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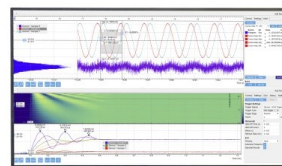
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Gender Imbalance in the Number of PhD Physicists and in Key Decision-Making Positions in the Republic of Serbia

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Abstract. In Serbia, one of the former republics of Socialist Federal Republic of Yugoslavia, men and women have equal access to higher education and professional employment. However, in practice, this equality is not always realized. In this paper we describe the status of women in physics in Serbia, focusing on student gender ratios and on positions held. The financial contributions of the Serbian government to the scientific sector are not sufficient. Many young physicists enter the information technology sector, where they can earn higher salaries. In addition, the lack of career opportunities motivates scientists to go abroad, so each year, more and more young people leave Serbia. Today, many young Serbian physicists plan their departure during their studies and leave the country immediately after graduation. We present statistical data for the last several years, reviewing the percentage of women who are pursuing physics as a subject of study or a profession. We report gender ratios at various career stages. Teaching at the primary and high-school level is the main professional activity for female physicists in Serbia. Even though a large percentage (about 50%) of Serbian physicists are female, few women hold positions in which decisions about scientific and educational policy are made. When women achieve leadership positions, their educational attainments often outstrip those required for the positions. Only six women have a high-level management position.

INTRODUCTION

Today, as in the past, women have the same opportunities as men do in Serbia. However, following the breakup of the former Yugoslavia and embargo, Serbian scientists have begun to open doors around the world, and each year more and more young people leave.

Women physicists in Serbia face the problems of relatively slow promotion rates and the low probability of occupying a leadership position. When women achieve leadership positions, their educational attainments often outstrip those required for the positions.

REPRESENTATION OF WOMEN IN PHYSICS

We report gender ratios at various career stages.

Physics Students

Five public universities in Serbia grant BS, MS, and PhD degrees in physics. These universities accept a total of 280 first-year undergraduate students in physics (University of Belgrade, 155; University of Novi Sad, 80; University of Nis, 30; University of Kragujevac, 15; and the State University of Novi Pazar, 75 [mathematics and physics]). Figure 1 presents data on the number of students at all levels in physics programs at four of these universities (Belgrade, Novi Sad, Nis, and Kragujevac).

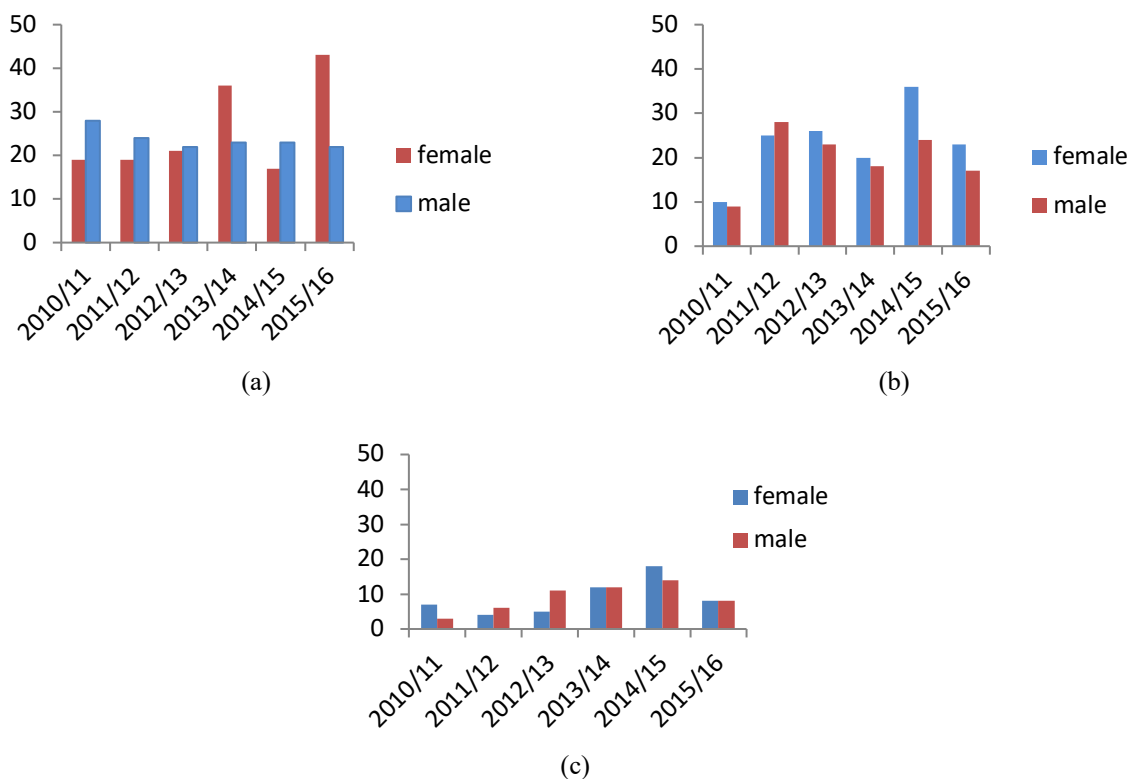


FIGURE 1. Statistical data for both genders at four universities (Belgrade, Novi Sad, Nis, and Kragujevac) for students pursuing a physics degree at the (a) BS level, (b) MSc level, and (c) PhD level.

Situation in Schools

According to the analytical unit of the Sector for Development and Higher Education, Ministry of Education, Science and Technological Development, the Republic of Serbia has 1,690 primary schools and 936 secondary schools. Table 1 presents statistical data for the number and gender of physics teachers in these schools.

TABLE 1. Number of Physics Teachers in Schools.

| Gender of Teacher | Primary School | Secondary School |
|-------------------|----------------|------------------|
| Female | 968 (57%) | 508 (54%) |
| Male | 722 (43%) | 428 (46%) |

As the data show, the number of female physics teachers is slightly higher than of male physics teachers. However, in a total of 2,626 schools, only 11 (0.41%) of female physicists are directors, and the majority of these directors are in Belgrade.

Situation in Faculties and in the Institute of Physics

In the following tables, we give data on the number of female physicists employed in the faculties of four universities (in order of faculty size, from largest to smallest).

Of the female physicists at the University of Belgrade (Table 2), two are department heads, one is a vice dean, and one is a director.

TABLE 2. Faculty of Physics, University of Belgrade.

| | Female | Male |
|---------------------|--------|------|
| Full Professor | 3 | 11 |
| Associate Professor | 3 | 10 |
| Assistant Professor | 3 | 11 |
| Assistant | N/A | N/A |

(Note: N/A = not available.)

At the University of Novi Sad (Table 3), physicists are employed in the Faculty of Sciences as well as in another two faculties: the Faculty of Technical Sciences (13 members, of whom nine are women [two full professors, two associate professors, three assistant professors, and two assistants]) and the Faculty of Agriculture (five physicists, two of whom are women [one associate professor and one assistant professor]) and one Higher Education School (one woman [assistant professor]).

TABLE 3. Faculty of Sciences, Department of Physics, University of Novi Sad.

| | Female | Male |
|---------------------|--------|------|
| Full Professor | 4 | 9 |
| Associate Professor | 4 | 2 |
| Assistant Professor | 4 | 5 |
| Assistant | N/A | 1 |

At the University of Nis (Table 4), in addition to the Faculty of Science and Mathematics, physicists are employed in the Faculty of Electronic Engineering (three women [one full professor and two assistants] and one man [full professor]), Faculty of Mechanical Engineering (one woman [assistant]), Faculty of Technology (one woman [assistant professor]), Medical Faculty (one woman [associate professor] and one man [associate professor]); and Faculty of Occupational Safety (one woman [assistant] and two men [one full professor and one associate professor]).

TABLE 4. Faculty of Science and Mathematics, University of Nis.

| | Female | Male |
|---------------------|--------|------|
| Full Professor | 0 | 7 |
| Associate Professor | 5 | 1 |
| Assistant Professor | 2 | 4 |
| Assistant | 1 | 5 |

At the University of Kragujevac, in addition to the Faculty of Science (Table 5), physicists are also employed in the Faculty of Agriculture, Cacak (one man [assistant professor] and one man [assistant]), in the Technical Higher Education School, Cacak (one man [full professor], three men and one woman [assistant professors] and also one man and one woman [assistants]), in the Faculty of Technical Sciences, Cacak (two men [full professors], two women and one man [assistant professors] and also two women and two men [assistants]) and in the Technical Higher Education School, Kragujevac (one man and one woman [assistant professors] and one woman [assistant]).

TABLE 5. Faculty of Science, University of Kragujevac.

| | Female | Male |
|---------------------|--------|------|
| Full Professor | 0 | 5 |
| Associate Professor | 0 | 3 |
| Assistant Professor | 3 | 3 |
| Assistant | 6 | 6 |

Analysis of the data in Tables 2–5 shows that the majority of female physicists are employed at the associate or assistant professor level, and that only a small number have advanced to the full professor level. In the case of the Faculty of Science and Mathematics, University of Nis, and the Faculty of Science, University of Kragujevac, this situation is even more extreme: No female physicist has advanced to the full professor level. As a consequence, there is a lack of women in leadership positions, given the fact that a requirement for any leadership position is an appointment to at least the associate professor level, but usually the full professor level.

In addition to members of the faculties, the Institute of Physics at the University of Belgrade currently employs around 300 people. Of these, 120 are senior researchers, 80 are doctoral or postdoctoral students, 50 are employed in spinoff companies, and 50 make up the institute’s technical and administrative staff. Statistical data for the three-year period from 2013 through 2015 are shown in Table 6.

TABLE 6. Institute of Physics, Belgrade.

| | 2015 | | 2014 | | 2013 | |
|------------------------------------|-------|--------|-------|--------|-------|--------|
| | Total | Female | Total | Female | Total | Female |
| Research Trainee | 19 | 14 | 23 | 10 | 33 | 11 |
| Research Assistant | 53 | 13 | 55 | 20 | 42 | 17 |
| Research Associate | 53 | 13 | 47 | 16 | 40 | 10 |
| Senior Research Associate | 33 | 13 | 32 | 12 | 32 | 16 |
| Principal Research Fellow | 48 | 16 | 44 | 16 | 48 | 15 |
| Total number of research employees | 206 | 79 | 201 | 74 | 195 | 69 |

KEY DECISION-MAKING POSITIONS

There is a large gap between the educational attainment and the number of leadership positions, so that only six women have a high-level management position:

1. Institute for the Advancement of Education (Federal agency for improvement of education (ZUOV)), Belgrade: Jelena Urošević, Advisor Coordinator in the Sector for the subject Science
2. Vice President of the National Assembly of the Republic of Serbia, General Secretary of the Democratic Party, and President of the Women’s Forum of the Democratic Party: Gordana Čomić
3. Ministry of Education, Science and Technological Development: Marija Krneta, Head of Group for general secondary and art school
4. Provincial Secretary for Education, Regulations, Administration and National Minorities, Biljana Kašerić, Assistant Secretary for Education
5. Vocational training centers (total of twelve): one director is a woman, Tatjana Marković Topalović
6. Faculty of Sciences, University of Novi Sad: Dean Dr. Milica Pavkov-Hrvojević.

SUMMARY AND CONCLUSIONS

There are many intelligent and talented female Serbian physicists, but this is not reflected by their participation in scientific research and at high positions in universities and in other public leadership positions.

Women are actively discouraged during their ascent of the social and business hierarchy. Women seeking success in business face obstacles pertaining to responsibilities of running a household as well as working in a company, and establishing a balance between their personal and professional life.

Recently, Serbia, understanding the importance of the principle of gender equality, built a legal framework for gender equality and ratified almost all international agreements on human and women’s rights. The Constitution states that women and men are equal, and it has provisions committing public authorities to pursue a policy of equal opportunities. The Constitution promotes antidiscrimination laws as well as the adoption of antidiscrimination strategies, action plans, and protocols. Institutional mechanisms put in place at the national, provincial, and local levels established the Women’s Parliamentary Network, which was formed in order to “strengthen the female voice.” Time will show whether the situation of women will improve.