	BS	F	BS	F	%F
Agriculture									
First - third Choice	97	0	64	49	20	21	182	70	38.46
Others	521	0	124	116	40	39	685	155	22.63
Total	618	0	188	165	61	60	867	225	25.95
Animal Health									
First - third Choice	26	0	16	7	6	6	48	13	27.08
Others	30	0	14	11	8	8	52	19	36.54
Total	56	0	30	18	14	14	100	32	32.00
Building and Textile Tech									
First - third Choice	153	0	0	0	0	0	153	0	0.00
Others	0	0	0	0	0	0	0	0	0.00
Total	153	0	0	0	0	0	153	0	0.00
Business and Law									
First - third Choice	511	0	105	104	22	22	638	126	19.75
Others	0	0	0	0	0	0	0	0	0.00
Total	511	0	105	104	22	22	638	126	19.75
Commerce/Addis Ababa									
First - third Choice	572	0	245	239	82	82	899	321	35.71
Others	82	0	15	13	2	2	99	15	15.15
Total	654	0	260	252	84	84	998	336	33.67

Field and Choice	3.0		2.8		<=2.6		Total		
	BS	F	BS	F	BS	F	BS	F	%F
Environmental Health									
First - third Choice	219	0	6	5	15	15	240	20	8.33
Others	0	0	0	0	0	0	0	0	0.00
Total	219	0	6	5	15	15	240	20	8.33
Forestry									
First - third Choice	39	0	19	19	5	5	63	24	30.09
Others	64	0	16	13	7	7	87	20	22.99
Total	103	0	35	32	12	12	150	44	29.33
Laboratory Technology									
First - third Choice	266	0	14	13	0	0	280	13	4.64
Others	0	0	0	0	0	0	0	0	0.00
Total	266	0	14	13	0	0	280	13	4.64
Nursing									
First - third Choice	191	0	292	278	0	0	483	278	53.21
Others	0	0	0	0	0	0	0	0	0.00
Total	191	0	292	278	0	0	483	278	57.56
Pharmacy									
First - third Choice	98	0	11	10	0	0	109	10	9.17
Others	0	0	0	0	0	0	0	0	0.00
Total	98	0	11	10	0	0	109	10	9.17
Radiography									
First - third Choice	29	0	1	1	0	0	30	1	3.33
Others	0	0	0	0	0	0	0	0	0.00
Total	29	0	1	1	0	0	30	1	3.33
Grand Total									
First - third Choice	2201	0	773	725	151	151	3125	876	28.03
Others	697	0	169	153	57	56	923	209	22.64
Total	2898	0	942	878	208	207	4048	1085	26.80

Source: Department of Higher Education Human Resources Development, MOE.

A similar comparison of choices to be admitted to degree awarding public higher learning institutions by female students, Table 3, indicates that female students' interest to join the fields of study of Natural Sciences is decreasing. Moreover, from the 2000/01 - 2001/02 data, the percentage of female students joining higher learning institutions is decreasing.

Table 3: Regular Degree Applicants Admitted into Public Institutions of Higher Education and GPA by Choice 1993-1994 E.C (2000/01 - 2001/2002)

Field	Choice	2000/01			2001/02		
		BS	F	% F	BS	F	% F
Natural Science	First	2405	449	18.67	4111	614	14.94
	Second	672	402	59.82	1237	419	33.87
	Third	86	56	65.12	34	10	29.41
	Others	1	1	100.00	0	0	0.00
	Total	3164	908	28.70	5382	1043	19.38
Social Science	First	1896	538	28.38	3162	760	24.04
	Second	0	0	0.00	0	0	0.00
	Third	0	0	0.00	0	0	0.00
	Others	0	0	0.00	0	0	0.00
	Total	1896	538	28.38	3162	760	24.04
Physical Education and Sports	First	33	11	33.33	70	8	11.43
	Second	20	19	95.00	0	0	0.00
	Third	0	0	0.00	0	0	0.00
	Others	0	0	0.00	0	0	0.00
	Total	53	30	56.60	70	8	11.43
Technical Teacher Education	First	7	1	14.29	49	9	18.34
	Second	43	34	79.07	74	30	40.54
	Third	33	28	84.85	74	42	56.76
	Others	61	44	72.13	157	67	42.68
	Total	144	107	74.31	354	148	41.81
Arbaminch Water Technology	First	322	6	1.86	321	7	2.18
	Second	5	3	60.00	0	0	0.00
	Third	12	11	91.67	0	0	0.00
	Others	6	6	100.00	0	0	0.00
	Total	345	26	7.54	321	7	2.18
Grand Total	First	4663	1005	21.55	7713	1398	18.13
	Second	740	458	61.89	1311	449	34.25
	Third	131	95	72.52	108	52	48.15
	Others	68	51	75.00	157	67	42.68
	Total	5602	1609	28.72	9289	1966	21.16

Source: Department of Higher Education Human Resources Development, MOE.

Hence, *quantifying can only be understood as a multilevel phenomenon* (Bogdan, 1980).

- Studying gender differences using the international data was based on the belief that the students' samples used in different countries were intended to be representative and free from any bias. As can be seen from Table 1, the only country with a very small difference in physics was England. However, in England the proportion of girls in the physics population was very small. This was interpreted to mean that the female population was selected; that is, only the highest achiever girls were enrolled (Postlethwaite and Wiley, 1992). As Bogdan (1980) pointed out, *both the person and his or her motivation for counting affect the meaning, the process, and the figures generated.*

- In the 1980s, intervention programs and research studies, for example, in the U.S., Australia, and U.K. were done focusing on *demasculizing and demystifying* science, usually by exposure to role models and career information, improving self-confidence and self-perceptions of girls' ability to do science, introducing methodologies that actively involve girls in science lessons and assisting development of girls' skills of doing science (Postlethwaite and Wiley, 1992). We also know that, nowadays, in the developing world greater intervention to improve girls' self-confidence and achievement in science is taking place. Even countries like the U.S. have started to ask questions like: *Are standards in the U.S. schools really lagging behind those in other countries?* Based on IEA results, other countries have also started to scrutinize the education system of those countries that achieved good IEA results. Therefore, we can say *counting releases social processes within the setting where the counting takes place in addition to and beyond the activities directly tied to counting (*Bogdan, 1980).

- Many of the researches reviewed are based on *deficit model* that implies that girls must lack some cognitive skills, personal characteristics, or experience that prevent them from achieving as well as boys. A research that characterizes *females as deficient males* perpetuates a distorted view of female achievement. It does not help to identify factors that uniquely influence achievement in science and women's educational and occupational choices.

Discussion

The studies indicate there is gender difference in science achievement. Significant gender differences in attitudes and achievement scores are found in physics and chemistry, and rather small differences in biology. Girls feel stronger than boys that science is not just for boys, but when asked about the relationship between themselves and science, girls respond more negatively than boys do. The interest of girls in science through active involvement is slightly less. In general, there is a gap between their attitude toward science and careers in science (Steinkamp and Maehr, 1984).

In the view of the physical and biological sciences, differences were minimal in biology and chemistry, but pronounced in physics. Children's attitudes toward gender roles in general become less stereotyped as they mature (Steinkamp and Maehr (1984). Analysis from the 1976 Science Assessment of the National Assessment of Educational progress (NAEP) (Zerega et al., 1986) indicated that girls attain the same scores as boys at the early adolescent level, and do comparatively less in late adolescence. In some countries such as Australia, Canada (French) and Ghana, no significant gender difference was seen in biology achievement. In Israel, girls scored better than boys in biology (see Table 1). There are researchers who say this is to be expected because biology is labeled *feminine*, and therefore, it is acceptable for girls to do well in it (Humrich, 1988). Some others say that gender differences appear least apt to emerge in countries providing more equitable home environment such as the kibbutz in Israel.

The Impact of Quantitative Data on the Research Problem

According to Bogdan (1980), *education statistics as a human process* has a soft face. Therefore, here below, the impact of quantitative data on gender differences in science achievement is discussed.

- Selectivity of the sample based only on sex differences is misleading. Hyde and Linn (1981) pointed out that males tended to be more advantaged than females in terms of parental income, father's education, and background in private school. In terms of sex differences in science achievement, it is also important to look at the impact of certain factors: single-sex vs. mixed-sex schools, female vs. male teachers, centralized vs. decentralized school system, and tracking vs. generalized curricula, presence of gender sensitive teachers, directors, and curriculum materials, etc. In addition, several different sources of gender differences in science participation and achievement, ranging from cognitive abilities to socio-cultural stereotyping of science as masculine, have been identified. There is evidence that some type of gap is due to the nature of the test as well as to the types of test items used to assess achievement in science. For example, males on average score higher on objective tests, whereas females as a group score better on essay test. Furthermore, many test items contain references to games, sports, and other activities that are based on boys' interest (baseball averages, motorcycle mileage, automobile engines). It should also be noted that a growing attention has been paid to gender and gender differences in performance when screening items in the test construction process. This in itself may reduce, to some extent, the magnitude of the observed score differences between the genders (Postlethwaite and Wiley, 1992). Therefore, as Bogdan (1980) has stated *the concept of real rates is a misnomer.*

- A comparison of boys' and girls' performance on science-related measures and factors that contribute to gender differences are attracting the attention of educators and facilitating the development of policies, theories, and classroom teaching/learning practices conducive to long-term achievement in science for females.

As it was reported, science facilities especially at the high school level have positive effect on achievement; therefore, countries with poor equipped schools are trying to bring up their facilities to the standard of those with adequate science facilities. The percentage of time teachers use in their classes, in their laboratory and the extent to which students do experiments is also increasing.

- In the early 1980s science had a masculine image, but later on girls started to believe that science is for girls as well as for boys. Many girls fear that to show an interest in science may diminish others' views of their femininity. Although much smaller differences in science achievement between sexes were expected during the SISS as compared to the FISS, due to feminist movement and many wives and mothers being employed in jobs outside of their homes, slight improvement is observed. However, in this respect we can say *quantifying has a temporal dimension* (Bogdan, 1980)

- Variations in the magnitude of science achievement of gender differences across countries are seen. These could be an indirect support for a cultural as opposed to a genetic explanation for sex differences in motivational orientations toward science. For example, in Israel girls' orientations towards science surpass those of boys. Efforts made to remove stereotypic labels from all tasks appear to have a positive effect on girls' orientation toward science (Steinkamp and Maehr, 1984). Other factors like differences in available number of laboratories, emphasis on science at the primary and secondary level, instructional hours, the proportion of male/female teachers in schools, and so on, have their own effect on generating the data. It was also observed that some people attribute the cause for gender difference in science achievement to genetic and others to socio-cultural factors.

In general, gender differences in motivational orientation and achievement are small, but they may indicate the superiority of males over females. Gender differences are also observable in developed countries. These differences also appear in more achievement motivated countries, like the U.S., which foster mass education, equity and educational resources (Steinkamp and Maehr, 1984). From the IEA study of Science II, the highest gender differences are observed in the physical sciences, for example, physics and the lowest are in biology. In chemistry, there was a very small difference in Ghana and Sweden. In physics, this was true in England and Singapore (Postlethwaite and Wiley, 1992).

In sum, there is evidence that at the early adolescent level, there are no significant differences in sciences achievement due to differences in gender; that is, girls do as well as boys. But four years later, in later adolescence, the female achievement levels are significantly lower than those of males. The years between age 13 and age 17 have an important differential effect because girls attain the same scores as boys at the start and do comparatively worse at the end of high school.

Furthermore, gender differences are not homogenous across measures, age groups, and content areas, which makes it difficult to draw any general conclusions. Therefore, parents and educators need to understand the factors that improve performance in science.

Conclusion

Role models, both in and out of school, are crucial factors in encouraging the greater involvement of female students in the sciences, thereby improving their performance in these subjects. According to Kahle and Meece (1994), the more women assume roles of instruction and leadership in the sciences and conduct research in these fields, the more likely that young girls will follow in their footsteps. Moreover, organizing girls' science clubs in schools and introducing a quota system in assigning university or college students to the science and mathematics related fields of study could also improve women's career in the field of science.

Studies done to investigate whether there is a gender difference in science achievements or not seem to imply that males perform better than females, especially in the physical science. However, issues like why women do not select science as a career or why males perform better than females are not yet well explained. Gender differences in science achievement should be explained with convincing reasons. People who say there are gender differences in science achievement are expected to show not only score differences in science achievement, but also specifically indicate what the different factors of achievement are.

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