Youth Invertor

Kostadin D. Nedev and Dimitar K. Nedev

Faculty of Physics and Technology, University of Plovdiv Paisii Hilendarski, Smolyan, Bulgaria

Abstract. Youth inventor is an educational mobile platform for kids, students and undergraduates in the area of computer science, electronics and robotics. It is a combination of video tutorials and hardware that gives them the opportunity to create their own electronics projects.

Keywords: education, computer programming, electronics, robotics

1. INTRODUCTION

According to UNESCO in the next 30 years more people worldwide will be graduating through education than since the beginning of history. The result is a combination of technology and its transformational effect on jobs in general, and demographic explosion. But how the education has changed for the last 30 years to meet the contemporary lifestyle? Nowadays the education system is predicated on the idea of academic ability. And there's a reason for that. Around the world, there were no public systems of education, not really before the 19th century. They all popped up to meet the needs of industrialism. The teacher was the only source of knowledge and skills due to lack of information and studying materials.

Every education system in the modern world has the same hierarchy of subjects. Doesn't matter where you go. You'd think it would be otherwise, but it isn't. Math and science are at the top, then come languages, then the humanities. The arts are at the bottom. Everywhere on earth. It all derives from the needs of industrialism. At this point education became nothing more than memorizing facts and numbers and has very little to do with skills and creativity. Due to the internet revolution there were no more need for that, because the internet knows everything. The teacher is not already the only source of information for the students. There are plenty of them. This is how the need of creativity became on the front page.

2. WHY HAVE WE CREATED YOUTH INVENTOR?

Picasso once said that all children are born artists. The problem is to remain an artist as we grow up. We believe, that nowadays we don't grow into creativity, we grow out of it. Or rather, we get educated out of it. As Picasso, we truly believe that every kid is an artist and an inventor. We created a platform to educate kids in a way that encourages their createvity though the process of learning computer science and electronics by providing them the best contemporary tools for that.

3. WHAT IS YOUTH INVENTOR?

Youth inventor is an educational mobile platform for kids, students and undergraduates in the area of computer science, electronics and robotics. It is a combination of video tutorials and hardware that gives them the opportunity to create their own electronics projects.

Let's take a look what is needed to make a small hardware project. We will start with English language. The number of materials in English are times greater than the Bulgarian ones. Than we need some basic computer programming and electronics knowledge. Last but not least practical experience and of course electronics components are also vital.
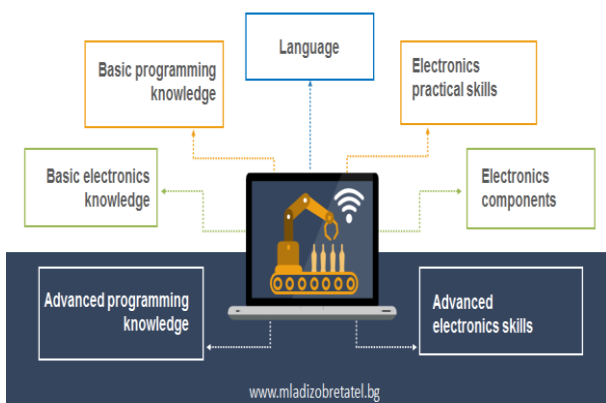
Fig. 1 Knowledges and skills for creating electronics project.

4. WHY IS YOUTH INVENTOR UNIQUE?

The structure of the program is based on US Air Force pilot's training where academics, simulators and flights are combined in a very specific order. The biggest difference from the most school and university programs is that it doesn't represent the whole academics at the beginning, but rather starts with just the basics needed for the first set of flights. A good example from the aviation is that the beginner pilots focus only on their speed and altitude. When they became comfort with the basic instruments they start to see the whole picture.

Fig. 2 Picture of beginner's pilot cockpit view (focus only on the basic flying instruments)

We took these principals from the aviation pilot's training and implemented them into electronics training, combining academics, simulations and practical exercises in a certain order.


Fig. 3 Rated pilot cockpit view (can focus all the instruments in the same time)

In the most of computer programming and electronics books or tutorials the information is presented in the same way and it doesn't matter if you are a professor or a beginner in the area. We took a different approach. We divided our materials into five different levels according to the student's entry level.

5. HARDWARE

Our development boards (Mini, Standard and SuperPro) are fully compatible with the popular Arduino IDE and can be programmed easily.
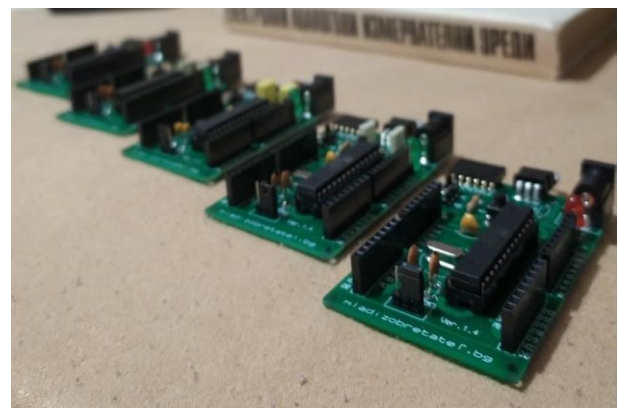

Fig. 4 Youth Inventor's developing boards

According to our survey among students and undergraduates between 14 and 30 years old there were a lot of them with programming knowledge and skills, but very few of them had electronics practical experience and knowledge. For this reason we created a number of fully assembled shields for our students. Most of the electronics hobbiers use breadboards and jumper connectors for their projects. Our experience has shown that it is a quick, but very unreliable approach. Often when students have problems they don't know if it is a hardware or software one. We fully eliminated this problem by soldering and testing every shield.
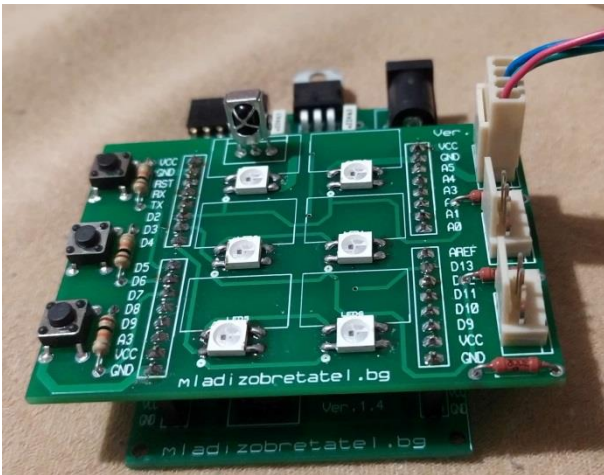
Fig. 5 Youth Inventor's RGB LED shied (Ver. 1.4)

Our first shield is sum of 6 WS2811 RGB LEDs, 3 push buttons, IR receiver and 3 connectors for external LED strips. Different projects with our shields can be found on our webpage http://mladizobretatel.bg. All software programs and hardware schematics are open source under the NC copyrights.
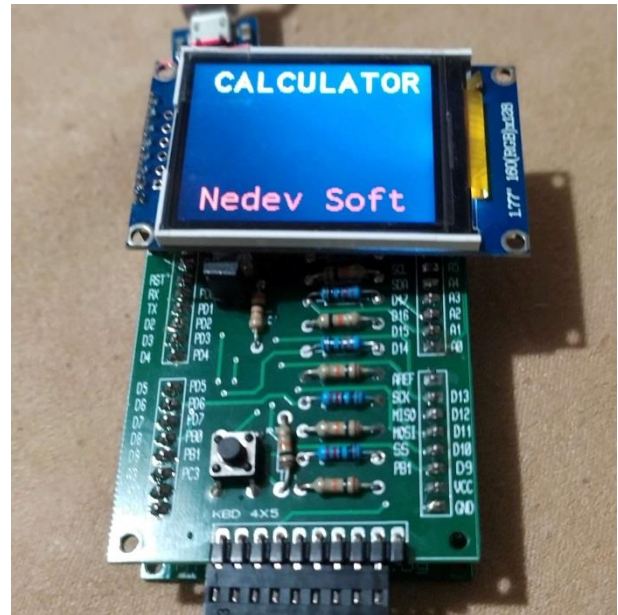
Fig.6 Youth Inventor's Calculator shied (Ver. 1.4)

6. CONCLUSION

For more information or questions about the project write us at

info@mladizobretatel.bg