



UNIMORE

UNIVERSITÀ DEGLI STUDI DI
MODENA E REGGIO EMILIA

Dipartimento di Ingegneria "Enzo Ferrari"

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Proposal for Minerva Awards 2018

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2. Nominator

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3. Abstract (100 words or less) which can be made public

"Ragazze Digitali" is a free summer camp of 4 weeks dedicated to female students of the third and fourth grade of the high schools organized by the University of Modena and Reggio Emilia. The initiative aims at encouraging female students to enroll in Computer Science/Informatics programmes through a creative and innovative approach based on learn-by-doing and team-based activities. During the summer camp, the participants learn to programme video-games in Python and are exposed to dedicated speeches of experts promoting existing female role models in the ICT fields.

4. Description of the initiative (max 2 pages)

The **summer camp 'Ragazze Digitali'** is organized annually by the Department of Engineering 'Enzo Ferrari' of the University of Modena and Reggio Emilia (Unimore)¹, in collaboration with the association European Women Management and Development (EWMD)², since 2014. Now at the fifth edition, the summer camp has the main goal of encouraging female students to enroll in Computer Science/Informatics programmes and to attract girls towards computer science through a creative and innovative approach based on team-based activities.

During the summer camp, which lasts for 4 entire weeks between June and July, the girls learn how to program video-games in Python. Laboratory activities focus on a **learning-by-doing approach** with a two-fold goal: 1) smoothly and nicely introduce girls to computer science and to a "smart"

¹ <http://www.ingmo.unimore.it/site/en/home.html>

² <https://www.ewmd.org/chapter/15068/about>

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technological world; 2) give girls a better understanding of what ICT actually is and how it can be applied to different and multidisciplinary fields. Moreover, during the summer camp dedicated seminars and speeches of external experts and women who have reached leadership positions because of scientific studies will help to **promote existing female role models**, that are disruptive with respect to the well-known social gender stereotypes, and to present the concrete opportunities that ICT-related competences may offer in terms of studies and careers at the local and national level. **Participation to the summer camp is free and no previous competences are required** in terms of coding or ICT skills.

The **main activities** carried out during the summer camp are:

- Introduction to the basic tools supporting programming and management of software projects, such as OS Linux, shell bash, IDE Python (Pycharm), Google Gmail, Google Drive.
- Principles of programming in Python
- Video-games development in Python (PyGame library)
- Principles of graphics, animations and audio in PyGame
- Seminars on ICT topics such as cybersecurity, digital communication on Web and social networks
- Speeches of experts and entrepreneurs of local ICT companies to inform girls about career opportunities of in this field

Moreover, preliminar and promotional activities are carried out:

- Promotional events organized in the high schools to present the project to teachers and students
- Public events to give visibility to the summer camp - press review at the link

<https://www.ragazzedigitali.it/category/parlano-di-noi/>

The **main objectives** of the project are:

- Increase girls' inclination to enroll in Computer Science / Informatics programmes, that is particularly important in a country that suffers a severe under representation of women in this academic fields (the percentage of female students in Computer Science / Informatics programmes in Italy typically ranges between 10% and 20%)
- Attract girls towards technologies and informatics to facilitate their inclusion in working environments related to the ICT field, providing them with technical skills and showing them the career opportunities available in this field at the local and national level.
- Involve a higher number of students with respect to the past editions
- Involve a higher number of high schools with respect to the past editions, attracting girls also from outside the provinces of Modena and Reggio Emilia
- Create a format for a summer camp in computer science that could be used to replicate the project in other universities and cities to extend the benefits of the initiatives at the national level.

The summer camp “Ragazze Digitali” is an **innovative** project: in Italy it represents the first and only summer camp entirely dedicated to girls. Its long duration (4 weeks) and the fact that it is free for the

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participants makes this initiative unique, not only in Italy but also in Europe and, at the best of our knowledge, in the world.

A further distinctive point is that the summer camp has been included in the Gender Equality Plans of our University as a positive action towards gender equality with the **support of the European Project Horizon 2020 (2016-2019) EQUAL-IST** "Gender Equality Plans for Information Sciences and Technology Research Institutions", G.A. 710549.

During the last years we put a lot of effort to **extend the initiative** in two main ways: a) to involve more girls in the Modena summer camp b) to extend the summer camp to other cities and universities, promoting the camp's format through our networks of contacts and colleagues and providing them with support, guidance and teaching materials to replicate the summer camp in their institutions. This attempt was successful and led to a double result. First, the support of a local foundation allows us to extend the summer camp in Modena to include two parallel courses in the forthcoming fifth edition: in addition to the traditional course based on programming video-games in Python, a new course will start where girls will learn how to program robots with Arduino. Second, this year two summer camps will start in other cities with their first edition. One camp is in Reggio Emilia, organized by Unimore in collaboration with the local Municipality: it will last for two weeks in July 2018 and it will be based on programming robots with Arduino. The other camp is in Cesena, organized by the University of Bologna: it will last three weeks in June 2018 and will be based on programming video-games in Python. Finally, promising contacts have been taken with the Universities of Rome and L'Aquila to replicate the summer in their universities.

5. Evidence of its impact (max 2 pages)

The impacts of the summer camp are reported in terms of:

- number and geographic origin of participants and of high schools involved
- feedbacks from the participants collected through a survey conducted for the last two editions
- impact of the summer camp on participants' future choice of studies

a) number and geographic origin of participants and of high schools involved

Every year at least 5 promotional events were organized to present the summer camp in different high school located in Modena and Reggio Emilia: from 2014 up to now, more than 3000 students of the high schools attended to the promotional events.

The total number of female students that participated to the 4 previous editions (from 2014 to 2017) of the summer camp is 202, with an increasing trend from the first to the last edition.

The participants came from 43 different high schools not only of the city of Modena (15 schools) and of its province (11 schools), but also from other Italian cities, both belonging the same region Emilia Romagna (Reggio Emilia: 6 schools, Bologna: 5 schools, Parma: 1 school, Rimini: 1 school) and located in other regions (Mantova in Lombardia: 1 school, Rome in Lazio: 2 schools, Lecce in Puglia: 1 school).

Many girls, indeed, come every year from outside of the city of Modena, where the camp is located. Specifically, the percentage of participant coming from outside the province of Modena was:

- 4% in 2014
- 27% in 2015

- 25% in 2016
- 45% in 2017

We see a major increase in outer participants from the 2014 edition to the 2015 edition; the trend is maintained in the 2016 edition and followed by another major increase in the 2017 edition.

Moreover, the average distance traveled by the participants is increasing from the 2015 edition to the 2016 edition. In fact, while the percentage of non-local participants was rather stable between the two editions, in 2016 the 58% of the non-local participants came from more distant locations with respect to the previous year. In the 2017 edition, not only the number of non-local participants but also the traveled distance increased. This increase is to be attributed to a gain in popularity of the summer camp outside of Modena.

In conclusion, while in the early editions of the camp the participants came mostly from Modena and its province, the newest editions saw a significant increase of participants coming from outside the province, both in terms of number and traveled distance.

b) feedbacks from the participants collected through a survey conducted for the last two editions

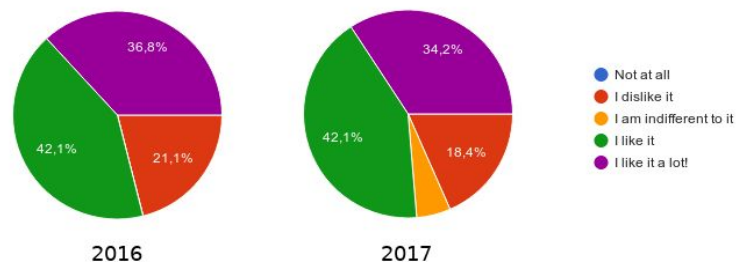
Overall, feedbacks from the participants to the two past editions were highly positive, especially considering that their skills in programming before the Summer Camp were rather poor: 70% of the participants in 2016 and 62% in 2017 weren't able to program at all before this experience.

After the camp, 80% of the girls in 2016 and almost 70% in 2017 stated they had definitely understood more clearly what computer science actually means. However, what makes us really proud about this project is that 100% of the girls in 2016 and almost 95% in 2017 declared they had acquired new technical and coding skills thanks to the Camp's activities.

Both in 2016 and 2017, 95% of the participants rated the team working and the collaborative projects carried out within the Summer Camp very positively;

team activities have been rated from very positive to excellent by 47 % in 2016 and by 55,3 % in 2017. Finally, after the camp the girls declared a high appreciation for programming, as shown in the graph.

Do you like to program?



c) impact of the summer camp on participants' future choice of studies

To evaluate the impact of the summer camp on the participants' future choice of studies, a survey was conducted in 2018 over the participants to the first 4 editions. The 34% of the girls answered to the survey with the following results.

Among the girls who got their High school diploma and who carried on their studies:

- 31,6 % chose a Faculty from the Information Technology area (that is, Information Technology Studies or Computer Engineering)
- 15,8 % went for a Faculty from the Engineering area other than Computer Engineering

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- 15,8 % chose another different Scientific Faculty not belonging to the Information Technology Department
- 36,8 % opted for a Faculty from other different areas.

One of the most relevant comments on the questionnaire was about the influence of the Camp on the girls' decisions about their future careers: 50% of those who have chosen IT or Computer Engineering studies at University declared that the Summer Camp experience had a major influence on the choice of the Faculty.

The data concerning the Digital Girls who haven't still finished High school are encouraging as well:

- 30 % of the girls are going to apply for a Faculty from the Information Technology area (that is, Information Technology Studies or Computer Engineering)
- 5% are going to apply for a Faculty from the Engineering area other than Computer Engineering
- 37,5 % are going to apply for another different Scientific Faculty not belonging to the Information Technology Department
- 7,5 % are going to apply for a Faculty from other different areas

Finally, as regards the enrollment of female students in the ICT courses offered by the University of Modena and Reggio Emilia, we registered a positive trend: while in 2014 the percentage of enrolled women was 11,37%, in 2017 we reached the 15,37%, with an increase of 4 percentage points.

6. Reference list

- Web site of the initiative www.ragazzedigitali.it
- Facebook Page www.facebook.com/ragazzedigitali/

7. Two letters of support

Two letters of support are attached at the end of this document.

The first letter is by the entrepreneur Lara Oliveti, CEO, Co-owner and Founder of Melazeta Srl, a local company creating games and apps for brand engagement and kids.

The second letter is by Eugenia Bergamaschi, President of the General Confederation for Agriculture of the Emilia Romagna Region (Confagricoltura Emilia Romagna).

8. Indication of whether the nomination can be considered as a runner up (if it does not win the award) and be included as an exemplar of best practice in future Informatics Europe publications.

Yes