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Discussions

Interactive comment on "Demystifying academics to enhance university–business collaborations in environmental science" *by* John K. Hillier et al.

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The study provides a model and pathway to increase academic participation in industry, by outlining (i) a detailed analysis of the time constraints of an early career academic, and (ii) a set of incentives that might encourage this academic to work with industry.

The first part of the study provides an overview (for I assume a potential collaborator in industry) of working conditions and time constraints of a typical academic. I have some reservations, however; overall it could be more succinct, not include links to out of date or wrong information, and not perpetuate poor practise in academia. The second part lays out how people in industry can try and work with academics, with a view to looking at ways to make collaborations of interest to academics and fruitful. This part of the

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Discussion paper

manuscript is well written and more successful in terms of communicating the potential synergies between industry and academia. However, the emphasis of risk between any collaboration is weighed towards the academic rather than the industry partner. For example, P26, Fund blue skies research. The conclusion here seems to be that to fund a PhD is risky for the industrial partner as there is a “chance of failure”. Blue-skies research by its very definition is risky, and joint PhD students are one of the best ways to link industry and universities together, as is recognised by many UKRI initiatives e.g. the Industrial Doctoral Centres funded by the ESPRC, NERC Industrial Case Students, NERC Industrial Strategy Innovation Placements etc.

But my main concern with the manuscript as a whole is with the figure of 0.5 days per week, calculated to be the amount of time an “efficient and effective” academic could set aside to work with industry. The figure really just appears, and is not based on a critical analysis of the empirical data as far as I can tell (although seems to be derived from Table 1). Also, it is based on the authors accepting that working a 50h+ week is acceptable, which I challenge below.

Overall, the article could be more focussed on just the UK system, and just on the environmental and geosciences. A summary of the extent of existing academic-industry collaboration would be helpful, and how the geosciences / environmental fields contribute to this. This would give some needed background asto the extent of the issue. Throughout the manuscript, examples to e.g. international centres or practises are given, but these are far too few and not comprehensive, so their added value is low, and only detracts from the key take home message about UK collaborations.

The article could discuss more implications of the current external drivers for research and teaching, such as REF and TEF. NSS is mentioned on P13, and TEF once on P14, but the URL given is now out of date as HEFCE no longer exists. REF impact is mentioned, but that this is such a significant driver of potential collaboration between academics and industry, it is a missed opportunity not to discuss this more. Also, I would personally like to have seen greater consideration of equality and diversity

issues related to potential collaboration with industry; not only do these considerations tie into employment structures such days or hours worked per week, but also have implications for potential funding sources, e.g. if your department has Athena Swan recognition etc.

1. Does the paper address relevant scientific questions within the scope of GC?

Yes – successful communication between academics, industry and business is an essential component of universities contributing to the economic wealth of the country. However, I would have liked to have seen a stronger case being made for the need for this knowledge. UK universities are arguably very successful in collaborating with industry and business, and while tensions for time will always exist, is this really new? Comments such as those on P3, Lines 17-18, starting "By better understanding. . ." are fine, but this study is aimed at early career scientists, who may not yet be "world-leading"; this is an important distinction in terms of expectations of knowledge, resources etc.

2. Does the paper present novel concepts, ideas, tools, or data?

The study from the outset suggest that the novel concept, or unknown parameter, is how academic workloads and incentive structures may act as a barrier to industrial-academic collaborations. Given the success of university – industrial collaborations in the UK already, I wonder if the first really is a barrier. It could be in the geosciences / environmental sciences, and maybe that needs to be explored a bit more deeply than university-industry collaborations in general. The wealth of existing training schemes, placement schemes, success of spinout companies, contributions of UK academia to GDP etc all suggest that issues with time constraints are well known but already workable with.

The statement, which in a sense is a crux of this study, ". . .there has been limited attention devoted to the exact nature of barriers facing academics. . ." needs to be evidenced. Some quick on-line searches shows that there are numerous studies looking

at the barriers academics face in terms of forging university-industry links. In fact, research intensive universities will have whole teams dedicated to addressing these challenges.

3. Are the scientific methods and assumptions valid and clearly outlined?

I do have some issues with aspects the methodology undertaken. The study paints a picture of a 'typical' early career academic at the Senior Lecturer (SL) scale of their career. This is based on 10 job adverts (which I think is rather low). However, some aspects of the methodology are either wrong, or not reflective of the rapidly changing academic environment today.

For example, on P7, lines 18-20, the authors link to some generic guidance to job descriptions. However, The information given here is wrong and very out of date. The link provided is for academic-related (AR) jobs: these are staff categories that were once seen to support academic workings, but are now viewed as professional services (PS), i.e. careers in their own rights. Whether termed AR or PS, the guidelines linked to here are not for the academic (teaching and research) jobs being discussed here.

The following two points are more picky I suppose, but potentially important in understanding the expectations of an early career academic at the SL level. First of all, I don't agree with the conflation of appraisals and promotion criteria. The study suggests that appraisals are "a relatively new phenomenon", but they are not; they have been undertaken at universities for over 20 years. Moreover, they are certainly not undertaken to "judge" (P7, line 31). Appraisal are designed for academics to set out aims and objectives for undertaking their job on an annual basis, and to have discussions as to whether these have been met. Promotion criteria on the other hand request for feedback on one's reputation for mainly research and (teaching) scholarship, so to bring the two together is not particularly helpful as they work on very different timescales. Second, the study is based around academics at the SL level, but suggests on P9, line 29 that this is equivalent to the North American Associate Professor (AP), but I would

argue that AP was more equivalent to Reader, where a UK academic is recognized for their world-leading research, as would someone be in the States on being awarded tenure and AP. For a SL, teaching and scholarship plays a stronger role in evaluations.

For me, more problematic, is “de facto expected” number of hours an SL is expected to work at week, up to 50 hours or more. It describes working 10h days or working at weekends as “respectable length”. These practices are greatly at odds with moves to have greater equality and work-life balance that reflects the needs for academics having caring responsibilities, to have a life outside of academia, and to minimize stress and mental health issues. The study goes on to state that the ideal person “is in good mental health” and are “efficient and effective” in their approach to research, to the point that “they would not remain in the their position if they were not” (P10, lines 1-2). This is patently nonsense – academics are not removed from their jobs on the basis if they are efficient or not. For me this gives the impression that the model being developed - for a person to devote 0.5 days a week to collaborate with industry - will not work if an academic does not want to, or cannot work, a 50h week, or miss time with families at weekend, or experience any kind of mental health issues etc. These factors are not trivial – they have important implications for diversity and equality issues, and personally, I would question the value of such a model from the outset.

Finally, the assumption that [P13, line 20] “PhD students can be an effective means to generate publications in a time-limited university environment” is not one that I or any academic I know would condone, and has no place in modern day academia.

4. Are the results sufficient to support the interpretations and conclusions?

Not really. The conclusion seems to be that an efficient and effective academic can probably find 0.5days a week to collaborate with industry, but I question the data and assumptions that this is based upon. It seems to me that this figure is a qualitative amount that the academics in the cohort suggested that they may be able to find, out of their already busy schedules. Which is fine, but this does not seem to be derived

from a critical analyses of what a SL does on a day to day basis.

5. Do the authors give proper credit to related work and clearly indicate their own new/original contribution?

I think so.

6. Does the title clearly reflect the contents of the paper?

The title mentions “business”, but in the manuscript refers mainly to “industry”

7. Does the abstract provide a concise and complete summary?

This was fine.

8. Is the overall presentation well structured and clear?

I thought that the Introduction, setting the scene etc could be much more succinct. Many times the manuscript refers the reader to future sections as justification of what is being stated, but this made reading of the paper difficult, as you have to keep going backwards and forwards to find out what is being referred to.

9. Is the language fluent and precise?

Overall it is fine. But there were a few tropes that could be avoided, such as P17, lines 2-3 “So, this work confirms that an academic with days and days to sit gazing around and pondering is a myth. . .”. This suggests a misunderstanding of how an academic may approach their writing, rather than just doing it. Writing does require thinking and pondering, for days, sometimes weeks or months, so I’m not really sure what is being got at here.

10. Are the number and quality of references appropriate?

These look fine.

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