Researchers in Residence Literature Review

What does researcher in residence mean?

According to Marshall et al. (2014) ‘the 'in-residence' model emerged to address the tendency of people with expert knowledge to socialise and work with like-minded people. This tendency can distance the expert from the wider society within which they operate, rarefying the expertise and excluding others from it’ (p.2). One way of closing such a divide between experts, often academic researchers, and practitioners is through co-creation of knowledge (Bate, 2000; Greenhalgh, T. and Wieringa, 2011; Marshall, 2014). This relationship places the researcher as a key member of the delivery team rather than an external observer and gives them a stake in the success, or otherwise, of the initiative (Eyre, 2015). A researcher-in-residence arrangement can be considered as an example of knowledge transfer, in which the temporary placement of researchers in companies or in the public or voluntary sectors can offer a more directed way of exchanging knowledge on a shorter term basis (Eyre et al, 2015). Utilised particularly within the health services, this approach responds to concerns that established linear methods of integrating research into practice do not adequately result in sufficient evidence-based decision-making i.e. a move away from research being produced by researchers and distributed to practitioners, toward collaborative knowledge production (Eyre et al., 2015). Indeed, the recent Standard for Teachers’ Professional Development and accompanying implementation guidance makes it explicit that all teachers will be expected to engage with research in order to better understand how and why practices work and how to implement them successfully in different contexts (Creaby et al., 2017)

Although there are a number of participatory initiatives reported in the literature, many fail to extricate managers, clinicians and academics from the traditional model ‘in which powerful incentives in the academic and service sectors keep the researcher and practitioner communities apart’ (Marshall et al., 2014, p2). The researcher-in-residence model offers a participatory arrangement that can more effectively share expertise, and one that treats researchers and practitioners as equals (Marshall et al., 2014). In common with other methods in participative research, the researcher-in-residence model embraces the principles of collaboration with a view to solving practical problems, of instigating change through shared (and increased) knowledge, an emphasis on reflection and collective inquiry, and acceptance that negotiation and compromise are necessary to progress ideas and actions (Eyre et al, 2015). Pragmatism could be considered as underpinning participative methods, with practical impact being a required element to add value to thought (Cornwall and Jukes, 1995; Marshall et al., 2014). The researcher-in-residence model also shares many of its characteristics, motivations and benefits with educational practices aligned to the concepts of research-informed teaching (Griffiths, 2004; Jenkins, Healey and Zetter, 2007); inquiry-based learning (Wu and Hsieh, 2006) and evidence-informed teaching practice (Cordingley, 2008).
Specifically, each of these practices seeks to promote teaching excellence and enhance the student experience. This can be achieved by, for example, students being taught research findings in related curriculum areas, students learning research processes and methodologies, students learning through critique and discussion between themselves and teachers, and students learning as researchers. Such engagement has been shown to increase student knowledge, satisfaction and employability (Burgum and Stoakes, 2016).

To share expertise more widely, many non-educational organisations have installed experts in specific forms of communication and dissemination into their delivery structures. Examples include poet-in-residence (Barnsley Football Club), artist-in-residence (Heathrow Airport) and entrepreneur-in-residence (British Library) (Marshall et al., 2014). Within the education environment, there are many similar schemes to that of researchers-in-residence, particularly in the USA. These include the Scientist in the Classroom programme (National Centre for Science Education), Elementary Science Education Partners (ESEP, Atlanta) and Caltech Precollege Science Initiative (CAPSI, California) (Barley et al, 2013; National Academy of Sciences, 2005a; National Centre for Science Education, n.d).

### A theoretical framework for researcher-in-residence collaborations

There is much in the literature on the benefits of connections between universities and schools, with the lack of connection between the learning in the former and field experience in the latter termed ‘the Achilles heel of education’ (Darling-Hammond, 2009, cited in Zeichner, 2010). This is an ongoing problem in traditional university courses (Zeichner, 2010), suggesting that the lack of school and university partnerships is a weakness that negatively impacts on the quality of education in schools.

Zeichner (2010) uses the term “hybrid space” (p. 89) to describe the crossing of boundaries to share expertise on an equal plane. The concept of hybrid space appears to have been extensively covered in the literature, principally in the context of teacher training. Here, university expertise and practitioner (usually, but not exclusively, teacher) knowledge combine to benefit the teacher trainer experience. Zeichner (2010) investigated a potential “hybrid space” course within primary Physical Education Teacher Education (PETE), concluding that although hybrid spaces may be an ideal rather than reality, such spaces have the potential to strengthen teacher preparation. For example, pre-service teachers can enhance their preparation by “creating hybrid spaces in teacher education where academic and practitioner knowledge and knowledge that exists in communities come together in new less hierarchical ways in the service of teacher learning” (Zeichner, 2010, p.89).

Hybrid spaces are further discussed in the literature in various contexts, including physical learning places i.e. school libraries (Subramaniam et al., 2012), web 2
technologies (Greenhow et al., 2009), and in spaces between home/community and formal institutions (Arhar et al., 2013).

Establishing a hybrid space requires the discovery of novel approaches to forging collaborations within the community. Effective communication and effort are therefore essential for the creation of hybrid spaces (Lynch, 2015). It does not take too much of a leap to assert that such a space can be just as applicable to collaborative research involving university researchers and school staff, for the benefit of the researcher, the practitioner, and ultimately the school students. Indeed, Arhar et al. (2013) saw just such an occurrence emerging from successful partnerships between university Research Fellows (apprentice doctoral students) and school-based practitioner researchers in their Education Works project. Interestingly, there was a sense of discomfort reported with some researchers due to ambiguous roles and not all the partnerships succeeded, particularly where the researchers were unable to let go of their familiar institutional roles. Arhar et al. (2013) conceptualised the ‘inquiry communities’ (p224) that derived from these apprenticeships as hybrid, or third, spaces.

Using hybrid space to accommodate a Researcher-in Residence arrangement could lead to research that is largely research on teaching, but it might focus instead on research by teachers or wider practitioners (practitioner research), where teachers’ roles are considered pivotal in the generation of knowledge (Cochran-Smith and Lytle, 1993; 2009). Practitioner research, in a researcher-in-residence context, could be led and undertaken by the practitioner with support and advice from the university researcher, or it could take the shape of collaborative research with practitioner and university researcher jointly acting as lead researchers.

Models of Researcher-in-Residence Schemes

A literature review of the multiple databases accessed via Plymouth University’s search portal, Primo, and Google Scholar, in conjunction with a broad internet based search, has led to a compilation of the following researcher-in-residence scheme typology. Some case studies are included to illustrate the model type. They are located within various disciplines.

1. Researcher embedded in front-line delivery

This model is firmly based on the principles of participatory research, involving collaboration across a range of stakeholders, including service users. Key drivers of this model are to focus on agency and addressing imbalances in power. Rather than working solely in an academic institution, the researcher spends much of her time as a member of a service-based operational team, working on and solving practical problems. There is clarity about the expertise that the researcher can offer, which includes a good understanding of the research evidence in their area of work and of the theoretical and conceptual basis of that field. There is an emphasis on
negotiating expert knowledge, as opposed to informing or imposing it on their collaborators (UCL, 2016).

**Case studies**

- UCL researchers, Martin Marshall, Laura Eyre and colleagues report on various health-based schemes and programmes that they are associated with that fit this model (Eyre et al., 2015; Marshall, 2014; Marshall et al., 2016; UCL, 2016). For example, one case involves a Health Services researcher working across an integrated care organisation where the role of the researcher was to evaluate an integrated care programme's processes, and determine how to use the findings to improve achievement of programme objectives locally (Eyre et al., 2015).

- Clapton and Daly (2015) report a case of a social worker academic-in-residence in which the researcher occupied a residency of a day a week for 12 months embedded in a third sector children and families social work agency. The residency aimed to develop a research mindedness amongst practitioners and the agency with a longer term view of helping the agency to become a centre for teaching, learning and research excellence. It was also hoped that the arrangement would result in firm links between the agency and the university staff, ultimately benefiting teaching and learning. Activities included conversations between teachers and researchers and mini-pedagogic conferences.

- The Digital Catapult Centre, London, and other local centres host an Engineering and Physical Sciences Research Council (EPSRC) funded digital literacy researcher-in-residence programme. In the field of digital innovation in business, participants from various UK universities apply for a place on the 3-year programme, assuming either junior or senior residencies at the Centre or located within user organisations. Junior residences are undertaken on a full-time or near full-time basis, and allow researchers to develop their research interests while working within user-centred projects which focus on impact generation or commercialisation. The senior researchers work full-time or in a series of secondments and help to create new activities and shape Catapult projects (Digital Catapult Centre, 2017).

2. **Young researchers gain professional development and access to knowledge and experience from working in an applied environment**

This model aims to increase awareness of the practice context in early career researchers (ECR) and thus shape research studies to support implementation of evidence. Although the host organisation will benefit from the outputs of the ECR’s work, the emphasis is on the researchers’ personal and professional gains resulting from the experience.
Case study

- Young digital humanities researchers spend six months in Koninklijke Bibliotheek (KB), the National Library of the Netherlands. They access KB data for conducting research and have data experts on hand to provide knowledge and experience. In return, the institution benefits from the information gathered which can help to improve services (KB, Nd).

3. Prominent researchers are invited into practice contexts

This model follows a consultancy format whereby expert researchers, likely to be senior academics, are invited in by an organisation and provide a brief advisory role, typically via a short series of visits, where the information flow is largely unidirectional and there is little element of 'residency' in the sense of a continued relationship.

Case study

- This model can be illustrated by a programme in North Carolina, sponsored by the National Institute on Alcohol Abuse and Alcoholism, which invited prominent academic researchers to make brief technical assistance visits to treatment clinics to present research-based information about specific practice improvements which the providers tried to adopt. Qualitative analysis of interviews concluded the programme was successful, largely due to its on-site nature (Hilton, 2002).

4. Trained researchers are mobilised to encourage systemic change in institutions

In an educational context, students gain practical experience relevant to their research training and can act as a conduit between the university and schools. The researchers add capacity to already-full teacher workloads, and skills and knowledge can be coordinated and disseminated broadly and consistently.

Case studies

- Collaborative research training in an applied context has been previously trialled at Plymouth University, where Early Years undergraduates worked on related projects with a Forest School focus to contribute to a report for Devon County Council. The students found the applied context motivating and the community of research helpful in developing their critical thinking (Waite and Davis, 2006).
In Atlanta, USA, the Elementary Science Education Partners (ESEP) programme developed kits in support of new science curriculum modules. Lead teachers were trained to deliver curriculum elements, and were supported by a team of undergraduate students from regional universities who were, in turn, mentored by experienced research academics at their respective institutions (National Academy of Sciences, 2005b).

5. **Researcher works with individuals in host organisations to enrich experiences of primary users i.e. working with teachers to develop activities for pupils**

This model is one in which the researcher demonstrates value of collaboration with higher education through joint activity. The nature of the collaboration may vary considerably, as determined by the needs of the partners involved, and the institutions, and may involve individuals from host organisations in engagement *with* research, or engagement *in* research (Creaby et al., 2017).

**Case studies**

- **National UK education researcher-in-residence scheme**

The first researcher-in-residence programme in the UK appears to have been established by the Department for Education in the early 1990s with university academics placed in schools to share knowledge and engage and enthuse children in science, with a view to ‘democratising expertise, relocating it to places where people lived and worked’ (UCL, 2016). The original national scheme ceased in 2012 and was replaced by a range of locally driven initiatives (Marshall et al., 2014).

The national scheme was funded by UKRC and the Wellcome Trust, and led initially by Sheffield Hallam University, and then by the University of Edinburgh from October 2006, and finally from 2010-2012 by the United Kingdom Atomic Energy Authority (Barley et al., 2013). Working with the Association for Science Education (ASE) they commissioned The Training Group to design and deliver specialist training to participating researchers. The stated aim of the scheme was to create a mutually beneficial relationship between researchers, secondary school pupils, and schools by placing researchers into schools. The scheme was principally directed at early stage career and post-doctoral researchers.

The national researcher-in-residence scheme was based on the following principles:

- Interaction with pupils
- Engaging and inspiring young minds
c) Employing transferable skills which met the Roberts Agenda requirement (development of strong transferable skills in postgraduate researchers (Roberts, 2002)
d) Engaging in teaching and learning
e) Taking own research into schools and sharing with pupils
f) Enhancing the school curriculum and enabling pupils to learn in new ways
g) Giving teachers access to cutting edge research
h) Providing CPD for teachers
i) Providing access to resources otherwise not available.

The process used was that researchers registered their interest on the national scheme website. Once registered they were invited to a training session after which the researcher-in-residence service matched them to a school. There was an induction at the school where the researcher met the host teacher, and they planned activities to include 14 hours of contact time with pupils and planning over a flexible time period. When the residency completed, the researcher attended a review. (see Appendix 1 for institutional case studies).

- Doctoral student research experience in Education Works, inspired by research apprenticeships - Working on research that tackles real school problems requires university researchers and school practitioners to address their cultural and political differences. This can be partially achieved through shared leadership, shared goals, skill development and allocation of sufficient time (Arhar et al., 2013). In the context of PhD students (future educational researchers who were previously full-time teachers) being positioned in partnership with local schools with the aim of improving the learning environment of high school classrooms, each research experience was focused on a particular goal, determined from practitioner knowledge.

- For the NCSE’s Scientist in the Classroom mentioned previously, this was a programme very similar to the UK scheme in terms of process, with a basic two-visit model as a minimum commitment. The first visit would be a “get-to-know-you” visit, with the scientist introducing him or herself, explaining their research in terms the students could understand, and telling the students the story of how they became a scientist. Teachers and scientists are offered prompts to help kick-start conversations and suggested questions to ask the students to maintain engagement during the visit. During the second in-class visit, the scientist works with the teacher to actually carry out some science activity work with the students related to climate change or evolution (https://ncse.com/scientistinclassroom). In practice, many collaborations extended beyond this minimum expectation.

- Semler (2013) describes how a University of Sydney academic-in-residence programme aimed to establish a space in which secondary and tertiary
educators could explore collaboratively the teaching and learning of Shakespeare to gain a better understanding of the student experience within large learning institutions. The programme ‘meant that for at least two days in every school term, the academic team visited the school and collaborated with teachers on experimental teaching and learning activities, lectures and workshops for students and staff, and planning meetings’

- An independent education-context case study incorporates aspects from several of the models presented previously. Young et al (2015) investigated the impact of having a ‘researcher-in-residence’ as a Partnership in Learning between University and School (PLUS) Champion embedded in the school environment to facilitate the implementation of a structured democratic partnership model. The project, situated within an ITE context, involved a PLUS champion from the University of Limerick i.e. a postgraduate student, locating in a local school one day a week for a six-week period of student teacher placements (2nd year undergraduates). The champion scheduled and facilitated a range of conversations between student teachers, regular teachers, principals and university tutors, creating ‘dialogic spaces between policy actors’ (p37). The key findings from various qualitative data sources were that peer-support between student teachers from pedagogic-related conversations was significant. There was also evidence of collaborative planning between teachers and student teachers, while the notable challenge was the lack of pedagogic-related dialogue with teachers and school leaders, who failed to see themselves as partners-in-learning with student teachers or university tutors. The initiative was viewed as successful in developing new professional relationships of learning between a variety of policy actors.

Summary of engagement models

Ritchie and Lewis (2003) categorised researchers-in-residence arrangements by the roles that the researchers adopted:

- ‘Expert’ scientist to share expert scientific knowledge and expertise with staff and pupils;
- ‘Trainee’ or ‘potential’ teacher to observe classes and gain a broad understanding of science education;
- ‘Role model’ to promote science and research, to demystify science and help to overcome stereotypes of scientists;
- ‘Classroom resource’ to provide assistance in the classroom and during extra-curricular activities'

The University of Limerick case outlined above (Young et al., 2015) could arguably be viewed as an additional category to those described by Ritchie and Lewis, namely that of researcher as ‘facilitator’.
Summary of education researcher-in-residence schemes' benefits and challenges

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| Creaby et al., 2017; Tanner, Chatman and Allen (Cited in Barley et al, 2013) | Benefits include:  
- problem-based learning  
- higher order questioning  
- academic enrichment  
- engaging teachers in current research  
- innovative strategies  
- mutual learning |
| Barley et al. (2013). Qualitative evaluation of the national researcher-in-residence scheme based on the experiences of participant teachers and postgraduate researchers in Edinburgh. Creaby et al. (2017) | Concluded that:  
- ‘the unique and mutual benefits of the researcher-in-residence scheme to the researchers, pupils and teachers made it the ideal scheme to assist schools in implementing key aspects of the Curriculum for Excellence’ (p125)  
- Provides effective, purposeful CPD for school staff, motivating and upskilling, so developing scholarliness and enhancing teaching expertise. |
<p>| Wenger (1998) | By collaborating with academics, schools and teachers can become part of an ongoing learning community which may enhance practice and create collaborations. |
| Hardwicke (2010) | Where researchers are primarily postdoctoral students, school pupils will benefit from rich learning experiences, i.e. practical scientific research, be inspired by interacting with a young, enthusiastic role model and gain greater awareness of academic careers. |
| University of Sheffield (2010) | Enables researchers to network with others with similar interests, provides opportunities to develop communication, team-working and interpersonal skills. |
| Hennell (2007) | Potential development of transferable skills (Roberts Agenda) including improvement of communication skills; Professor Brian Cox was a researcher-in-residence in his early postdoctoral career, for example. |
| AHRC (2015) | Ability to share research with a wider (less technical) audience and broaden research topics. |</p>
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<td>Hennell (2007); Lancaster University (nd)</td>
<td>Can create bridge between schools and universities potentially leading to further access to resources and other researchers</td>
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<td>Creaby et al. (2017)</td>
<td>Contributes to a constructively critical and supportive school ethos</td>
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There are very few critical views of researcher-in-residence schemes. However, Tanner, Chatman and Allen (2003) found that some postgraduate students saw scientist-teacher partnerships as a tick box exercise, and teachers did not always recognise the collaboration as a contribution to their CPD.

**Designing a researcher in residence model**

Taking the various relationships described from examples of researcher-in-residence schemes and programmes evidenced from the literature as a whole, an alternative categorical model is proposed, one based on the main purposes/benefits from the researcher-practitioner collaboration:

1. Researcher skill development (Roberts Agenda)
2. Researchers’ data collection (empirical research)
3. Pupil learning from direct researcher engagement in support of teacher i.e. in-class presentations/discussions of topical research (knowledge transfer)
4. Pupil learning from direct researcher engagement as teacher (teaching of specific curriculum area using own research knowledge (research-informed teaching) (knowledge transfer)
5. Teacher skill development from collaborative working (practitioner research; participatory reform; evidence-based practice; knowledge transfer)
6. Collaborative research/scholarly activity (practitioner research; research-informed teaching; pedagogic research; evidence-based practice; knowledge exchange)

Educators or practitioners considering establishing a researcher-in-residence scheme might find this comprehensive cataloguing of possible purposes useful in helping to focus scheme design on the expected outcomes from the collaborative process.

**References**


APPENDIX 1

Examples of the RCUK & Wellcome Trust Researcher in Residence scheme

In this UK national scheme, specific institutions around the country were designated with regional leadership roles. A number of universities include references to this scheme on their websites, or through archived web pages, and include:

University of Bristol

Although there is no detailed information of the scheme on the university’s current website, the following promotional text shows how the scheme was publicised at the time (University of Bristol, 2016):

Would you be interested in getting a cutting-edge scientist into your secondary school for a few days?

If the answer is yes, then the Researchers in Residence scheme may be the one for you. Funded by the UK research councils and the Wellcome Trust, Researchers in Residence enriches the classroom experience of secondary school students by placing University/HEI researchers into schools. Researchers work with the teacher in their host secondary school to deliver activities that makes their subject and research relevant and exciting for school children. Contact xxxxxxxx or on xxxxxxxx.

University of Liverpool

The Arts and Humanities Research Council present a case study on their website of a University of Liverpool Masters student undertaking a placement in a local high school, where she worked with teachers and directly with pupils, covering topics that helped students relate to their curriculum work (AHRC, 2015).

Lancaster University

An Early Career Researcher from the Lancaster Environment Centre was matched to the Queen Elizabeth Teaching School in order to enhance the Biology curriculum for year 13 students and provide informal CPD for three teachers. The researcher undertook fortnightly visits, participating in lessons in various ways including presenting his own research, facilitating other researchers to visit, providing access to university resources, working alongside teachers during lessons, and discussing links between the curriculum and cutting edge research (Lancaster University, nd).

University of York

Melanie Thompson was a researcher who secured a placement at Eastingwold School. She used her residency to explore Science in Society issues. She delivered seven sessions over a two week period, focusing on good and bad bacteria and chemicals in processed food. Melanie also took the opportunity the stereotype of what a scientist 'looks like'. She did an experiment with the pupils where she got them to test manufacturer's claims of bacteria acid
resistance in probiotic drinks such as Yakult and Actimel and they discovered that the claims were not necessarily true. Following the experiment they looked at bad bacteria and some of the diseases that it can cause, which led into a discussion about hospital acquired infections. Later Melanie did a very focused piece of work with a small group of pupils who were doing their GCSE course work in chemicals in processed foods. She talked to them about the types of chemicals that are found in processed food and related topics such as diabetes and obesity and the effects that those can have. She helped the pupils to do some detailed research which they were able to use for their GCSE course work (Hennell, 2007).

University of Edinburgh

Joe Rainger, a biochemistry postgraduate at Edinburgh went into Broughton High School for his placement. Joe delivered a number of sessions over two terms in which he incorporated theory and practical activities focused on his area of research, human genetics. Joe first gave a presentation about the type of research that is conducted by the Human Genetics Unit at the University of Edinburgh and he was able to relate that to the biology curriculum after having discussed this with the teacher. He then did some practical experiments with the pupils where they had the opportunity to learn how to copy specific pieces of DNA in PCR reactions and then they identified genetic mutations in genes which were responsible for developmental diseases. Following the residency, the Human Genetic Unit ‘adopted’ Broughton High School, giving scientists at the Human Genetic Unit the opportunity to engage with the wider community and communicate their research, whilst the pupils from the school had the opportunity to attend seminars, workshops, mini conferences and to see some cutting edge research happening within the vicinity of their school (Hennell, 2007).