ELN Workshops Combined Notes

1. What are your experiences of using/testing ELN?

1. Variety of solutions currently in use with varying degrees of success/acceptance – can we/ should we do some sort of uni wide survey of what is currently being used?
    a. RSpace – some groups happily using this, others tried it and decided it didn't suit them so moved onto Lab Archives. Need to look at issues around connections to DataStore, DataShare, OneDrive, and HPC (EDDIE, etc). At least one group has achieved a "paper-free" lab by the use of RSpace
    b. LabGuru - low cost, excellent control for moving between institutions. (Glasgow) Some people use project management software (Glasgow).
    c. OneNote – low functionality, wasn't popular with one groups members as was seen to increase workload – transferring notes from paper lab books into Onenote at end of each day, but works well for others in arts and humanities
    d. SharePoint – seems to work well for those using it, but is there something better with the same low barriers to entry, possibly Wikibench
    e. Jupyter Notebooks – space and customisability may be limitations but very useful for people using R or Python regularly
    f. Lab Archives – Very bioscience focused, currently being used as part of 5 year trial by one group who are very keen for Uni to support and funded.
    g. Benchling – seems well designed with low barriers to entry, free and paid versions, but web based which raises concerns about access if network goes down and about storage of sensitive data.
    h. WikiBench – "in-house" solution using confluence Wiki, of interest to groups that already use Wikis or Sharepoint, cheap and uses Uni servers. Support is very limited, how much if any support would IS helpline be able to provide?
2. Some groups have looked at ELNs over a number of years, feel that only now are they becoming a practical solution, however;
    a. Buy-in from senior managers and PIs is required for any EN to be a success
    b. Some senior people are still very resistant to the idea – need to win hearts and minds
    c. Training for staff and PGRs at all levels (possibly UGs too) is required to ensure any benefits are realised – ENs are a tool not a solution!
    d. Support staff need to know what is available and which options will best suit their users needs
3. The ability of ENs to improve collaboration both within and beyond groups is a crucial factor – easier to share access to an EN than a paper notebook
4. Integration is also very important, very unlikely that any EN will provide all of the functionality required by a group so the ability to integrate with other specialist tools is vital
5. Commitment from funders, regulatory bodies, etc to support the use of ENs, some PIs reluctant to commit in case they are told funder won't accept it.
6. There need to be clear incentives backed up by support for groups adopting new ways of working, writing SOPs, doing training, etc.

2. What are the main barriers to adoption/deal breakers?

7. Equipment is a major barrier, many labs can't/won't permit devices like phones, tablets, or computers into the lab for H&S reasons, or if they do they won't be allowed out again.
    a. Extra costs and storage/charging space required if tablets are to be procured and kept in lab permanently which additional computers outside
    b. Also require decontamination or disposal procedures incase a device gets contaminated or damages
    c. Alternative is to use a "hybrid" system of taking printed notes in and out of the lab but this generates extra work and removes some of the gains from implementing an EN
    d. University does not currently recommend or support any tablets or other portable devices – does this need to be reviewed?
    e. Also Wellcome trust does not allow tablets as an allowable expense and these are the most efficient way to use ENs in some circumstances.
8. Are entries in ENs immutable, will a user be able to tell easily if, for example, an image has been changed or modified after original entry?
    f. For formal ENs the answer appears to be "yes" they all time stamp entries and enable users to view past versions of each entry thereby protecting integrity
    g. For other options like Sharepoint, WikiBench this is a bit less certain, there maybe some versioning, roll-back ability but would this be acceptable to regulators etc.
9. Storage space maybe limited within the ELN leading data to be stored elsewhere and linked in from, for example, DataStore or a cloud service. This could potentially limit the shareability of the data using the EN
10. RSpace using an API to ingest data this may be limiting to some user groups, is this also a problem with other platforms?
11. Uncertainty over longevity and stability of platforms – what will happen if platform closes down or University withdraws support?
12. How portable is the data in the EN?
    h. If a user wants to move to another platform how difficult will that be?

3. What can Information Services do to support adoption of ELNs?

13. Recommend / support suitable devices for use in wetlabs and similar situations
14. Help "sell" ELNs generally to senior staff in schools / centres
    a. look at cost per user of paper notebooks, buying them and storing them (x-ray films also, etc.) Look at savings for implementing a lab notebook.
    b. Sustainability policy suggests going digital.
    c. Look at solution of either destructive or non-destructive scanning of paper notebooks; need indexing, searching.
15. Provide certainty for users that RSpace (or other University supported ENs) will be available at UoE longterm
    d. potential users need to know that funding and support won't suddenly stop and that they won't be required to change platforms every few years
16. Improvements to University networks are required to support web/browser based EN's
    e. Network fault / downtime could result in data loss if updates can't be saved or inability to access EN when required.
17. Improved information on EN platforms
    f. Improve information on website
    g. Identify local "champions" who can give discipline appropriate advice and/or training on platforms used locally
    h. Provide additional training on achieving good RDM by using an EN
18. Consider adopting other EN platforms, e.g. LabArchives or Benchling, also roll out research version of Noteable / Jupyter Notebooks
    i. Would require extensive university wide research and collaboration to decide which additional platforms to support – researchers may not get what they want at the end of it! Can't implement and support every possible platform!
    j. For Wikibench it was stated that "IS helpline will support you in using the University wiki" we need to check if this is the case and the degree of help available.

Rough Notes from the Workshops

Mary Donaldson – University of Glasgow is trialling RSpace and SciNote (open source), and also investigating digitisation of paper notebooks

Has it been approved that notebooks are suitable for IP validation. Paper notebooks would need double sign off. – Double sign-off/witnessing is available for some ELN platforms and all provide timestamps. RDS team to check with someone who is expert in IP if ELNs generally provide documentation suitable for patent application or regulatory purposes

Poll of attendees 50% of attendees really want to be using ELNs

1. What are your experiences of using/testing ELN?

I use LabGuru – low cost, excellent control for moving between institutions. (Glasgow) Some people use project management software (Glasgow).

In my previous lab we had an intermediate solution between paper and digital – my PI wanted us to use OneNote. He asked us to export locked PDFs at the end of each month. The result was that everyone used paper by day and then felt hassled to type up their notes at the end of the day. The Postdocs didn't like it because they had always used paper.

In my current lab I would like to introduce one that we all use, am shopping for the best option. CDBS?

Does RSpace link to EDDIE? No but there may be ways. Does RSpace link to DataStore groups?

genomics lab: interested in notebooks for group and team wet and dry lab (coding). Currently have a lab wiki. Interested in wikibench. New student who wants to access data from across multiple researchers.

business school Is team representative: how to introduce them to it and support.

engineering: new lab: multi collaboration. Using SharePoint at present which works well but looking at whether is it worth implementing a new solution

Cardiovascular Science- wanted to know more about what is available

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Postdoc lab manager. I've been using RSpace, everyone in our lab uses it.
Pricewise and functionality.
Large datasets as well, can link to University data storage.
Did you consider others? Can't remember – some were small and not helpful, some were expensive.
Any limitations with RSpace? So far nothing particularly. Lab manager still working out how to access individual lab books – learning curve.

XXXX – using Noteable product for teaching. I do wish there was a research counterpart for that, would be very useful.
Limitations? Space (I picked up customization was also limitation.) for me as a user where I can keep my R or Python packages and not request help every time I want to start a new space and install the packages.

James Lack from LTW, Nuria from EDINA, running the Noteables project for Education. EDINA interested in developing it for research as well.
Pre-populated environment in the service, where cloud has you install packages yourself. We can go over requirements with you before you begin.
If anyone's interested in using Jupyter for teaching or for research, contact me and I can help set it up. Costs? Free at point of use, the University if paying for the platform at the moment.

We tried RSpace first, but it was hard to use. It wasn't intuitive then (3 years ago), it looks totally different now. With Lab Archives the barrier for usage was very low, there was not pushback (Used in the context of microbiology and imaging.).
I have 5 years for free and there are two years remaining, will have to pay if an enterprise version not established.
We don't do programming or sophisticated algorithms, just replace the paper notebook.

Benchling - Free at basic level, but still very powerful. Very attractive, you can get your data back. The cloud aspect of your data may be a concern/drawback, I haven't really checked those aspects (Picked up acceptability to pharma industry here. And facilitates workflow management. Independent account and own projects also supported so not restricted to group.). I also use Jupyter Notebooks, docker files, other tools for version control, but for biological experiments Benchling is intuitive and useful for biologists (Mentioned using other tools for **analyses** purposes). If you collect microscope data you will run out of storage, large datasets, then you may want to use Seek for Science.
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Data Champion from QMRI:
We looked into moving to ELNs 6-7 years ago, looked at RSpace and it was decided field not ready
Now technology has moved on - and RSpace licence through Uni.
Discussion with PIs. They don't want to implement it. Quite resistant
Possibly requires a culture shift in group leaders and better understanding of actual funder requirements- that this is a requirement not a 'like to have'

Researcher Wellcome Centre for Cell biology.
Been having this discussion in the team for 2years. PI main objection/reluctance has been to commit to a given application and then to be told Wellcome Trust does not approve it/approve a different one and they have to move. Waiting for direction.

PhD Student at Waddington: New PhD students are being made aware that funding requirements indication they should be using an ELN. Got talk of Benchling.

Mary Donaldson UoG- first experience was using LabGuru - 6 years ago. Lab undergoing split to USA. ELN facilitated split. Has good inventory functionality for lab

University wiki- used.

PI Waddington Building
Runs a totally paper free lab. RMarkdown for data analysis- notes onto samples.
Using RSpace.
However, use is a bit hesitant and how to set a standard for the lab. Need for SOP. Lack of culture
Practical training for how to translate funder requirement into what do to do on day to day basis.

Ralitsa Madsen (speaker) former PhD at Cambridge: On Edwards comment, Cambridge implemented local data Champions to help with advice and training for this. Volunteer basis

Senior PIs need to be on board.
Incentives are increasing.

Mary Donaldson UoG : Glasgow focusing on new PhD students – they are clean slate
Found in requirements gathering: PI have significant inertia about backfilling existing data.
Also target new PIs. Find some have good practice- have lab bible. SOP for documentation how to and how often. Others completely left to freeform.

, PI Waddington Building
Commented he finds out most of his useful information on the UK new PI and slack channel

Nature future have lab manifesto career future (2-page document) good for new students
happy to share:
Arts humanities: using OneNote with Surface- simple works well.

Jen asked group about experience of using WikiBench, reason why not - most people had not heard about it.

2. What are the main barriers to adoption/deal breakers?

Again – I want to take a tablet into the lab, I don't want to duplicate it. Practicalities - how do they work in the wet lab? what do you take into lab?
No good solution- requires printing out and writing notes on the paper.
I am just having a problem with ELNs. (Four slides – My Dream: doing the experiment, not leaving but using the tablet) The University needs to support tablets and its configuration for wet labs. I need to connect to DataStore.

There are some labs around the university using cheap Android tablets so that they can be disposed of if they get wet/broken. Cheap is the way to go.

I have to write in the lab, then take it back to the office and write it up, then print it out and put it in a paper notebook – it's ridiculous.

Can you monitor if someone changes an image can you check the versions of the image?
If someone writes up their notebook and then updates an image of a gel two weeks later, can you tell this has happened and can you access both versions – Yes

Glasgow described a set up for category 3 lab work.

With Office365 online version, it's easy to do what I need to do – simple calculations.

Nobody uses the lab notebooks (in Roslin) because it's not easy to add links, etc. They put the information into Readme files, etc. [Roslin scans its notebooks.]

A wiki should not be used for legal compliance as it's not incorruptible. However, it does help with portability.

RSpace doesn't digest data; need an API to get the data in.

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Cost and customization came up in earlier discussion

has found that the desirable features are easy to share with your whole lab, assign roles, such as PI. Indexing, audit log. Be able to click on the link and see it – DOI.
working with teacher organisation, looking at lab use of ELNs with students.
looked at Benchling, since we're already using snapchain for sequence data, concerned about conflicts with the product.

Verga, working in Molecular Biology, we are looking at Lab Archives and Benchling. We have a lot of microscope photos. Benchling is useful for a day to day notebook.

Images have to be stored somewhere and linked in, too costly otherwise.

Physics – using Microsoft OneNote, often use phone to input bits of text. I deal with large volumes of powder and liquids, handling a phone is not ideal. I work on commercial sensitive data so wanted to use University-controlled server. Free one TB allocation with University account. Main limitation is data input. I need an electronic pen or something like that, will have to give up on OneNote. Lab Archives seems very generic.

Product Manager for Noteables but don't have the computational skills to use it myself.

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Mary Donaldson commented from UoG. Found some researchers 30% in Physics and astronomy which usually had good uptake, did not work digitally and simply wasn't appropriate to adopt them. Nothing would convince them

cost: linking to storage. set/up

University support: for example, the university licence with RSpace won't simply disappear

Engineering PI: Raised concerns about security of data in sharing platform. Not clear. GDPR- how do we make sure names dates contacts are safe?

Movement between lab and office problem moving – need appropriate hardware in lab to not negate the whole initiate. Edward Wallace commented: Wellcome trust don't allow Tablets as a valid expense.

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Wet lab issue: Using tablets in the lab/contamination/spillage. How do we get around this? how does this comply with getting rid of paper?

Raltisa comment that with gloves on, tablet won't work anyway and in reality it depends what you want out of an ELN- it doesn't address paper reduction but having it out of the lab does still addresses the RRR

General comments that moving to ELN is a transition. Users are resistant. Good idea to get new students at start. Requires discipline, training on how to use it and what good practice is.

What features most important? Portability/sharing/DOI any of these essential?

A DOI would be a good thing.

3. What can Information Services do to support adoption of ELNs?

I just think that in this day and age there should be university supported/ recommended tablets.

Help convince Roslin (my organisation) to use the digital notebook.

Glasgow suggestion – look at cost per user of paper notebooks, buying them and storing them (x-ray films also, etc.) Look at savings for implementing a lab notebook.

Glasgow looked at solution of either destructive or non-destructive scanning; need indexing, searching.

Sustainability policy suggests going digital.

Procurement issues – is there a chance the University would make us stop using RSpace [ELN of choice] if it went out for a university-wide procurement.

Jupyter Notebook – the research one has been on Eleanor and has been switched off. James Reid and Kenton have been discussing turning it back on.

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Lab Archives: get a university-wide licence for everyone like other universities have done.

Jupyter Notebook we have used for Python, didn't know it could be used with R, we use R Markdown for everything.

Valuable to get people together to share experiences.

I don't know how portable things are, if your notebook is not selected in a procurement exercise, what are you going to do?

Actually, we just need a basic electronic notebook to replace our paper lab books, we already use a wide range of tools for specialised things. The ELN product doesn't have to have all the functionality because we can use other tools.

Treat the ELN like a paper book that can be read/followed and link out to other objects.

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Guarantee continuity for RSpace set up is and will always keep running. And for other services

More information on website

Also, information on example users /contacts: Champions.

Improved internet- Waddington/KB experiencing downtime on network

IRIDIA- stratified medicine Scotland platform

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: information about what is available?

: what local contacts within schools?

Ralitsa comment on why they used Dropbox. It would be good to have guidance on moving data into the university when lab joins and not use dropbox

Notion of data induction needed for new starts.

why are people here not using it?

Mainly just didn't know about it or have an interim system that works.

Discussion about needing a lab guidance/rules and person enforcing from top down

Data Management Overview and lab culture.: we should do training on this.

Comments on Demos

During the demos and discussion- things I didn't know.

Full training video for RSpace on YouTube and there is live chat facility on website.

Jupyter notebooks

Runs on cloud so no installation needed

Panda data science library can be loaded

oreilly and nature starting to support interactive publications Jupyter can be used for this

Noteable for researchers. They want researchers to work with them to develop it

Moving system to Amazon AWS cloud: next year bigger scale.

I query where does the data go when using this?

They are working to integrate with GitLab and GitHub