Comment on gc-2021-32
Anonymous Referee #1

Dear Authors,

Thanks for the opportunity to read and review your work on living-labs. The papers case studies and framework for using a living-lab will be of interest to educators and practitioners in the field. Although I am supportive of the paper and can see its potential, I do have some comments and suggestions that I outline below. These are intended to make the paper stronger, not detract you from sharing your work in this area.

1. Living Labs - There is a short definition of living labs in the introduction and a broader discussion later in the introduction. I feel this needs to be expanded. The initial definition you use Hossain et al (2019) contains a number of discrete elements, space, societal challenge and stakeholder involvement. However, it is hard to see the explicit links between all of the case studies and this definition alone, a broader discussion on living labs, encompassing other viewpoints may address this. For example, why is the drone case study simple not a outdoor practical / field work? what make it distinctively a living lab? I think the difference between living labs and other pedagogical approach that take place outside (field work /practical's) is one to emphasis.

2. Case studies - On their own the case studies are all of interest, but they are also all feel quite different narratively. The comment above (comment one) applies here about making sure the 'living lab' elements are specifically identified, for example what is the societal challenge in the drone and crime scene case studies. The case studies seem to have varying approaches to the amount of detail they include on the approach / activity (such as between case studies 2 and 4), it would probably enhance readability to be a little more consistent here. It is not always clear what the situational context of these case studies are they incurricula / extracurricula? are they assessed formally (noting the emphasis on authentic assessment in the introduction). Finally, there appears to be a very strong emphasis on skill development in several of the case studies, if this is indeed a major purpose for their use. I feel that this not fully explored in the introduction or discussion.

3. Framework - The discussion includes a framework for the use living labs. These are
framed as a series of questions. I would suggest that this is either not presented as a framework or adapted. Firstly, as this is presumably the authors work some commentary on the pedagogic development of this framework would be useful. Secondly seeing it applied to the case studies in question would also help the reader understand its execution, at present the questions you are ask are not explicit in all the case studies. It is possible these could be introduced before the case studies as the conceptual framework you used in their design.

4. Principles - Linked to the above, you introduce the living lab principles in the introduction. As well the direct expression of these in the case studies (see previous comment) how do these principles inform / feed into your case study design (explicitly) and then how to they link to the framework?

5. Discussion - The discussion moves to some broader discussions about design and the framework, but I feel there is lots more to be unpicked here. Firstly, the authentic assessment narrative and learning lab principles from the introduction are not explored fully in the discussion. There is some links to the individual case studies, but I feel there is more to discuss here, for example case study uses PBL and flipped-classrooms how does the intersection of these pedagogies apply to a living labs context. I feel more critical evaluation of the living lab examples would be useful for the reader. Finally beginning line 415 is very Keele specific can this be generalised for a wider readership and, the paragraph beginning line 492 feel disconnected from the living lab discussion that precedes it.