Top tips for interprofessional education and collaborative practice research: A guide for students and early career researchers.

Veronica O'Carroll[1], Melissa Owens[2], Michael Sy[3], Alla El-Awaisi[4], Andreas Xyrichis[5], Jacqueline Leigh[6], Shobhana Nagraj[7], Marion Huber[8], Maggie Hutchings[9], Angus McFadyen[10]

Abstract

Interprofessional research within the contexts of education and health and social care practice has grown exponentially within the past three decades. To maintain the momentum of high-quality research, it is important that early career researchers embarking on their first research journey and new to interprofessional education or interprofessional collaborative practice search, and students undertaking a programme of research, feel supported in making their contribution to the field. This guide, developed by the Centre for the Advancement of Interprofessional Education (CAIPE) Research Group, has been written with these groups in mind who are embarking on their first research journey, and new to the interprofessional field. It aims to raise awareness of academic resources and share practical advice from those who have previously experienced problems when undertaking interprofessional research in education or health and social care practice.

Introduction

Over the past three decades, although interprofessional research has increased (Paradis & Reeves, 2013), there is still some uncertainty related to the tangible impact of interprofessional education (IPE) and collaborative practice (ICP) on healthcare outcomes (Cox et al., 2016). This is likely due to the complexities with study design, the types of research questions needing to be asked, and the quality of research undertaken (Gilbert, 2013, Institute of Medicine, 2015; Reeves et al., 2017). As the drive for more effective ICP is reinforced globally (World Health Organisation, 2010), there is an increased need for more rigorous research to evidence the impact on healthcare outcomes (Reeves et al., 2017).

Members of the Centre for the Advancement of Interprofessional Education (CAIPE) research group have written this guide to aid students and early career researchers embarking on their first research journey and new to IPE/ICP research. The CAIPE research group includes research students, service users, researchers with varied experiences, and educators and practitioners from different professions and countries. In formulating this guide, we have considered factors that may be helpful to know based on our own queries, quandaries, and experiences. We have been inspired by other helpful resources for researching IPE (Anderson, 2016; Green et al., 2015; Khalili et al., 2019; Reeves et al., 2015; Reeves & Barr, 2016). In our paper, we focus on broad principles to guide those working independently or as part of a team of researchers. Throughout this guide, we use the term interprofessional research to refer to both IPE and ICP research.

Who is in your research team?

Interprofessional collaborative research practice is considered a domain of team science where multiple disciplines and professions undertake research collaboratively to create new knowledge (Little et al, 2017). The principles of team science can be helpful when considering membership of the research team, their individual contributions and areas of expertise, and in managing team dynamics (Conn et al., 2019). Professional imbalances in healthcare teams and particularly the historically dominant position of the physician has previously been discussed (Reeves, MacMillan & Van Soeren, 2010). Similarly, power imbalances could occur in interprofessional research, between different professionals, disciplines, or between students and research supervisors. All parties need to be aware of the negative impact that this can have on team dynamics and the outcomes of the research.

Enabling service users and informal caregivers to play a greater role in the planning and delivery of care has been considered as one way of addressing power imbalances (Coulter, 2002). Involving service users and informal caregivers in IPE inevitably followed, as a means of ensuring they remained at the centre of the interprofessional team (Barr, et al., 2016; Rhodes, 2012). It is now recognised that service users and informal caregivers should be actively involved in health and social care research, thus ensuring research is conducted *with* them rather than *on* them (Neale et al., 2017). They can be involved in different ways, but we would advocate full involvement as part of the research team. They can provide valuable and unique contributions; ensuring the research focus and outcomes are truly relevant to those they

3

are attempting to serve; considering ethical implications; and helping provide important perspectives that may have otherwise been missed.

As a research student, you may be required to work independently, by necessity of your programme of study, on a research project with a supervisor who may or may not be an expert in interprofessional research. The addition of a co-supervisor or an advisor with IPE/ICP subject knowledge can work well by bringing a combined set of expertise to the supervisory team. Internationally, we see the increase in forums and organisations promoting IPE/ICP who encourage student engagement through involvement with student-led activities. The CAIPE student committee have previously hosted Twitter chats to generate discussion and debate related to interprofessional research (@CAIPEUK, 2018). Conferences and seminars often encourage student delegates to network via student-led or student-focused sessions dedicated to sharing and disseminating interprofessional research in progress.

Identifying the research gaps

As IPE research has grown, it has become easier to identify and draw on a wealth of resources. For example, various frameworks can help with identifying research and evaluation priorities and objectives (Cooke, 2005; Suter et al., 2011). The modified Kirkpatrick Framework (Barr et al., 2005) is frequently used to help frame education-focused evaluation studies. Reviewing current systematic reviews and meta-analyses related to effects and impact of IPE/ICP can be helpful in tracking the research gaps and areas where the evidence has grown (Reeves et al., 2013; Reeves et al., 2016; Reeves et al., 2018). Additionally, the recommendations and gaps identified by national and international organisations can serve as a compass to important and

pressing research questions. For example, the United Nations Development Programme (2015) 2030*Sustainable Development Goals* presents opportunities for interprofessional research to secure better health and wellbeing for all.

Identifying sources of funding

Although not all research undertakings necessitate funding, having tangible funds can maximize the potential of your interprofessional research. Funding specifically targeted at IPE/ICP research is limited and therefore requires researchers to optimise the existing funding opportunities. To maximise opportunities, instead of searching specifically for IPE/ICP related funding, consider the place that interprofessional research has within the themes and categories often proposed by funders. For example, quality and efficiency of healthcare and well-being is a common theme in funding associated with global health challenges.   The impact of ICP in a global crisis such as COVID-19, pose opportunities for creative IPE/ICP research proposals.

Research funding bodies now often require that service users and informal caregivers must be actively involved in research projects before any applications are considered (Rose, 2015).   In recent years, public engagement in the planning, development, and delivery of research has gained momentum, with the United Kingdom (UK) being at the forefront of this movement (Rose, 2015). In the UK, researchers are encouraged to follow a set of standards, created by the organisation 'INVOLVE' (2019; invo.org.uk); a government-funded organisation, which aims to support improved involvement of service users and informal caregivers in health and social care research and thereby ensure its relevance.

Formulating the research question and focus

Collecting empirical data is but one aspect of the research process and doing this outside a sound research plan or design is a common pitfall among interprofessional scholars. From the outset, a clear research question, aim, and study objectives can help frame and guide the direction of your research design and methodological approach (Doody & Bailey, 2016; Robson, 2011). Be clear and consistent with the terminology used, depending on the interprofessional foci. For example, consider if the IPE initiative is truly interprofessional, multiprofessional, or a form of shared learning. The range of definitions formulated by Reeves, Lewin et al., (2010), Barr and Low (2013), and Khalili et al. (2019) can be helpful to determine this focus. For ICP research, consider whether you intend to study collaboration, coordination, networking, or teamwork (Dow et al., 2017; Reeves et al., 2018). Reeves, Lewin et al's., (2010) typologies of interprofessional teamwork may be helpful for determining the design and purpose of the team under study.

Choosing your research method

Choose your research methods wisely, depending on what you want your interprofessional research to achieve in relation to your research question. Effectiveness questions are best answered by quantitative designs (Creswell, 2014), and there are a range of tools to quantitatively measure outcomes of IPE and ICP that are evolving in response to appraisals of their validity and reliability (Oates & Davidson, 2015). When numerical scales are used to collect data, they must either have well-documented psychometric properties supporting their validity and reliability or studying

their psychometric properties should be part of your study proposal. In-house instruments are often un-supported by evidence even if items have been extracted from instruments with good psychometric properties. Changing the number of items, their wording or language or even their order can invalidate psychometric properties. Spending time to think through different options, reading other approaches, and using tried-and-tested techniques often lead to stronger research.

Understanding, experience, and implementation questions are best approached through qualitative research (Creswell, 2014). There are a wide range of data collection methods commonly used in qualitative research, including focus group interviews, semi-structured interviews, and observations (first-hand or through alternative mediums such as video clips, photographs, or written text), with a reflexive diary generally used to capture thoughts and observations throughout the data collection process.

Mixed methods are becoming increasingly desired in interprofessional research due to the complex nature of interprofessional foci and the need for more breadth and depth of evidence to support the impact on healthcare outcomes (Institute of Medicine, 2015; Khalili et al., 2019; Reeves et al., 2015;). There have long-since been calls for IP research to move away from simply evaluating IPE to a greater focus on positive health outcomes (e.g., Lutfiyya et al., 2016).

Finding the right theory to inform the research

A common pitfall in interprofessional research is that underpinning theory is often not made explicit. Theory can be grand like interactionism, middle range like social categorization, or micro based on a hypothesised model specific to particular projects. Theory can be used early in the research process to help focus the research question

and design, or later to help with the analysis and discussion of findings. A wide range of theories relevant to interprofessional research are discussed and helpfully signposted by Anderson (2016); Hean et al.(2009); Hean et al.(2013); Hean et al., (2018). O'Leary and Boland (2020); Reeves and Hean (2013); and Suter et al. (2013).

Research teams may choose an emancipatory approach to their research. The dominant position of the physician can negatively influence power relationships within interprofessional teams (Reeves et al., 2010). Equally, it has been found to have an impact on IPE activities, resulting in the 'othering' of some students (Fealy, 2005). Emancipatory research may, therefore, be one theory which is particularly relevant to IPE and ICP. It offers a means of addressing the influence of medical dominance, achieving a non-hierarchical, level, professional field (Haddara & Lingard, 2013), and valuing the contribution of service users and informal caregivers (Rose, 2015).

Research ethics

When conducting interprofessional research, ethical approval may be required from more than one institutional review board (IRB) before commencing data collection. For example, IPE research with different health professions' faculties from different universities may require approval from each of the universities' IRBs. Some IRBs require the outcome from the other to reach a decision. Similarly, ICP research in a practice setting may need approval from the university-based IRB and also from the practice setting where data collection is planned. The ethics approval process can be time consuming but think ahead, allow time for ethics approvals in your project timeline, and engage with IRBs early for advice and guidance.

8

Data collection

Collecting data in an academic and practice setting can be challenging for IPE/ICP research. IPE research in either setting may depend on established and sustained IPE already running or alternatively may require the researcher to incorporate an IPE intervention into their study design. For ICP research, access to health or social care settings, recruitment of practitioners as study participants, and sustaining this sample can be problematic due to transient working conditions and the need to prioritise delivery of care. This can pose challenges for longitudinal IP research such as following an interprofessional team over a period of time. The initial sample of participants may deplete as participants move between departments or organisations. Gaining permission and support from line managers to access staff for study recruitment and data collection is essential. Ensure that your participants are contactable and that you are too if data collection plans have to change. Be prepared to be flexible to adapt to their availability. The practice setting poses challenges, but recent developments also bring new opportunities. The increase in digital health systems provides an opportunity to use large data sets from electronic health records or mobile health applications as another data source for measuring the impact of IPE or ICP on care delivery.

Data analysis

With quantitative research, the collection process is intertwined with the analysis, and therefore methods of statistical analysis need to be decided prior to data collection. One of the main reasons interprofessional studies and peer-reviewed papers are rejected is the use of inappropriate statistical methods. This is often due to a piecemeal approach taken when a more comprehensive method should have been used, such as

multiple *t*-tests when, a *k*-factor ANOVA was required. Another common mistake is to use parametric tests, ignoring their underlying assumption of a normal distribution for the data (e.g., *t*-tests, Pearson's correlation, ANOVA) or homoscedasticity of the variance.

Similarly, with qualitative research, the processes applied should be rigourous and trustworthy (Elo et al., 2014). It is important to use an identified analytical framework, appropriate to the methodology you have used. Ideally, your research team will also be involved in this part of the research process, with two or more members of different professions independently analyzing the data and comparing results. In interprofessional research, the context, culture, political landscape, and biases embedded in the data need to be considered, to ensure sound interpretation and to understand what contributes to effective IPE/ICP.

Dissemination of findings

Although social media and online platforms, are increasingly being used as a quick way of sharing works in progress or completed projects, presenting research at conferences or via journal publication are common ways to disseminate research findings or progress. Presenting your research can provide the assurance that your work really matters and can be a valuable stepping-stone to publication (Vogel et al., 2019). In health or social care conferences, there is increased opportunity to provide sessions devoted to interprofessional-related themes, where research can be shared and disseminated. To ensure a targeted reception of your intended audience, consider in advance which conferences fit with your research goals.   For journal publications, a

journal or author name estimator (e.g., , http://jane.biosemantics.org/) can be valuable to use for an automated assessment of what potential journals fit your work.

Conclusion

This guide has identified key considerations, collated from the CAIPE Research Group. Although there is a growing body of work to guide and influence rigorous and robust interprofessional research, this guide serves to compliment this prior work and share tips and considerations to assist early career researchers and students through their interprofessional research journey.

References

Anderson, E. (2016). Evaluating interprofessional education: An important step to improving practice and influencing policy. J*ournal of Taibah University Medical Sciences, 11*(6), 571-578. doi.org/10.1016/j.jtumed.2016.08.012

Barr, H., Gray, R., Helme, M., Low, H., & Reeves, S. (2016). Steering the development of interprofessional education. *Journal of Interprofessional Care, 30*(5), 549-552

Barr, H., Koppel, I., Reeves, S., Hammick, M., & Freeth, D. (2005). *Effective interprofessional education: Assumption, argument and evidence*. Blackwell.

Barr, H., & Low, H. (2013). *Introducing interprofessional education*. CAIPE: Available from www.caipe.org.uk.

CAIPEUK (2018, August 18). Good evening all, welcome to Augusts #CAIPEchat. tonight we will be discussing Interprofessional research. Please take a moment to introduce yourself and let us know your here. Don't forget to use the #CAIPEchat hashtag in all your tweets. [Twitter post]. Available from https://twitter.com/CAIPEUK/status/1035225644412624896

Conn, V., McCarthy, A. M., Cohen, M. Z., Anderson, C. M., Kilion, C., DeVon, H.A., Topp, R., Fahrenwald, N.L., Herrick, L. M., Benefield, L.E., Smith, C. E., Jefferson, U.T., & Anderson, E. (2019). Pearls and pitfalls of team science, *Western Journal of Nursing Research*, *41*(6), 920-940

Cooke, J. (2005). A framework to evaluate research capacity building in health care. *BMC Family Practice*, *(6),* 44. doi:10.1186/1471-2296-6-44

Coulter, A. (2002). After Bristol: Putting patients at the centre, *British Medical Journal* *324*(16), 648–651

Cox, M., Cuff, P., Brandt, B., Reeves. S., & Zierler. B. (2016) Measuring the impact of interprofessional education on collaborative practice and patient outcomes, *Journal of Interprofessional Care*, *30*(1),1-3. doi:10.3109/13561820.2015.1111052

Creswell, J.W. (2014). *Research design: Qualitative, quantitative and mixed methods approaches* (4th ed.). Sage

Doody, O., & Bailey, M. E. (2016). Setting a research question, aim and objective. *Nurse Researcher*, *23*(4), 19-23. doi:10.7748/nr.23.4.19.s5.

Dow, A., Zhu, X., Sewell, D., Banas, C., Mishra, V., & Tu, S-P. (2017). Teamwork on the rocks: Rethinking interprofessional practice as networking. *Journal of Interprofessional Care*, *31*(6) 677–678. doi: 10.1080/13561820.2017.1344048

Elo, S., Kääriäinen, M., Kanste, O., Pölkki, T., Ultriainen, K., & Kyngäs, H. (2014). Qualitative content analysis: A focus on trustworthiness. *SAGE Open*, 4(1),1–10.

Fealy, G.M. (2005). Sharing the experience: Interdisciplinary education and shared learning. *Nurse Education in Practice 5* (6), 317-319

Gilbert, J. H. (2013). Interprofessional - Education, learning, practice and care. *Journal of Interprofessional Care*, *27* (4), 283-285, doi: 10.3109/13561820.2012.75580727:283285

Green, C., Anderson, L., Joseph, S., McFadyen, A., & Reeves, S. (2015) Expanding interprofessional research in the United Kingdom: A new national research

Group. *Journal of Interprofessional Care*, *29* (5), 407-408. doi:
10.3109/13561820.2015.1081803

Haddara,W., & Lingard,L. (2013). Are we all on the same page? A discourse analysis
of interprofessional collaboration. *Academic Medicine*, *88*(10), 1509-1515

Hean, S., Anderson, E., Bainbridge, L., Clark, P. G., Craddock, D. Doucet, S.,
Hammick, M., Mpofu, R., O'Halloran, C., Pitt, R., & Oandasan, I. (2013) IN-2-
THEORY – Interprofessional theory, scholarship and collaboration: A community
of practice, *Journal of Interprofessional Care*, *27*(1), 88-90,
doi:10.3109/13561820.2012.743979

Hean, S., Craddock, D., & O'Halloran, C. (2009). Learning theories and
interprofessional education: A user's guide. *Learning in Health and Social Care*,
8 (4), 250-262. doi:10.1111/j.1473-6861.2009.00227.x

Hean, S., Green, C., Anderson, E., Morris, D., John, C., Pitt, R., & O'Halloran, C.
(2018). The contribution of theory to the design, delivery, and evaluation of
interprofessional curricula: BEME Guide No. 49, *Medical Teacher*, *40* (6), 542-
558. doi:10.1080/0142159X.2018.1432851

Institute of Medicine. (2015). Board on Global Health; Committee on Measuring the
Impact of Interprofessional Education on Collaborative Practice and Patient
Outcomes. *Improving research methodologies*. National Academies Press (US).
Available from: https://www.ncbi.nlm.nih.gov/books/NBK338354/

Involve. (2019). UK Standards for Public Involvement: Better public involvement for
better health and social care research. Available from

https://www.invo.org.uk/wp-content/uploads/2019/11/UK-standards-for-public-involvement-v6.pdf/

Khalili, H., Thistlethwaite, J., El-Awaisi, A., Pfeifl e, A., Gilbert, J., Lising, D., MacMillan, K., Maxwell, B., Grymonpre, R., Rodrigues, F., Snyman, S., & Xyrichis, A. (2019). Guidance on global interprofessional education and collaborative practice research: Discussion paper. A joint publication by InterprofessionalResearch.Global, & Interprofessional.Global. Avaliable from www.research.interprofessional.global

Little, M. M., St Hill, C. A., Ware, K.B., Swanoski, M. T., Chapman, S. A., Lutfiyya, M, N., & Cerra, F.B. (2017). Team science as interprofessional collaborative research practice: A systematic review of the science of team science literature. *Journal of Investigative Medicine*, *65* (1) 15–22. doi:10.1136/jim-2016-000216

Lutfiyya, M.N., Brandt, B., Delaney, C., Pechacek, J., & Cerra, F. (2016). Setting a research agenda for interprofessional education and collaborative practice in the context of United States health system reform, *Journal of Interprofessional Care*, *30*(1), 7-14

Neale, J. Bouteloup, A. Getty, M. Hogan, C. Lennon, P. McCusker, M., & Strang, J. (2017). Why we should conduct research in collaboration with people who use alcohol and other drugs. Editorial. *Addiction*, *112* (12) 2084-2085

Oates, M., & Davidson, M. (2015). A Critical appraisal of instruments to measure outcomes of interprofessional education. *Medical Education*, *49* (4), 386–398. doi:10.1111/medu.12681

O'Leary, N. & Boland, P. (2020) Organization and system theories in interprofessional

    research: A scoping review, *Journal of Interprofessional Care, 34*(1), 11-19. doi:

    10.1080/13561820.2019.1632815

Paradis, E., & Reeves, S. (2013). Key trends in interprofessional research: A

    macrosociological analysis from 1970 to 2010. *Journal of Interprofessional Care*,

    27(2), 113–122. doi: 10.3109/13561820.2012.719943

Reeves, S., & Barr, H. (2016). Twelve steps to evaluating interprofessional education.

    Journal of Taibah University Medical Sciences, *11*(6), 601-605.

    doi.org/10.1016/j.jtumed.2016.10.012

Reeves, S., Boet, S., Zierler, B., & Kitto, S. (2015). Interprofessional Education and

    Practice Guide No. 3: Evaluating Interprofessional Education. *Journal of*

    Interprofessional Care, *29* (4), 305-312. doi:10.3109/13561820.2014.1003637.

Reeves, S., Fletcher, S., Barr, H., Birch, I., Boet, S., Davies, N., McFadyen, A., Rivera,

    J., & Kitto, S. (2016). A BEME systematic review of the effects of

    interprofessional education: BEME Guide No. 39, *Medical Teacher*, *38* (7), 656-

    668. doi: 10.3109/0142159X.2016.1173663

Reeves, S., & Hean, S. (2013). Why we need theory to help us better understand the

    nature of interprofessional education, practice and care, *Journal of*

    Interprofessional Care, *27*(1), 1-3, doi: 10.3109/13561820.2013.751293

Reeves, S., Lewin, S., Espin, S., & Zwarenstein, M. (2010). *Interprofessional teamwork*

    for health and social care. Blackwell-Wiley.

Reeves, S., MacMillan, K., & Van Soeren, M. (2010). Leadership of interprofessional health and social care teams: A socio-historical analysis, *Journal of Nurse Management*, *18 (3)*, 258-264

Reeves, S., Pelone, F., Harrison, R., Goldman., J., & Zwarenstein, M. (2017). Interprofessional collaboration to improve professional practice and healthcare outcomes. Cochrane Database of Systematic Reviews 2017, Issue 6. Art. No.: CD000072. doi: 10.1002/14651858.CD000072.pub3.

Reeves, S., Perrier, L., Goldman, J., Freeth, D., & Zwarenstein, M. (2013). Interprofessional education: Effects on professional practice and healthcare outcomes. *Cochrane Database of Systematic Reviews*, 3(CD002213). doi: 10.1002/14651858.CD002213.pub3

Reeves, S., Xyrichis, A., & Zwarenstein, M. (2018) Teamwork, collaboration, coordination, and networking: Why we need to distinguish between different types of interprofessional practice, *Journal of Interprofessional Care*, *32*(1), 1-3, doi: 10.1080/13561820.2017.1400150

Rhodes, C. (2012). User involvement in health and social care education: A concept analysis. *Nurse Education Today*, *32*(2),185-189.

Robson, C. (2011). *Real world research*. (3rd ed.). John Wiley & Sons Ltd.

Rose, D. (2015). The contemporary state of service-user-led research, *Lancet Psychiatry*, *2* (11) 959-960

Suter, E., Goldman, J., Martimianakis, T., Chatalalsingh, C., Dematteo, D. J., & Reeves, S. (2013). The use of systems and organizational theories in the

interprofessional field: Findings from a scoping review. *Journal of Interprofessional Care*, *27*(1), 57–64. doi:10.3109/13561820.2012.739670

Suter, E., Lait, J., Macdonald, L., Wener, P., Law, R., Khalili, H., & McCarthy, P.L. (2011). Strategic approach to building research capacity in inter-professional education and collaboration. *Healthcare Quarterly*, *14*(2), 54-60. doi: 10.12927/hcq.2013.22381

United Nations Development Programme. (2015). *Sustainable development goals*. Available from: https://www.undp.org/content/undp/en/home/sustainable-development-goals.html

Vogel, M. T., Abu-Rish Blakeney, E.,Willgerodt, M. A., Odegard, P. S., Johnson, E. .L., Shrader, S., Liner, D., Dyer, C. A., Hall, L. W., & Zierler, B. (2019). Interprofessional education and practice guide: interprofessional team writing to promote dissemination of interprofessional education scholarship and products, *Journal of Interprofessional Care*, *33*(5), 406-413, doi:10.1080/13561820.2018.1538111

World Health Organisation. (2010). *Framework for action on interprofessional education and collaborative practice*. Author. Available from http://www.who.int/hrh/nursing_midwifery/en/.