Queen Mary University of London

Electronic Engineering and Computer Science

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Home Lab Kits for Electronic Engineering: Examples, considerations, pros and cons

"Chemistry, and *Electrical and Electronic Engineering* have both held steady against or risen above sector averages".
National Student Survey (NSS) results – 2021, Professor Stephanie Marshall and Shamima Akter

Learning resources (Scale06)
18 The IT resources and facilities provided have supported my learning well
19 The library resources (e.g. books, online services and learning spaces) have supported my learning well
20 I have been able to access course-specific resources (e.g. equipment, facilities, software, collections) when I needed to

UKPRN	Provider	Subject Code	Subject	Level	Question Number	Answered 1	Answered 2	Answered 3	Answered 4	Answered 5	N/A	%Agree Confidence interval - min	%Agree Actual value	%Agree Confidence interval - max	Response	Sample Size
10007775	Queen Mary University of London	CAH10-01-08	Electrical and electronic engineering	First degree	Scale05	1%	6%	25%	49%	19%	0	46%	68%	84%	23	30
10007775	Queen Mary University of London	CAH10-01-08	Electrical and electronic engineering	First degree	Q18	0%	9%	13%	35%	43%	0	56%	78%	91%	23	30
10007775	Queen Mary University of London	CAH10-01-08	Electrical and electronic engineering	First degree	Q19	4%	4%	9%	43%	39%	0	60%	83%	94%	23	30
10007775	Queen Mary University of London	CAH10-01-08	Electrical and electronic engineering	First degree	Q20	0%	0%	9%	43%	48%	0	71%	91%	98%	23	30

Early planning and adoption

EECS sent over 500 Parcels during lockdown!

The schools Electronics Teaching Group was quick to respond to the need for kits and was able to draw up a requirements list and its impact on the learning experience.
From this list a remote access vs home lab kit requirement was proposed, and module organisers were able to make decisions on how to proceed with labs.

Module	Runs labs? [Y/N] + give details about the extent to which these rely on facilities and hardware [Alt + Enter for new line in the cell]	Hardware currently used (list) [Alt + Enter for new line]	Hardware replacement needed (Yes/No)	Projected Student numbers	Online alternatives (if known): give a list, or state if not posisble, or not known at present [Alt + Enter for new line]	Facilities needed [Alt + Enter for new line]	Specialised software ['N' or give a list] [Alt + Enter for new line]	Group work required? [Y/N]	Kit that staff need to replicate (teaching tools) [Alt + Enter for new line]	Could adapt to VIRTUAL lab setup? Y / N	Could adapt to REMOTE lab setup? Y/N

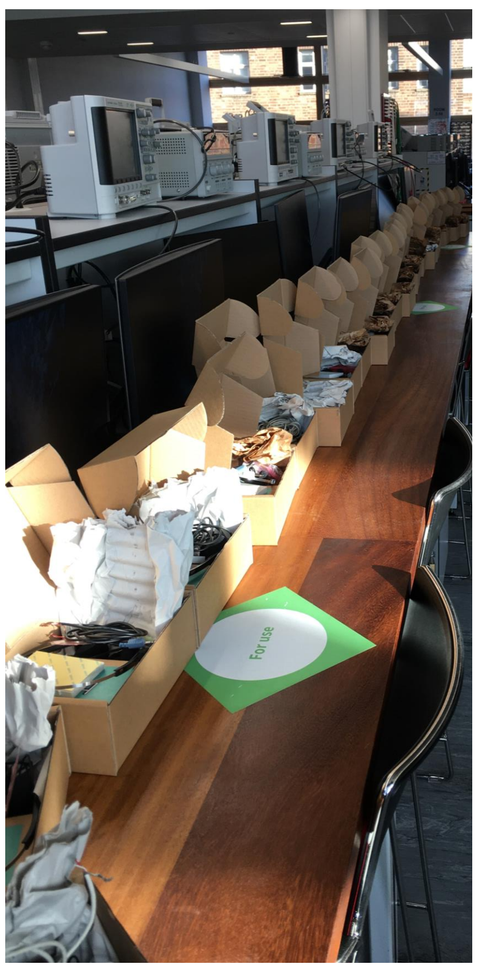
The above table was populated in March-June so that preparations could take place for testing, purchasing and kitting before a dispatch process in early September depending on destination.

Student owned Lab Kits

Did you know: Residences do not have a place to store student parcels!

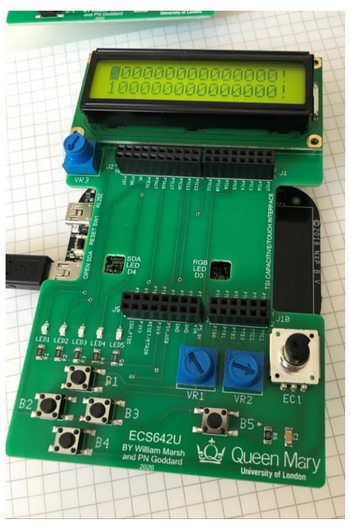
One lab kit (National Instruments MyDAQ) was provided to the students as an ownership item. This is a deal with the manufacturer that allows the provider (QM) to purchase at half the price but the item is owned by the student. The decision to do this was made by the schools teaching group which saw the long term use of the kit over the course of he degree programme.

Space required for Packing



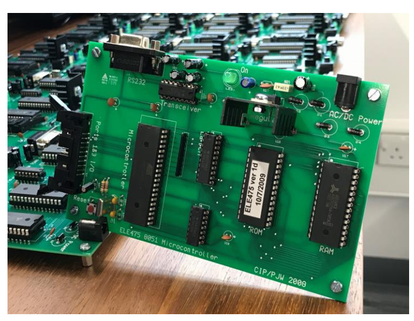
Packing of home kits requires space! Some kits were packed at home and some on campus. Logistics of deliveries and collections were varied but where possible home organisation was most reliable over the lockdown. One of the most important parts of home kits was the importance of reliability and not missing items. No checking available during lockdown, so reliance on individual precision.

Specialist kits



Custom kits were fabricated to meet teaching needs of particular modules. Utilisation of technical staff working at home time to develop over lockdown. These specialist kits by design need to be returned for use in subsequent years.

Opportunity to expand



Existing kits that have been custom and restricted to use in the lab have been multiplied and provided as home kits. This increases the throughput of lab sessions now that capacity and kit availability is not limited to a small number.

Ongoing impact

Although the benefits brought by home kits are well received, Student satisfaction, access to labs and lab equipment, ability to study at own pace etc… it has been observed that some students still prefer to stay away from in person activities especially with the availability of home kits. This distracts the students from coming to the labs where in person support is available. Whilst every effort is made to support students offline and remotely this can't be equivalent to supported lab sessions.

Usage of kits in lab. The home lab kits are intended to for home use but during lab session on campus students are expected to bring them in. This is not always ideal based on size distance etc… Additional kits or alternatives need to be available in lab and this adds to load and resource requirements.

Engineers generally use PCs not MACs! For the majority of kits a software component is required and this will most likely be based on a Windows operating system. Emulators and virtual options are available but this are either incompatible or cannot support the hardware requirement. Although an attempt to communicate this to students for academic year 2021-22, a number of students still opted to purchase MAC based computers.

Investment. It is hoped that even though the home kits have some disadvantages and trad-offs compared to traditional labs, the benefits are worth pursuing. This includes improved module evaluations and NSS results.

Top Tip: If you can't send it in time, order it and delivery at destination!