Direct notes to James Orr for 12 Oct 2023 meeting

Here is my plan for what I definitely want to say to you today.
Of course, we can talk about anything you like, or we like: but here is the advance plan.

A. Defining "reflection"

I have a rambling web page on reflection (in education): https://www.psy.gla.ac.uk/~steve/reflection.html
The first lesson to draw from it is that there is quite a large literature on reflection, but no two authors have the same meaning for it. However most or all of the different meanings are of some importance.

Here is a different angle on this:
If you didn't tell someone you were talking/thinking about education at all, but showed a picture of reflections on mountains in water, or of standing on Arctic snowfields, and then asked them what "reflection" might mean in learning or education, an image that sprung to my mind was of a teacher/lecturer looking inspired and beaming out light to the students, and those students paying full attention and reflecting the light again off their shining faces (this is called "reflectance" in physics / optics). I.e. not absorbing any of it at all. We don't want reflection but absorption in learners. So the word "reflection" was not a particularly good word to choose for a technical term in education.

On the other hand, in dictionaries, "reflection" often has a basic meaning of "thinking". (E.g. "I reflected that my sister was habitually late, so I decided not to start cooking until she arrived.")
But that meaning ("thinking") also isn't it. So step 1 in defining "reflection" here is probably to divide thinking into two separate classes:

Class I) Doing a complex but well practised task e.g. walking down a crowded street (avoid barriers, managing micro-social encounters (smile at each person, avoid each other), noticing obstructions which weren't there yesterday, noticing close friends and smiling, etc.) Or again, writing an email to a colleague: lots of micro issues of spelling, how to be brief yet clear, etc., but mostly you can write it directly without a separate planning stage. There is thinking going on from moment to moment, but not deep thinking which creates new ideas and whose details should be remembered rather than used and forgotten.

Class II) Doing tasks which are not well-practised: ones which therefore require non-automated thinking. These require "reflection" in the education sense. Some might be spread over many stages; some might have only one stage e.g. re-reading your notes or draft paper and thinking about whether you could change their structure, or reselect their main point.

=> Basically, perhaps, in education "reflection" means "re-thinking". This is an important part of learning (especially academic learning) but very seldom thought about and acted on explicitly in course designs: which is why there is a considerable literature on it.

So I suggest that reflection in education means "re-thinking", and is all about class II thinking, and not class I, is slow not fast. and is part of fast skillful action.

An example for you, in programming, might be something like this. I imagine that much of your own programming is largely class I: you go ahead probably without much planning, making progress and fixing problems as they come up. Then you might put it aside, but the next day re-read the code and re-think it more carefully (class II). I at least used to do that, and in going over it I might start thinking about issues I hadn't thought about before; perhaps about structure, or cases of input data I hadn't thought of in advance, or whether I should put in more internal runtime checks, etc.

B. Selecting the case of reflection which you will focus on for your project

So for your project, you should think of a particular case of educational reflection and how you might support that. (E.G. a student going over their lecture notes again; Possibly going over an outline plan for a piece of code, and reviewing its structure, what it should have included or didn't, ...)

C. Defining your project

The project should NOT be about a little gadget just for reflection; but be defined as designing and supporting a WHOLE user task e.g.

a. Take notes,
b. Review them
c. And do thinking about them, (how to capture these new thoughts?)
d. Then eventually export the new thoughts into a report somewhere else e.g. a Word document.

And the project should be judged as a whole (all the steps), not just one bit about the type of reflection you most care about, or a gadget you implement to support just one step of the overall task.

Bear in mind that many people make little sketches, not just notes in words, when thinking OR working out what is meant. So handling sketching and pictures may be important.
BUT that changing input medium e.g. mouse to keyboard is disruptive of the free flow of thinking. And probably it is just as important to avoid switching Apps for each medium.

I suggest that you read papers by Beryl Plimmer. They are NOT about reflection nor learning -- they are about how to design and implement software to support a CompSci lecturer doing marking. But why I think they are landmark work is because she paid real attention not to what marking is supposed to be, but what real lecturers really do and need to do. It was for me an eye-opener and made me realise many things I do when marking but which I had never talked about or reflected (!) on. And then she implemented a support system for that actual task (not for some official idea about it) which was much more complex in detail than most people realise.

Beryl Plimmer's work:

Plimmer,Beryl & Apperley,M.D. (2007) "Making paperless work" *CHINZ '07 Proceedings of the 7th ACM SIGCHI New Zealand chapter's international conference on Computer-human interaction: design centered HCI* 2007: pp.1-8 dl.acm.org/citation.cfm?id=1278961 doi:10.1145/1278960.1278961

Plimmer,B. & Mason,P. (2006) "A pen-based paperless environment for annotating and marking student assignments" *PROC.7TH AUSTRALASIAN USER INTERFACE CONFERENCE, CRPIT PRESS* pp.37-44 http://crpit.com/confpapers/CRPITV50Plimmer.pdf

Apply this attitude to your project on writing a gadget to support reflection for learning.
So: The project should NOT be about a little gadget just for reflection; but be defined as designing and supporting a WHOLE user task e.g.

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In a sense, HCI / user interface design will be absolutely central to the project. Equally, reflection in education is delicate: it takes the whole mind, so very little attention is left over to fiddle with technology. Or you could say equally, but in very different words: this is a real SoftEng project where eliciting the real requirements is a big challenge and making them up or asking a few casual questions of a "client" will get you nowhere useful.