

Characterising the collaboration between academia and practice in UK Environmental Assessment

Alan J. Bond – School of Environmental Sciences, University of East Anglia, UK; Research Unit for Environmental Sciences and Management, North-West University, South Africa

Thomas B. Fischer – Environmental Assessment and Management Research Centre, Geography and Planning, School of Environmental Sciences, University of Liverpool, Liverpool, UK; Research Unit for Environmental Sciences and Management, North-West University, South Africa

Abstract

The UK has been one of the countries at the vanguard of developments of Environmental Assessment (EA) theory and practice. It is likely that this globally prominent position has been developed through ongoing collaboration between academia and practice which pervades teaching, research, and practice itself. However, the scale and nature of the collaboration is unclear, which restricts learning that might lead to encouraging and growing existing collaborations, not just inside but also outside the UK; therefore, the aim of this paper is to fill this research gap by characterising the nature of the academia-practice collaboration in the UK. To achieve this aim, a typology of collaboration was developed through literature review and used as the basis for a survey of research and publication active UK-based academics to both, validate the typology, and determine the nature of their collaboration with practice. The results, whilst biased to the views of academics, indicate a considerable range of collaborative activities that benefit both academics and practitioners alike. The resulting typology of collaborative activities might conceivably act as a template for knowledge exchange between academia and practice in the EA field. This template can conceivably be applied as a set of criteria to plan better collaboration to the benefit of academics and practitioners alike.

Key words

Collaboration; academia; EIA; practice; knowledge exchange; capacity development; guidance

1. Introduction

The UK has been a globally prominent country with regards to the development of theory and practice of Environmental Assessment (EA) as well as capacity development through higher education since the 1980s. This is reflected in research and associated publication activities, as well as higher education programmes. Furthermore, the UK hosts a wide range of globally recognised EA consultancies that are active both nationally and internationally. Overall, environmental consulting services (which include EA, but are broader) offered by UK-based companies have a value of about £2B annually (IBISWorld, 2022), which equates to a global market share of nearly 7% (The Business Research Company, 2021) which is more than twice the size of that of, for example, Germany (Research and Markets, 2017). About 22,000 people are employed in the UK environmental consultancy service sector, many of whom have likely been educated in UK universities. These professionals are supported by a professional body, the 'Institute of Environmental Management and Assessment (IEMA)', which has approximately 15,000 members. IEMA supports its professional membership through the development of professional standards, an EA accreditation scheme (the EIA quality mark (Bond *et al.*, 2017)), knowledge dissemination, the maintenance of a competencies

framework, amongst many other services. Academics have been involved in all of these services since the creation of one of IEMA's precursors – the Institute of Environmental Assessment.

Therefore, it seems reasonable to argue that the UK has been a significant contributor to the global practice of EA, and that collaboration between academia and practice has underpinned this contribution. However, the nature of this collaboration is not well understood which presents a research gap and, therefore, the aim of this paper is to characterise the collaboration between EA academics and practitioners. A better understanding of the nature of the collaboration may point to mechanisms through which EA practice can be improved and, at the very least, might reassure existing collaborators of the value of their activities.

In order to achieve the aim, in Section 2 we will introduce the methods used to characterise collaboration between academia and practice in EA, which includes the development of a typology and a subsequent questionnaire survey of selected UK academics. Section 3 provides the results of the survey, relating them to the existing literature before conclusions are drawn in Section 4.

2. Methods

The approach taken was to:

1. Develop a typology of collaboration between academia and practitioners
2. Survey research-active UK academics to determine:
 - a. Which forms of collaboration are undertaken in the UK
 - b. Whether the typology of collaboration is comprehensive

The typology was developed through a two-stage process. Stage 1 involved a literature review to identify journal articles containing reference to potential types of collaboration. Stage 2 involved a rough coding approach applied to the text of the journal articles consulted (that is, the individual articles were not systematically coded, instead, categories were synthesised based on an overview of all journal articles identified and using the experience of the authors and their own knowledge of collaboration).

The survey asked respondents to indicate their levels of collaboration in the identified types of collaborative activity, and also asked if types of collaboration were missing from those listed (some additional types were suggested, for which it was not possible to determine the extent of practice). The survey was approved through the standard ethics approval process for research involving human subjects in one of the authors' institutions, and all surveys were distributed with participant information sheets and consent forms.

The literature review was designed to supplement the experience of the authors by helping to identify characteristics of collaboration between academia and practice. As a starting point, a Scopus search of titles, abstracts and keywords using the following search string in May 2022 identified 912 sources: TITLE-ABS-KEY (education OR university OR academ* OR research OR training AND collaborat* OR cooperation AND environmental W/3 assessment). A further search using the search string: TITLE-ABS-KEY (education OR university OR academ* OR research OR training AND collaborat* OR cooperation AND "impact assessment") identified 935 documents. However, if the search terms "collaborat* OR cooperation" were excluded from the first Scopus search string focusing on environmental assessment, it led to 17,708 documents being identified, with 15,572 documents identified when excluded from the second search string focusing on impact assessment. In either case this was too many to review.

Results from the two searches were combined and duplicates were removed along with any entries with no authors listed. This left 1403 sources from which an initial scan of the title led to deletion of another 1310 papers as having no relevance, to leave 93 potentially relevant papers. For these, the abstracts were read, leading to the deletion of a further 65 papers as having no relevance and a final total number of 28 (of which two could not be obtained). Snowballing (following citations in these 26 papers back and forward in time) added another 12 sources (all of which were obtained), leaving 38 papers which were read in full. Two of these were then rejected as not having sufficient relevance, leaving a total sample of 36 journal articles which contributed to the development of the collaboration typology. Note that some of the sources identified tend to be only indirectly related to collaboration between academia and practice (or the involvement of academia is only inferred through reference to international scientific expertise), or feature such collaboration, but not in the field of impact assessment. Nevertheless, it was considered that examples of types of collaboration could still be usefully extracted and form the basis for a practitioner survey of EIA academics in the UK that could validate the collaboration type. Nor does the approach applied allow the identification of co-authorship between academics and practitioners, as this cannot be systematically identified through database searching. Indeed, even if author affiliations are checked, it can be unclear whether authors that have both academic and practitioner roles include all of these or are selective. As with any literature review, both the choice of database and the choice of search terms is critical. No attempt was made to systematically identify grey literature, and reliance was placed on Scopus as a widely used database that included over 77.8 million records from over 25,100 titles as at January 2020 (Research Intelligence, 2020).

In addition to the literature review a questionnaire survey was used to obtain examples of collaboration between academia and practice and also to identify some broad indication of the level of collaboration. A pragmatic approach was taken to this survey based on some key assumptions:

- 1) Research output is an indicator of collaboration (between academia and practice) in UK universities. In this context, Fischer and Onyango (2012, p.8) found that “*refereed journal articles often refer to practical experiences*” as a main information source, and therefore some collaboration seems essential.
- 2) Collaboration (between academia and practice) in UK universities leads to research output

There are circumstances where such assumptions would not hold, for example, where confidentiality agreements preclude publication. It is also theoretically possible for academics to collaborate with practice, and choose not to publish in the public domain, but given the authors’ knowledge of promotions procedures in university systems, which emphasise publications as well as research and consultancy income, this was deemed unlikely. Academics could undertake research projects where no collaboration takes place (for example, developing theory), but it is assumed (following on from Fischer and Onyango, 2012) that most research is grounded in the development of practice, and therefore cannot realistically ignore practitioners. Survey participants were identified based on the knowledge of the authors (as current or recent Editors-in-Chief of the two main journals publishing in the Environmental Assessment field, *Environmental Impact Assessment Review* and *Impact Assessment and Project Appraisal*, over most of the past decade). This necessarily constrains the potential respondents to a relatively small subset of the academics who may be involved in teaching EA in the UK but, as Enríquez-de-Salamanca (2019) identified in Spain, there is likely to be large number of academics with little collaborative or research practice. A limitation of this sampling approach is that it focuses on the views of academics to identify types of collaboration, rather than seeking the views of practitioners. Despite the fact that some of the academics responding to the survey are also practitioners (which helps to reduce the potential for bias), it is possible that some collaboration approaches acknowledged only by practitioners could be missing.

3. Results

Across the literature, there are few sources that specifically deal with the topic of collaboration between academia and practice in the field of environmental assessment. Some sources consider collaboration in the Health Impact Assessment field (HIA) (e.g., Dora and Racioppi, 2003; Pollack *et al.*, 2015; Schuchter *et al.*, 2015) which is closely aligned to environmental assessment and so is likely to have relevance. A number undertake bibliometric analysis related to environmental assessment scholarship (e.g., Zhuang *et al.*, 2011; Li and Zhao, 2015; Nita, 2019; Nita *et al.*, 2022) which have relevance as they evidence collaboration between universities (which other sources indicate can be the basis for networked collaborative ventures with practitioners). Several sources examine evidence of beneficial collaboration between academics and businesses in fields other than environmental assessment (e.g., Abell and Rutledge, 2010; D'Este *et al.*, 2013; Gilman and Serbanica, 2014; Thune *et al.*, 2016; Rossi *et al.*, 2017; Compagnucci and Spigarelli, 2020; Cozma *et al.*, 2020; Queirós *et al.*, 2022; Rejeb *et al.*, 2022; Rossi *et al.*, 2022), these provide a surrogate for the kinds of collaboration which might be apparent in the environmental assessment field and warrant testing through the survey. There is also some research that aligns academic endeavour with the development of policy, or guidance, in the environmental assessment field (e.g., de Smedt, 2009; Noble, 2015; Karjalainen *et al.*, 2017), or in other fields (but still connecting academic endeavour to policy development)(e.g., Stoecker, 1999; Thune *et al.*, 2016; Hansen and Pedersen, 2018; Rossi *et al.*, 2022). Research looking at the role of academics in setting up knowledge centres to help build capacity both inside and outside the context of environmental assessment was identified (Korber and Paier, 2014; IEMA, 2020). There are also a number of studies that focus on the education sector in terms of the development of environmental assessment scholarship (Gazzola, 2008; Morrison-Saunders and Retief, 2015; Enríquez-de-Salamanca, 2019) which help to clarify the extent of training and capacity development activities that are available. Finally, a number of sources cover some element of engagement between academics and practitioners in relation to environmental assessment, or some component of it (EIA Centre, 1994; Lee, 2006; Pope *et al.*, 2013; Runhaar and Arts, 2015; Burnard *et al.*, 2017; Ma *et al.*, 2018), or focus on environmental assessment outcomes whilst implying (or explicitly stating) roles for universities (Wood and Lee, 1988; Duinker *et al.*, 2013; Dendena and Corsi, 2015).

One of the few specific analyses of collaboration between practitioners and academics in EA investigates a specific case study of the United Nations Environment programme (UNEP) EA of Ogoniland in Nigeria (Kakulu *et al.*, 2013). This details a collaboration between UNEP and the Rivers State University of Science and Technology (RSUST), focussing on an assessment of environmental and health impacts of oil contamination in the Niger delta area of Nigeria (Ogoniland). The project involved RSUST acting akin to a gatekeeper to local communities, and assisting in data collection and analysis. Kakulu *et al.* (2013) characterise the collaborative purpose as being knowledge transfer in both directions, breaking this down into specific activities as follows:

- 1) Political, institutional and social guidance
- 2) Training workshops and establishment of baseline studies
- 3) Geo-referencing and awareness raising
- 4) Provision of expertise to practitioners
- 5) Data management.

The many sources that equate academic endeavour to useful policy outcomes are typified by Hansen and Pedersen (2018) who highlight current demands on publicly funded research to deliver impact, that is, demonstrable societal change. As a result, the research focus of academics has moved away from a focus on topics of interest, towards topics that fulfil a societal need. Whilst Hansen and

Pedersen (2018) do not focus on collaboration, the impacts of academic ‘events’ that they identify point to the many benefits of collaboration. For academics, this includes citations and publications. More broadly, it includes the development of networks, learning by crossing interdisciplinary boundaries, professional development, institutional development, amongst others. In the context of EA, this mirrors the pleas of the EIA Centre (1994) almost thirty years ago for higher education to fulfil the training needs apparent in the early years of the EIA directive in Europe.

Korber and Paier (2014) point to publicly-funded collaboration centres which aim to benefit from the co-location and joint working of companies, research organisations and universities. Their focus is on the Vienna Life Sciences Innovation centre, but equivalent models of science parks with similar goals (and/or funding arrangements) can be seen across Europe and across the UK (for example, Norwich Research Park (Norwich Research Park, 2022), Cambridge Science Park (Cambridge Science Park, 2022)) or Liverpool Science Park (Liverpool Science Park, 2022). In addition, professional institutes established to oversee EA practice generally act as knowledge centres; in the UK, this function is performed by IEMA (which also accredits degree programmes, usually with certain modules fulfilling specific learning objectives).

From the literature review, the categories of collaboration outlined in Table 1 were identified, with each being associated with the sources that evidence the type of collaboration. As indicated in the methods section, there are few examples of clear evidence for the collaborative activity taking place in the EA field, nevertheless, the inferences that led to the development of this typology were subject to further validation through a survey of experienced, research-active academics in the UK.

Table 1 Collaboration typology developed from literature and author experience

1. Act as a ‘critical friend’ in EA procedures for the public and private sector	de Smedt (2009); Kakulu <i>et al.</i> (2013); Gilman and Serbanica (2014); Thune <i>et al.</i> (2016); Cozma <i>et al.</i> (2020); Queirós <i>et al.</i> (2022)
2. Engaged in EA quality control (e.g., review of EA reports, elements of EA process, etc.)	Wood and Lee (1988); Kakulu <i>et al.</i> (2013); Bond <i>et al.</i> (2017)
3. Involved in developing practice guidance	Wood and Lee (1988); Dora and Racioppi (2003); de Smedt (2009); Duinker <i>et al.</i> (2013); Gilman and Serbanica (2014); Dendena and Corsi (2015); Noble (2015); Ma <i>et al.</i> (2018); Compagnucci and Spigarelli (2020); Cozma <i>et al.</i> (2020)
4. Involved in professional capacity development / training	Wood and Lee (1988); EIA Centre (1994); Abell and Rutledge (2010); Duinker <i>et al.</i> (2013); Kakulu <i>et al.</i> (2013); Gilman and Serbanica (2014); Korber and Paier (2014); Pollack <i>et al.</i> (2015); Schuchter <i>et al.</i> (2015); Thune <i>et al.</i> (2016); Karjalainen <i>et al.</i> (2017); Compagnucci and Spigarelli (2020); Cozma <i>et al.</i> (2020); Queirós <i>et al.</i> (2022); Rejeb <i>et al.</i> (2022)
5. Involved in actual EA practice (e.g., involved in scoping / report writing)	Kakulu <i>et al.</i> (2013); Thune <i>et al.</i> (2016); Queirós <i>et al.</i> (2022)

6. Involved in educating / teaching future practitioners	Wood and Lee (1988); EIA Centre (1994); Gazzola (2008); Abell and Rutledge (2010); Korber and Paier (2014); Pollack <i>et al.</i> (2015); Runhaar and Arts (2015); Thune <i>et al.</i> (2016); Ma <i>et al.</i> (2018); Enríquez-de-Salamanca (2019); Compagnucci and Spigarelli (2020); Queirós <i>et al.</i> (2022)
7. Involved in development of digital practice	IEMA (2020)
8. Research with (or as) academics only to develop practice	Zhuang <i>et al.</i> (2011); Li and Zhao (2015); Morrison-Saunders and Retief (2015); Thune <i>et al.</i> (2016); Burnard <i>et al.</i> (2017); Nita (2019); Nita <i>et al.</i> (2022)
9. Co-research with practitioners to develop practice	Stoecker (1999); Dora and Racioppi (2003); Lee (2006); Kakulu <i>et al.</i> (2013); Pope <i>et al.</i> (2013); Korber and Paier (2014); Noble (2015); Rossi <i>et al.</i> (2017); Ma <i>et al.</i> (2018); Compagnucci and Spigarelli (2020); Cozma <i>et al.</i> (2020); Queirós <i>et al.</i> (2022); Rejeb <i>et al.</i> (2022); Rossi <i>et al.</i> (2022)
10. Co-producing academic research (papers or grants) between academics and practitioners	D'Este <i>et al.</i> (2013); Korber and Paier (2014)
11. EA component research (e.g., ecology, hydrology...)	Wood and Lee (1988); Dora and Racioppi (2003); (Noble, 2015); Burnard <i>et al.</i> (2017)

As described above, our survey established the extent of collaboration in each of these types of collaborative activity for known research-active academics in the UK (see acknowledgements). The survey asked respondents if they undertook any of these eleven types of collaboration, and asked for more detail to evidence the responses. The survey was sent to eleven academics and was returned by nine of them. Together with the authors, this represents the views of the eleven most research-active academics in the UK, representing eight different universities. Figure 5 illustrates the results. The fact that evidence was found for all eleven types of collaborative activity helps to validate the initial typology, albeit some additional types of collaboration were identified as we explain below.

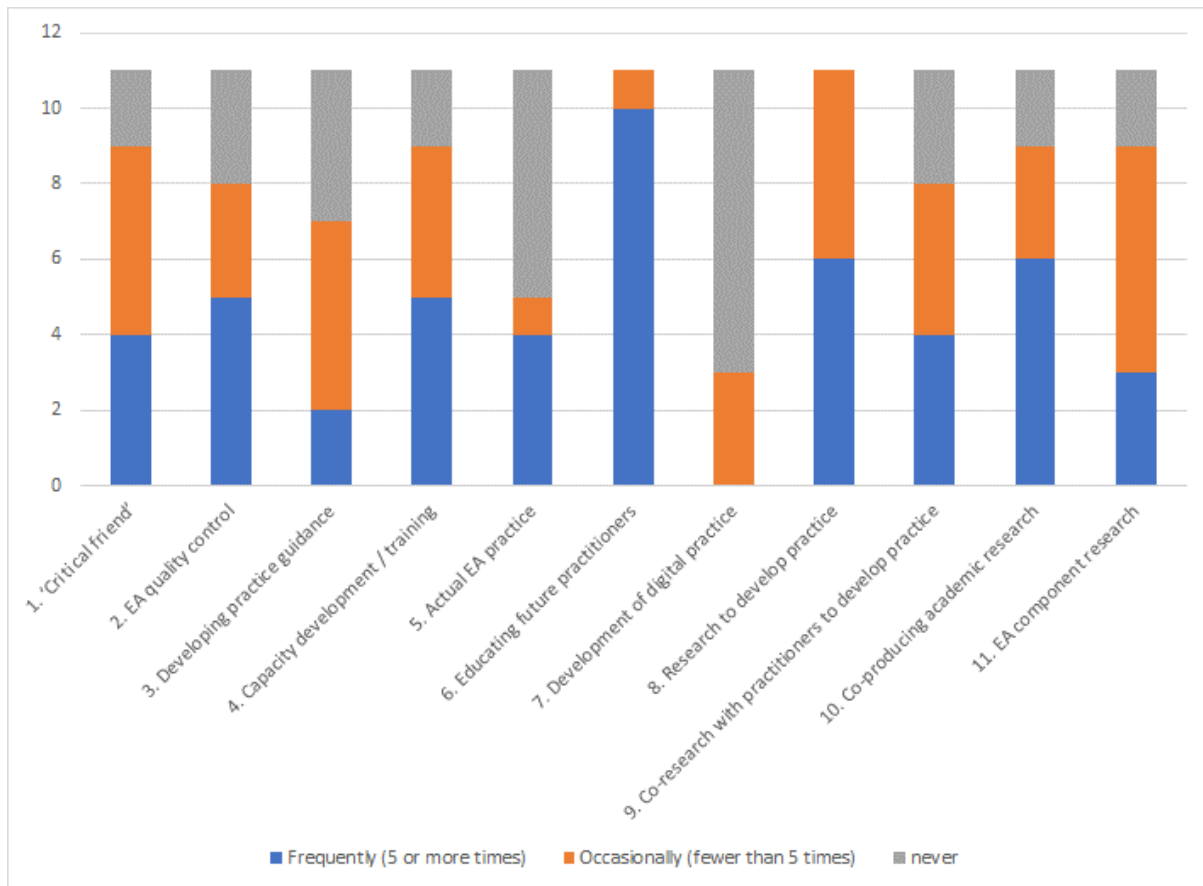


Figure 5: collaborative practice amongst research active UK-based academics

Below, we briefly summarise the results for each of the forms of collaboration. These results summarise the additional information provided by survey respondents, and help to validate the collaborative activities suggested in Table 1 from the literature from the perspective of UK EIA academics:

1) Act as a 'critical friend' in EA procedures for the public and private sector

Most respondents had experience of this role, with examples varying from assistance for development banks including ADB, JICA; peer reviewing draft environmental statements, advising water companies, advising local authorities, advising UK and overseas consultancies and consortia, and assisting regulators and radioactive waste agencies.

2) Engaged in EA quality control (e.g., review of EA reports, elements of EA process)

Typically, this involves assisting the competent authority in checking the quality of submitted EISs, and this includes local authorities in the UK, and overseas lending banks. Two respondents were either existing members of the IEMA Quality Mark review team, or past members (these reviewers are instrumental in determining whether environmental consultancies are accredited by the professional institute in the UK, although this is a voluntary process – see (Bond *et al.*, 2017)). There are other examples of advice related to judicial review for NGOs, and also for countries (at international court proceeding before the international Court of Justice). Many quality review packages used internationally have been initially developed within UK universities, with examples including the review package developed by Manchester EIA Centre (Lee and Brown, 1992), the Oxford Brookes Impacts Assessment Unit package (Glasson and Therivel, 2019), Health Impact Assessment review package developed in collaboration with practice (Fredsgaard *et al.*, 2009), with other review packages often using one of these as a starting point.

3) Involved in developing practice guidance

A number of academics have been involved in developing guidance for a range of institutions, including Natural Resources Wales, European Commission, Environment Agency, Radioactive Waste Management, International Atomic Energy Agency, amongst others. The examples range from assisting individual institutions, through to assisting devolved regions of the UK, the UK Government itself, and international agencies and the European Union.

4) Involved in professional capacity development / training

Many academics were involved in delivering Continuing Professional Development (CPD) training over many years. The focus varies depending on context but includes training of environmental consultancies (in e.g., ecosystem services), and considerable experience of training local authority staff to undertake their role as competent authority in the EA process (both at the project level, EIA, and strategic level, SEA). One respondent is a member of the training team for the International Association for Impact Assessment that provides Professional Development and Practice training for practitioners globally. Some respondents also conduct training courses, from time-to-time, at IAIA's annual conferences.

5) Involved in actual EA practice (e.g., involved in scoping / report writing)

Research active EA academics include a number of people who share their time between professional practice and academia. EA practice includes involvement with development of scoping reports, undertaking SEAs over 15 years for UK devolved Governments, and European transnational projects. Another academic had moved to academia from practice and therefore had past experience of conducting EAs to draw on. This was one of the few types of collaborative activity where a slight majority of the academics did not have experience, and it is interesting to note that this does not appear to affect involvement with practice through other forms of collaboration.

6) Involved in educating / teaching future practitioners

This example of collaboration (which can be better related to meeting future capacity needs), was a key role for 10 out of the 11 respondents (the one exception being a retired academic who now works primarily for the Planning Inspectorate dealing with EAs of Nationally Strategic Infrastructure Projects, and therefore contributes less frequently to teaching). The staff teaching the EA courses were accredited by a variety of professional institutes, reflecting the wide scope of sectors to which EA is applied. These include the Royal Institution of Chartered Surveyors (RICS), Energy Institute, Royal Town Planning Institute (RTPI), Landscape Institute (LI), Institute of Environmental Management and Assessment (IEMA). This variety reflects both disciplinary focus, and departmental settings within universities, which are extremely varied (and cross faculties – including both Arts, Social Sciences and Sciences).

7) Involved in development of digital practice

As a currently developing area of practice, collaboration was less frequent than for any other of the collaborative types included in the survey. Nevertheless, there are still three academics involved in collaborative development of practice, which tends to suggest that academics are often at the vanguard of new developments. This question was asked to help identify the extent to which academics are involved in one developing new areas of practice to see if academics still provide a role as innovators.

8) Research with (or as) academics only to develop practice

This type of collaboration tends to involve the delivery of outputs under a research or consultancy project. The element of collaboration is often with the funder and involves meeting a research need that they elucidate. It can also include client-based student projects. Examples include for windfarm studies, National Oil Companies, WHO, European Commission and local authorities. This also

involves the promotion of the benefit of considering theory in EA (see Cashmore *et al.*, 2005) and development and improvement of EA techniques and frameworks, including the development of EA tiering. Apart from the key role of the majority of the academics in educating future practitioners, this was the one other collaborative roles where every respondent had some involvement.

9) Co-research with practitioners to develop practice

Responses for this category were similar to those for the previous category – with the addition of environmental consultancies, regulators, NGOs and others.

10) Co-producing academic research (papers or grants) between academics and practitioners

As indicated above (collaborative type 5), the respondents include some people who are also practitioners. Only two academics who responded had not collaborated on academic papers with practitioners, suggesting a benefit of such links when undertaking empirical research.

11) EA component research (e.g., ecology, hydrology...)

Whilst there were many examples of this type of collaboration, it was less common than many other types of collaborative venture. Examples include the development of guidance on including specific environmental components in EA, like health, climate, hydrology, cultural heritage and, more recently, net gain (biodiversity). There was also mention of sector-specific collaboration, for example, related to developing guidance on EA for wind power.

Thus, examples of collaboration are extensive and varied, covering all the example types raised. The survey asked a few more open questions to identify specific examples of good practice, some potential barriers to collaboration and sought to determine whether the types of collaborative activity had changed over time for the respondents. The responses for each of these are summarised below, beginning with a question asking for other types of collaboration missing from the initial survey.

Are there any categories missing from the Table (that is, types of collaboration between academia and practice that do not fit into any of those listed) (please detail if yes)?

Most respondents left this part of the survey blank, but some additional examples of collaboration were raised, including the practice of appointing visiting Professors who are practitioners, who then attend classes to pass on their knowledge. Along the same lines, visiting guest speakers are common at most UK universities to impart practice elements to students, and this is a common teaching approach globally (Sánchez and Morrison-Saunders, 2010). Another example given was the awarding of academic prizes to students linked either to academic achievements in particular areas of practice (reflected by the award giver) or linked to competitive work placement opportunities.

It was also suggested that collaboration between practitioners and academics included the co-delivery of education, e.g., involvement in consultancy projects. More specifically, collaborations between practitioners and academics to assist the public in the submission of comments as part of EA participatory or consultation processes was highlighted.

One Scottish academic referred to the knowledge exchange that takes place through the EIA/SEA forum in Scotland, which brings together EA academics and practitioners to talk about issues of interest and/or concern in Scotland.

There was also reference to placement of students with industry as part of degree programmes, with mutual benefits in terms of learning for both parties. And whilst such practices are common,

Strathclyde University has been particularly active in managing 259 such collaborative placement projects in the last decade.

Are there any examples of your collaboration with practice (in any category) you think are particularly worth mentioning (please detail if yes)?

One respondent wrote “*I think that one of the advantages of collaborating with practice is being exposed to what actually happens in practice and in decision making*”. This reflects a need to accurately communicate to students and trainees the reality of EA practice.

Examples which respondents seemed particularly proud of included collaborations to develop guidance which would then influence practice at a much larger scale. For example, developing guidance for funding banks like ADB and JICA and organizations like the WHO and IAEA were specifically mentioned, as was the development of guidance for developers (like Vattenfall), and monitoring and auditing guidance for the UK New Nuclear Local Authorities Group. Sánchez and Morrison-Saunders (2010) identified the inclusion of guidance as being a common way of disseminating knowledge in EA courses globally, and this is therefore one of the ways in the UK contribution can extend farther afield where some of these guidance documents are embedded in degree schemes elsewhere.

CPD training and quality control work was also mentioned as being particularly noteworthy. As were the delivery of expert webinars to practice through IEMA. The specific example of collaboration between consultants (including people who were also academics) in the 2000s led to the development of several items of guidance, including a guidance note on appropriate assessment of plans which was considered to have moved practice along significantly (Scott Wilson *et al.*, 2006). It was also commented that these collaborations led to a less competitive (and therefore more collaborative) relationship with other consultancy companies.

Working with a range of organisations outside academia was cited by a number of respondents, and included examples like working with communities in consultation exercises as part of the submission of comments for the Malmo Quay planning application, working with the Environment Agency in the co-development and delivery of EA teaching in accredited programmes, working with WHO, IEMA Radioactive Waste Management, and others. Each example offering particular insights into the challenges faced by organisations in the context of EA.

Capacity development was highlighted as being an area of work for which there was clear value, including SEA training for local authorities in Scotland, and EIA training for local authorities in the UK. And the joy of training large numbers of students to be ready to embark on a vocational career was a pervasive view.

One respondent commented on the advantages of dividing work time between being both a consultant and an academic. This facilitated lots of collaboration opportunities and helped to overcome “*the limited scope for funding of EIA and SEA research under academic frameworks while there is often much more scope in pushing the boundaries and trying out novel approaches through large strategic SEAs, e.g. Scottish Rural Development Programme SEA, e-Highway 2050, Integrated SEAs for Mayor London/GLA, Thame Water WRMP SEAs, multiple Environment Agency SEA for RBMPs, FRMPs etc*”.

Are there any barriers you face with regards to collaborating with practice (please detail if yes)?

One respondent noted that “*the challenge with collaborating with other practitioners is their availability to get involved in projects*”. Another commented on their visibility appearing to be a

barrier “*and perhaps, institutional affiliation*”, reflecting a perception about the relative status both of different institutions to external organisations, and also the level of seniority of the academic.

The most cited barrier to collaboration was time. This could be because of existing work commitments of the academic, the timescales that consultancies work to (which can be very tight), and the slow administration within universities to support collaborations. Time constraints also prevent the use of external consultants as guest lecturers in some instances. Academics who also worked as consultants were particularly damning of the need to go through slow central processes to get research signed off in universities, and even mentioned limits being set on the time that could be spent on consultancy, or the rate that could be charged. These issues were not universal but do reflect the focus of universities on obtaining funding from UK funding research councils, which feature most significantly in the Research Assessment Exercises that rank universities against each other. This focus tends to lead to an attitude at universities that consultancy income earned by an academic is less valued (in terms of esteem) than traditional research grant income earned from funding councils. A particular issue relates to grades of research quality which underpin the cycle of Research Assessment Exercises to which UK universities are subjected. The grade system scores research as (Richards *et al.*, 2009, p.232):

“4*	Quality that is world-leading in terms of originality, significance and rigour
3*	Quality that is internationally excellent in terms of originality, significance and rigour, but which nonetheless falls short of the highest standards of excellence
2*	Quality that is recognised internationally in terms of originality, significance and rigour
1*	Quality that is recognised nationally in terms of originality, significance and rigour
Unclassified	Quality that falls below the standard of nationally recognised work or work which does not meet the published definition of research for the purposes of this assessment”.

This grading means that collaboration needs to be able to be considered world-leading, or internationally excellent, if it is to help further the career of the academic. And this has implications for the nature of the collaboration an academic feels minded to embrace. Research which makes a contribution in the UK only is vitally important in terms of meeting the needs of EA practice in the UK but is not likely to be considered worthy by a university aiming to improve its ranking by submitting examples of research perceived to be worth grades of 3* and 4* only. And despite engagement being a key area of development for all UK academics, there is a feeling that this is purely rhetoric given the limits to which such UK-based collaborative activities can lead to better grading in Research Assessment Exercises.

Ethics were also mentioned in terms of the need for careful consideration if the collaboration is to support a commercial activity or service. This was felt to be particularly important where students were involved.

A more philosophical point made was that “*of course brainstorming and writing voluntary guidance isn’t good for chargeable hours!*”, which reflects the need for consultancy companies to make money on their contracts to keep their staff employed. Academics are detecting a shift in the same direction amongst universities, with the proportion of research income provided centrally by the Government significantly reducing over the years, constraining the space for pursuing research areas purely for the sake of the interest.

Have you experienced any changes in emphasis (between the categories of engagement) with regards to your collaboration with practice over time (please detail if yes)?

One respondent commented that *“it has been noticeable over the last 20+ years how more practitioners and practice organisations undertake research without input from academia (the emergence of what Nowotny et al. (2003) called ‘Mode 2’ knowledge production)”*.

Another respondent also commented on academia no longer being seen as the ‘thought leaders’, and that roles had reversed over the last 15-20 years *“with a good deal of practice research and innovation coming from industry (as academics struggle to keep up with the ever-increasing University workloads and declining resources)”*.

Without further investigation, these comments are difficult to fully explain. Evidence from the literature review makes it clear that universities are under pressure to deliver societal impact from their research (Hansen and Pedersen, 2018) and, further to this, to endeavour to deliver research that is considered to be world leading or internationally relevant (Richards *et al.*, 2009). We could hypothesise that this diminishes the focus on domestic implementation of EIA in the UK as this cannot be evaluated in these terms, thereby creating a market opportunity for consultancy companies to fill.

Another respondent commented that *“training work dried up once IEMA developed and set up their own training activities”*, that is, the professional institute set up to represent EA practice took over some of the capacity development work previously conducted by universities. There were further views that although critical friend activities have continued throughout one respondent’s time in academia, collaboration over the development of best practice guidance has changed in emphasis – away from Government sponsored, and towards other stakeholders that are independent of Government, or are located overseas. This fits in with a role of universities as innovators, with the private sector then commercialising that innovation, and the fact that some academics were involved in the development of digital practice suggests this remain a role for universities. But university funding has moved away from a wholly state-funded model, to a primarily student-funded model, with state-funded research being targeted at the achievement of societal benefits. The opportunities to innovate for the sake of it are no longer financially viable in the academic sector.

There were comments that collaborations tended to expose the economic underpinnings of development, and the sustainability/viability of businesses as the priority. This can potentially lead to uncomfortable involvements for academics where they have different values.

The economic realities of working at universities have changed over the years, with central funding for teaching being replaced by student grant income which has been capped in recent years despite rising inflation. One area this has impacted is the pressure placed upon recruitment of students, which takes up increasing amounts of staff time, and also demands that courses have some form of professional accreditation in order for them to be seen as attractive to students by providing a pathway to employment. All these market pressures eat into the time available to academics to collaborate which, for the purposes of seeking accreditation at least, is not necessarily time well spent (Harvey, 2004).

Refreshingly, despite the questions teasing out the barriers and changes, there was a lot of belief in the value of collaboration, with it being cited as underpinning *“the pleasure of my work”*, and the inability to engage in big pieces of work without the collaboration. Some forms of collaboration are in demand, with Strathclyde University noting that *“despite the pandemic, we had record numbers of industry wanting to engage (more than 80 projects) which was a record”*. However, collaboration opportunities were viewed as becoming harder to come by over time, and one respondent indicated that far fewer types of collaboration were taking place than had previously been the case.

Nevertheless, the overriding sentiment was clear that collaboration was seen as being highly desirable, and would continue to be embraced by the respondents.

4. Conclusions

The examination of academia-practice collaboration in the UK has revealed a range of types of collaboration, based on survey responses to a typology initially developed based on the literature and author experience. With the caveat that the survey sample was restricted to selected academics known by the authors to be research active (and the limitation that biases the sample to academics, albeit some of whom are also practitioners), the findings identify the following typology of collaborative activity based on the initially proposed types developed for our survey, supplemented by additional types suggested by survey respondents:

- 1) Acting as a 'critical friend' in EA procedures for the public and private sector
- 2) Engagement in EA quality control (e.g., review of EA reports, elements of EA process, etc.)
- 3) Involvement in the development of good practice guidance
- 4) Involvement in professional capacity development / training
- 5) Involvement in EA practice (e.g., involved in scoping / report writing, public participation)
- 6) Involvement in educating / teaching future practitioners
- 7) Involving practitioners in educating / teaching future practitioners (includes both teaching, and student placement opportunities)
- 8) Co-delivery of education (e.g., through involvement of students in consultancy projects)
- 9) Involvement in development of digital practice
- 10) Research with (or as) academics only to develop practice
- 11) Co-research with practitioners to develop practice
- 12) Co-producing academic research (papers or grants) between academics and practitioners
- 13) EA component research (e.g., ecology, hydrology...)
- 14) EA Knowledge exchange fora

Inevitably, there are overlaps between collaboration types. EA knowledge exchange fora (type 14) can be fora for co-producing knowledge both with other academics (type 10) and with practitioners (types 11 and 12); and EA component research (type 13) could be co-produced in a number of ways (types 10, 11, 14). It is difficult to resolve all these potential for overlap without losing information, or creating new overlaps. That is, the typology is far from perfect.

Whilst EA is taught in different shapes and forms in over 50 academic institutions in the UK, only about a fifth of those are actively involved in EA research and publication activities. All academics who were invited to contribute to our survey underlying this paper come from research and publication active institutions. However, it is important to note that academics who are less research active (and so were not included in the survey) are still likely to engage in some of these collaborative approaches, particularly where it educates future practitioners. Their omission from this research has potentially missed some innovative collaborative approaches in these other universities to co-deliver education. Nevertheless, given evidence from studies on EA education suggests that the majority of teaching is undertaken by academics who do not conduct research and rely on the output of those who do (that were respondents to our survey), we consider that we have identified the majority of types of collaboration between academia and practice in the UK.

It is important to underline that most of the survey participants had also worked outside academia, either at the beginning, during, or at the end of their careers. We believe that this is associated with the applied nature of the subject. As a consequence, collaboration may be perceived as more natural

than in non-applied academic subjects. It may also help with the limitation that the survey was restricted to academics and not sent to practitioner; the reality is that many EIA academics are also practitioners.

The benefits of collaboration between academia and practice have come across very strongly. Despite some changes over time, for example, with regards to some perceived barriers in terms of an environment that is not always supportive, the evidence is that the collaboration in the UK is alive and well and considered to be very worthwhile. From the experience of the authors – it is very much a two-way street; practitioners reach out to academics and seek engagement across the range of collaboration types (including asking to teach!), and academics reach out to practitioners to develop their own activities.

The typology above can potentially be used as a template to examine, and improve, collaborative practice elsewhere. And the expectation is that future examples, and innovations, will expand the typology further. It is also clear that there are some shifts in emphasis over time, and so a typology such as this needs to be considered to be dynamic. Also, the survey element of the research has potentially led to more new questions being posed, specifically in relation to the explanations for the typology, and the need for a systematic analysis of the changing roles of universities in the EIA field in the UK, to determine whether the currently identified shifts are a good thing, or the opposite? Specifically, new lines of research should explore what forms of collaboration are needed in the future rather than simply documenting what is happening now. The typology derived in this research can act as a benchmark for these future studies.

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