ROBOCAMP | K12 Computer Science Program for Girls

Author : **Simona Baciu, Founder of Transylvania College, Romania**

RoboCamp @Transylvania College is designed

Abstract Summary

RoboCamp @Transylvania College is designed to increase IT literacy among girls aged 10 – 16 and foster their interest in Computer Science by providing an engaging and active programming experience using software and robotics educational platforms (e.g. Microsoft Kodu and Lego robotics).

Objectives

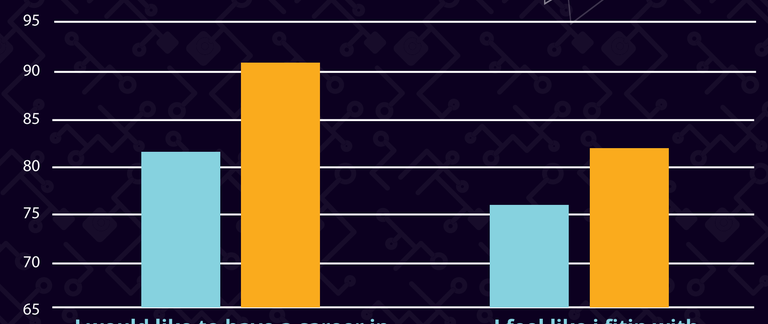
1. Organize coding camps and after-school coding clubs for girls, meant to develop IT and leadership skills, and enhance self-confidence for young women to pursue leadership positions in the IT field.

2. Raise awareness for parents, proving that coding (just like the traditionally assigned color blue) is not just for boys, but also a valid option to consider when choosing the direction of their daughters' education. Girls are more likely to engage in exploratory activities when asked to participate in real life tasks related to their interests, such as utilization of technology for storytelling and communication.

3. Organize professional development trainings for middle- and high-school teachers in Cluj to facilitate a deeper understanding of CS concepts.

Results

Through the ex-ante and ex-post program evaluation, we surveyed the students, as well as the teachers who attended the training. We found out that girls are as curious and passionate about technology as boys, and that they have the determination and patience to code and build robots. Parents were be impressed by their daughters' potential and progress, saying they will encourage learning Computer Science. Teachers have gained more knowledge about CS and have learned different innovative ways of teaching it in class, after-school clubs and camps.



100% of the student respondents agreed that the camp activities helped them to better understand computer sciences.

100% of the student respondents agreed that they would like to participate in the summer camp again next year.

Relevance

The Romanian pre-university education system lacks competent IT teachers, suitable technology and infrastructure, and the curriculum has not been updated in over a decade, with IT classes being optional in schools. The number of girls pursuing careers in IT has significantly grown in the last years, but not enough to fill the gap in the labor market. Computer Science has become a universal language young women need to speak in order to be equally successful. Girls should also be capable of developing computational thinking and know how to implement it in computers in the form of codes.

Methods

Using structured guidance, authentic tasks, and peer mentoring, the RoboCamp curriculum provides a hands-on learning environment that enables girls to reflect on their learning, share ideas, and build confidence in their abilities and future. The girls developed new CS skills while the parents saw the connection between such skills and the world around them, including Math and Science courses that they take in school (as IT courses are optional in schools). Female mentors will explain reasons for which they decided to pursue a CS degree, courses that they have taken, and their career plans, will provide girls with advice on college major selection. Teachers will be taught to fully utilize the available IT resources and infrastructure

Conclusions

We noticed a change in girls' mentality, as CS is not purely abstract thinking. Supporting women from very young ages to pursue careers in CS can be an incredible opportunity for them to close the gender equity gaps that we see in Romania due to the high wages in the IT field. This initiative can help schools match the instruction they provide with the skills employers are looking for. Moreover, regular CS camps and clubs are a great instrument for schools to adapt as fast as the market needs are changing, because they are not bound to the bureaucracy of updating a national curriculum.

References

D Marghitu, JW Hur, Y Rawajfih, J Hall, C Stephens, Promoting Computer Science among Girls: An Auburn University Pilot Program, Auburn University

D Marghitu, M Fuller, TB Brahim, E Banu, Auburn university robotics and computer literacy K-12 engineering camps: A success story - ASEE-SE, 2009

Acknowledgements

The program was initiated by Daniela Marghitu Ph.D from Auburn University.