manufacture of symbiotic concentrate was paid to the optimization of culture medium, and the creation of conditions for the growth of mesophilic lactic acid bacteria and yeast fermenting lactose is not characteristic of the fermentative microflora used in baking production.

Thus, the developed technology for producing bacterial symbiotic ferment concentrate provides the ability to eliminate semi-continuous cultivation in production without requiring additional factors to sustain activity and reducing the costs of raw materials.

1. Black I.V. Perfection of rye and rye-wheat bread based on the optimization of biotechnological properties of semi-finished test.: Author. Dis. cand. tehn. Science / Moscow, 2009. – 187 p.
2. Kozmina N.P. Biochemistry bakery. – M.: Food Industry, 1978. – 440 p.
3. Brusilovsky L.P. Process control cultivation of starter cultures and dairy products. – M.: Light and food industries, 1982. – 127 p.
4. Botina S.G. Molecular biological approaches to the selection of bacterial cultures to create ferments for biotechnology: Author. Dis. Dr. is biological. Sciences. – Moscow, 2011. – 46 p.
5. Popova V.M. Development and improvement of biotechnological processes in industrial production of biological products: Author. Dis. Dr. is biological. Sciences. – Schyolkovo, 2011. – 46 p.
6. Tikhonov I.V. Biotechnology // I.V. Tikhonov, E.A. Ruban, Gryazneva T.N., Samujlenko A.Y., Gavrillov V.A. Ed. Acad. RAAS ES Voronin. – SPb.: GIORD, 2005. – 792 p.
7. Guslavsky A.I. High-performance machines for the separation, purification and concentration of liquid systems and new biotechnological processes on their basis. Author. diss. Doctor. tehn. Science, Shchyolkovo. – 2007. – 55 p.
8. Pridannikova I., Elizarova E. A. New generation of starter cultures in the development of technology of dairy products // Dairy Industry, 2003. – №9. – s. 32-33.
9. Boyarineva I.V., Hamagaeva I.S. Development symbiotic starters for bakery production // Herald ESSTU. – 2014. – №6. – s. 101-107.
10. Boyarineva I.V., Hamagaeva I.S. Investigation of culture conditions the symbiotic microflora of sourdough for bakery production // Herald ESSTU. – 2015. – №2. – s. 74-80.

Tsarev T.A.

Practical use of opportunities of the center of youth innovative creativity in Karelia

*Petrozavodsk State University
(Russia, Petrozavodsk)*

doi: 10.18411/gdsn-25-12-2019-06

idsp: scienceconf-25-12-2019-06

Abstract

There are presented the information about Youth Innovation Creation Centre by Petrozavodsk State University in Petrozavodsk city. It is shown the purposes, equipment of modern appliances and possibilities. There are expositions of some real results that young people receive on its base.

Key words: innovations, teaching, 3D-printing, program-lathes.

Introduction

The project to create the Center for Youth Innovative Creativity (CYIC) was initiated in 2012 by the executive director of the All-Russian public organization Young Innovative Russia A. Bukhalo and approved by the Supervisory Board of the Agency for Strategic Initiatives.

Since 2012, the project on the creation of CYIC has been introduced (realized) as part of the State Support Program for Small and Medium Enterprises of the Russia Ministry of Economic Development. The priority is the non-commercial use of equipment by children and youth in order to acquire skills in working with high-tech equipment [1].

In various regions of the Russian Federation, more than 140 CYICs have been opened; new similar centers are continuing to open.

The requirements for CYIC are put forward, mainly by the presence of:

- own or leased premises with an area of not more than 120 square meters for equipment;
- a standard set of equipment (3D printer, milling machine, laser cutting machine, cutting plotter, 3D scanner, + office equipment);
- a staff of at least two specialists who can work with the whole range of equipment and have experience working with children;
- Internet connection and Internet portal for access to a single FabLab network.

Brief description of the Petrozavodsk LLC CYIC

The Center “CYIC” LLC in Petrozavodsk was established with 100% participation of Petrozavodsk State University (PetrSU) as a founder with the support of the Ministry of Economic Development of the Russian Federation and the Ministry of Youth, Physical Culture and Sports of the Karelia Republic in accordance with agreement of July 13, 2016 No. 051-MB-16 within the framework of the "Support and development of small and medium-sized enterprises engaged in socially significant activities" measure [2].

The basis for the creation of CYIC was the FabLab model - fabrication laboratory, the “production laboratory”, first developed by Neil Gershenfeld - Center for Bits and Atoms (CBA) in MIT (USA) [3].

CYIC is located at 58 A. Nevsky Ave. in the building of IL-GiSN (Institute of Forest Mountain and Construction Sciences).

The main objectives of CYIC are the following:

- Ensuring of the children and youth access to modern equipment of direct digital production for the implementation, verification and commercialization of their innovative ideas;
- Support for innovative creativity of children and youth, including for the purpose of the professional implementation and self-employment of youth business undertakings;
- Technical and industrial support of children and youth, small and medium-sized businesses involved in the development of promising types of products and technologies;
- Interaction, exchange of experience with other centers of youth innovative creativity in the Russian Federation and abroad;
- Organization of conferences, seminars, working meetings, etc.
- Creation of a database of users of the Center for Youth Innovation Creativity;
- Conducting regular training events and the implementation of training programs in order to assimilation of the capabilities of equipment by users of CYIC.

The main users of CYIC are students, schoolchildren, applicants, small and medium-sized businesses.

CYIC is equipped with diverse modern equipment that allows to perform many production operations:

- 3D printer Picaso 3D Designer PRO 250;
- 3D scanner Shining 3D EinScan-Pro;
- Laser station KamachII 1510;
- Cutting plotter Mimaki CG-60SRIII;
- The milling machine with ChPU Kamach 1325W;
- Digital oscilloscope Agilent MSOX2022A;
- Machine turning and milling Metal Master MML 2870 M;
- Multimeter digital desktop Keysight 34450A;
- Digital multimeter Fluke 17B +;
- Digital multimeter Fluke 107;
- Soldering station digital Hakko FR-802 / Hakko FX-951;
- Soldering station Lukey-852D +;

- Stereoscopic microscope Altami PS.

The presence of this equipment allows CYIC not only to provide training for young people, but also to produce various products on order. On the Kamach II 1510 laser machine, stencils are cut out, nameplates, tablets, signs and souvenirs are engraved. Kamach 1325W milling machine copes with thick sheets of plywood that are not suitable for laser cutting, as well as engraving three-dimensional objects from wood billets. And the Russian-made Designer PRO 250 two-extruder 3D printer prints complex plastic models, from prototypes of engineering parts to foundry molds.

The following materials and consumables are used: wood (including plywood, veneer, chipboard, MDF), TESA film for engraving, acrylic, ALUMAMARK, aluminum for engraving, anodized aluminum, brass steel, decorative overlays, PVC foam, polystyrene, PET, automatic transmission, ABS, leather.

Workers attribute not only high-quality materials to their advantages, but also speed of execution, reasonable prices and an individual approach to the customer.

Examples of the implementation of the CYIC tasks in Petrozavodsk

In 2018 the author has passed production and pre-diploma practices on the basis of the enterprise “CYIC” LLC at PetrSU, during which it was possible not only to get acquainted with the impressive possibilities of modern production equipment, but also to implement the project for final qualification certificate [4]. As a result, a much deeper understanding of the design of virtual enterprises, their functioning and planned standard products has appeared. This type of training was incredibly useful, which was noted by supervisors as well as by the certificate commission.

The future masters of Forest, Geology and Building Institute are received practical skills in the Center at 2019 year. Also, the finalists of the UMNİK contest in 2018 (Fund for the Promotion of Innovations) are provided with a site and equipment for the design of products, including this opportunity is provided to the author of this article.

Conclusion

In general, it can be noted that the idea of CYIC at PetrSU successfully works, which is confirmed by the following:

1. The center helps youth in the implementation of scientific projects.
2. He is self-sufficient at the expense of commercial orders.
3. Self-sufficiency allows him to engage in his core business - to be a platform for youth creativity, material and technical, economic, information and social basis for the formation, development, preparation for independent activities of small innovative enterprises, commercialization of scientific knowledge and high technology.

1. WORLD // Young Innovative Russia - URL: <https://i-innomir.ru/projects/1>, free. - (09/19/2019)
 2. CYIC Petrozavodsk // Center for Youth Innovative Creativity - URL: <https://cmit10.ru/about/>, free. - (12/10/2019)
 3. TED Ideas worth spreading // Neil Gershenfeld about Fab Labs - URL: https://www.ted.com/talks/neil_gershenfeld_on_fab_labs/transcript?language=en#t-21422, free. - (10/16/2019)
 4. Tsarev T.A. Design of a workshop for single and small-scale products from wood and wood materials on CNC machines. Graduation work. Petrozavodsk: Petrozavodsk State University, 2018.151 s.
-