Nominee Claim National Teaching Fellowship Scheme 2019

Name:	Dr Katharine Hubbard
Institution:	University of Hull
Section A: Context statement (not scored by reviewers)	
I am an education-focussed lecturer in Biology at the University of Hull (UoH), and have won multiple awards for teaching. I obtained my PhD in plant biology from the University of Cambridge (UoC) and then undertook Postdoctoral research at the University of California for 2 years. I taught UoC undergraduates from the start of my PhD in 2004; I gave my first tutorials before setting up my first experiment. After my Postdoc I decided that I wanted to establish an education-focussed career, so returned to UoC and for 3 years gave up to 25 undergraduate tutorials a week through zero-hour contracts. I became a Teaching By-Fellow and Director of Studies for Biology at Churchill College Cambridge in 2012. UoC students are high achieving and generally from affluent backgrounds, although Churchill admits a high proportion from state schools. I became a Teaching Associate in the Department of Plant Sciences at UoC in 2013, where my responsibilities primarily involved delivery of large laboratory practicals. In 2016 I moved to UoH for a Teaching and Scholarship lectureship. Students at UoH have a diverse range of educational backgrounds, including a high proportion from WP groups. I generally teach large classes of first and foundation year students; I run an academic skills module that has up to 450 students, and our core first year cell biology course. I am Programme Director for BSc Biology, and chaired the Biology Programme Board of Studies. I am a Senior Fellow of the HEA, and have developed a portfolio of pedagogical research projects that have been published and given as invited talks at a national level. I have been actively involved in the Society of Experimental Biology (SEB) 'SEB+' (Education and Careers) section since 2015, presenting at and organising conference sessions at the annual main meeting.	
Section A word count (maximum 300 words)	*Enter word count for Section A here: 297 words*

Section B: Claim against the NTFS Award Criteria

(evidence against each Award Criterion 1-3 scored separately by reviewers)

Criterion 1: Individual excellence

Evidence of enhancing and transforming student outcomes and/or the teaching profession; demonstrating impact commensurate with the individual's context and the opportunities afforded by it.

"Katharine has an energy and passion to teach like no other. We all felt like she personally cared that everyone in the room achieved their absolute best."
– 1st year student, UoC

"I have worked with few people who are so inspiring when it comes to teaching in HE as Katharine." – Dr Domino Joyce, UoH

Choosing to develop an education-focussed academic career was the best decision I ever made, as I strongly believe that the greatest impact that I can have as a scientist is to educate the next generation. However, as an early career academic who was passionate about education I was told directly *"There's no such thing as a teaching career in HE"* (Hubbard et al., 2015). Although this advice was well meant, I found it deflating, and considered careers outside academia. However, the more I thought about this advice the more I thought it couldn't be true; there are over 5,000 biology graduates every year in the UK, each of whom needs high-quality education to enable them to realise their own ambitions. I became determined to build an education-focussed career on a par with research-focussed colleagues. Fulfilling this ambition has benefitted hundreds of students, and inspired many other academics wanting to focus on educational excellence.

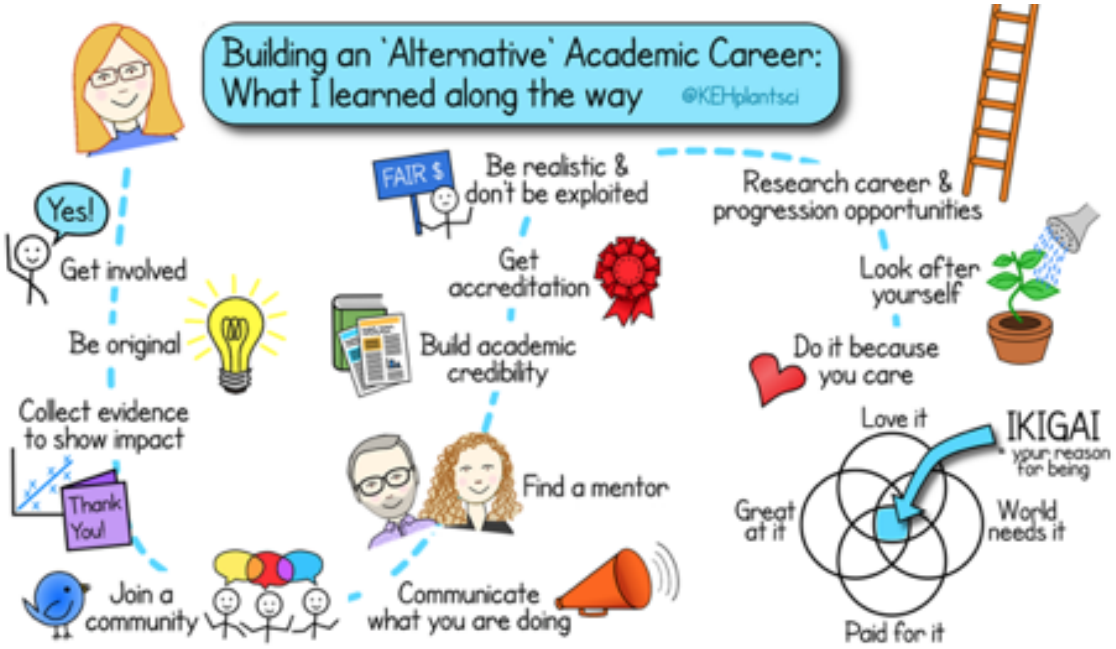

Figure 1: My advice for early-career academics establishing 'alternative' or education-focussed careers, which formed the cornerstone of my SEB President's Medal address; various versions of this have been retweeted over 200 times.

Ever since I started teaching, I have cultivated a meaningful educational relationship with students, using high-impact pedagogies to support their learning and providing tailored support to enable them to achieve personal goals. This student-centred approach has resulted in Student-led awards from student unions at Cambridge (Outstanding Lecturer, 2015) and Hull (Innovative Lecturer, 2018).

> *"Katharine has been the best source of help and support throughout university. She always pushes us to reach our full potential whilst remaining realistic and ensuring we place our health and well-being first."* - 3rd year student, UoH

However, to turn this into an academic career, I realised I needed to adopt the same strategies as excellent researchers including collection of evidence, dissemination of findings through publication, speaking at conferences, gaining funding and demonstrating impact. Some years after committing to an education-focussed career, I was awarded the Royal Society of Biology HE Teacher of the Year Award (2016) and the SEB President's Medal (2017) for my work raising the profile of early career academics who teach. I used the opportunity of my SEB Medallists address to present education-focussed careers as a legitimate and fulfilling choice, giving support, inspiration and advice to others aspiring to educational excellence (Figure 1).

The first step in building my education-focussed career was to consider how effective my own teaching methods were. I had been giving tutorials to support biology courses at the University of Cambridge throughout my PhD. In these small-group settings students felt able to tell me areas of the course they struggled with, particularly in relating material between lectures and practical classes. I developed various strategies to help students actively engage with this material, including quizzes, simulating experiments through interactive spreadsheets and model answers to exam questions. In 2013 I was appointed as a Teaching Associate, and found myself in charge of the same laboratory classes my students had struggled with. I seized the opportunity to change the way these labs were delivered. I obtained a grant of £9,000 from the Cambridge Teaching and Learning Innovation Fund for the 'Bridging the Gap' project to develop resources to support practical class teaching using a students-as-partners model. The grant supported four student internships, with undergraduates developing online quizzes and explanatory videos, based on similar approaches elsewhere (Cann, 2014; Whittle and Bickerdike, 2015). The resources were embedded into courses from 2015 onwards and immediately gained positive student feedback; the video collection has been viewed 16,000 times. The interns co-presented the project to internal and external conferences (e.g. Enhancing Student Learning Through Innovative Scholarship 2016, Methods in Chemistry Education Research 2018), and were co-authors on a manuscript that actively incorporated their voices as student partners (Hubbard et al., 2017). The manuscript has been cited 6 times, and was

selected as a focus for an online journal club run by the Higher Education Academy in March 2018. Perhaps most rewardingly, one of the four interns used the project as a springboard to establish a successful career in science communication.

"Using the practical resources has saved me so many times when I need some hints for questions or a full run through, definitely has helped my learning!" - 1st year student, UoC

"Students have made good use of [the pre-lab] materials - I thank and congratulate Katharine for her vision in driving this project, which has benefitted myself as practical course organizer and hundreds of first-year students." - Dr Matt Mason, UoC

"Katharine hired me as a summer student to work on a teaching project, which showed me that I really enjoyed communicating science and engaging others. This was the first step towards a successful career in science communication." - Maria Garcia, Senior Engagement and Communications Officer, King's College London

When I moved to Hull I immediately adopted a similar approach to support students in practicals, introducing pre-practical quizzes and video tutorials. My teaching YouTube channel has over 21,000 views and is used by students around the world as well as in my own lab classes. My earlier work had me made very aware that many students feel stressed in practical classes (Hubbard et al., 2017), a potential barrier to skill development and authentic inquiry-based learning. I have therefore designed new practicals to specifically address these affective concerns; for example my first year 'Cells and Organelles' module is designed to build student confidence by training students in new techniques through an intensive lab based week complemented by pre-laboratory exercises online. My approach to teaching is consistently rewarded with some of the highest rankings in UoH on module evaluations for large class teaching.

"Katharine ran some of the first lab sessions I took part in at university - she made the transition from school to university practicals easy and stress free." – 1st year student, UoH

Having taken on leadership responsibilities by becoming Programme Director of BSc Biology, I extended my focus on student voice, outcomes and skill development at a departmental level. For example, I identified an under-performing 2nd year genetics module with poor student feedback and an average module score of 48%. I coordinated the establishment of a new module that taught genetics in a more modern and relevant way; this module now has an average mark of 60% meaning students are better prepared for their final year. I have also

introduced a new 2nd year module 'Green Planet' to provide training in modern plant biology, and have worked with the programme team to diversify our final year project portfolio, including alternatives to 'traditional' dissertations including science communication and educational projects. Partly as a result of my leadership of the programme, we climbed 12 places in the Guardian League Tables for Biosciences. I developed a new BSc 'Biology with Teacher Training' that will help to fill gaps in national teacher recruitment, and will recruit its first students in 2019.

The more involved in undergraduate education I became, the more I realised the need to collect robust evidence about the impact and effectiveness of pedagogical approaches, and the assumptions that educators make about the student experience. I have therefore established a number of pedagogical research projects, increasing my academic credibility. For example, one project identified that undergraduates typically under-value the results sections when reading research papers (Hubbard and Dunbar, 2017). This paper has already been viewed over 11,000 times, cited three times, and was included as key source material in a workshop run by Dr Trevor Day (Royal Literary Fund) at the AdvanceHE STEM meeting 2019. I have introduced workshops into our programme helping students to navigate papers and focus on data, and other institutions have adapted curricula to incorporate similar activities on the basis of my research.

"Katharine bridged what felt like a very large gap when it came to understanding academic literature. It was never "they just mean this", but a helpful explanation of the language and conventions used."
- 3rd year student, UoH

"Katharine's work around how students read research papers has directly changed practice in my department. In my final year case study module we now break down the analysis of the papers taking into account how students read, directing them towards the figures." – Dr David Smith, NTF, Sheffield Hallam University

Word count for evidence against Criterion 1 (maximum 1500 words)	*Enter word count here: 1499 words (1427 + 72 words on Figure 1)*

Criterion 2: Raising the profile of excellence

Evidence of supporting colleagues and influencing support for student learning and/or the teaching profession; demonstrating impact and engagement beyond the nominee's immediate academic or professional role.

"Dr Hubbard has influenced curriculum design, teaching leadership, and pedagogical approaches of her colleagues. Her consistent persuasive enthusiasm for modern evidence-led approaches to teaching have been instrumental in our improvements." – Dr Dave Lunt, Head of Biology, UoH

When trying to develop an education-focussed career in a research-orientated institution, I found few role models I could approach for advice. I found this lack of visibility for teaching excellence frustrating, and was struck by how different this was to research. It has therefore been important to me to fill this gap and become a 'champion' for teaching and teaching-focussed careers. I have therefore supported colleagues in developing their teaching, created and shared teaching resources, and provided career advice and mentorship to others wanting to teach.

One model of support for scientific education that I am incredibly proud of are the resources I created for the 'Teaching Tools in Plant Biology' series (Hubbard and Dodd, 2016). This initiative is run by the American Society for Plant Biology (ASPB) to distribute high quality teaching materials online, particularly to countries where access to textbooks and academic journals is prohibitively expensive (Williams et al., 2015). This Teaching Tool has been downloaded in over 40 countries, supporting plant science education around the world. I have been contacted by international students from universities and schools who were inspired by the resources, and I have subsequently supported them with projects and essays.

"Your Teaching Tool immediately caught my attention and I decided to focus my International Baccalaureate project on the topic of circadian rhythms in plants." - High School Student, Sweden

"Katharine is a leader in plant science education; she co-authored one of the Teaching Tool in Plant Biology series on "The Plant Circadian Clock", which has been downloaded over 3000 times. The bar for acceptance to this series is extremely high; this is an impressive achievement and an invaluable resource for the plant science community." – Dr Mary Williams, ASPB

My first opportunity to support other educators was at UoC, where my responsibilities included coordinating the activities of PhD students and Postdoctoral researchers who contributed towards departmental teaching. I established the 'Plant Sciences Supervisors Network' which met regularly to discuss effective tutorial delivery and best assessment practice. In addition to the increased confidence supervisors reported, this established Plant Sciences as a department where teaching was valued; after I took on this role enrolments on the 2nd year Plant Sciences course rose from 32 students to 54, the largest cohort

ever seen. The network is ongoing, and the resources I created still support tutorial teaching at UoC.

"Katharine was amazingly supportive when I was teaching small groups of undergraduates. The supervisors network dramatically improved my experience of teaching and made the process a lot less stressful (and a lot more fun) than it had been before."– PhD student, UoC

Lacking in immediate education-focussed role-models within my department, I turned to social media to find a community of like-minded educators, and in doing so found that teaching-focussed conferences existed. One theme that emerged from these was the relative lack of reward and recognition for teaching excellence (Cashmore et al., 2013; Cashmore and Ramsden, 2009). At a meeting hosted by the Society of Experimental Biology in 2015, I was struck by the similarities between experiences of early-career academics who teach, and the lack of visibility of teaching-focussed careers. In response, I was lead author on an article highlighting challenges and opportunities for teaching-focussed staff (Hubbard et al., 2015). This has been viewed 1600 times, shared via Twitter 56 times, cited twice and was discussed in detail in Dr Abel Napfayme's keynote address to 'Enhancing Student Learning Through Innovative Scholarship' (2015) as a rare example of teaching-focussed careers being a proactive and legitimate choice.

When I moved to Hull, I found that I had expertise that would be immediately beneficial to colleagues, particularly in relation to digital teaching. In Cambridge we had switched VLE, and I had quickly gained a reputation of 'VLE champion' due to my use of online quizzes, videos and interactive teaching tools. When UoH switched platform, I again became 'VLE champion'. I arranged training sessions for staff in my department and elsewhere on how to use new tools, providing personalised support in adapting content. I was invited to deliver a University Wide 'Summer Masterclass' on VLE use, and approaches presented in the workshop have been used in other departments.

"Katharine was instrumental in influencing our VLE use in Chemistry; we have standardised course front pages, used modular structures and formative assessment. Students are now more pro-actively engaging with the material, and scoring significantly higher marks on the summative components of the course." – Dr Chris Armstrong, UoH

As I became more confident in my educational experience, I sought to present my expertise on a par with that of my research colleagues, and to act as a 'broker' between education and research communities (Tierney, 2016). For example, when Student Reps and Academic Support Tutors in Biology raised concerns about the first year tutorial essay assignment, I implemented ideas from the Developing

Engagement with Feedback Toolkit (Winstone and Nash, 2016), through use of a structured rubric promoting 'feed-forward', and dividing feedback into 'major' and 'minor' points, helping students to prioritise improvements. As a result of this being used across the department, marks on this assignment increased by 10%, and students reported feeling more confident in their academic writing.

"The major-minor feedback comments were so helpful on my [essay] draft - I went from a third to a first and I now understand how it is the university wants me to write" - 1st year student, UoH

To share my expertise more widely, I have presented my teaching practice and pedagogical research at national meetings including the AdvanceHE STEM Meeting (2019), Horizons in STEM Education (2018) and Enhancing Student Learning Through Innovative Scholarship (2016, 2017). I have given invited talks at the Bioscience Education Summit (2016), Methods in Chemistry Education Research (2018) and the Society of Experimental Biology (2017). I have given invited departmental seminars at the Universities of Greenwich, Liverpool and Bristol, and the Royal Veterinary College. In these seminars I have presented work on student-partnership, the need for evidence-based approaches to teaching and the research-teaching nexus. As a result, my work has gained wider reach, and has directly impacted practice in other institutions.

"Katharine's presentation on student partnership was a great trigger for action in our department. Since her visit we established a student journal which is edited by PhD students and where students can publish their research, literature reviews, or reflections on study abroad or work placements. " - Prof Susanne Voelkel, NTF, University of Liverpool

Through interacting with the teaching-focussed community, I realised the power that accreditation had in raising the profile of teaching. Many education-focussed colleagues were Fellows of the Higher Education Academy, and saw fellowship as a valuable tool in demonstrating their own prestige and establishing their credentials with colleagues. I became the first Fellow of the HEA in my department at Cambridge, which immediately made me more confident in presenting my expertise to research-focussed peers. I have become a strong advocate for others gaining fellowship; I have directly supported 12 people through mentoring, giving feedback on applications or writing references. Whenever I give external talks or seminars I highlight the value of accreditation; as a result I have supported individuals from research-focussed institutions lacking local mentors. Partly as a result of supporting others through Associate Fellow, Fellow and Senior Fellowship applications, I was awarded Senior Fellowship of the HEA in 2017.

"Katharine has been an excellent role model for me and supported me in developing my teaching career. She has provided advice, guidance and support, and encouraged me to apply for Associate Fellowship of the HEA, and introduced me to teaching conferences." - Catherine Mansfield, PhD Student, John Innes Centre

As developing scholarly outputs has been so important to my own career in terms of external influence, I have also supported colleagues in developing their scholarship. I have published three manuscripts with collaborators who were new to pedagogical research (Douglas et al., 2018; Hubbard et al., 2017; Hubbard and Dunbar, 2017). I have made invited contributions to University training programmes including 'Passport to Teaching' course for PhD students/Postdocs, and 'Introduction to Pedagogical Research' for Hull's Postgraduate Certificate in Academic Practice. I am the subject specialist for pedagogical research on the Faculty Ethics Committee; as such I am responsible for overseeing ethical conduct of projects, supporting applicants to ensure that research aligns with e.g. British Educational Research Association guidelines. I have reviewed over a dozen ethics applications, data from which will be used for institutional AthenaSWAN applications, postgraduate research qualifications and peer reviewed publications, and in doing so have enhanced the research capabilities of others across the faculty.

"As someone who hasn't done much educational research before, I really appreciate the support and guidance you have given me throughout the ethics process." - Student Engagement Officer, UoH

Word count for evidence against Criterion 2 (maximum 1500 words)	*Enter word count here: 1491 words*

Criterion 3: Developing excellence

Show the nominee's commitment to and impact of ongoing professional development with regard to teaching and learning and/or learning support.

"Katharine's teaching is grounded in theory and in a reflective comprehension of the practice of others (from observation of her peers and from the literature). She provides support to teaching focused staff making their first tentative forays into the scholarship through her organisation of the STEM Education Research Group." - Prof Graham Scott, NTF, UoH

I have always found that the best way to enhance my practice is to learn from others, so sharing ideas and implementing successful strategies from others is at the heart of my approach to education. Having trained as a plant physiologist, my transition to an education-focussed career has required me to acquire a range of new skills and ideas. As such I have been very proactive in seeking out opportunities for professional development. A key event was attending a HEA supported meeting of Biology and Chemistry educators at the University of Reading. This was the first time that I encountered a community who thought rigorously about science education, and introduced me to ideas including flipped classrooms, iterative assessments, blended learning and student partnership. Attending this meeting was utterly transformative, and it defines the true start of my student-centred approach to education. Immediate benefits of that meeting included meeting academics in other institutions using their VLE in creative ways that I was directly able to implement into my teaching practice. For example, I visited Dr Anna Bertram at the University of Nottingham after seeing her speak at this meeting, and have used her ideas about video-based resources and online assessment ever since. These have always been positively received by students, and I was awarded the Hull University Union Student Led 'Innovative Teaching' Award (2018) primarily for my use of online teaching tools.

"Katharine's teaching includes one of the best uses of technology and her use of the VLE is second to none - I have personally recommended Dr Hubbard to any lecturers and students struggling with the VLE " – Steven Storey, Faculty Student Representative

When I arrived in Hull, one of the most valuable activities was joining the Bioscience Education Research Group (BERG). Having previously worked in an institution with no culture of the Scholarship of Learning and Teaching, being able to discuss educational research on a regular basis was fascinating and propelled me into taking a more rigorous approach to scholarship. In particular, I learned the value of using pre-validated survey instruments, the value of conceptual frameworks and formal models of learning. I took on the role of group organiser, and took the decision to open the group up to colleagues across the Faculty of Science and Engineering to form the STEM Education Research Group, forming a collaborative community of practice. I have directly worked with other group members to write funding bids (e.g. 'STEMMing the leaky pipeline' written for the Nuffield Foundation) and collect data for existing projects across departments.

Alongside this, my experience of educational research methodologies is increasingly informed through acting as a peer reviewer for journals including *Higher Education Pedagogies*, *Education Science*, and the *Journal of Biological Education*

> *"Dr Hubbard made me welcome in Hull's STEM Ed Network, which helped me develop a scholarly approach to my teaching. I used her Higher Education Pedagogies paper as a star to guide me; her inclusion of student voices was particularly inspirational, and helped me to find a way to write Scholarship I was proud of."* – Dr Michael O'Neill, UoH

One of the things I found most valuable in moving to Hull was being in a more teaching-focused culture, where external seminar speakers included leading educators as well as researchers. For example, shortly after I arrived in Hull I attended a seminar by Prof Susanne Voelkel (University of Liverpool) who demonstrated the impact that two-stage adaptive release quizzes had had on her students, allowing students to practice questions in a formative quiz before unlocking the summative component (Voelkel, 2013). I had just been made module leader of a large Level 3 academic skills module 'Preparing for Learning in Higher Education' which had 450 students of various abilities, and spanned disciplines from physics to psychology. I could immediately see how this model might support students in developing their academic skills at a pace that was right for them, while also giving a sustainable assessment model for large cohorts.

After discussing the model with Prof Voelkel, and enlisting our Technology Enhanced Learning (TEL) team for help with technical aspects of implementation, I replaced a large written summative assignment that students found unhelpful and confusing with a series of weekly two-stage quizzes focussed on various aspects of academic study skills including referencing, formatting academic work and sources of support. After switching to this assessment strategy, failure rates on the module fell from 19% to 9%, meaning more students could progress onto the full degree programme. Student feedback was very positive, and the number of students obtaining a 2i or higher increased from 43% to 68%. I have presented this model of assessment at several University level events (e.g. Partner Colleges Event, December 2017; Faculty of Science Best Practice Event 2017). My implementation of Voelkel's model has also been presented by TEL colleagues at international educational technology conferences (e.g. InstructureCon 2018) as an example of using VLEs to support creative and varied assessment methods.

> *"The quizzes were fantastic. The A+B format really was great to be able to practice"* - Foundation Year student, UoH

In addition to the direct impact of adopting Voelkel's assessment model on students, moving to this model has allowed the Biology Education Research Group

to develop a large project on the use of data analytics to predict student success. After being awarded £31,000 as a Co-PI on a HEFCE funded grant, we were able to employ a data scientist to use the Preparing for Learning module as a test case to determine whether data on submission rates, performance in assessment tasks and demographic factors were able to identify at-risk students. Working with our data scientist has significantly increased my own understanding of learner analytics and mathematical models as tools for asking educational questions. The project identified that students from BTEC backgrounds were less likely to succeed at the start of the module, but that engagement with the two-stage quizzes reduced the 'BTEC gap' (Nattrass et al., n.d.). This work has been presented to University level Learning and Teaching Committees focussing to improving support systems for at-risk students across campus, and subsequent manuscripts are currently being peer reviewed so that this work can have impact beyond UoH.

Having directly benefited so much from communities of educational practice, I aimed to establish and extend networks so that others could benefit from sharing their teaching experience. I co-organised the Education Session for the SEB international conference in 2016 (Theme: "Enhancing Biology Education") and 2018 ("Teaching at Scale: Challenges and Opportunities"), inviting bioscience educators from around the world to share their approaches to teaching. In addition to the exchange of ideas at the meeting, at least three of the speakers have used their conference contributions in successful promotion case studies or to demonstrate institutional Key Performance Indicators. The "Teaching at Scale" conference session was the focus of a two-page feature article in the SEB magazine (Autumn 2018), and was highlighted in Times Higher Education as an example of a thriving community of practice around higher education (Tierney, 2018).

"The invitation to speak at SEB 2018 made a major contribution to my successful application for Senior Lecturer. The meeting was incredibly useful for making new contacts at an international level in HE Teaching." - Dr Nicola Veitch, University of Glasgow

"Katharine contributes very actively to SEB+ education sessions. Last year, she organised the flagship Teaching and Learning session at the SEB Annual Main Meeting. Katharine's dedication and scholarship are clear to see and she is highly regarded in the SEB+ Teaching and Learning group. Such is Katharine's standing, that SEB+ recognised her contribution in 2017 with the award of the President's Medal."

– Dr George Littlejohn, Chair of the Society of Experimental Biology SEB+ committee

When I first adopted an education-focussed career, I had little expectation that it was possible, let alone that I would see such impact and success. So many people

have told me that I was the first voice they heard saying that teaching was a valuable activity, and I will therefore continue to build communities of practice, to disseminate my activities and to mentor and empower others who teach. However, the most rewarding part of my job is still to see students grow, learn, thrive and become the scientifically educated citizens of the future. While I am thankful for awards and endorsements from colleagues, I am eternally grateful for the robust and honest opinions of students, their hard work and creativity, and their cards, cakes and words of thanks. Creating a culture of educational excellence benefits all in the academic community, and I hope to drive and inspire that culture for many years to come.	
Word count for evidence against Criterion 3 (maximum 1500 words)	*Enter word count here: 1489 words*
Section C: Reference List (not scored by reviewers)	

NB **Bold** indicates papers I have contributed to. Underlined names indicate co-authors for whom this was their first pedagogical research paper, some of whom were undergraduates.

Cann, A.J., 2014. Increasing Student Engagement with Practical Classes Through Online Pre-Lab Quizzes. J. Biol. Educ. 50, 101–112.

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Douglas, C., Yearsley, J., Scott, G., **Hubbard, K.,** 2018. The Student Thesis Conference as model for authentic and inclusive student research dissemination. Higher Education Pedagogies 3, 319–341.

Hubbard, K.E., Brown, R., Deans, S., Garcia, M.P., Pruna, M., Mason, M.J., 2017. Undergraduate students as co-producers in the creation of first year practical class resources. Higher Education Pedagogies 2, 58–78.

Hubbard, K.E., Dodd, A.N., 2016. Rhythms of Life: The Plant Circadian Clock. Plant Cell doi/10.110.

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Hubbard, K., Gretton, S., Jones, K., Tallents, L., 2015. Challenges and opportunities for early-career Teaching-Focussed academics in the biosciences. F1000Res. 4, 76.

Nattrass, S., Morrell, L., **Hubbard, K.E.,** Henri, D.C., Scott, G.W., n.d. Can changes to assessment strategy to improve student outcomes be equitable? In review.

Tierney, A., 2016. Communities of practice in life sciences and the need for brokering. F1000Res. 5, 280.

Tierney, A., 2018. The scholarship of teaching and learning is thriving [WWW Document]. Times Higher Education (THE). URL https://www.timeshighereducation.com/blog/scholarship-teaching-and-learning-thriving (accessed 3.20.19).

Voelkel, S., 2013. Combining the formative with the summative: the development of a two-stage online test to encourage engagement and provide personal feedback in large classes. Research in Learning Technology 21, 19153.

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Williams, M., Lockhart, P., Martin, C., 2015. Digital teaching tools and global learning communities. F1000Res. 4, 59.

Winstone, N.E., Nash, R.A., 2016. The Developing Engagement with Feedback Toolkit (DEFT). Higher Education Academy, York.

Nominee signature*: **(*electronic signatures are accepted)**	
Date:	26th March 2019

By signing this document I confirm that:

- I have read, understood and agreed to the Advance HE Privacy Notice
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