

Sustainable Behavior Change Gaming Tool Implemented in a School in Trento

Abstract

During October and November 2023 an energy education initiative was conducted in a secondary school in Trento. The objective was to educate students about how behaviors can impact our energy consumption, both at school and at home. The activity incorporated gamification elements, with different classes competing against each other in an energy measurement “challenge”.

Key points

Gamification initiative to educate students on sustainable energy behaviors, was implemented in a secondary school in Trento.

The Energy Expert Challenge successfully engaged young citizens in one of STARDUST’s lighthouse cities.

From October 2nd to November 14th 2023, Eurac Research organized an energy education initiative in a secondary school in Trento, co-developed with Trento’s environmental protection agency (APPA*) and carried-out in classrooms by expert educator firm Level-Up. A gamified tool for sustainable energy behavior was implemented, with the aim of informing young citizens on energy consumption topics and promoting sustainable energy behavior change. The initiative targeted a total of 200 students aged 14 –16 and split across 10 classes.

Introductory activities

In the context of the initiative, students went through a series of introductory activities, supported with tools such as a role-playing energy game, arming them with general knowledge on energy topics. These activities further aimed to educate students on how energy consumption can be monitored at home with the use of smart plugs or available information online.

Energy Expert Challenge

A gamified energy measuring challenge, supported by a web-tool was carried out, the so-called the “Energy Expert Challenge”. During the challenge, students in each class would visit different types of room in the school building (including for example a classroom, computer lab, science lab, admin office, etc.) while mapping all the electricity-consuming devices in these rooms. This included lighting and other electrical appliances, for which they would then estimate the consumption during a typical school month. They could do this using specific plugged power meters, or

more generally leveraging the skills learnt during the introductory activities.

Students in each class would then have to enumerate the number of rooms of each type in their school building, and finally calculate the overall consumption of the building during the current month. The estimated values from each class would be compared to the building’s real electricity bill from the previous year. The class that more closely approximated the real consumption value would win the challenge.

Each student in the winning class was handed an energy saving books to help them in their future energy saving journey. All participating students were rewarded with smart plugs to monitor their consumption at home, and a certificate attesting the completion of the challenge, recognizing their status as young Energy Experts (figure).



Figure: Energy Expert Certificate handed-out at the conclusion of the challenge.

Credit: Level-Up.

The Web-Tool

Throughout the challenge, students would write their estimated values in the supporting web-tool. This tool would inform them how behaviors factor into these calculations and help them reflect on

how their individual energy use affected consumption. More specifically, the tool encouraged students to think of ways to reduce consumption on their own, and to share their reflections in class at the end of the challenge.

Finally, the tool also nudged students to think about how energy consumption translated into real financial costs, by presenting an interactive graph where students could visualize how their estimated values would translate into real costs in Euros, assuming different prices per kWh. Using this graph, students could also compare with the costs from average consumption of different types of buildings, such as homes and bars/restaurants. This feature would communicate to young citizens how energy saving is not only important for environmental reasons, but also financial ones.

(*) Agenzia provinciale per la protezione dell'ambiente.

Conclusions

The activity was appreciated by students and faculty alike, with the hands-on, competitive nature of the challenge being particularly effective at engaging with the young citizens of one of STARDUST's lighthouse cities. The hope is that the activity can impact daily routines of students and families going forward, encouraging more conscious energy use at home.

The gamified activity and web tool could easily be adapted into other school energy education programs, with an emphasis on how energy consumption varies through different seasonal changes. The scope of the web tool could also be expanded to integrate scientific findings around thermal comfort and energy use for space heating/cooling, adapted to different European climates. Finally, future applications could introduce a similar challenge in residential buildings, where there are numerous other possibilities for users to directly adjust energy behaviors and monitor changes in consumption, something which was impossible to do in the present school context.

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