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Integrative Reviewing for exploring complex phenomena

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- **Integrative Reviews go beyond traditional boundaries of systematic reviewing by welcoming experts as valid sources of evidence and as providers of continuous data collection and synthesis**
- **Development of a robust Integrative Review (IR) protocol is crucial for preserving confidence in the process and quality assurance**
- **IRs are characterised by an underpinning positivist ontology, acknowledging that certain sources of evidence can be treated as real; yet IR furthers that position by acknowledging that such reality is socially constructed, thus allowing a more fluid epistemology to emerge, more aligned to a post-positivist perspective. This aligns IR processes with a Critical Realism tradition**

The desire to provide evidence of developments in policy and practice has supported a wider range of methods to systematically review the work of others. Victor (2008) contends that systematic reviewing can be categorised as: traditional, extended or integrative, with Integrative Reviews (IRs) being the most iterative and flexible. While all of these methods aim to synthesise research findings into a 'coherent whole' (Cooper 1982: 291), IR is distinctive; set apart by use of varied data sources, comprising both empirical and theoretical literature and a combination of data from diverse research designs, rather than assuming that these designs are mutually exclusive. The scope and design of traditional (in clinical medicine) and extended (in social sciences) reviews have been well documented elsewhere (see Cochrane Collaboration, Campbell Collaboration and Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI-Centre) for databases of examples). The focus of this *Update* is on IR and its application in social research.

Underpinning Principles of Integrative Reviewing

Cooper (1982: 297) noted that IRs 'interpret data using inexplicit rules of inference', but this dated overview failed to include detail on the IR method or the challenges of combining diverse data sources. Whittemore and Knafl (2005)

provide an updated discussion of the intricacies of IR as a rigorous process for analysis and synthesis. They outline the following stages:

1.*Problem Identification*—providing clear identification of the problem, purpose of the review and variables, to provide focus and clear boundaries.

2.*Literature Search*—creating a well-defined and documented search strategy (search terms, databases used, varied search strategies, and inclusion and exclusion criteria) acknowledging limitations.

3.*Data Evaluation*—whilst there is no prescribed way to evaluate the quality of data sources in an IR, the approach should be guided by the types of sources used and carried out using a transparent and fully articulated quality assurance process in alignment with recognised and established protocols.

4.*Data Analysis*—using constant comparison methods (data reduction, display, comparison, conclusion and verification) to extract themes, patterns and relationships that form the basis of conclusions.

5.*Presentation*—of generated conclusions clearly linked to evidence, including explicit identification of limitations and reflections on the review process.

The advantages and disadvantages of IRs have been documented by Victor (2008) and compared with alternative reviewing methods. IRs developed initially within health and behavioural sciences are now used to evaluate evidence within an increasing range of subject areas, including social policy. This *Update* considers the wider application of this approach, in recognition of the limitations of positivist research reviews ('what works?') and the demand for realistic evaluations of "what works, for whom and in what circumstances?" (Porter, 2007:4).

IRs have the ability to provide deeper and more sophisticated conclusions through the potential richness of sampling frames (Whittemore, 2005) and can be used to identify gaps and conceptual frameworks (Cooper 1982). The method needs to provide a vigorous defence of threats to validity, including potential for over-ambitious scope, ineffective sampling (in IRs not all sources can be reviewed) and inaccurate conclusions or bias in the research process; mirroring those criticisms often attributed to qualitative or mixed methods research. Whittemore & Knafl's (2005) process, outlined above, provides a rigorous and transparent approach for researchers to quality assure their work. As Victor (2008) argues, the inclusion of researchers' expertise and judgement, alongside that of others, increases the overall validity of the review process through an iterative and interpretivist process of appraisal (Austen et al. 2016). The combination of varied data sources, research designs and contrasting epistemological and ontological foundations that is characteristic of IR is its strength and can yield valid and robust research.

Philosophical Origins of Integrative Review

The philosophical foundations of the IR process align closely with the perspective underpinning Critical Realism. Jones-Devitt and Smith (2007) note that Critical Realism emerged in the latter half of the 20th Century through dissatisfaction with two dominant world view perspectives within which research is conducted: the positivist perspective and the post-positivist (interpretivist). Critical Realism is an approach that borrows from both, combining a realist ontology concerning the nature of being and a relativist epistemology of how knowledge is constructed (McEvoy and Richards, 2003). Critical realists reject post-positivist notions of radical relativism—in which all truths are 'real' and thus equally valid—whilst recognising the fallibility of a positivist perspective in which 'absolutes' about observable scientific certainty are accepted while taking minimal account of the conceptual frameworks in which scientists operate. IR mirrors this view in being dissatisfied with processes of inquiry taken solely from either perspective. In alignment with Critical Realism, IR takes elements of rigour from the positivist systematic review process whilst recognising that subjective post-positivistic interpretations of meaning can be legitimate forms of evidence, especially when investigating emerging or contested concepts.

Table 1 illustrates how common components of Critical Realism—adapted from the critique of McEvoy and Richards (2003)—can be used effectively within IR to produce a feasible, yet robust, alternative to both positivistic and post-positivistic forms of inquiry. The table attests to the importance of developing a detailed protocol for all IRs. Complexities, recognition and synthesis of contrasting types of evidence, weights given to different kinds of explanation and in-built processes of continuous iteration need to form the basis of all IRs.

A Practical Application of Integrative Review

An example of the application of IR is a project that applied IR methodology to assess a range of literature and approaches about the infrastructure and strategies that would support the effective use of technology enabled learning (TEL) in UK universities (Austen et al. 2016). It was anticipated that good practice guidelines for developing digitally-capable teaching excellence would be established as an outcome of the project through a process of identifying and synthesising available literature and via continuous evaluation by wider expert reference groups.

Table 1. Alignment of Integrative Review with Critical Realism

Critical Realism component utilised in IR	Explanation	Integrative Review application
Searching for generative mechanisms	Below the surface processes that contribute to what is seen as 'real' in appearance. Mechanisms may not be directly observable but still real as effects emerge at the surface.	Recognises that whilst the synthesised literature can be classed as 'real', the collation of expert opinion (within the context of a robust protocol) is vital in developing understanding of emerging concepts which can then be surfaced.
Stratified nature of natural and social worlds	Physical reality is mediated by socio-cultural construction at macro, meso and micro levels of experience.	Recognises that whilst there will be a body of evidence about a subject or concept that can be documented, there will be a wider reality concerning how the concept or evidence is viewed, dependent on the socially constructed world of the viewer; hence, the need for an integration of evidence sources within the established protocol.
Interplay between social structures and humans	Tensions exist between material and behavioural explanations of lived experience. Material structures enable or inhibit individual behaviours yet human behaviour is not fixed immutably or predictively dependent solely on structures.	Recognises that effective inquiry needs to straddle the dichotomy between material and behavioural explanations. IR protocols address these tensions by applying agreed Weight of Evidence indicators to found artefacts.
Critiquing existing social order	Adopting a one-dimensional socio-political critique to aspects of inquiry will not provide the fullest account of the phenomena(on) under investigation	Recognises that pragmatic pluralism is desirable. IR protocol development and all agreed underpinning processes start from the basis of examining complexity and finding resources and opinions that can be refined and agreed as part of an iterative and continuous process.

Development of the protocol is the first and most crucial stage of an IR and represents the 'Problem Identification Stage' outlined by Whittemore and Knafl (2005). The protocol details each phase of the review process and outlines when and how expert stakeholders should be consulted. The Digital capability and teaching excellence IR followed protocol guidelines developed by the Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI 2017) which include the following mechanisms:

• *Internal Review Appraisal*—An 'Internal Digital Capability Steering Group' was selected, including colleagues at the host university (Sheffield Hallam University) who had expertise in both learning and teaching and digital technology. This group provided critical commentary throughout the research process in face to face meetings.

• *External Review Appraisal*—An 'External Digital Capability Steering Group' was selected, including external expert stakeholders, chosen to bring a diverse range of perspectives throughout the scoping exercise. This group provided additional critical commentary and sector-wide relevance throughout the process via virtual meetings. (Both groups were advised of the ethical parameters of their involvement, and formally consented to use of their input as data).

• *Quality Assurance*—Two lead researchers applied inclusion and exclusion criteria independently and then compared for consistency at interim periods during data collection, including reflections on a pilot search. At the pilot search stage, a third researcher added an additional layer of moderation to augment confidence in the robustness of the process.

• *Maintaining Database Records*—When each search was conducted, records were stored on a shared document and two Data Custodians were appointed from within the research team.

• *Data Management*—References for each search were recorded using RefWorks. This included full lists of all hits before inclusion and exclusion criteria were applied.

In the development of the Review protocol, internal and external steering groups were established to make key decisions regarding the process and operationalisation of the research question. One of the first decisions concerned definitions of the two key terms 'teaching excellence' and 'digital capability'. These terms have similar characteristics—both are fluid, temporal and contested—and each has gained prominence within Higher Education debates. An IR approach is apposite in researching emerging concepts; in particular, having an opportunity to develop and refine terms in collaboration with identified sector experts allowed the research team to agree on definitions with sector-wide relevance. There is a dearth of evidence concerning the term 'teaching excellence' and this term yields scant material under strict SR criteria; hence we would have reported that there were no or minimal findings if we had been using a standard systematic review. This experience supports Whittemore and Knafl (2005: 548) who suggest

that IRs have 'the potential to result in a comprehensive portrayal of complex concepts' and counters earlier work of Dixon Woods et al. (2004) who contend that IRs should be used when concepts are already well-established.

Following appraisal by both steering groups, the Review protocol was finalised and a comprehensive scoping, piloting and internal moderation of the search terms was undertaken, as per the 'Literature Search Stage' identified by Whittemore and Knafl (2005). Steering groups were then consulted to refine search terms and provide guidance on appropriate databases. There was also substantial discussion about the types of artefacts deemed appropriate for the review process and which inclusion and exclusion criteria ought to be applied.

Inclusion and exclusion criteria were applied to all searches and a final database of included literature was analysed according to principles of the 'Weight of Evidence' (WoE) model (EPPI) aligning with the 'Data Evaluation Stage' identified by Whittemore and Knafl (2005). WoE assesses:

- Trustworthiness of results judged by the quality of the study within the accepted norms for undertaking the type of research used in the study (methodological quality)
- Appropriateness of study design for addressing the review's research question (methodological relevance)
- Appropriateness of focus of the research for answering review questions (topic relevance)
- Judgement of overall weight of evidence based on assessments made for each of these criteria.

Initial searches yielded 1,818 pieces of literature. Thirty-four were included in the final sample and formed the evidence base for the findings.

The IR method has been particularly effective in generating reach on publication due to the commitment from Steering Group members who are well-placed to disseminate and advocate for this work. Continuous communication and engagement with a group of chosen and supportive sector experts has increased the quality of the review and produced significant opportunities to disseminate, collaborate and influence sector discussions. Whilst beneficial, the assurance of ethical protocols should be carefully managed, especially if governed by a funder. The recognition of expert opinion as valid sources of evidence, along with the experts' signposting to key artefacts, has influenced all stages of the process. This richness of data and resultant outcomes would not have been achieved by relying solely on traditional forms of synthesising evidence.

Conclusion

The sovereignty of traditional systematic reviewing can be challenged when needing to build theory from emergent and contested areas. The IR process provides a feasible alternative if considering mechanisms for exploring emerging concepts or contentious issues. The added value of enhanced reach, both while outcomes are emerging and at the final dissemination stage, makes IR a very powerful research tool.

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