

Building Industry in Sweden – a gender survey on education and employment

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Abstract

This is a short report on the gender situation for women in the building and construction industry, and it also shows statistics of the number of women that study building and construction at different educational levels in Sweden. This is a part of a project supported by The European Union Regional Development Fund Interreg Botnia-Atlantica. The number of women working with crafts and on building sites in Sweden are about 2 %, so there is a strong male dominance, which can be perceived as unsatisfactory from a gender perspective. The situation at the work places can be improved by policies and legislation, but such measures are no quick solutions. The Swedish Construction Workers' Union and the Swedish Industry Association among others, have programs and work shops etc where the situation regarding the gender inequality is addressed. In the educational systems, both at the upper secondary level and higher education, the statistics show a male dominance. To improve the gender balance in this industry it is important to recruit and attract more women into the building and construction programmes in the educational system. To be able to reach that goal, one has to start to create interest in technology and engineering for girls at a young age.

Introduction

The project “Circular Economy – A Gamechanger for the Wood Building Industry” is supported by The European Union Regional Development Fund Interreg Botnia-Atlantica. The goal of the project is to boost the competitiveness for regional small and medium enterprises (SME's) by introducing Circular Economy (CE) and enhance cross-border cooperation in the Botnia-Atlantica region of Sweden and Finland. During the project process and activities, such as workshops, lectures and webinars etc, female participation has been seen as very important.

The aim of this short report is to show the how, and if, there has been a change during the last decade when it comes to the number of male and female students in the educational systems that leads to a future within the building and construction sector in Sweden, and the Swedish part of the Botnia-Atlantica region.

Background

The unequal gender distribution in the building industry is common in most countries. In a study by J. Byrne et al [1], they describe a situation in Western Europe with very few women among manual site workers, often less than 1%. The situation in Sweden is about 2% [2, 3]. The situation for employees in higher positions with higher education, for example university degrees is better but there is still a strong male dominance. According to a report by G. Olofsson et al [4], women employees in the building sector have a significantly higher level of education compared to the men. A possible reason for this may be that men may have many years of professional experience, and have worked their way up, as they often are in an older age group. There are fewer female engineers working in field offices and on the work site, but rather in headquarters and planning offices. Compared to men, it appears that women are in a better position for promotion where formal education and

qualifications are required where employment conditions are regulated by proactive recruitment activities, policies and laws [1]. Barriers facing women in the building and construction industry are discussed in a study by M. Ibanez [5]. Here, different possible barriers are mentioned that in some extent may have been a part of the gender inequalities. The lack of suitable protective clothes for women and of separate changing rooms seems to be a problem of the past. However, discrimination of sexual character, explicit sexual references and rude language are still common. For example, in a recent report by the Byggnadsförbundet, a Swedish industry association, from last year about the “macho culture” in the industry it can be read that twice as many women as men state that they have experienced sexual harassment at their place of work during the last 12 months [6]. The view that the work is heavy and that women do not have the necessary physical strength can probably be true in some work areas, but today there are many technical devices to aid men and women when performing heavy lifts etc. However, to show great physical strength is a part of a “macho culture” in the building industry, something that can lead to an increase in work related injuries if not stopped. A press release by The Swedish Work Environment Authority [7] based on four recent research reports conclude that the macho culture is related to accidents among men and is a big problem in the building and construction industry. Byggnadsförbundet has a continuous dialogue and workplan with for example The Swedish Construction Workers’ Union and The Swedish Construction Federation aiming to stop this and other types of discriminating behaviour that can be found in certain places of work [6, 8]. Byggnadsförbundet is a policy organisation within the building industry with the aim to encourage male workers to distance themselves from the macho culture [9].

In order to improve and find a better balance between male and female workers within the building and construction industry, one has to start in the early years in the educational system. One method to increase the interest in technology among girls are different programs with specific courses, often during a couple of weeks during the summer. There are more than one hundred of the Swedish municipalities that arrange this every year, financed by governmental grants [10].

The programme for Building and Construction Technology is one out of five of the upper secondary school programmes that are pointed out as “boy programmes” as there are more than 90 % male students on the programmes [10]. Of the very few women that started the upper secondary programme for Building and Construction Technology between 1994 and 2002 (figure 1) 17 % chose to leave the programme, whereas only 9 % of the male majority on the programme chose to leave [10]. It has been pointed out that good role models or mentor ships might be one solution to this problem [11]. There were 14.9 % women on the programme for Building and Construction Technology in 2020, but the numbers are higher at university level with 37 % on the three-year programmes and 40 % on the five-year programme which show a slight increase the last years. The programmes for architecture show figures for women around 50 % and more for the year 2020 [2, 12].

The largest group of women within the building and construction industry are working in the field of consulting and contracting, i.e. employees with a university degree. Whereas there are very few women working with crafts and on the building site, mainly women that has a degree on the upper secondary level (table 1) [2, 13].

There are different networks for women in the building and construction industry, within certain companies and/or regions. That is described as a good example on how to strengthen women’s position in the work place [11, 14]. Such networks can also be very important for support and the job satisfaction. In 2016, the Swedish government gave the Ministry of Trade and Industry an assignment for state coordinators to review the need for measures to ensure sufficient manpower capacity in the building and construction industry [15]. One of the important points in that mission was that in

particular follow up on women's situation in the building and construction industry and on that there is a need to propose measures that lead to more women being employed in the industry and that more women choose to stay. In another article from 2018 [16] the Ministry of Trade and Industry refers to the assignment from 2016 mentioned earlier. In this article they mention a specific initiative by the real estate company Ikano Bostad [17] called "Hentverkarna" to encourage women start a career in the building and construction industry. A. Vänje working at the Royal Institute of Technology (KTH) has written a report describing this initiative focusing on equality, working environment and safety [18]. Out of more than 300 applicants, 16 adult women without previous experience in the building industry, was assigned to the 3.5-year educational project as apprentices to become carpenters and joiners. The conclusion was that the project was successful and that the working conditions for women was improved, and that there now are more women working as carpenters and joiners. One reason for these improvements is that there are more women in the different groups of carpenters and joiners etc. in the company. Women are no longer in minority which has had a positive effect on the otherwise male dominance and macho culture [18]. Networks and mentorships for women in the industry can be an important measure to get women to stay on in the industry. Both Byggföretagen and Byggnads have special networks for women in the building industry, networks on both national and regional level [14, 19, 20,] that arranges workshops and courses [11]. Many of the large entrepreneurs also have special networks for women, for example the network AKS at Skanska [21] and Stella at NCC [22]. In-house courses aiming to give women a possibility to change their careers in the company can also be a way to keep women in the company.

Method

This report is mainly based on a short literature review, where statistics are collected from various governmental and official web-sites as well as journal articles describing women's situation in the building and construction industry. The focus is to find statistics on the numbers of men and women who have chosen an education that is connected to, or may lead to a working position within the house building and construction industry. In addition to the literature review the project included interviews of SME's in building construction companies in the Swedish part of the Botnia-Atlantica region. During the visit's interviews were made on the basis of a questionnaire that had been formed by the project members at the Department of Applied Physics and Electronics at Umeå university and Umeå School of Business, Economics and Statistics at Umeå university.

Results

The ratio of male and female students in different study programmes in Sweden involving building construction and architecture depend on the type and length of study programme.

Building Technology at Upper Secondary School level

The programme for Building and Construction Technology for the upper secondary schools in Sweden is a three-year programme for students that have finished the compulsory nine years of schooling. Data from the Swedish National Agency for Education, presented on the web page for The Swedish Construction Federation [2], shows the number of men and women at the programme for Building and Construction Technology for the upper secondary schools in Sweden (figure 1). It is a three-year programme for students aged 16 to 20 years. The number of female students is very low with an average ratio of $9.1 \pm 2.3 \%$ compared to men during the years 2002 to 2020. However, there has been a clear increase in women on the program with 14.9% in 2020 compared to 3.4% in 2002. However, there the statistics show a declining total trend in enrolment of students since 2008, apart from a slight increase in numbers 2016 – 2018.

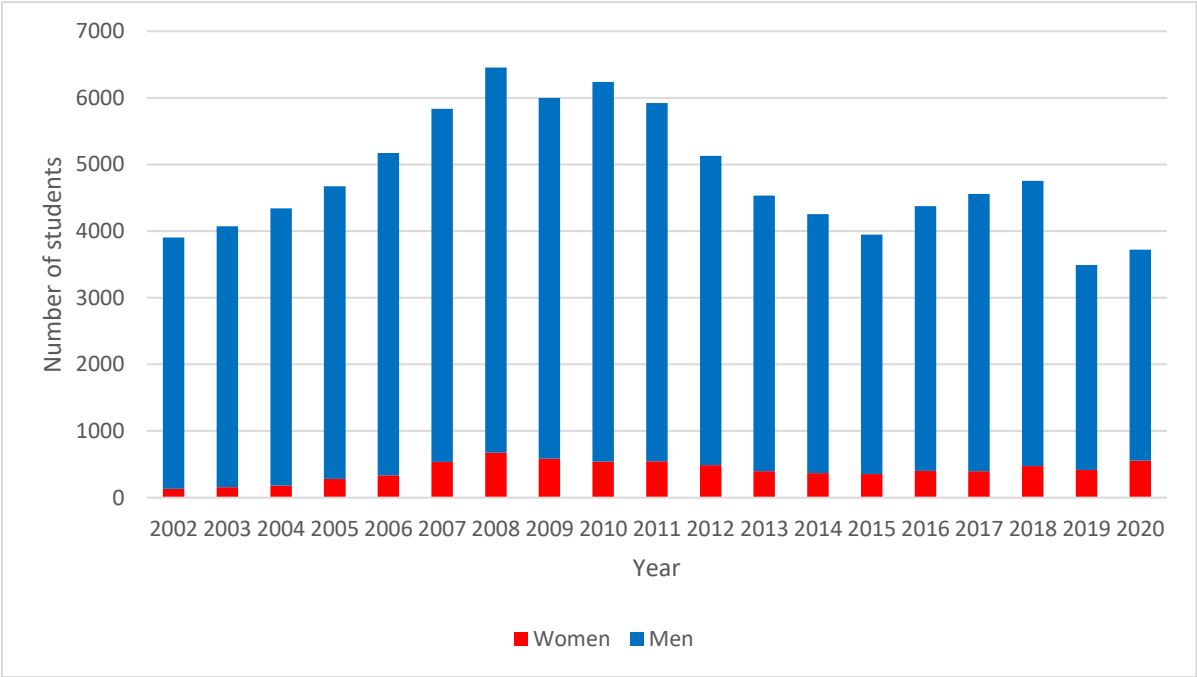


Figure 1. The number of men and women in the upper secondary schools for Building and Construction Technology in Sweden at the start of the autumn semester each year [2].

Building Technology at University level

The five-year university programmes in Building Technology in Sweden have a higher ration of women compared to the situation in the upper secondary schools. Data from The Swedish Council of Higher Education [12] for programmes that lead to a master of Science degree in Building Technology (figure 2) show an average ratio of $38.4 \pm 3.1 \%$ women for all programmes in Sweden between the years 2008 and 2020.

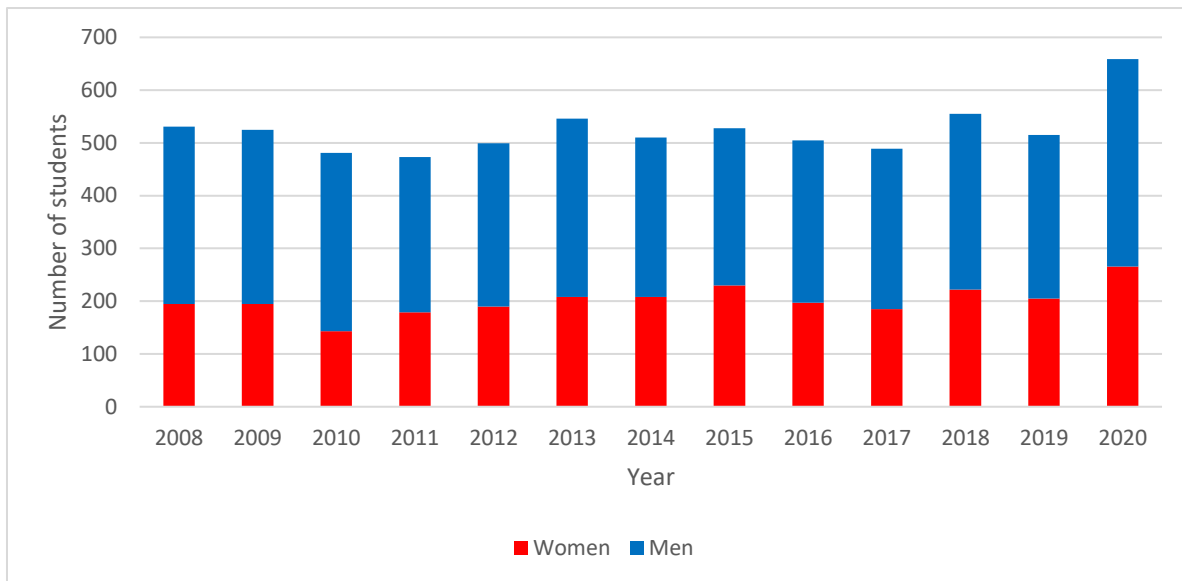


Figure 2. The number of men and women in the five-year university programmes for Building Technology in Sweden at the start of the autumn semester each year [12].

The three-year programmes that leads to a Bachelor’s degree in Building Technology show slightly less women enrolment as compared to the five-year programme in Building Technology. The average ratio of women for all programmes in Sweden between the years 2008 and 2020 is $33.2 \pm 1.9 \%$ (figure 3) [12].

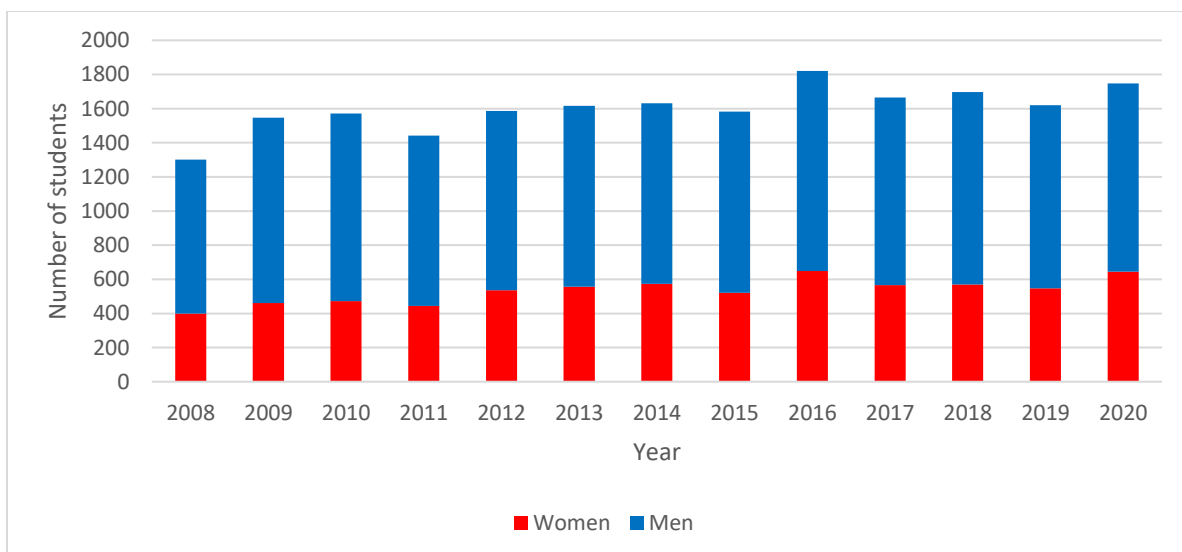


Figure 3. The number of men and women in the three-year university programmes for Building Technology in Sweden at the start of the autumn semester each year [12].

The situation at the three-year programme in Building Technology at the University of Umeå has an average ratio of $24.3 \pm 8.4 \%$ women for the years 2008 to 2020 (figure 4) which is lower than the national average [12].

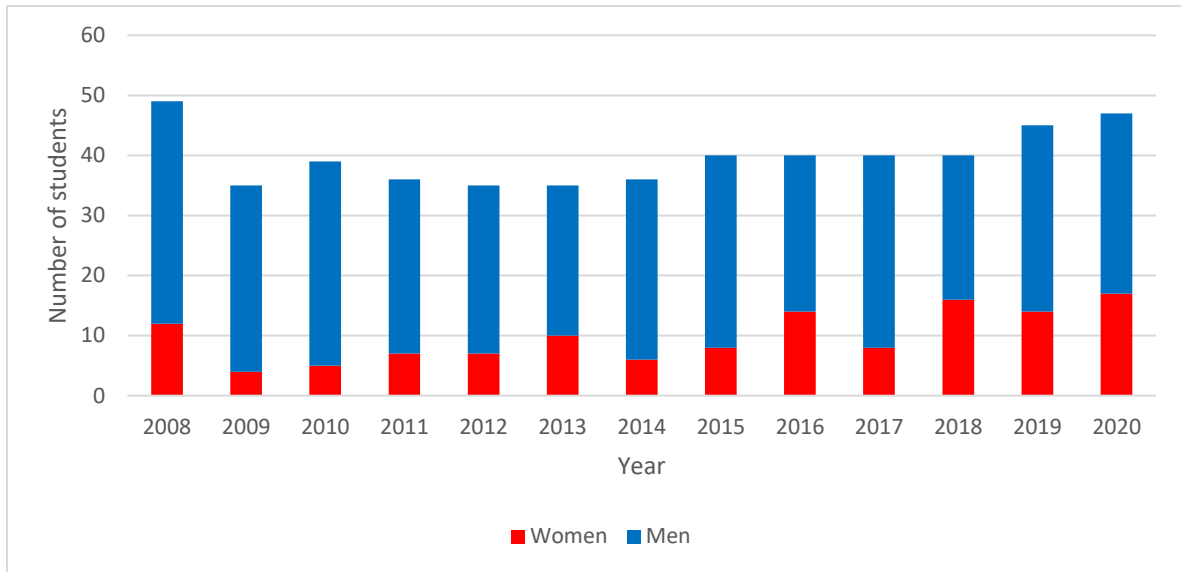


Figure 4. The number of men and women in the three-year university programmes for Building Technology at the University of Umeå at the start of the autumn semester each year [12].

Architecture programs at University level

Data from The Swedish Council of Higher Education [12] for the five-year university programmes in Architecture in Sweden is shown in figure 5. The programmes lead to a master of Science degree in Architecture. The distribution between women and men is considerably higher for these programmes compared to the programmes in Building Technology with an average ratio of 59.1 ± 2.1 % women for all programmes in Sweden between the years 2008 and 2020.

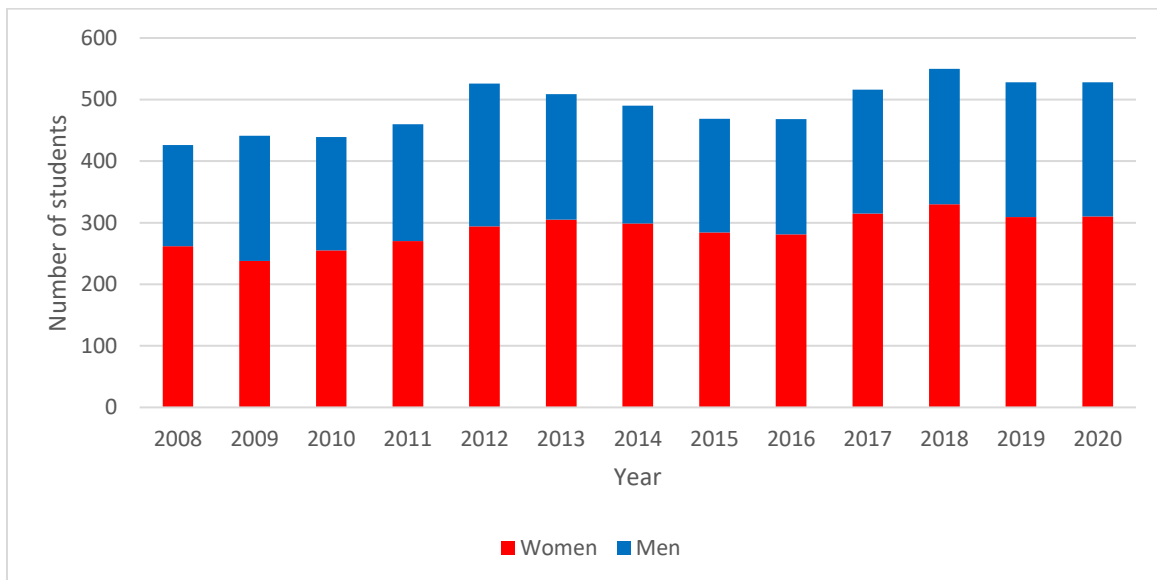


Figure 5. The number of men and women in the five-year university programmes for Architecture in Sweden at the start of the autumn semester each year [12].

The three-year programmes that leads to a Bachelor’s degree in Architecture show slightly less women. The average ratio of women for all programmes in Sweden between the years 2008 and 2020 is $45.1 \pm 4.0 \%$ (figure 6) [12].

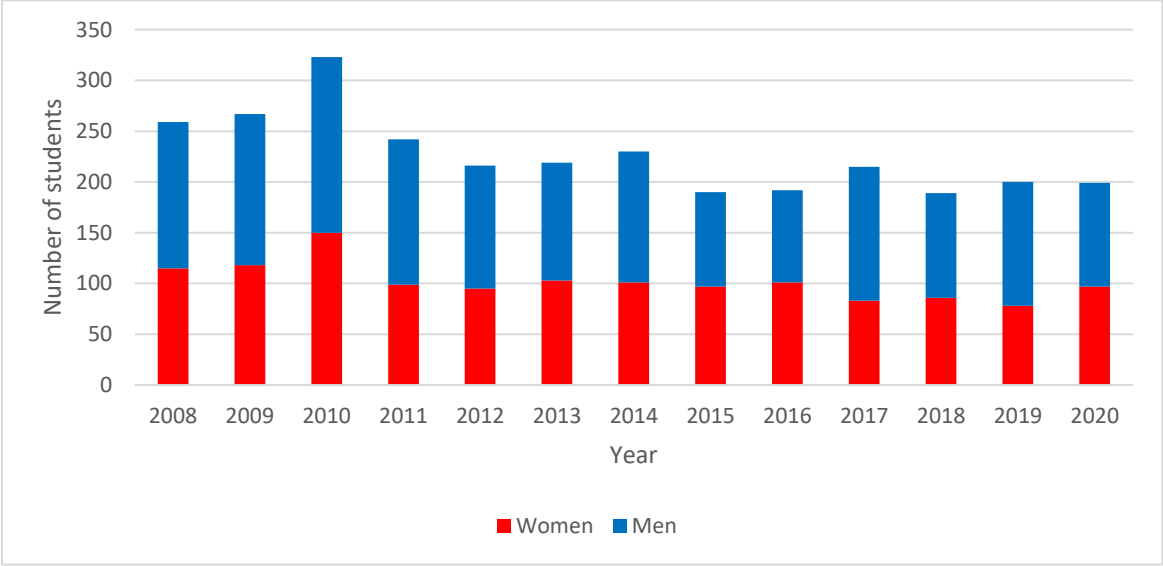


Figure 6. The number of men and women in the three-year university programmes in Architecture in Sweden at the start of the autumn semester each year [12].

The situation at the five-year programme in Architecture at the University of Umeå has a high number of women on the programme. The average ratio is $59.3 \pm 3.8 \%$ women for the years 2010 to 2020 (figure 7) [12].

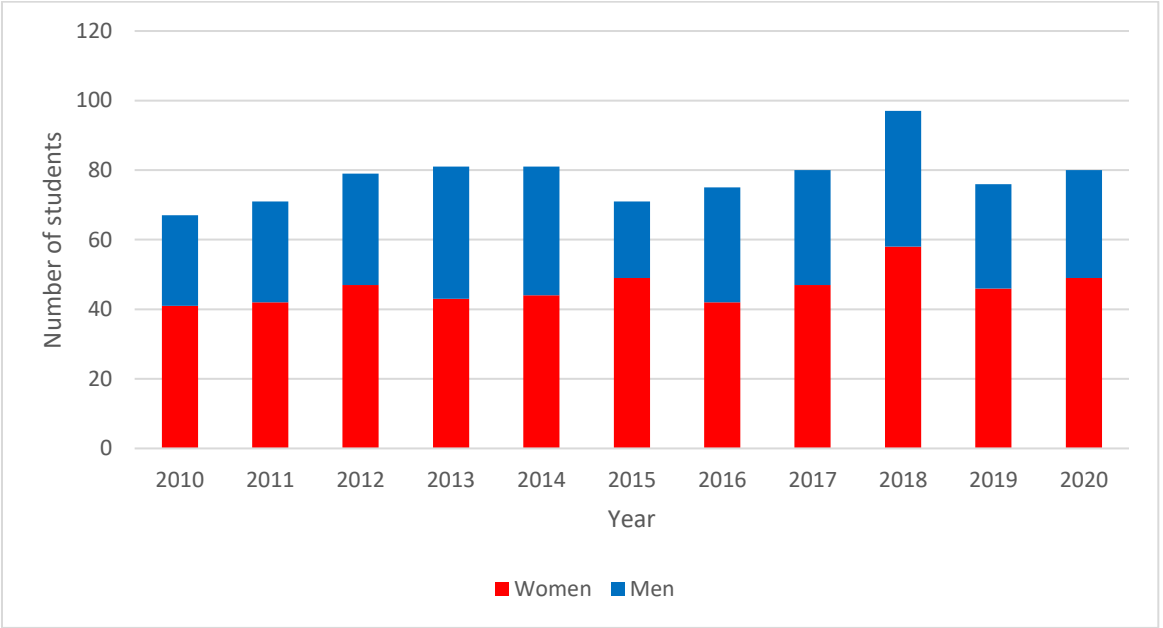


Figure 7. The number of men and women in the five-year university programme in Architecture at the University of Umeå. The figures are at the start of the autumn semester each year [12].

Men and women working in the building and construction industry

The total number of persons working in the building and construction industry in Sweden was retrieved from the web-page of The Swedish Construction Federations [2]. The data is based on the statistics from Statistics Sweden (SCB) [13], based on labour market statistics. After a decline in the numbers from 1991 to 1997, there has been a steady increase in employment in this sector, and employed 36400 persons in 2018. The building and construction industry can be divided into the persons involved in the actual process of building houses, about 80%, and the remainder are construction workers i.e. infrastructure at the site. The previous trend with a large number of people of higher age has changed and the age group 25 - 34-year-old's has increased to 25.5% in 2018 compared to the year 2000 when the largest age group was between 45 – 54 year [13].

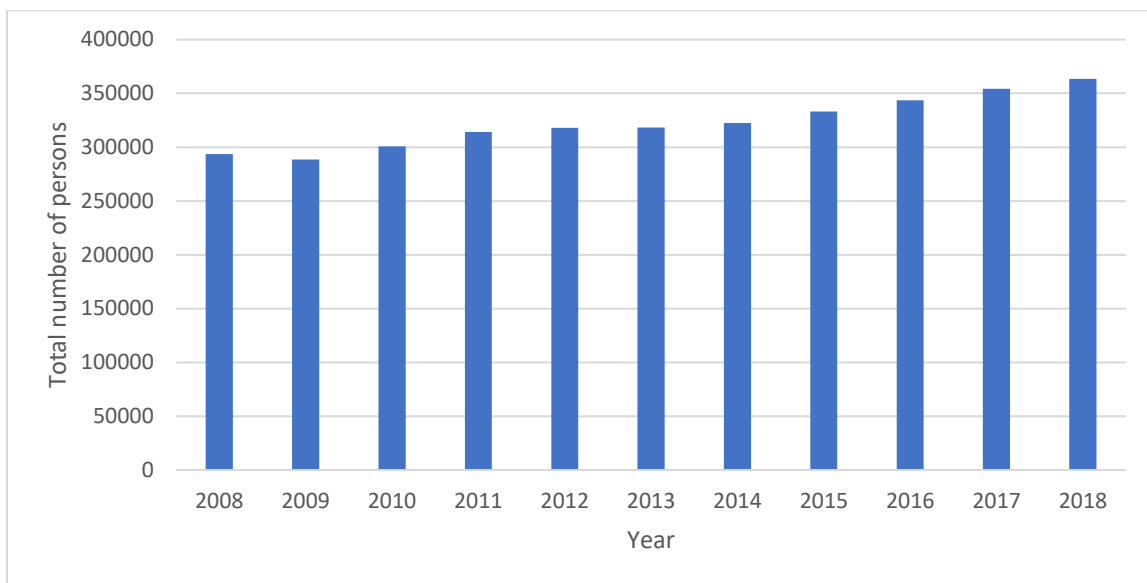


Figure 8. The number of men and women in the building construction industry in Sweden in the month of November each year [2, 13].

There are naturally many different job positions within the building and construction industry, some are more male dominated while some are less. In a licentiate thesis by Annicka Cettner. *Kvinna i byggbranschen – civilingenjörers erfarenheter ur genusperspektiv*, she mentions the consultant sector is an area where women are more integrated and a favoured career choice [23]. According to Byggföretagen [2], the total number of women working in the building industry has gone up increased from 8.1 % in 2010 to 9.6 % in 2018. However, the largest group of these women, 44 %, was working in the office-, sales- and service category, whereas only 2 % was working in the crafts category in 2018. Data from Statistics Sweden in Table 1 show the ratio of women in positions, excluding the office-, sales- and service category, but instead positions where it is likely that they have an education within the field of building and construction [13]. The occupational categories are defined and indexed by Statistics Sweden (SCB) depending on the level of education for each professional role [3].

Table 1. The number of women in different positions in the building industry in Sweden 2018 [2, 3].

Occupational category (SCB index)	Definition according to SCB and examples of professional roles	Ratio of women %
SSYK 1xxx	Leadership: <i>CEO and senior administrative managers within the company etc.</i>	12.2
SSYK 2xxx	Professions with higher requirements for advanced higher education: <i>Architects and Civil engineers in various subject areas etc</i>	39.4
SSYK 3xxx	Occupations with requirements for shorter higher education: <i>University engineers in various subject areas, supervisors etc.</i>	16.4
SSYK 7xxx	Crafts and manual site workers: <i>Carpenters and Joiners, Brick layers, Concrete workers etc</i>	2.0

Survey results with SME's in building construction companies

This report covers the areas that are included in the Swedish part of the project are the counties Västerbotten and Västernorrland as well as the municipality Nordanstig in the county of Gävleborg. As a part of the project, interviews with 18 SME's wood building industry in the region were conducted. Eight of the companies had less than 10 employees, 7 companies had 10-49 employees and only 3 had between 50 and 100 employees. The interview focus was not on gender, however there were a few questions related to gender issues and it will be mentioned in this report. The responders were all male, most of them in a position as chief executive officers (CEO's), which seems to be typical for most SME's in the wood building industry. Approximately one third of the companies interviewed mentioned that they had women in leadership roles, and about 40% had women in the board of directors. The percentage share of women among total employees in the companies interviewed ranged from 0 – 28 %. However, in a small SME, for example one with only three persons, if it has one women employee then it gives a ratio of one third which may seem misleadingly high, whereas a company of 100 persons with three women only has a female ratio of only 3%.

In the questionnaire that was used during the interviews, there was a question regarding if they had any suggestions on how to achieve more gender balance in the building industry. Most answered that they saw it as very important to attract more women to the building sector. They pointed out that the early (teen) school years would be an important age group for more information regarding possibilities for further education that can lead to attractive jobs in the building sector. The fear for that it is a physically heavy job can be answered by the fact that there are so many technical solutions and lifting devices in the industry today.

Discussion and Conclusion

The wood building industry is a traditionally male working sector, but as CE often involves new design and product development it may open up for more interest from women and women's employment in this sector. Wallhagen et al [24] has studied gender differences in environmental perspectives and found a higher interest in environmental issues among women. An increased gender equality in the building and construction sector would be beneficial. By introducing a transformation towards more CE in the SME's a new market for services and products, new actors

might appear that can break traditional structures which can be positive when it comes to an increased gender equality.

To increase the number of women working in the building and construction industry one has to start in an early age to create an interest among girls for technology, and here the teachers have an important role. There are examples of companies and municipalities that offer special courses and workshops directed towards young females. Some kind of mentorship between young women at the university level and technically interested female youth in the upper secondary schools might be one way. Other important measures are for the employers and the unions to work with gender issues. The “macho culture” that is prevalent on certain places of work must be wiped out. It is the men that needs to change, not the women that needs to adapt to the current situation in the industry.

Declaration of interest

The authors report no competing or conflicts of interest. The authors alone are responsible for the content and writing of the paper.

Acknowledgements

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