



Integration of the gender perspective in mathematics at university level. **Yes, we can!**



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Summary

- We show how **gender perspective** can be implemented in **mathematics at university**. In particular, in a subject about **Statistics** and Numerical methods in **Industrial Design Engineering degree** at Jaume I University in 2019/2020 course.
- The ideas also serve for **lower levels**.
- This connects with the priority topic of Gender Summit Global “**Advancing human well-being**”, with relevant **SDGs: 4 (Quality Education) and 5 (Gender Equality)**.



Relevance; Aims & Objectives

- **Gender gap in STEM** is important. However, few works deal with **integration of gender perspective** at math, and less at university level.
- Various **Spanish laws oblige the integration** of a gender perspective in university teaching.
- However, the **reality** is that in the vast majority of subjects **there is no effective incorporation** of the gender perspective.



Introduction

- The subject is a **first-year and second-semester** subject, therefore, due to the pandemic, we used **distance learning from mid-March** to the end of the course.
- The contents of this subject include in the **theoretical part** (19 hours) and **problems** (10 hours), those of a **basic statistics** (sampling, descriptive statistics, frequency and statistical inference). While in the **laboratory part** (28 hours), not only the contents of **statistics** are covered, but also **numerical methods**. (The mathematical foundations have been seen in the previous subject of Mathematics I, which does not have laboratories).
- This subject, although it belongs to degrees in the branch of Engineering and Architecture, has **an equal enrollment in terms of girls and boys (50-50%)**.



Methodology and Results

- The adequate management of the classroom.
- The visibility of the contributions of women in these areas.
- The use of an inclusive language.
- The methodology through active teaching.
- The contents.
- The work in values by humanizing the problems.
- The use of the computer.
- An appropriate evaluation.
- Interpersonal relationships, where empathy is essential as well as breaking with stereotypes and implicit biases.



Methodology and Results

- **The adequate management of the classroom: promoting an equal participation.**
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- The use of an inclusive language.
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Methodology and Results

- The adequate management of the classroom.
- The visibility of the contributions of women in these areas, with different activities, ranging from quotes to escape rooms.
- The use of an inclusive language.
- The methodology through active teaching.
- The contents.
- The work in values by humanizing the problems.
- The use of the computer.
- An appropriate evaluation.
- Interpersonal relationships, where empathy is essential as well as breaking with stereotypes and implicit biases.



Methodology and Results

- The adequate management of the classroom.
- The visibility of the contributions of women in these areas.
- The use of an inclusive language in all levels, oral, written, etc. note that no textbook uses inclusive language, so material was prepared.
- The methodology through active teaching.
- The contents.
- The work in values by humanizing the problems.
- The use of the computer.
- An appropriate evaluation.
- Interpersonal relationships, where empathy is essential as well as breaking with stereotypes and implicit biases.



Methodology and Results

- The adequate management of the classroom.
- The visibility of the contributions of women in these areas.
- The use of an inclusive language.
- **The methodology through active teaching: learning by doing mathematics, working in cooperative groups, by projects, etc.**
- The contents.
- The work in values by humanizing the problems.
- The use of the computer.
- An appropriate evaluation.
- Interpersonal relationships, where empathy is essential as well as breaking with stereotypes and implicit biases.



Methodology and Results

- The adequate management of the classroom.
- The visibility of the contributions of women in these areas.
- The use of an inclusive language.
- The methodology through active teaching.
- **The contents: showing the importance of adequate sampling, the adequate questions in order to see all the visions, i.e. to show the importance of taking into account gender in engineering through data.**
- The work in values by humanizing the problems.
- The use of the computer.
- An appropriate evaluation.
- Interpersonal relationships, where empathy is essential as well as breaking with stereotypes and implicit biases.



Methodology and Results

- The adequate management of the classroom.
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- The use of an inclusive language.
- The methodology through active teaching.
- The contents.
- **The work in values by humanizing the problems: some activities were about discrimination, climate change, etc.**
<http://www3.uji.es/~epifanio/TEACHINGP/gender.tar>
- The use of the computer.
- An appropriate evaluation.
- Interpersonal relationships, where empathy is essential as well as breaking with stereotypes and implicit biases.



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- The work in values by humanizing the problems.
- **The use of the computer.**
- An appropriate evaluation.
- Interpersonal relationships, where empathy is essential as well as breaking with stereotypes and implicit biases.



Methodology and Results

- The adequate management of the classroom.
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- The methodology through active teaching.
- The contents.
- The work in values by humanizing the problems.
- The use of the computer.
- **An appropriate evaluation: the final exam was only 55% and diversity and different problematics because the pandemic was taken into account.**
- Interpersonal relationships, where empathy is essential as well as breaking with stereotypes and implicit biases.



Methodology and Results

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- The work in values by humanizing the problems.
- The use of the computer.
- An appropriate evaluation.
- **Interpersonal relationships, where empathy is essential as well as breaking with stereotypes and implicit biases. For example, one activity about the use of confidence intervals presenting the effect John-Jennifer can be seen at <https://www.youtube.com/watch?v=RSkQELAzglc>.**



Methodology and Results

- After the final exam, the **anonymous opinion of the students** was collected, and **100% were very satisfied**.
- Most of the statistical projects in the subject were about **social issues**, and in particular, **gender discrimination**, which were carried out by men. Note that **students could select the theme freely**, and one of the variable that was used is **Gender**. Some examples of titles of projects are:
 - “Are contraceptive methods really used?”, “The role of women in the Spanish series of the s. XXI”, “The wage gap in basketball”, “Hours invested in sports throughout the week between men and women”.



Conclusions

- We have seen how the integration of the gender perspective has been carried out in a Math (Statistics) subject of an Engineering degree.
- A complete reference with many details and for other math subjects, including research, is Epifanio (2020).
- There is no reference to equality in syllabus of the vast majority of mathematics subjects of all the world's universities.
- However, teachers, also math teachers, must contribute to the knowledge and development of:
 - Human Rights, democratic principles, the principles of equality between women and men, of solidarity, of environmental protection, of universal accessibility, and promotion of the culture of peace.



References

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**Thank very much for
your attention**

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