

Solutions to Exercises

Solution for Chapter 2 Exercise 2-1

We have placed two reviews on related topics side by side and have briefly listed the differences between the two reviews (Turner & Muller, 2005, w137) (Pirzadeh, 2010, w154). Both our reviews examine aspects of human factors in successful project management. The first is a conventional or traditional review of project manager's leadership style. The second is a systematic literature review on human factors in software development.

Conventional or traditional review	Systematic Review
No details of database sources used to identify studies	Four databases used and listed
No details of number of included studies	Clear accounting of studies included/excluded at each stage with reasons
No details of methods used	Detailed description of all methods
No categorisation of studies by type	Taxonomies used to group studies
Narrative commentary of individual study features	Data extraction used to identify shared study features
Individual studies loosely grouped under subheadings	Model or framework used for presentation of studies
No definitive conclusion –subjective identification of research gaps	Specific identification of research gaps linked to review findings etc
etc.....	etc.....

Solution for Chapter 2 Exercise 2-2 How systematic is that review?

Performing X in Y: a structured review of the literature.

Abstract

{Two brief sentences of Background}. A literature search was conducted across {list of Databases and Internet sources} of studies that evaluated X^A. Information on the type of activity, sample and setting, endpoints, and study design were extracted. Studies were classified based on a modification of the {Hypothetical Worthy} model^C. Four categories of activity were identified: actor, decision support, involvement and systems^C. The search strategy and selection criteria yielded 21 articles^A. Eleven studies used an actor activity; of these, eight also employed a systems activity, and one also used an involvement activity^C. Two studies used a decision support activity, seven used an involvement activity, and one used a systems intervention^C. The overall quality of research was uneven in several areas: research design—nine studies were quasi-experimental in nature, endpoint measures were not consistent—three did not perform statistical analysis, and sample characteristics varied dramatically^B. In conclusion, the number of high-quality studies of X remains limited^B. Methodological limitations include measurement of an inappropriate surrogate measure when measurement of an endpoint would be more valid^D. Further research is needed to understand how each type of activity improves the quality of performing X in a Y setting^D.

A: Search - The authors list the databases and sources they have used. They also indicate the presence of selection criteria which provide an explicit means of deciding which studies will or will not be included.

B: Appraisal - The authors indicate that a process of quality assessment was undertaken. They looked at such elements as the research design, the statistical analysis and the characteristics of the sample. As a result they are able to conclude that there are a limited number of “high-quality studies”.

C: Synthesis - To enable synthesis (identification of patterns across studies) the authors use an existing {Hypothetical Worthy} model. In addition they identify their

own categories of activities across studies (actor, decision support, involvement and systems). Both these approaches enable the reader to look across a body of studies rather than only engage at the level of individual studies.

D: Analysis – As a result of conducting the review and synthesis the authors are able to identify shared methodological limitations and gaps in the research base.

General Presentation – The title, although not specific to a particular type of review indicates that a structured approach has been undertaken by the authors. It is noticeable that **all four SALSA characteristics (A-D) are present** in the Abstract indicating the high likelihood of use of structured approaches.

Solution (Worked Example) for Chapter 4 Apply what you have learnt 4-2

Protocol: *Impact of School Library Services On Achievement And Learning* (w203)

What are the key databases and sources within Information Studies/Education (the most relevant disciplines for the topic)?:

- ERIC (w079)
- British Education Index
- Education Abstracts
- LISA including Current Research in Library and Information Science
- Information Science Abstracts (ISA)
- Library Literature

What methodological documentation does the author cite that may be of value in my own review?:

The critical appraisal framework (General Teaching Council for England) referenced may be of use, with possible adaptation.

What does the way that the review protocol is organised and presented tell you about the quantity and quality of the literature available?

The protocol gives the impression that literature relating to this topic is vast and crosses multiple disciplines. There seems to be a range of quality – ranging from high to unknown. There is also a need to adopt supplementary methods to database searching such as reference list checking, hand-searching and contact with experts due to the diversity of the topic fields.

Solution for Chapter 5 Exercise 1

Database	Concept	Thesaurus Term
ASSIA	neighbourhood watch	Neighbourhood watch schemes
	lifelong learning	Continuing education
	foster care	Foster care (consider using narrower terms if appropriate)
ERIC (w079)	computer based learning	Computer Assisted Instruction
	english as a foreign language	English (Second Language)
	peer harassment	Bullying
LISA	outreach librarian	Outreach services
	information retrieval	Information Retrieval thesaurus term is very broad, consider using narrower term(s)
	Dewey	Dewey Decimal Classification
MEDLINE (w131)	Prozac	Fluoxetine
	Shingles	Herpes Zoster
	cost effectiveness	Cost-Benefit Analysis

Solution for Chapter 5 Exercise 5-2

1. This is a very comprehensive search using nearly all the search techniques discussed so far. The author has searched a large number of databases across different disciplines. However, the author has also used several other methods to identify evidence such as contact with experts in the field and reference list checking. These approaches are particularly useful in this instance since they allow identification of evidence not indexed or abstracted well in electronic databases, and thus not picked up by the literature search. Such problems are well documented in the social sciences (Petticrew & Roberts 2006). Overall, the approach used reduces the likelihood that relevant studies will be missed in this review.

2. As this was a comprehensive search involving multiple search techniques, this approach will have been very time-intensive for the one author of this review. The approach used also identified a significant number of references - over 11,000- but only 11 studies were judged as relevant to the review question. That represents a large number of references to go through for a very small return!

3. Think about:

- how the disciplines covered by each of the databases searched in the case study may be relevant or irrelevant to your own topic.
- which techniques might be most important to your area. For example, if studies in your topic area generally have poor abstracts or are inconsistently indexed in electronic databases, you might want to focus on spending more time using other techniques such as contacting experts or citation searching, rather than searching every database that may have some relevance for your review.

Solution for Chapter 5 Exercise 5-3: Research Question A

- Note that the outcome of “adverse health effects” was not included – this was because using the population (school children) and exposure (electromagnetic fields) and the context of school location was focused enough – there were 8 references found in the search.

- This search makes use of both subject searching and free-text searching. Note that there are several synonyms used for the “location” concept.
- This search uses Boolean logic successfully, by combining like concepts (e.g. synonyms) with OR and different concepts (e.g. population and intervention terms) with AND. Truncation (\$) has been used where appropriate.

Solution for Chapter 5 Exercise 5-3: Research Question B

- This search strategy utilises thesaurus terms and free text terms for each concept (e.g. the population of primary school children, the intervention of ICT in maths, and the outcome of problem solving). Again, appropriate synonyms are used – particularly note the different terminology to describe the population and the use of acronyms and full definition regarding ICT.

Solution for Chapter 5 Exercise 5-3: Research Question C

- Note this search only uses free-text searching. This is because Web of Knowledge does not have any functions for thesaurus searching. The search makes good use of truncation (*) and synonyms, particularly for the concept of “cars” and the outcomes (benefits to society). Note that the outcomes have been specifically defined – examples of financial and environmental benefits. This is a good idea as studies are more likely to focus on (and therefore name) specific outcomes, rather than benefits to society as a whole concept.

Solution for Chapter 5 Exercise 5-3: Research Question D

- This search uses both thesaurus searching and free-text searching for the population (stroke patients) and the intervention (early hospital discharge). Note that two relevant thesaurus terms have been found for the intervention – “stroke patient” ; “stroke”. In addition note that the thesaurus term for the intervention is “hospital discharge” – although this is a broader concept than “early discharge” it is likely that any studies about early discharge would be indexed with this heading. This search makes use of a search filter (steps 9-40) to limit the search to systematic reviews only. Note the effect this had on the number of results retrieved

- without the filter 1,925 references were found (step 8). By using the filter a much more manageable 46 references were found (step 41).

Solution for Chapter 6, Exercise 6-1: Study scenario

1) Selection bias- well-behaved children

Recall bias- can the children accurately recall their pre-study test score? Will the children be truthful about their pre-study test score?!

Investigator bias- might the teacher want the outcome of the study to go in a particular direction?

2) Small sample size

Confounding factors: We are told very little about the children that took part and there are likely to be confounding factors that might influence the results, for example consider the following pre-study test score on weekly maths test, parental help with maths homework.

Incentive- ICT intervention is a reward for good behaviour

Solution to Chapter 10 Exercise 10-1 Problem Solving Scenarios

Scenario	Problem	Strategies
<p>Scenario A: Too wide scope [Adebola]</p>	<p>Problems of too wide a scope may largely be anticipated by detailed attention to the techniques described in Chapter 4. Adebola’s original review question has all the characteristics of a Background question i.e. it has no definition of population, exposures or outcomes. Adebola’s approach has been overly inclusive.</p>	<p>Adebola must make some difficult decisions about review priorities. It would be helpful to gain as much advice as possible both from experts and from the literature. If the decision is to keep the review broad then selection of either a “review of reviews” approach or conducting a mapping review (without detailed quality assessment) may help achieve review objectives. Alternatively a sampling approach (e.g. of selected common conditions for particular populations) may maximise variability sampling and allow some generalisations. If the decision is to narrow the scope then Adebola will need to specify elements of the PICOS formulation.</p>
<p>Scenario B: Too narrow scope [Sonja]</p>	<p>Again problems of too narrow a scope may be anticipated by detailed attention to techniques in Chapter 4. Whereas in the past a reviewer was encouraged to set the scope of the review in a protocol and not to explore the literature too extensively because of the threat of bias pragmatic considerations have tended to take precedence. Data mining software such as</p>	<p>Further room for manoeuvre is offered by favouring a question-driven review rather than a literature driven review. In other words the protocol can be written saying that the reviewer will drill down within the literature until a suitable quantity and type of studies can be identified to answer the question under consideration. This protects against an “empty review” – frustrating enough within the</p>

	<p>PubMed Reminer (See Chapter 4) allows the reviewer to obtain a good feel for the quantity and quality of the literature in a proposed topic (w159). Generally this problem reflects premature resolution of the review protocol. It may therefore require reopening discussions on the protocol or, possibly, renegotiation with the commissioners of the review.</p>	<p>context of the [g]Cochrane Collaboration but even more so for the reviewer undertaking a literature review for their Doctorate or Masters Dissertation! Sonja will also find it helpful to leave one aspect of the [g]PICOS question deliberately broad, at least initially. e.g. to look for a programme or intervention within all contexts or populations or to consider all outcomes. She can then narrow down her scope in the light of feedback.</p>
<p>Scenario C: Scope Creep [Sanjay]</p>	<p>Scope creep is often a major problem for all types of review, particularly systematic reviews (See Chapter 4). Most strategies for tackling scope creep are preventative rather than remedial i.e. they are best put in place before the issue arises. A reviewer can never have an accurate picture of exactly how many included studies exist in your topic. It is unlikely that the inclusion criteria will anticipate all contingencies in advance of study identification. Subject experts, although invaluable for the interpretation and application of review results, invariably wish to extend the original scope of a review.</p>	<p>A clearly defined focused question, recorded in the review plan or protocol, provides a reference point for Sanjay to check his bearings. Similarly it is important to gain agreement in advance regarding whether the review will be restricted to a particular study type or whether a “best evidence” approach will be used. The former criterion prevents inclusion of lower quality study designs. If a best evidence approach is used it may be helpful to devise a drill-down strategy i.e. to search first for higher quality designs and, only if these are not forthcoming, to then expand to other study types. The trade-off is inconvenience of repeated iterations of the literature search phase versus inordinate time</p>

	<p>Incidentally subject experts typically underestimate numbers of studies in a topic area, mainly because they base this assessment on their personalised information strategies and not on a comprehensive review of all sources. A reviewer/review team should treat with caution advice along the lines of “it won't be worth checking resource X” or “you won't find any studies in resource Y”. It is always best to validate such opinions through systematic searching, both to enhance the rigour of review methods and to pre-empt possible criticism once the review is published.</p>	<p>processing low quality evidence. If, subsequently, a subject expert suggests expansion of scope this can be handled in one of two ways; first Sanjay can refer to the formally agreed record of scope in the review protocol or second Sanjay must make sure not to agree an on-the-spot expansion of scope. Instead he should suggest that he will go away to explore the implications of such a change, perhaps through additional scoping searches. He can then return with recommendations for amendments to the protocol.</p>
<p>Scenario D: Going over Time [Eloise]</p>	<p>This is quite a late stage at which to identify this problem. Regular monitoring of the project against the sample timescales given in Chapter 3 would have signalled this problem earlier giving Eloise more flexibility. It is important to establish whether the review has turned out to be larger than intended or whether this is simply the result of inefficient personnel or poor review management.</p>	<p>If the review turns out to be larger than expected (or in the event of some unforeseeable personnel problem) it may be possible to enlist the support of the funders in obtaining a no-cost extension. However the potential impact on the review team reputation must not be underestimated. Funders typically expect you to absorb such problems within your own resources. A review of the budget will reveal whether there is scope to bring in extra support. The parent organisation</p>

		<p>may be willing to subsidise the project in the interests of reputation management. Eloise can also look at compromising review process quality e.g. extracting data direct to tables, using single reviewers, performing rapid quality appraisal etcetera. She could also look at strategies to undertake interim analysis to correctly identify likely conclusions and, consequently, priorities for what remains of the review timescale.</p>
<p>Scenario E: Going over Budget [Sandra]</p>	<p>Sandra seems to be working from the assumption that expenditure on the review is equally distributed throughout the project. This may be true for staffing, although activity tends to build in intensity as the review progresses, but this will not be the case for consumables. This may still be an actual problem, not merely a perceived one, and the project may be going over-budget, in which case other problem-solving strategies will be required.</p>	<p>Much review expenditure, for example, purchase of software, interlibrary loans, photocopying and bibliographic database fees will occur early in the review timetable. Sandra should map expenditure against the review timetable. She should also explore the proportion of included articles that have already been obtained. If the review is actually going over budget then she could look at substitution of cheaper research personnel (under supervision) for more expensive staff and possible reductions in some processes requiring double reviewer input.</p>
<p>Scenario F Methodological Problems [Tomas]</p>	<p>With so many different types of literature review to choose from it is increasingly difficult for a supervisor to possess the</p>	<p>Key strategies will involve identifying sources of the missing expertise. First, is this expertise available within the organisation on</p>

	<p>complete skill set. Increasingly supervision is a “team game” – not simply within the immediate supervisory panel but also in accessing occasional external expertise as and when required. Tomas and his supervisor have not anticipated a specific need for methodological support. The specific scenario relates to qualitative evidence synthesis but could equally concern meta-analysis or some other type of methodological expertise.</p>	<p>an <i>ad hoc</i> basis? Several review organisations offer specific training events. However their timing may not coincide with a specific training need. Discussion lists exist for qualitative evidence synthesis, meta-analysis and other review topics and methodology groups associated with initiatives such as the Cochrane and Campbell Collaborations are often willing to provide succinct and focused advice. A starting point may be to narrow down the range of possible options from general overviews on synthesis techniques and to then address a specific question in an email to a pre-identified methodology expert.</p>
<p>Scenario G: Communication Challenges [James]</p>	<p>The ease of sending (and ignoring!) email messages often masks some of the communication challenges facing any multi-centre project. It is clear from James’ own words that this frustration has escalated, fuelled by lack of contact. While the symptoms relate to complete lack of communication it is not possible to exactly ascertain from the information given what the exact problem may be (i.e. why the team members are not</p>	<p>Looking beyond the immediate symptoms of non-reply to email there seems to be a need to clarify team roles and responsibilities as well as shared expectations from the review process. Frequently a review proposal broadly assigns team roles, often with percentages of time or an allocation of days, without specifying the nature of input. James could firstly check that the previous email communications have been clear in specifying actions expected with clear deadlines. It is often difficult for</p>

	replying).	<p>review team members to schedule input for non-specific tasks particularly when involved in multiple projects. James could telephone each member of the team to clarify roles and expectations and to help diagnose any specific problems. However it seems that, as this is a shared problem, it would be timely to set up a teleconference, or possibly a face-to-face meeting given the proximity, to discuss roles. This could include a discussion on “rewards” from involvement in terms of potential publications, enhanced profile and increased prestige.</p>
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