My goal today is to show you how here in Croatia we tried to somehow attract teachers, mentors and their students to the activity of modeling.

I will try to explain our idea to you, so that you can apply some of it to you.

Well, let's go

Slide 1. – Title Slide

Slide 2. – Organizer

Slide 3. - What is the Croatian Association of Technical Culture (CATC)?

The Croatian Association of Technical Culture (CATC) is the highest national institution in the field of technical culture in the Republic of Croatia and consists today of 18 national associations, 19 county and 36 city technical culture communities, and more than 600 associations of technical culture with over 60.000 members**.**

In 2021 it marked 75 years of its activity with numerous manifestations and festivities. CATC members can in their mission and content be:

- technical-hobbyist (these are mostly the communities and centers of technical culture, like the Croatian Ship Modelars' Association, Croatian Astronautical and Rocketry Association, Croatian Astronomical Union, Croatian Robotic Association and so on
- technical-sporting (Croatian Aeronautical Federation, Croatian Canoe Federation, Croatian Sailing Association, Croatian Diving Association and associations oriented towards sailing or diving),
- artistic-technical (Croatian Film Clubs' Association and Croatian Photographic Union and their associations), inventors, Scouts Croatia, informatics or professional.

In associations of technical enthusiasts, both in the last century and today, scientists, engineers and technicians contribute to the gaining of knowledge and skills and the increase of the level of technical culture, as well as the stimulation of technique in manufacturing and everyday life, through promotional-enlightening activities, technical literacy and education programs for citizens, publishing and stimulating construction and innovation.

The regular school system and specific educational programs cannot, in a short amount of time, offer to a large number of participants the knowledge and skills necessary for the use of technical, economic and other potentials, and enable a large number of young people to form their inclinations and abilities, and the choice of educational programs for technical and research-oriented vocations.
On the other hand, associations devoted to technical content can assure this, because they are organized in order to provide their users the chance for gathering of technical knowledge and skills, and the development and confirmation of their abilities, as well as the implementation of ideas and creativity.

Slide 4. – Financing

The Republic of Croatia has two laws that are very important for technical culture, the law on technical culture and the law on the Croatian lottery.
The Croatian Community of Technical Culture is financed from the budget of the Republic of Croatia according to the Law on the Croatian Lottery. This means that technical culture in Croatia is financed from the funds of games of chance.

We could say, bigger crisis, more betting, more money...

Slide 5. - Basic Tasks

According to the Law on Technical Culture the basic tasks of the Croatian Association of Technical Culture are to:

- stimulate and promote all the activities of technical culture;
- participate in articulating the policy for promotion of technical culture,
- propose the public needs programs of the Republic of Croatia in the field of technical culture;
- harmonize the activities of national associations in technical culture in the realization of the development of technical culture;
- stimulate research and care for the education of employees in technical culture;
- develop extra-curricular and extra-educational activities of children and youth,
- educate and qualify citizens
- publish materials.

Slide 6. – Cooperations

It is clear that CATC cannot perform its tasks alone...

CATC implements its programs in cooperation with:

- Ministry of Education
- Agency for Housing and Education (part of Ministry of Education, and is in charge of primary education)
- Civil Society Associations
- Kindergartens (kindergarten teachers)
- Primary schools (mostly teachers of technical culture, physics and informatics)
- Secondary schools (teachers from secondary vocational schools)
- Faculties (Faculty of Pedagogy, Faculty of mechanical and naval engineering, Faculty of Electrical Engineering

Slide7. - The Modeling League

The modeling league is a team competition for students in the field of wood modelling, which the Croatian Association of Technical Culture conducts in all counties and the City of Zagreb in cooperation with the Croatian Association of Technical Culture Pedagogues, county and city associations of technical culture, associations of technical culture pedagogues and primary schools.
The modeling league connects communities of technical culture (system of informal education) with schools (system of formal education) and encourages the resolution of some of the technical-material limitations, as well as cooperation between schools and communities of technical culture.

Slide 8. - Beginings of the Modeling League

The league was launched at the beginning of the 2012/2013 school year, with the aim of encouraging students to extracurricular acquisition and development of technical knowledge and skills, motor skills, creativity, innovation, teamwork, choice of secondary vocational and technical schools.
That year, teams from 6 counties that held county competitions and 3 teams by invitation took part in the final.
For two years, workshop leaders from CATC held workshops throughout the Republic of Croatia. In addition to the workshops, the participants also received material and equipment for further work.
CATC still supports its associations by providing equipment and materials for holding workshops and competitions.
Thanks to continuous investment in equipment and training of teachers and mentors, today students from all counties of the Republic of Croatia are included in the Modeling League.

Slide 9. - ML 2022./2023.

A total of 1,325 students from 264 elementary schools and 19 technical culture associations passed through the county and school levels, under the guidance of 253 mentors.
27 students with disabilities participated in the competition, 8 of whom also competed at the state level.

At the state level of the Modeling League, 58 students from all counties of the Republic of Croatia took part, led by 31 mentors.

It is important to note that many more children participated in the workshops, from which only the best went to the competitions themselves. So it is about twice as many students in total in the Modeling League system.

Slide 10. - Implementation of ML

Croatian Association of Technical Culture provides the organizers of the county-level competition with basic resources for the implementation of the competition (administrative support, consumables, equipment). Tasks for the implementation of the competition at all levels are prepared by the Croatian Association of Technical Culture in cooperation with the Croatian Association of Technical Culture Pedagogues.

The team consists of two students from elementary schools, associations or special departments of elementary schools from the fifth to the eighth grade who are brought to the competition by a mentor.
Students with developmental disabilities produce the same work as the other teams, but their work can be partially adapted to their abilities and is not evaluated in the same way as the works of other competition participants (they are not ranked), but the best work is singled out.
Competitors within each team jointly create the same project task during 3 full hours (180 min) at the county level, and 4 full hours (240 min) at the state level of the Modeling League.

At all competition levels, mentors may not be in the competition room during the competition. However, at the beginning of the competition, and after each break, mentors have 5 minutes for consultation with their students.
Mentors of teams of students with disabilities may be in the room during the competition and give instructions, but may not physically assist their students.

Although the Modeling League is not part of the formal education system, many high schools in Croatia value the results of the best teams from county and national competitions when enrolling students in high schools. We consider this one of the biggest successes of the Modeling League.

Slide 11. - Nacional level of the Modeling League

First place teams from 21 counties of the Republic of Croatia take part in the national level of the Modeling League. Along with them, up to 5 best teams of students with disabilities. Depending on the number of teams, the State Commission of the Modeling League additionally invites teams from counties where there was the largest number of participants.

The plan is to increase the number of teams at the National Competition in the coming years.

Slide 12. – Video from 2022. Final

Slide 13. – Prizes

CATC awards prizes in order to provide even better conditions for their further work, but also as an incentive to involve more students in the field of modeling.
For example, students from the winning team participate in the Summer School of Technical Activities, which lasts 9 days and where each participant creates their own complex work, such as a robotic arm made of plywood, driven by a microcontroller interface, or a robotic car made of plywood.

Slide 14. - Documentation for the competition

Official forms

- Rules of the ML 2023/2024. - Basic document for the implementation of the Modeling League in the Republic of Croatia.
- ML implementation plan for 2023/2024. - Filled out by the organizer of the county level of the competition by filling in the Application Form for the county level ML, on the website https://www.hztk.hr/modelarska-liga.aspx, at least one month before the competition.
- Application form for ML 2023/2024. It is filled out by the mentor of the team that will participate in the competition and sent to the organizer of the county level of the competition (by the deadline set by the organizer).
- Registration list - Filled in by the competitor registration commissioner, who is appointed by the organizer of the county level of the competition on the day of the competition.
- Score list - Completed by the Evaluation Committee appointed by the organizer of the county level of the competition.
- The report form - is filled in by the commissioner for data processing appointed by the organizer of the county level of the competition and sent to the address: hrvoje.vrhovski@hztk.hr.
- Descriptive report from the county competition - Filled in by the commissioner for data processing appointed by the organizer of the county level competition and sent to: hrvoje.vrhovski@hztk.hr.
- Certificates of commendation, county level - Certificate of commendation template for competitors at county level
- ML Awards, county level - Award template for competitors at the county level ML
- Thank you notes for mentors - county level - Template thank you notes for mentors at the county level ML

The end

Finally, we have a few more little things...

I don't know if our system is good or not, I don't know if it is applicable elsewhere, but it shows results here.
Namely, the largest number of children and teachers both in the formal and informal education system are engaged in modeling.
Here in Croatia, we also have the Young Technicians Competition. It is a competition for upper elementary school classes, from 5th to 8th grade.
It is a competition in the formal education system and is organized by the Ministry of Education. It is implemented by the Education Agency and CATC.

It consists of 7 areas of technical culture from formal education and 5 areas of technical culture from informal education, so a total of 12 areas.

The competition conducted through three levels, school, county and state.
Usually over 7000 students participate in the school competition. At the national level, 255 students are participating, 21 in each area and several additional students.

These areas are

- Construction,
- Wood Modeling,
- Material Processing,
- Mechanical Structures,
- Electronics,
- Electrical Engineering and
- Robotics

from the formal system and

- Photography,
- Robotic Victim Rescue,
- Radio Communications,
- Automatization and
- Modeling of useful technical creations

from the informal education system.

The three first-placed students from each of those 12 areas earn points for enrollment in secondary schools, depending on the area and type of secondary school.

Thanks to the Modeling League, the largest number of students appear in areas related to modeling, Construction, Wood Modeling and Modeling of useful technical creations.

This shows that we are still on the right track...