Empowering Nepal's Future: A CSR Initiative in Arduino-based Engineering Education

Abstract

An Arduino-based training was launched by Engibex company as a CSR project in Nepal to assist primary-school students in understanding the basics of mechatronics. Students learned to use the Arduino hardware and software to turn their ideas into reality. The completion of the project also encouraged other neighboring schools to perform such activity. The 5-day training was for the students of group age 9-15 years and was a great success. It has encouraged us to join hands with other organizations to plan and implement such educational projects in the near future.

Keywords

Arduino, CSR, NRN, mechatronics

1 Introduction

Engibex is a Belgian engineering consulting firm that assists SMEs and large industrial organizations in bringing their innovation and R&D initiatives to life. We are not only involved in professional job but also committed to fostering education and innovation. Therefore, Enbibex has initiated a Corporate social responsibility (CSR) project in Nepal. Main focus is to teach young minds to delve into the world of simple engineering projects using Arduino, a versatile and accessible platform for budding innovators. Engibex has always empowered to develop entrepreneurial mindset.

1.1 The Need for Tech Education in Nepal

which is in a rural area of province-2 of Nepal. The per capita income of this province is 1072 USD which is very low and so is the literacy rate i.e. 63.5 % [1].
From my personal experience, the basic education and methodology that has been used 20 years back has not been upgraded. Students are following the old traditional method and do not have access to modern technology or any training to practically understand it. Being a mechanical engineer and member of the same village, I had difficulty collecting the resources and materials to do smaller projects which was a building block of the career that I have built. Everyone is not fortunate enough to study in cities. Therefore, to assist students practically to some extent with mechatronics, we launched a project which is detailed in the section below.

1.2 Introducing Arduino: A Gateway to Innovation

Arduino is an open-source electronics platform that is used to make small to professional projects with the help of hardware and software. It is extensively used by students for their projects to put their ideas to reality. There are hundreds of Arduino hardware and related software that can be used for various projects like agriculture, automotive, production line, mechatronics, etc. As the technology is getting more sophisticated, Arduino is providing a comparatively cheaper, effective platform to understand and improve the technology. Furthermore, it is open-source with good documentation and step-by-step procedures can be abundantly found on YouTube.

1.3 Our CSR Initiative in Nepal

Engibex as one of the biggest consulting companies is committed to providing social support. After a detailed discussion and planning, we decided to execute the project in Nepal. It was a 5-day program and our objectives are listed below:

1. Provide fundamental info about mechatronics and Arduino
2. Familiarize about Arduino-programming
3. Inform about the sensors and actuators
4. Practically visualize the above points in a project

Our main goal is to make primary school students familiar with mechatronics so that they can turn an idea into reality.

1.4 Simple Arduino Projects for Schoolers

To achieve our goal within a short interval, a simple project was designed to turn off the light in the day and turn it on in the night. For this project photo-resistor-sensor, light bulb, and Arduino Uno board were used. After achieving the 1,2 and 3 objectives which took most of the project time, it was easier for them to understand the workings of the system. Also, various YouTube links and documentation from the Arduino website itself were provided for help and self-learning. In the end, everyone was able to build their own project. Online support will be provided in the near future for further assistance in projects.

1.5 The Workshop Experience

Participation in this kind of project was not new for me but was amazing to see curious minds work together to understand what they have never used before. First of all the learning material was collected and gathered on the basis of their curriculum. It made me easier to find a starting level of training. Training space was arranged in the computer lab of the school which was enough for 15-20 students. Students were divided into groups and individual group was given a target to meet. The simple, quiet, and calmness of the village life added a sense of relaxation during the training as well. The first few days were a struggle for the students because most of the topics were new. I myself learned a few tricks to make them understand in an easy way. Learning method differs from place to place and sometimes language comes as an understanding barrier. During the last days, they were able to understand the workings of hardware and software together. I could see the brightness and new ideas emerging in their eyes. Furthermore, Engibex provided a laptop and Arduino kits to all the students for projects. I felt a moment of pride that I was assisting young minds of my village to a bright future.

1.6 Impact and Success Stories

Most of the students had curious bright ideas. We would discuss for a long time even after the classes. Most of the ideas were solving village problems. Parents were also curious and proud of their children's achievements. I along with the school authority arranged a suitable place and time for the interested students to do their projects in a safe way. Now, the school has an Arduino lab.

2 Looking Ahead

This project was found interesting to neighbouring school and approached personally for similar projects at their school. We want this project to be mobilized in other places as well and are working on the planning. Similarly, there are various Nepalese organizations like NRN

(Non-Resident Nepali) who are willing to support similar projects. We are looking into the future to join hands together with Belgium organizations for educational-related projects.

3 Conclusion

In conclusion, Engibex is proud to contribute to the educational development of Nepal through our Arduino-based engineering initiative. By empowering schoolers with practical skills and fostering a love for innovation, we believe we are sowing the seeds for a brighter and more technologically advanced future in Nepal.

References

[1] Wikipedia. Madhesh province. https://en.wikipedia.org/wiki/Madhesh_Province, 2023. Accessed: 01-Jan-2023.


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