learnometer mini research projects

guidance for schools in their mini-research activity using Learnometers to optimise learning spaces

The Learnometers are carefully designed and calibrated to measure many of the environmental features of your learning space. These impact on how well your brain functions when you learn and work in that space. Where those details are sub-optimal, your cognitive processes will be too. Learnometers measure CO_2, chemicals (TVOCs), fine dust (PM2.5), humidity, temperature, ambient light (lux), ambient noise (dBA). Following much research, from many teams, we know that each of these has an optimal range. Aggregated together, the learnometer also produces an overall value (the LearnoMetric) up to a maximum (ideal) of 100 (see the 82 value above). Values are displayed on the front of the Learnometer; the devices also produce an online dashboard of data, for you to follow, graphing each parameter over time.

mini-research activities

audit my space

At the simplest level an audit of a learning space by students is a valuable starting point. Is there a dark hot corner, does the room vary between registration and lunch? Does CO_2 fall near to the open windows… ?
It is interesting to start with a hypothesis ("Poor engagement is often in "that' corner. Maybe there is a problem with the corner?")

Comparing different rooms is another good starting point. Counterintuitively, often the newest spaces do not prove to be the best spaces for learning!

audit a day in the life

The Learnometers have a good in-built battery which will run for some 6 or 7 hours away from their USB charging lead. This means that the device can accompany one person - a student or teacher - for much of a school day. This can provide real insights: why do I feel
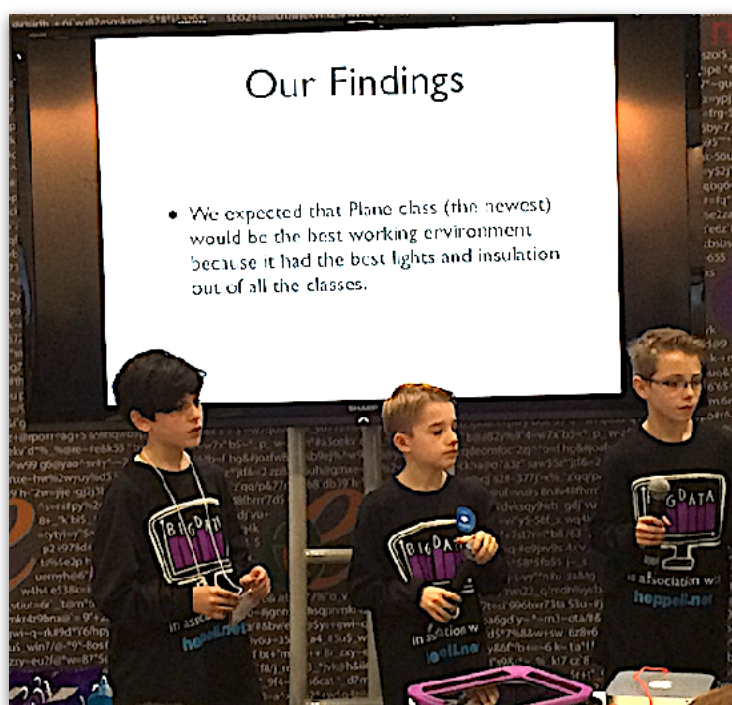
sleepy in Geography? Why do I need to walk around when I invigilate a test paper? Why do I have headaches on Fridays? Different people will have different experiences to explore and share.

audit the HOMEwork spaces
The places where homework is done vary. Each student's home, or dormitory, will be different. Some spaces that we surveyed in our research phase were far too hot, too dark, badly ventilated, and it would have been very difficult to focus on homework in them for more than 20 minutes or so. Taking turns to take a Learnometer home is interesting for parents too. It may reduce a lot of arguments ("Can't you just FINISH your homework!!")

Of course, in the blended learning world since the CoVID-19 pandemic arrived, these home learning and working spaces matter even more than before, for teachers too.

OK, we see a problem, let's fix it
Elite sport has taught us that the aggregation of marginal gains can add up to a big improvement. Helpfully, the Learnometers make it straightforward to "pick off" those marginal gains, one mini-research project at a time. These can proceed in parallel as different groups of children focus on each one. "Fixing" the sub-optimal condition is usually cheap and quick to do. Reflecting on how to resolve issues needs good science, good collaboration, some ingenuity and a lot of reflection by the students. We have found no age limit, neither too low not too high, for children's engagement with this.

Two sound monitors at Hargrave Park School, in London

A good starting point would always be the "worst" score, of course. There is much material on the https://heppell.net website, the learnometer.net website, and in social media too, as many schools around the world engage in this work, and enjoy sharing, their progress.

Examples might be: adding plants to cut CO2, changing lightbulbs to brighten and whiten the environment, setting children up as monitors each day to keep a parameter within optimal bounds.

Sometimes a little detective work is needed; we were aghast to see some really steep graphs for TVOCs this year. After some investigation it turned out to be the industrial strength cleaning fluids being used early morning to keep classrooms "CoVID safe", but that were sadly having a profound and damaging impact on children's ability to concentrate throughout the day (see TVOC graph, left).

If you have an active STEM programme then building little Arduino based self watering devices for the CO_2 reducing plants is a great way to keep humidity up above 40% too.

Even simply covering desk surfaces with white paper will have a noticeable impact on the Lux readings in a learning space. Or taking all paper off the window glass.

where to site the device
common sense

Basically, the little devices need to be located where the students are. Neither too high, nor low down on the floor. You want readings that are typical of where the students are breathing, seeing and hearing. Obviously keeping out of strong direct sunlight gives a 'fairer" reading unless you are seeking to explore just how hot that window seat gets in summer.

In other words, use common sense in locating the device. There is a wall bracket too if you are fixing them in position for the long term.

ingenuity and sharing
a global research family

Helpfully, Learnometers are being used all around the world. As your children research and discover effective solutions to making the learning spaces optimal, there is an opportunity to exchange practice.

Each school or organisation will be unique. Your solutions will be the best for your context, but others will want to learn from what you do, now that you have joined this family of Learnometer learning space researchers.

One favourite from the last couple of years was this school in New South Wales where they sought to reduce excessive (and very stressful) dining room noise. The students' solution was very effective. Parents were engaged too. They did this:
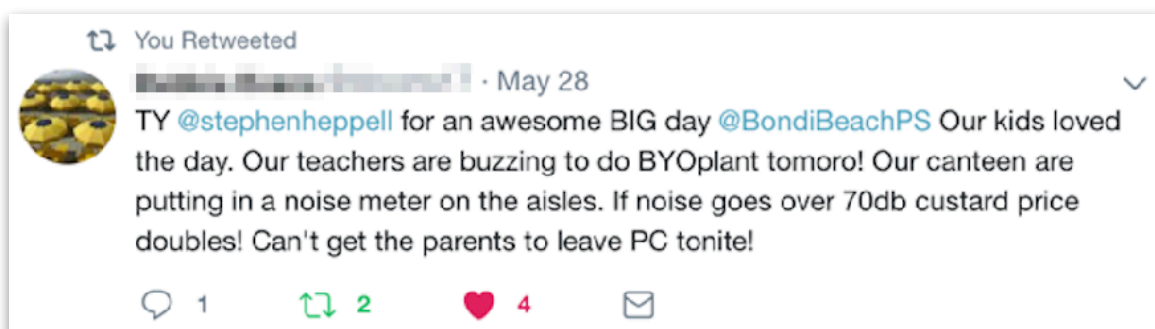
We are all looking forward to seeing what your solutions might be!