

WOMAN AND DESIGN

Hynek Maňák¹, Ludvika Kanická¹, Dominik Horák¹

¹ Faculty of Forestry and Wood Technology, Mendel University in Brno, Zemědělská 3, 613 00 Brno, Czech republic

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Abstract

The generally assumed lower proportion of women in technical fields is due to a historical development full of gender stereotypes and persistent anxieties. The proportion of women studying design at LDF Mendel has long been around 80%. At the Department of Design and Furniture, the technical difficulty of the content of the study programme has been discussed with regard to this high proportion of women, and the subjects of mathematics, physics and geometry have been reintroduced into the study programme. At the same time, higher requirements were set for knowledge in the areas of mechanical and physical properties of materials, furniture design and dimensioning and production technology. The defended final theses of the students prove that women are able to process these works with the high technical complexity required by this level of education. The study thus creates a high prerequisite for women's further career development.

Keywords: study of furniture design, woman, gender stereotypes, female role models, technical fields, professional career of women

Introduction

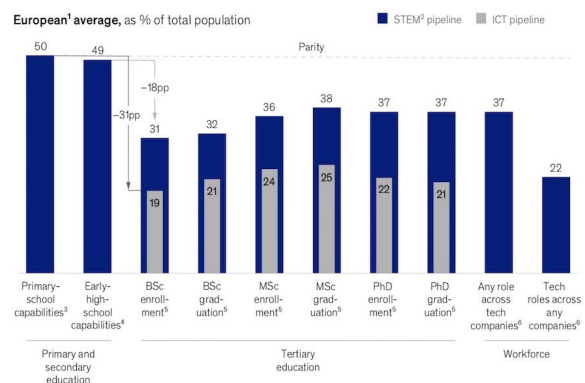
Some fields are perceived as specifically male or female. Yet research on brain function is busting myths such as that men have better spatial perception and women have better communication skills. The predisposition to different types of jobs illustrated by the myth: „Girls don't have the cells for maths“ is not true. The problem lies only in the stereotypical settings of society [1].

Women in technical fields

In addition to compensating for the general labour shortage, the main reason for including more women in corporate management processes is to make companies more efficient. Gender intelligence expert Barbara Annis says that when you include women leaders in your organizations, you not only save money and reduce employee turnover, but also improve brand reputation. Research shows that women bring valuable insights and approaches to the idea generation process, leading to simpler solutions to complex problems [2].

The labour market in Western Europe and the US addresses the under-representation of women in technology professions in senior positions. The decline of women in the European labour market during the development process from primary school to the workplace occurs at two points in time

when there is a significant percentage of women in STEM fields (science, technology, engineering and mathematics (Fig. 1), [3].



1: Graph of female attrition on entry to university and employment

The first moment is in the transition from primary and secondary education to university (with a decrease of 18%). The second moment is in the transition from university to the workplace (a decrease of 15%).

Even after women enter the technical workforce, another key issue is keeping women in positions of influence without interrupting their professional



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growth. The interruption in women's professional growth is caused by several factors:

- interruption of work due to maternity leave,
- lack of management support,
- persistent masculine preferences.

To retain women in technical occupations, employers offer job benefits (in order of popularity) [4]:

- Hybrid telework (Home Office);
- Paid time off;
- Medical benefits;
- Professional development / training opportunities;
- Family holidays;
- Coaching / Mentoring / Career counselling;
- Childcare.

Lack of Female Role Models

An important factor influencing the lower proportion of women in technical fields is related to the lack of female role models to look up to for career advancement and growth. Research has shown that women in technology lack mentors, face challenges in a male-dominated environment and have more family responsibilities than their male counterparts. Female role models and mentors were difficult to find in the technology field because it is mostly male dominated. Yet women have made a major contribution to the development of technical fields in the past. In fact, in the past, the role of women in science has been overshadowed by their male colleagues. Achievements and prizes were attributed only to men. This phenomenon is known as the „Matilda effect“ [1].

Women Studying Design at LDF Mendel University

In recent years, the proportion of women studying design at the Institute of Design and Furniture at LDF Mendel Brno has stabilised at around 80% (Fig. 2). At the same time, there have been discussions on whether the field of Furniture Design is an artistic or technical direction and what the content structure of teaching should be. In the previous period, subjects such as mathematics, physics and geometry were removed from the

curriculum. The return of the technical field of study, in view of the high proportion of women, was hindered by stereotypes and the view that women do not have the aptitude for technical fields.

According to the accreditation [5] of the study programme Furniture Design, the main emphasis is on balancing artistic skills and technical and technological knowledge in the field of furniture production. The current study programmes already include these subjects again, and the demands on technical knowledge in the field of furniture construction, furniture dimensioning and verification of mechanical and physical properties of materials have also increased. This knowledge is especially necessary with the advent and solutions of new eco-friendly materials such as hemp structural boards, seaweed and other materials newly being considered for furniture production.

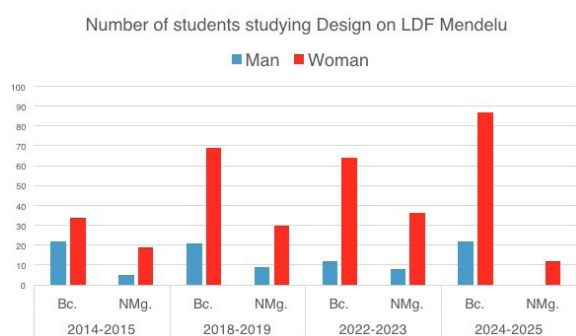
Inspirational / Female Professional Role Models

An important part of the study of design at the Institute of Design and Furniture at LDF Mendel Brno is knowledge of the history of furniture design. Here it is possible to look for patterns and find sources of inspiration. Although in the overcrowded male world, for the reasons mentioned above, „brave female designers“ are almost disappearing, there are a few personalities who have literally wiped the male world's eyes clean.

The imaginary bar for design as a result of the combination of science and the design process was set at the beginning of the 20th century by Margarete Schutze Lihotsky, who proposed the division of kitchen operations into working, cooking and washing zones based on the measurement of kitchen tasks. She was then able to test her theory in several thousand kitchens, which formed the basis for the furnishings of the post-war housing developments in Frankfurt am Main. The principle of the Frankfurt Kitchen is still in use almost 100 years later, but has been supplemented by new appliances and the application of new technologies.

Other successful women include Ray Eames. Today we do not know to what extent her husband Charles had her back, but both are shining examples of the fructification of the results of war research in the peace process. The knowledge of plywood bending required to make wounded men's splints resulted after the war in the design of an elegant chair which, nearly 100 years on, is still the ornament of every headmaster's office. Their almost endless list of technological innovations is unrivalled on a planetary scale.

Another example of the feminine approach is the work of „lone wolf“ Eileen Gray. Her work oscillated between functionalism and art deco. She was one of the first to deal comprehensively with interiors, looking for new functions for storage systems, which she tested on herself, as did her later Scandinavian colleague Nana Ditzel.



2: Representation of women studying Design at LDF Mendel University in Brno



3: Photograph of Mrs. Zdena Maňáková at work, successful and popular kitchen AROMA



4: Bedroom ADAM and DIES, by Eva Bubláková

We should not forget Charlotte Perriand, Le Corbusier's right-hand woman. Her unquestionable contribution to the design of furniture for the highly acclaimed „god“ of architecture somewhat disappears with the designation of the team's products as LC. In the case of this woman, her managerial and popularising activities must also be added to the scales. She managed to bring Japanese culture to France, which was also a source of inspiration for her.

Finally, it should also be mentioned that prominent women designers were able to excel in managerial positions, such as Florence KNOLL, who, after her husband's death, headed the highly successful American company KNOLL, which she brought to the position of a competitor of Hermann Miller, not only thanks to a precisely chosen production programme, but also thanks to the licensed production of European furniture icons (e.g. the Barcelona chair).

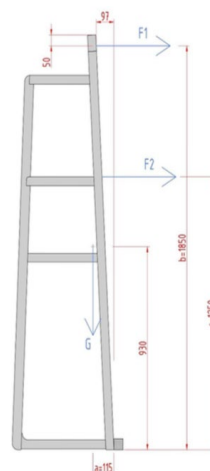
There are more similar examples from around the world, the situation in socialist Czechoslovakia is admirable. Here, women interior architects (the word designer was almost taboo) had to face the unqualified opinions of the then management of furniture colossuses. At this stage, one cannot fail to mention the stubbornness of Zdena Maňáková (Fig. 3), [6], or Eva Bubláková (Fig. 4), [7], whose designs combined elegance with function. Perhaps that is why they were put into practice despite enormous problems. These ladies of Czech design can in no way be accused of plagiarism, because their designs were placed behind an impenetrable wall, which was imaginatively reinforced by the

information barrier imposed by the then absence of literature and the Internet.

METHODOLOGY

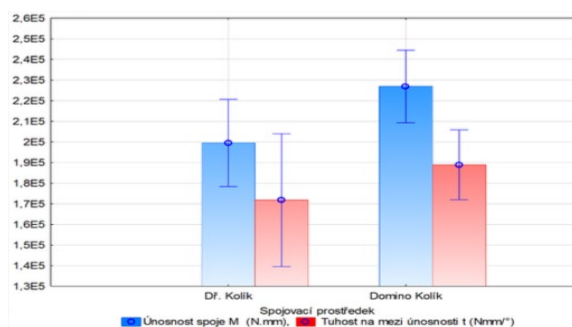
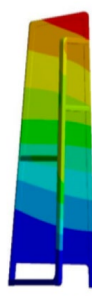
The article uses a quantitative approach for evaluation based on primary and secondary sources, professional literature in the field of labor resources. Four bachelor's theses defended by women at the Institute of Furniture Design in 2023 and 2024 were selected for analysis. The selection criterion was the complexity of the work, including, in addition to studies, design and production documentation, product stability calculations, FEM analyses, practical testing of material properties, as well as the students' participation in development of new ecological materials for sustainable management.

- In order to clarify the current state of the argumentation on the issue of the employment of women in technical fields, a question on ChatGTP was used in the form of four questions, two formulated positively and two formulated negatively:
- 1A Why can women be successful in designing furniture?
- 1B Why can't woman be successful in designing furniture?
- 2A Why can women be successful in technical fields?
- 2B Why can't woman be successful in technical fields?



A: Static Structural
Total Deformation
Type: Total Deformation
Unit: mm
Time: 1 s
13.03.2024 16:18

0,074744 Max
0,066439
0,058134
0,04983
0,041525
0,03322
0,024915
0,01661
0,0083049
0 Min



5: Samples from the final thesis Mirrof as furniture solitare by Gabriela Vaculíková [8]

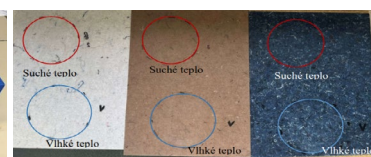
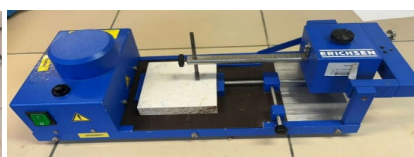
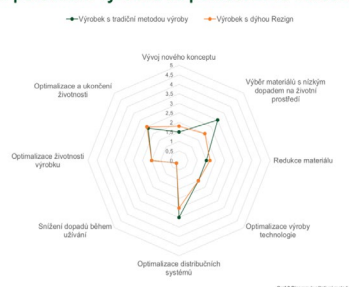
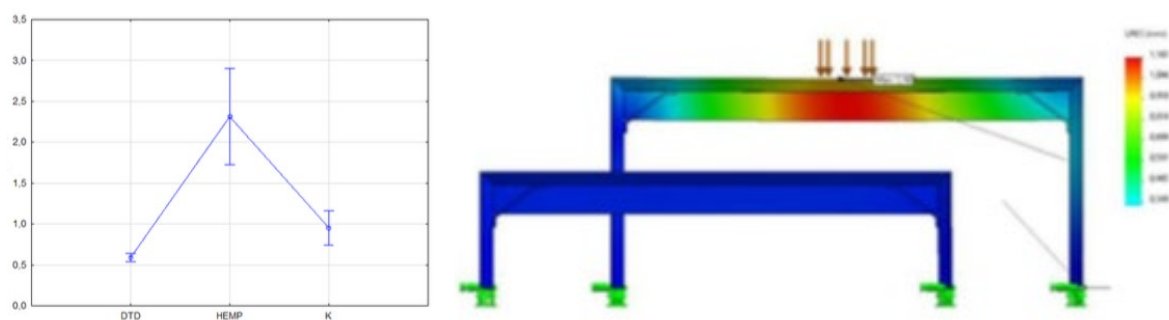
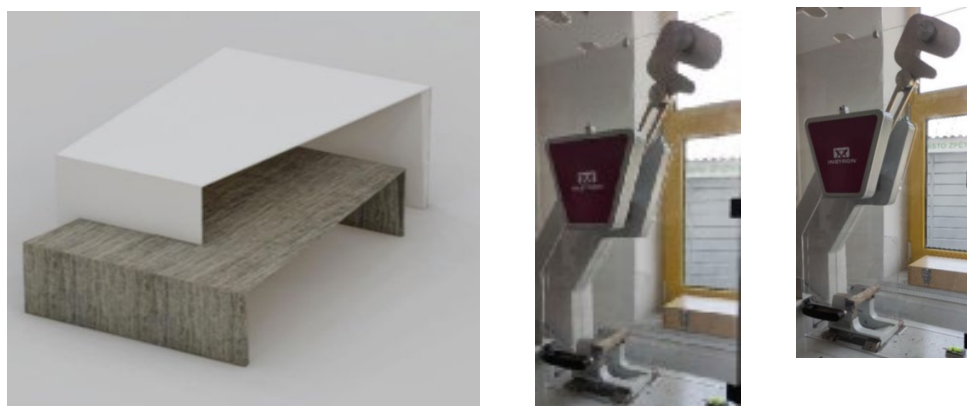


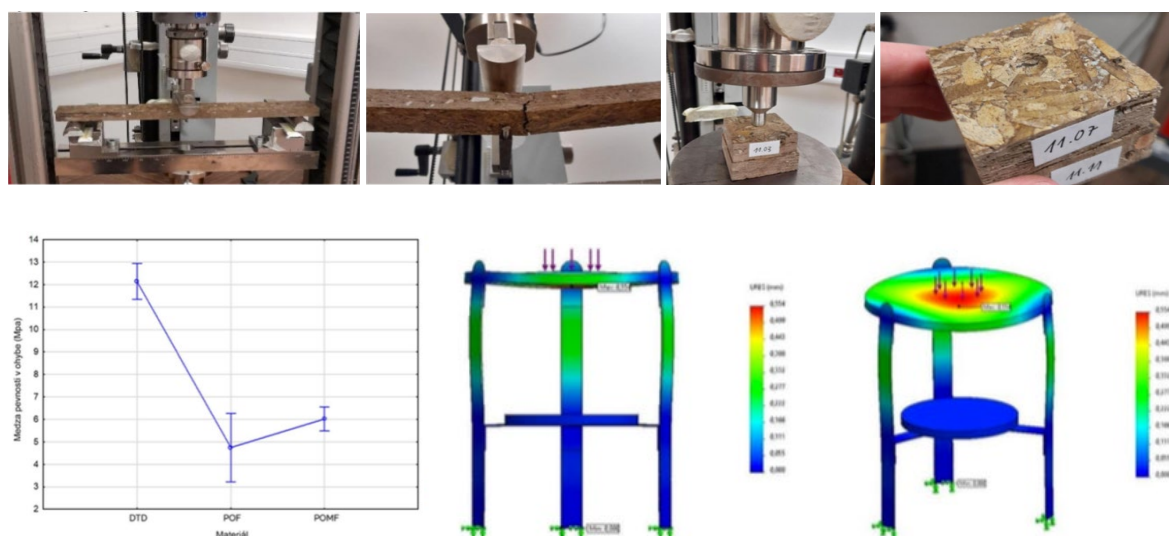
Diagram porovnání výrobku za pomoci LiDS Wheel metody



6: Examples from the final work Furniture from recycled material Reigin by student Anežka Petrušková [9]



7: Examples from the final thesis Conference table made of Cannabis Sativa L material by student Jana Michlová [10]



8: Samples from the final thesis Furniture element made of seagrass material by student Veronika Bellayová [11]



9: Student participation in the development of new materials from hemp and seagrass

RESULTS

Thesis topics

Currently, the thesis topics of students of the Furniture Design study programme are assigned with the requirement of interaction of product design with testing and evaluation of physical and mechanical properties of materials and design principles. The theses of female authors defended in 2023 and 2024 demonstrated their ability to produce work with a high proportion of technical parameters (Fig. 5, 6, 7, 8). As part of final theses students also participated in the development of new ecological materials for sustainable management (Fig. 9).

What about ChatGTP?

To test the validity of the arguments, the following questions were posed to AI [12]:

1A Why can women be successful in furniture design?

Women can be successful in furniture design for several reasons based on their specific approaches, skills and perspectives. Women often demonstrate a high level of empathy and ability to understand the needs of users. This enables them to design furniture that is not only aesthetically appealing but also functional and comfortable for everyday use. They are sensitive to details that can improve the user experience, such as ergonomics, safety and comfort.

1B Why can't women be successful in furniture design?

There is no objective reason why women cannot be successful in furniture design. If one tried to argue against it, it would be more about prejudices or stereotypes that have influenced various professional fields, including design, in the past. Here is one of the fallacious arguments that may have been put forward by so-called „historical stereotypes“: in the past, some professions were seen as male domains and furniture design, like other technical or craft fields, may have been happy to be less accessible to women. However, this prejudice does not hold true in modern times, as women have the same educational and professional opportunities as men.

2A Why can women be successful in technical fields?

The longer answer is systematically broken down into the following points, which contain brief positive arguments:

1. Equal access to education;
2. Logical and analytical thinking;
3. Ability to work in a team and communicate;
4. Different perspective and innovative thinking;
5. Resilience and ability to overcome obstacles;
6. Growing support and mentoring;
7. Adaptability and ability to learn with new technologies;
8. The contribution of diversity in the fields;
9. Improving working environment.

2B Why can't women be successful in technical fields?

The answer is again structured into multiple points which, in turn, refute the reasons:

1. Stereotypes about “male” and “female” roles;
2. Underestimating the technical abilities of women;
3. Lack of female role models;
4. Preconceptions about the emotional nature of women;
5. Male-dominated culture of technical disciplines;
6. Unequal opportunities and lack of support;
7. Social expectations;
8. Lower self-esteem and imposter syndrome;
9. Biological differences.

What is interesting about ChatGTP's responses, then, is that it brings specific point-by-point reasoning to the positively phrased question on the successful application of women in AI technical fields. To the negatively worded question, the AI answers: „There is no objective reason why women cannot be successful in furniture design“ and presents various societal reasons and biases for women's employment in technical fields. AI refutes the biological differences between men and women.

DISCUSSION

Gender stereotypes and prejudices that women are not suited for technical fields have now been overcome in Western economies and do not prevent women from entering technical fields. Studies in various fields have refuted these stereotypes. On the contrary, positive role models of women's success in technical fields confirm and inspire female applicants choosing to study technical fields. In addition to the presentation of female role models, the creation of suitable working conditions once women have entered the workforce also helps to increase the proportion of women in technical fields. For the future career growth of women in the technical profession, it will be necessary for employers to offer women valuable bonuses and remove the persistent masculine atmosphere from the workplace.

The proportion of female students studying Design at LDF Mendel has stabilised at 80% in recent years. This paper describes the emphasis on the technical demands of studying at the Department of Design and Furniture at LDF Mendel University Brno, regardless of the gender composition of the students. The presented final theses prove that if the demands on students are set by the professional management without any gender stereotypes and prejudices, women are able to produce final theses with high technical difficulty, just like men. Technical studies free from gender prejudices can prepare a new generation of educated professionals capable of tackling current issues in furniture production and design with a high proportion of women in practice.

CONCLUSION

The final theses of women defended in 2024 in the framework of design studies at the Institute of Design and Furniture at LDF Mendel Brno prove that if the demands on students are set by the professional management without any gender stereotypes and prejudices, women are able to produce final theses with high technical complexity, just like men. This way, the study prepares a new generation of educated professionals capable of tackling current topics in furniture production and design with a high proportion of women in practice.

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Reviewer

Dr. Manja Kitek Kuzman, PhD – University of Ljubljana (Slovenia)

Contact information

Hynek Manak: hynek.manak@mendelu.cz