THE END-USER PERSPECTIVE

How to consider the effects of teaching and research on society

University Mediterranea of Reggio Calabria

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The distinction between the provision of didactics and the development of scientific and technological research is generally very weak, particularly, but not exclusively, in the so-called "STEM" (Science, Technology, Engineering and Mathematics) areas and in those industrial and operational-management sectors where the application results of scientific research are rapidly spreading in society.

The reduction of time between the results of research activities and the dissemination of products and services in society, makes it necessary to reflect on the impacts generated on different users, or, in other words, raises the question of the "end-user perspective". While some aspects of the end-user perspective have now entered into design practice - for example, the elimination of architectural barriers in view of the use of spaces by disabled people; the use of sound warning systems for road traffic lights to allow the safe crossing of visually impaired people; the design of safety devices on board vehicles tested on various categories of users for physical characteristics and age - on the other hand, the possible impacts related to the gender of the end user remain unexplored, or at least deserve reflection.

The introduction of the gender variable in international studies and research is relatively recent, although in some sectors the gender perspective has become established in experimentation (e.g., medical and pharmaceutical sciences), design (e.g., services and facilities), planning (e.g., urban spaces and usable areas).

The objective of this document is to provide ideas for a more conscious teaching and research activity on the impacts on the end user, in particular from a gender perspective.

Premises

1. The development of the degree courses with the individual teaching modules, must go hand in hand with the progress of the results in scientific and technological research that constitute a consolidated, so as to calibrate output professional profiles attractive to the labor market;
2. the research topics developed at Italian universities are often shared or managed in collaboration with important national and international industrial poles for the development of attractive models for industry;
3. the individual lecturer transfers his or her experience as a researcher to teaching;
4. the Italian university system allows lecturers to choose independently the contents of their courses as well as the research topics to be developed in compliance with ministerial and/or local constraints, allowing, on the one hand, to protect the student population that entrusts its university education to higher education centers with quality certification and, on the other hand, to develop research projects of relevant national and international interest.

Starting from these premises, this document intends to provide useful indications to promote a greater awareness of gender repercussions in carrying out teaching and research activities, also considering that the expected results

in the second area will have repercussions and/or effects in the first one.

Didactics

In carrying out teaching activities, attention should be paid to the fact that the audience is made up of individuals whose social reference models (e.g. men and women) are different. Therefore, examples always declined according to one of the two genders (typically male) can provide a distorted perception of the relationship between the contents of the discipline and the fields of application. In disciplines, where the female presence among teaching staff is typically rather low, this can cause further distortion by providing the perception that the area, typically STEM, is almost exclusively male.

The effects of such a perception are multiple: professional repercussions (e.g., incorrect design with respect to the end-user perspective), loss of resources (e.g., reduction of enrolments of female students who perceive some areas as "male"), impacts on society (e.g., training of people who in turn will perpetuate a distorted model that will not consider, if not marginally, the end-user perspective).

Below are some examples of how to take the end-user perspective into account when carrying out teaching activities.

a. A typical university lecture is structured starting from shared hypotheses and then presenting fundamental results that can be objectively demonstrated. Where the person who obtained these results is explicitly identified, it would be appropriate for each teacher to highlight whether the result in the literature was obtained by a man or a woman; this approach makes the teaching activity more inclusive compared to the audience and at the same time makes the underrepresented components more confident in their own abilities;
b. Structure the lesson by giving, when possible, equal space to the results obtained by men and women, giving prominence, where relevant, also to the results obtained by female scholars (e.g., among others Sonia Kowalewskaya, Emmy Noether, Giuseppina Masotti Biggiogero, Ingrid Daubechies for basic sciences, without forgetting the Italian Maria Bassi, first woman to obtain a chair in physics in 1732; Sarah Guppy, Verena Holmes, Sara Ayrton, Lisa Meytner, Hedy Lamarr for Engineering). The scientific literature in these fields is particularly rich as evidenced by numerous texts and/or biographies and websites dedicated to these eminent figures of Scientific and Technological Research (for example, https://www.dols.it/2016/04/26/donne-ingegnere-del-passato\, https://sciencecue.it/top-19-ingegneri-nella-storia/11994/;
c. Gender equality in the presentation of results is usually easier to implement for the courses characterizing the three-year degree courses and for the master's degree courses, since the conclusions of studies and research obtained in more recent

years are used, which see the presence of women in scientific research continuously increasing also in the STEM area;

d. Each teacher uses, during the teaching activities, a language respectful of differences, as reported in the document "Indications for a use of language in respect of differences", adopted by the Mediterranean University of Reggio Calabria with D.R. n 352 of 21/12/2018 and in force since that date;
e. Each teacher stimulates interest in the culture of gender equality, also by promoting extra-curricular activities.

Checklist:

- Have you thought about the number of women/men academics you have invited for a lecture or seminar during your course?
- Have you considered inviting a visiting lecturer known for his or her gender-sensitive approach? Such a person could bring a gender perspective that may be missing from your course.
- Have you encouraged students to work in mixed gender groups?
- Have you thought about how your teaching could inspire future scholars to conduct more gender-sensitive research in your discipline?

Research

As far as research activities are concerned, two main aspects can be distinguished: 1) research from the perspective of the end user; 2) the composition of the working groups in carrying out the activities.

Research from the perspective of the end user

a. In carrying out a research activity, consider, where relevant, which and how much aspects of the theme are dependent on the specific characteristics of the users (e.g., user-dependent security devices and/or systems);
b. In research activities related to the optimization of decision-making processes concerning measures and policies to be implemented on the territory and, in general, territorial planning in anthropized contexts, verify that the structuring of the research program does not hide an unintentional prejudice such as that of assuming that certain functions are prerogative of a gender;
c. To carry out gender research for statistical reasons, in order to assess the impact of the under-representation of a group in the extrapolation of research results. Indeed, if the sample is not representative of the actual population the results are distorted and the practical application of the research results will create further distortion in society;

d. As for didactics, each teacher uses a language respectful of differences in the research, as reported in the document "Indications for a use of language respectful of differences", adopted by the Mediterranean University of Reggio Calabria with D.R. n 352 of 21/12/2018 and in force since that date. Please note that the recommendations reported in the above mentioned document are also expressly specified in the guidelines to authors for the submission of scientific articles by many journals in the STEM area.

Checklist:

- Did you have both men and women in mind when you formulated your project/research activity?
- When identifying a research problem, do you consider that men and women might relate differently to that problem?
- If your project addresses issues that have structural repercussions in society (e.g., decisions and decision-making processes), do you think about how the position of men and women differs in society? Are they equally represented in the decision-making bodies responsible for translating some of the research results into practice?
- When identifying a research problem, do you consider how the differences between men and women may be relevant to the research results?

- When examining the state of the art, do you introduce literature references that are relevant to your research topic and also take the gender perspective into account?
- When providing research results, if relevant, do you report data in a gender-sensitive way?
- When preparing a research project, do you pay attention to the use of gender-sensitive language, trying to understand whether stereotypes may influence your research activities?

Composition of the working groups

In general, the participative working group environment, even gender balanced, is much more effective than teams where women and men are segregated or have different segregated roles in different research subgroups acquiring different types of knowledge. While, from a theoretical point of view, it is recognized that the varied composition of working groups (e.g., multidisciplinarity) represents an added value for the conduct of research, as it brings new perspectives and different points of view that enrich the content and results of the research, on the other hand in the choice of the different components gender balance, which helps to introduce the gender perspective, is often ignored. In fact, with equal skills, the composition of working groups that are not gender balanced often arises from the participation of individuals in formal or informal networks

where one of the two genders prevail over the other, resulting in the choice of people in a set that is not balanced from the outset. It is desirable that the composition of research groups is also balanced with respect to gender, as well as disciplines.

Checklist:

- Is your research group quite diversified? (e.g. in terms of gender, nationality, ethnicity, language, etc.)
- Have you noticed patterns of hierarchical gender relations in your working group? (e.g. Senior Researchers tend to be men, and Junior Research Fellows - who have less control over the research agenda - tend to be women)?
- Are the working conditions within the project (e.g., working hours and tasks) organized in such a way as to ensure fair distribution of activities and assignment of roles between men and women?

Expected results

As suggested in the document "Gender Equality in Academia and Research", edited by the European Institute for Gender Equality (https://eige.europa.eu), the most important results that can be obtained from the adoption of an end-user perspective in teaching and research activities can be summarized in the following five points.

1. Creating a better working environment

   Universities and Research Institutes are working environments made up of men and women. Gender balance in teaching and research activities develops the skills of individuals and teams by meeting their expectations, balancing work and private life and bringing added value to the institution as a whole.

2. Attractiveness and Talent Retention

   Data related to Italian and European Universities show the existence of a loss of resources in the STEM area, in particular with regard to the female component, during the various phases of the academic career (see, for example, the periodic report She Figures, https://publications.europa.eu/en/publication-detail/-/publication/9540ffa1-4478-11e9-a8ed-01aa75ed71a1/language-en). This high rate of abandonment of scientific careers by the female population (the reasons for which have been the subject of many studies and are now well established) constitutes a loss of resources and skills that should be valued to improve the performance of the institution and to contribute to the development of society. From this point of view, following the above indications for teaching and research activities can favor the attraction and permanence in the university system of all potential human resources, without gender distortions.

3. Research Quality

   Bringing a gender dimension to the content of research and innovation improves the overall quality of design, assumptions, protocols and research results in a wide variety of fields. It not only addresses and removes gender bias by building stronger, evidence-based research, but further contributes to multidisciplinarity.

4. Organizational Change

   Gender equality, involving all categories of academic staff (including decision-making bodies), provides an opportunity to improve the sense of community and belonging while also ensuring benefits in terms of transparency and accountability in career management.

5. Additional benefits
   i. Gender balance in each teaching. In particular, eminent figures in scientific research of both genders are appreciated.
   ii. Awareness of the importance of gender equality in vocational training.
   iii. Education of the new generations in scientific research with a view to gender balance.
   iv. Interest in the popular scientific literature produced by both genders.

v. Education of the new generations in the use of a language respectful of gender equality.

Suggestions

In compliance with current privacy legislation, and subject to appropriate consent, it would be desirable to enhance the value of graduates and graduates at the Department through the establishment of an appropriate register, including online, and possibly the position held within three years of graduation.

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