

TEACH TWO MAGAZINE

N. 3

June 2013

Summary

Teach Two 1

Methodology step
by Step

Perceptive test 2

Critical test 2

Analytical Test 4

TEACH TWO METHODOLOGY STEP BY

Teach Two is an European energy-saving project for schools, that allows to investigate the current situation with regards to energy use in your school and start to improve the situation.

The Perceptive survey

The perceptive survey asked participants to comment on their perceptions of their working environment and how it impacts on their physical and mental well-being and comfort. This has enabled possible issues relating to temperature, light levels etc to be identified and the causes have been investigated further through the critical survey which followed.

The critical survey

The critical survey investigated how energy is currently used within the school in terms of the building fabric, the technology used and the way in which building users interact with these. Being mindful of cost implications for the school, a mix of no-, low- and capital-cost measures have been included so that some steps can be taken to improve energy efficiency regardless of any financial constraints.

The analytic survey

This involved students taking a range of measurements in order to produce a thermal energy balance for the school buildings. This has enabled the team to test the potential impact of heating and insulation measures should they be implemented and some of these have been presented in the form of a business case, with information on return-on-investment and payback times.



ITIS Newton - Italy



Tewkesbury School - England



School survey—Greece

The project has been designed so that these surveys can be repeated on an annual. This will enable the impact of any measures installed to be identified and the situation to be re-evaluated so that the school is able to continually move forward.

The Teach TwO Project has been brought to you by:



THE PERCEPTIVE TEST

Respondents were asked to rate their own energy-saving behaviour and that of staff and students in the school generally. They were also asked to comment on whether they carried out certain energy-saving behaviours. This will show which energy-saving steps are already being carried out and which need to be encouraged as part of an energy-saving campaign that will be implemented as part of this project.

Air quality

Are most rooms stuffy, draughty or about right?

Is the air generally considered to be too humid, too dry or about right?

Are there particular problems with air quality experienced within particular buildings / floors of buildings / rooms facing a certain direction?

Temperature

Do people generally feel too hot, too cold or about right?

Are particular buildings perceived as being too hot or too cold?

Are there floors of particular buildings that are too hot or too cold? Why do you think this might be?

Lighting

Are natural light levels good, poor or about right?

Are artificial light levels good, poor or about right?

It is worth noting that where natural light levels are poor, the provision of good quality artificial light becomes all the more important.



ISIS "C.Volontè" - Italy



IIS Lunardi - Italy



Secondary Schhol "Anna Frank" - Italy

THE CRITICAL TEST

There are actually three different survey forms that need to be completed; one by the lead teacher, one by the site manager and one by a team of students. The following aspects were surveyed and the main findings from each are summarised below:

Heating - Natural lighting - Artificial lighting - Electric devices - Ventilation and insulation - Water.

Heating

Heating is usually the largest and most expensive energy user in a school and significant savings can be made through the implementation of even simple, low-cost measures. In fact, **it is possible to cut heating costs by up to 30% by making a few adjustments to heating settings.**

Ex.: Boilers and boiler rooms

How is heating and hot water supplied to the school? – How many boiler rooms are there? Which areas do they serve?



Chosen Hill - England



Istituto Pessina - Italy



Tewkesbury School - England

Natural lighting

There are a number of benefits to making good use of natural light. Firstly, it is a free source of light and **making good use of natural lighting in a classroom can reduce lighting costs by 19%**. However, this is not the only benefit. **Natural light has significant physical and mental health benefits**. Think about how you feel on a dark, miserable day compared to a bright sunny one. Natural daylight improves mood and alertness and can help with concentration, improving learning.

Ex.: **Is the natural lighting sufficient for the activities carried out?**

These may include:

- North facing rooms
- Buildings that are shaded out by other buildings



ISIS "C.Volontè" - Italy



Istituto Pessina - Italy



School 2— Grecia

Artificial lighting

Lighting typically accounts for approximately 10% of a school's total energy use but up to 25% of total costs as electricity is usually considerably more expensive than heating fuel. Therefore, there are substantial savings that can be made by improving the type, control and use of lighting in our school.

Ex.: **Light fittings and equipment**

It is not only the lights themselves that are important. Also of great importance is the light fitting. Fittings which include some sort of cover can help to reduce glare, whilst fittings with reflectors can help to ensure that more of the light produced enters the room and that is more evenly distributed across the room. The light fittings should be cleaned regularly too as dirty covers and reflectors will prevent the maximum amount of light from entering the room.

Did most lights in each block / area have lightshades, covers or reflectors?

Were there any areas of the school where this was not the case?

If this is the case and this was highlighted as an issue in the perceptive survey results, recommend that these are fitted in these areas in order to reduce glare and ensure a more even distribution of light across rooms.



ITIS Newton Italy



ISIS "C. Volontè" - Italy



IIS Lunardi - Italy

THE ANALYTICAL TEST

The Critical test leads to the preparation school heating energy balance.

This involved measuring various aspects of the building and finding the insulating properties of the building materials in order to work out how much heat energy enters and leaves the building.

Our results show how much heat is entering the building from various sources and how much energy is lost from the building during the winter months.

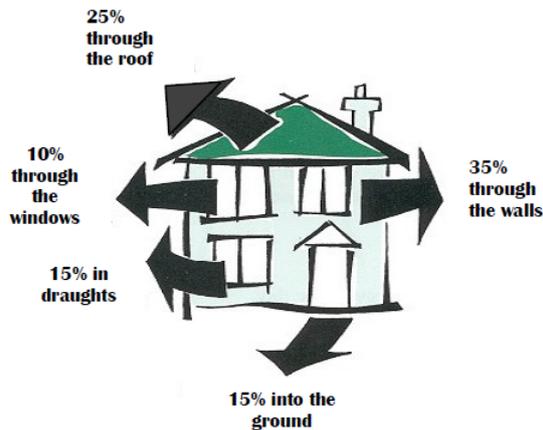
From this, we have been able to work out how much energy is required from the heating system in order to keep the school at a comfortable temperature over winter.

Ex.: The total amount of heat energy entering the building over the winter period was ** MJ.

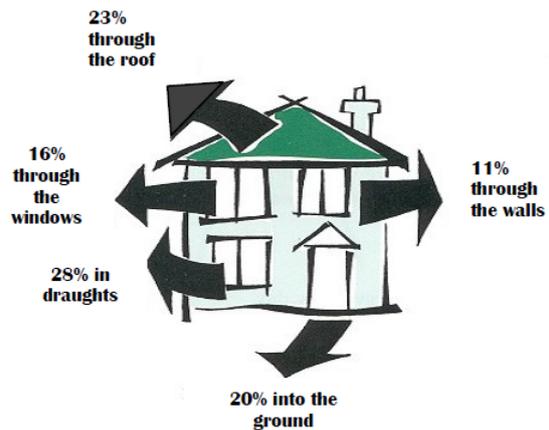
This means that we have an energy shortfall of ** MJ.

This is the energy required from our heating systems to keep the school heated to the current temperature.

Heat gains		Heat losses		
Solar heat gains	61,270	Heat loss through walls	125,222	
Internal heat gains	204,114	Heat loss through windows	198,446	
		Heat loss through floors	249,131	
		Heat loss through roof	287,324	
		Heat loss through ventilation	337,629	Energy balance
Total heat gains	265,384	Total heat losses	1,197,753	-932,369



Typical Heat Loss from a domestic property



Heat Loss from our school in 2010

If the school is currently heated to above 18°C:

Reducing heating time and temperature settings:

We could adjust the heating time and temperature settings, reducing the set temperature and / or the amount of time the heating is on for. It is recommended that classrooms are heated to a temperature of 18°C.

Our figures show that if we reduced the temperature to 18°C this would save ** kWh of **insert heating fuel** per year.

This is a saving of **% and bearing in mind that the school currently spends £** on heating, this works out at a saving of £** per year.

The software that we have used to conduct the analytic survey enables us to model potential changes to the structure of the school buildings, particularly with respect to improving the insulation of the buildings.



Edited by © Ecoazioni

All multimedia products and results of the surveys will be published on the website.

<http://www.teach2project.eu/>