1.4.1 Vocabulary for the Introduction

1. ESTABLISHING SIGNIFICANCE

(a) basic issue	economically important
(a) central problem	(has) focused (on)
(a) challenging area	for a number of years
(a) classic feature	for many years
(a) common issue	frequent(ly)
(a) considerable number	generally
(a) crucial issue	(has been) extensively studied
(a) current problem	importance/important
(a) dramatic increase	many
(an) essential element	most
(a) fundamental issue	much study in recent years
(a) growth in popularity	nowadays
(an) increasing number	numerous investigations
(an) interesting field	of great concern
(a) key technique	of growing interest
(a) leading cause (of)	often
(a) major issue	one of the best-known
(a) popular method	over the past ten years
(a) powerful tool/method	play a key role (in)
(a) profitable technology	play a major part (in)
(a) range (of)	possible benefits
(a) rapid rise	potential applications
(a) remarkable variety	recent decades
(a) significant increase	recent(ly)
(a) striking feature	today
(a) useful method	traditional(ly)
(a) vital aspect	typical(ly)
(a) worthwhile study	usually

(an) advantage	well-documented
attracted much attention	well-known
benefit/beneficial	widely recognised
commercial interest	widespread
during the past two decades	worthwhile

Here are some examples of how these are used:

- A **major current focus** in population management is how to ensure sustainability of…
- **Numerous experiments have established that** ionising radiation causes…
- Low-dose responses to radiation have **generated considerable recent research interest**.
- Analysis of change in the transportation sector is **vital** for two **important** reasons: …
- PDA accounts for **over 95%** of all pancreatic cancers.
- **It is generally accepted that** joints in steel frames operate in a semi-rigid fashion.
- Nanocrystalline oxide films **are attracting widespread interest** in fields such as…
- **The importance of** strength anisotropy has been demonstrated by…
- Convection heat transfer phenomena **play an important role in** the development of…
- For **more than 100 years** researchers have been observing the stress-strain behaviour of…
- **Much research in recent years has focused on** carbon nanotubes.

2. VERBS USED IN THE LITERATURE REVIEW TO PRESENT PREVIOUS AND/OR CURRENT RESEARCH AND CONTRIBUTIONS

achieve	develop	obtain
address	discover	overcome
adopt	discuss	perform
analyse	enhance	point out
apply	establish	predict
argue	estimate	present
assume	evaluate	produce
attempt	examine	propose
calculate	explain	prove
categorise	explore	provide
carry out	extend	publish
choose	find	put forward
claim	focus on	realise
classify	formulate	recognise
collect	generate	recommend
compare	identify	record
concentrate (on)	illustrate	report
conclude	implement	reveal
conduct	imply	revise
confirm	improve	review
consider	incorporate	show
construct	indicate	simulate
correlate	interpret	solve
deal with	introduce	state
debate	investigate	study
define	measure	support
demonstrate	model	suggest
describe	monitor	test
design	note	undertake
detect	observe	use
determine	prefer	utilise

Here are some examples of how these are used:

- This phenomenon **was demonstrated** by…
- In their study, expanded T-cells **were found** in…
- Initial attempts **focused on identifying** the cause of…
- Weather severity **has been shown to**…
- Early data **was interpreted** in the study by…
- The algorithm **has been proposed** for these applications…
- The results on pair dispersion **were reported in**…
- Their study **suggested** a possible cause for…
- An alternative approach **was developed** by…

Note: You can recycle these verbs at the end of the Introduction when you say what you plan to do in your paper (see **4** below)

3. GAP/QUESTION/PROBLEM/CRITICISM

This is often signalled by words such as however, although, while, nevertheless, despite, but.

ambiguous	(the) absence of
computationally demanding	(an) alternative approach
confused	(a) challenge
deficient	(a) defect
doubtful	(a) difficulty
expensive	(a) disadvantage
false	(a) drawback
far from perfect	(an) error
ill-defined	(a) flaw
impractical	(a) gap in our knowledge
improbable	(a) lack
inaccurate	(a) limitation
inadequate	(a) need for clarification
incapable (of)	(the) next step
incompatible (with)	no correlation (between)
incomplete	(an) obstacle
inconclusive	(a) problem
inconsistent	(a) risk
inconvenient	(a) weakness
incorrect	

ineffective inefficient inferior inflexible insufficient meaningless misleading non-existent not addressed not apparent not dealt with not repeatable not studied not sufficiently + adjective not well understood not/no longer useful of little value over-simplistic poor problematic questionable redundant restricted time-consuming unanswered uncertain unclear uneconomic unfounded unlikely unnecessary unproven unrealistic unresolved unsatisfactory unsolved unsuccessful unsupported	(to be) confined to (to) demand clarification (to) disagree (to) fail to (to) fall short of (to) miscalculate (to) misjudge (to) misunderstand (to) need to re-examine (to) neglect (to) overlook (to) remain unstudied (to) require clarification (to) suffer (from) few studies have... it is necessary to... little evidence is available little work has been done more work is needed there is growing concern there is an urgent need… this is not the case unfortunately

Here are some examples of how these are used:

- **Few researchers have addressed the problem** of…
- **There remains a need for** an efficient method that can…
- However, light scattering techniques have been **largely unsuccessful** to date.
- The high absorbance makes this **an impractical option** in cases where…
- **Unfortunately**, these methods do not always guarantee…
- **An alternative approach** is necessary.
- The function of these proteins **remains unclear**.
- These can be **time-consuming** and are often **technically difficult** to perform.
- **Although** this approach improves performance, it results in **an unacceptable** number of…
- Previous work has focused **only** on…
- However, the experimental configuration was **far from optimal**.

Note: Some of these words/phrases express very strong criticism. A useful exercise is to put an asterisk (*) next to those you think you could use if you were talking about the research of your professor or supervisor. You can also alter them to make them more polite (*i.e.* instead of *unsuccessful*, which is quite a strong criticism, you could write *may not always be completely successful*).

(to) attempt	(is) organised as follows:	(were/are) able to
(to) compare	(is) set out as follows:	accurate/accurately
(to) concentrate (on)	(is/are) presented in detail	effective/effectively
	(our) approach	efficient/efficiently
(to) conclude	(the) present work	excellent results
(to) describe	(this) paper	innovation
(to) discuss	(this) project	new
(to) enable	(this) report	novel method
(to) evaluate	(this) section	powerful
(to) expect	(this) study	practical

4. THE PRESENT WORK

(to) facilitate (to) illustrate (to) improve (to) manage to (to) minimise (to) offer (to) outline (to) predict (to) present (to) propose (to) provide (to) reveal (to) succeed	(this) work begin by/with close attention is paid to here overview	simple straightforward successful valuable
		aim goal intention objective purpose

Here are some examples of how these are used:

- **This paper focuses on**…
- **The purpose of this study is to describe and examine**…
- **In order to** investigate the biological significance…
- **In this paper we present**…
- New correlations were developed with **excellent** results…
- **In the present study** we performed…
- **This paper introduces** a scheme which solves these problems.
- **The approach we have used in this study** aims to…
- **This study** investigated the use of…
- **In this report** we test the hypothesis that…
- **This paper is organised as follows**:…

Note: In a thesis or a very long research paper, you use these to say what each chapter or section will do. Don't rely on one-size-fits-all verbs such as *discuss*; some chapters/sections do not 'discuss' anything, and even if they do, their main purpose may be to *compare* things, *analyse* things or *describe* things rather than to *discuss* them.