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Smart Home Models in VET Newsletter

The First Project Year Is Over

Our project lasts two years and in mid-October 2023, we successfully completed the first half of it. Representatives of all five project teams met on 16-18 October to consider the progress of activities essential for the development of the work packages that make the project. It was another hybrid transnational meeting held simultaneously in two locations that were connected remotely via an online link. In Panevėžys, Lithuania, there were IVVEC and PMS teams, while the project coordinator ELPROS hosted the teams of BMSC and VTSNS in Osijek, Croatia.



Smart home models in VET



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- Curriculum content innovations
- Cooperation with smart home companies
- Student practice related to smart technology
- Dissemination of project results among colleagues and students
- Small smart home model created in VTSNS

Smart Home Model News

The IVVEC team have completed the compilation of normative technical documentation, which is necessary for the development of an innovative smart home model. They have been working on the development of a smart home hub for the model using Raspberry Pi4 and Home Assistant



Visit to IVVEC

Within the framework of the Smart Home Models in VET project, Ida-Virumaa Vocational Education Center welcomed the Lithuanian team of Panevėžio Mokymo Centras in June 2023.

The working visit to Estonia was a good chance to directly discuss various aspects of joint project activities. The most important among them is the development of the Smart Home Club curriculum for VET school pupils that will be the basis for delivering the extracurricular activity on the essentials of smart home technology in partner schools. It consists of 40 academic hours of theoretical work followed by eight academic hours of practical work, i.e. the construction of a cardboard smart home model.



*There is a busy year behind us and an even busier one ahead of us.
Some project activities have been completed, others will soon be brought to an end.
Also, there are those yet to be started.*

Curriculum Update

During the summer, the teachers of IVVEC undertook a comprehensive review of the curricula for students of Mechatronics, Automation and Electrical engineering specialities, as planned in project Activity 3.5 - Innovating existing courses with new smart home content.

The revised curricula now incorporate a systematic approach to studying smart home technology, beginning with fundamental systems and progressing towards more intricate ones, encompassing their design and assembly. Students will study several key systems and software commonly used in smart homes, including Schneider Electric SmartLink and Modicon, KNX, ETS6, Siemens LOGO, Dali, and communication systems such as ZigBee, Wi-Fi, Bluetooth, and BLE Mesh, among others.

Contacts with Companies

The team members from IVVEC, Valentina Volkova and Konstantin Malinovski, have recently been to Poland on business and met with representatives of two renowned companies. They are F&F (<https://www.fif.com.pl/en/>) that offers domestic and industrial automation, and Zamel (<https://zamel.com/en/>), an enterprise specialized in smart home production. Considering that both companies have been operating in the electrical industry for years, the meetings have provided an invaluable opportunity to discuss the range of products manufactured by them, their functionalities, compatibility with other brands, and their certifications for use in various building environments.



Polish products for home automation





Transnational Meeting 4

At the October meeting, which connected Osijek and Panevėžys online, the implemented project activities were discussed and good practices shared focusing on smart home technologies. The Agenda covered the following:

- Forms of reporting and data collection for the Interim report;
- Activities 2.3 Smart home model building and testing, which has been in its final stage, and 4.5 Video on making the model and its operation;
- Activities 3.3 Smart Home Clubs programme development, for an extracurricular activity including a smart home model making, and 3.4 on the piloting and evaluation of the programme;
- Activities 3.5 Innovating existing courses with new smart home content, as well as 4.2 Creation of instruction materials, and 4.3 Peer reviewing, which produce teaching and training material for clubs;
- Activity 4.4 Glossary of terms frequently used in smart home technology that will help users adopt typical vocabulary in this field in English and national languages;
- Activity 4.6 “Home Smart Home” animated short film, planned to be created with student participation;
- Activity 5.5 Five national webinars for VET staff, which was announced at the meeting and will last till June next year, aiming at equipping teachers from schools not on the project with necessary information about making smart home models or setting up clubs on the topic; and
- Activities 5.6 Five national Smart Home Open Days and 5.7 Smart Home VET Net formation, dealing with dissemination of project results.

Left: Photos from the sessions

BMSC Smart Home Model

The model consists of several wall mounted boards each representing a room with characteristic electrical installation, as seen in the photos.



Two sides of a board with the floor plan

Project Activities with Students

In Zipernowsky Károly Technical School, a member of the Hungarian partner BMSC from Pécs, students learn in IT classes how to build the hardware and software environment for computers capable of controlling the smart home equipment. It is planned to run the workshop for half a year, 15 x 3 hours in two groups. The first sessions took place on 22 September 2023 with students of the 9th D class.



Presenting the Aim and Results of the Project

On 1-2 June 2023, Pécs-Baranya Chamber of Commerce and Industry organized an event dealing with the digitalization of education and the use of digital tools in it. As said at <https://pbkik.hu/esemeny/karriertervezes-a-mesterseges-intelligencia-tamogatasaval-ismerje-meg-a-career-intelligence-projektet/>, "Digitalization can be a great help in education if used well. However, for many it is still an unknown area, they are not aware of the possibilities [...]".



Upon invitation, László Naszáry, Deputy Director of BMSC Zipernowsky Károly Technical School, and a project team member, participated in the session "The place and role of digitalisation in vocational education", where he introduced the audience with the aim and results of the Erasmus+ KA220-VET project Smart Home Models in VET.

ELPROS and IVVEC Collaboration

From 7 May to 3 June 2023, a group of students from Ida-Virumaa Vocational Education Centre came to Electrical Engineering and Traffic School Osijek as part of their Erasmus+ mobility. During the four week stay they participated in the laboratory work at the hosting school and went on a placement period in local companies.

They were accompanied by two of their teachers, who are also members of the Estonian team working on the project 'Smart home models in VET'. Consequently, the partner schools organised activities for both students and teachers that corresponded with the KA220-VET project. So, the students worked on programming sensors for a small scale model of a smart home and created an installation layout.

The teachers monitored the laboratory practice of the electrical installation project, as well as the laboratory practice of mechatronics students regarding PLCs (Programmable Logic Controllers) and microcontrollers. They also visited newly equipped ELPROS workshops and exchanged information related to the progress of project activities they collaborate on related to smart home technologies.

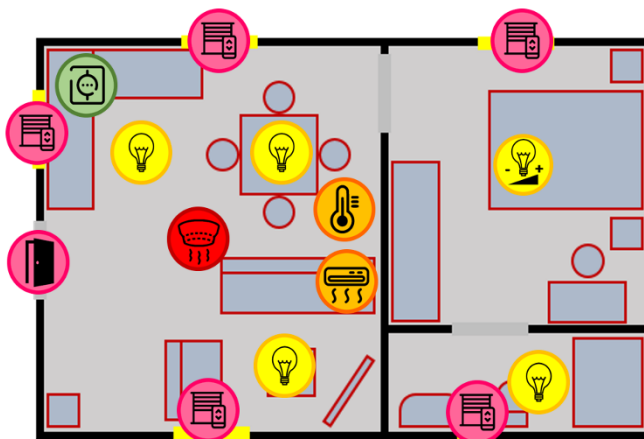
Although the cooperation on this project is mainly carried out online, participating organisations find ways to enable their teams to work together in person through mobilities agreed within other Erasmus+ projects.



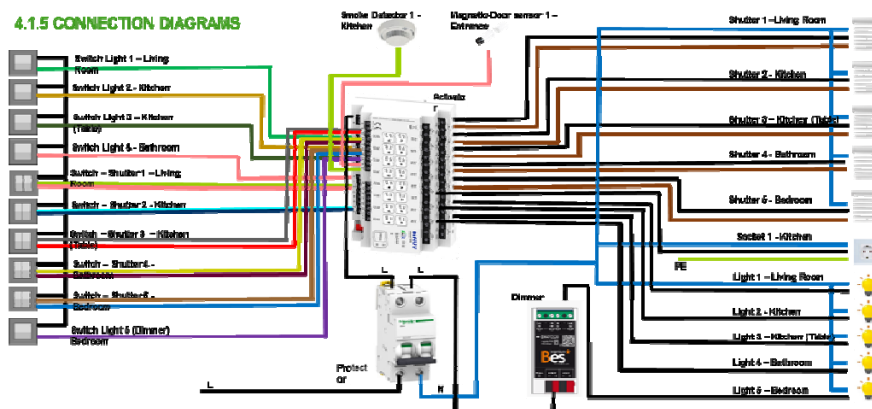
Combining mobilities in KA121-VET projects with activities on smart home technologies of this KA220-VET project has given great results.

Students Designing Smart Homes

These diagrams made by Leon and Tomislav while in Spain present the simplest of the four models they created, a one bed-room home. They did all necessary planning and determined different types of devices needed along with their connections. Manufacturer's datasheets were very useful to them, as well as consultations with IKNX colleagues.



4.1.5 CONNECTION DIAGRAMS



IKNX Ingeneria Placement

ELPROS students, Tomislav Viduman and Leon Glogoški, both future mechatronic technicians, finished their 90 day long placement in Cordoba, Spain, on 20 August 2023. They acquired comprehensive theoretical and practical knowledge that helped them carry out a complex assignment of designing smart homes of different size, using KNX systems. The placement period and achieved results will be recognized as their final exam. Besides, their smart home project can be implemented in all new ELPROS activities planned as innovation of the existing curricula.



ELPROS students with their Spanish mentor, IKNX CEO Antonio Molero Fernández

Project-Based Papers

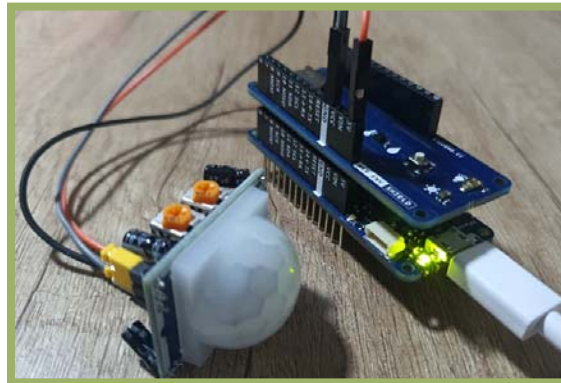
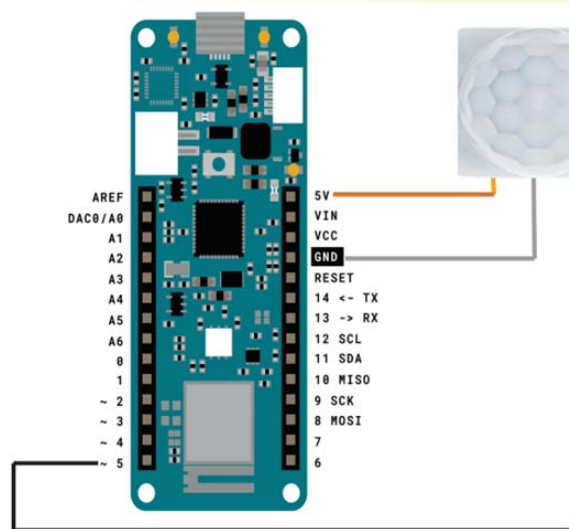
VTSNS teachers have written several conference papers on the role and importance of smart home technologies. Based on project goals and activities, the papers spread the word of the project "Smart home models in VET" and contribute to the dissemination of its results among educators and wider audiences attending the events. Also, they serve as literature to students writing seminar papers or final works.



For the paper "The making of a smart classroom" authors from VTSNS were awarded a diploma by the Association of Innovators in Bosnia and Herzegovina in 2023.

Master Thesis on Smart Home Model Creation

Njegoš Jovović, a student of master studies in IT at VTSNS, defended his thesis titled "Making a smart home model using Arduino as part of STEAM project-based learning" in June 2023. His task was to create a small-scale model of a two-bedroom home, carry out its electrical installation, add Arduino elements to it, and do the coding. Since it is an example of PBL, the participation of pupils was planned during the building of the model and its transforming into a smart one. The two photos below are from the work and show the connection diagram of Arduino MKR Wi-Fi 1010 with PIR HC-SR501 motion sensor and these two devices connected, while the remaining photos are from the viva defence.



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To learn more about the project,
visit its website at:

<https://smarthomemodels.eu/>



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