

# Presenting and writing up social sciences, STEM, humanities and design research in an inter-disciplinary urban research community

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Effectively communicating research ideas to an academic and non-academic audience in both verbal and written forms is an essential skill for Research Postgraduate (RPg) students. Students are advised to carefully prepare their presentations and writings according to the purposes, expectations and common practices in different settings, e.g. conferences, workshops, candidature confirmation, and thesis submission. This essay aims to assist and inspire RPg students in preparation for the presentation and probation report for MPhil/PhD candidature confirmation and writing up MPhil/PhD theses.

## 1. Choice of topic

- Skip right to the end of these guidance notes and read about ‘significance, rigour and originality’. This is what you are after. Your topic should be able to support three to four years of research that when written up will be regarded as having significance to either academic or end-users or both; is conceptualised and undertaken with academic rigour (that basically means in a way guaranteeing the requisite degree of quality control in knowledge-development); and is original.
- You can arrive at such a topic in many ways: a topical social issue giving rise to questions that have not yet been answered; an insight into an issue generated by the novel application of theory; an idea for a new theory (rare); a question about the unknown end state of a known original state and a known mechanism of change; a question about an unknown cause for an observed outcome with a known mechanism or change; a question about an observed starting and end state but unknown route from one to the other; an idea about transferring a technology or concept from one domain to another; a specific gap in knowledge that you have identified from a literature review, perhaps during your master’s studies or even undergraduate (Professor Ronald Coase won his 1993 Nobel Economics prize for two essays, one which he wrote as an undergraduate in LSE over 50 years earlier).
- It is fine to work on a project that your supervisor is managing. A good STEM or social sciences supervisor should offer you options for working on aspects of his or her research agenda. This should be an attractive option because it gives you a head-start to be working at a globally cutting-edge level; will mean you have access to a wider set of resources; may mean that some of your work at least can be based on data that has already been collected; will mean you have much greater confidence all through your PhD process; and means that you are likely to be able to publish more, earlier and to a wider audience.

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- This typically does not work so well for humanities scholars, but you may well benefit from working in your supervisor's own specialist area as a basis for launching yourself into a related specialism, for example, moving from Republican Chinese architecture (your supervisor's global claim to fame) to the export of Republican Architecture or to Eastern versus Western China Republican architecture. You will hugely benefit from launching yourself from the shoulder of a giant, rather than to choose, for example, to study the impact of Vesuvius on the structure of Roman villas. This would be to squander a potential life-changing and career-building chance. If you want to study early earthquake-resilient buildings, better to study in Italy, Iran or Western China.

## 2. Key components of a MPhil/PhD thesis (items a-h apply to the presentation and probation report for candidature confirmation)

### a. Title

- A good title can grab the attention of your audience immediately.
- Usually comprises an eye-catching main title (avoid jargon) and a concise sub-title encapsulating key elements of your research.
- Note, your title and sub-title does not have to capture all important elements of your research, but it should give a memorable signal to the reader, listener or evaluator about what to expect.

### b. Thesis structure/style/table of content

- Refer to one or two theses in your general field and any you can find that are close to your specific field. But be careful: not all these are good models. They should be but they are not. Ask your supervisor(s) or an academic whose work you are following, to suggest a good thesis to read.

### c. Abstract

- A succinct summary of key components of your report, thesis or presentation
- There are many approaches:
  - One is to try to summarise the thesis in the order it is written – a very concise chapter summary.
  - A second is not so much to summarise the chapters, but the argument. This allows you to, and sometimes demands you to, tell the story in a slightly different way to the chapter order. For example, you may want to summarise the findings first.
  - A third, is to tell a concise story, without trying to comprehensively or systematically summarise. The object here is to impact the reader or listener with compelling narrative. You will be filling in the details in what comes, so why not use the abstract or introductory slide to demonstrate your literary and communicatory prowess? Make an impact that is beyond the academic content. Show how relevant your work is and how smart, creative and confident you are by making an analogy, quoting a literary master-piece, citing history, referencing an idea from a Nobel laureate, sketching a topical problem that your work relates to? You should give some indication of what's in the thesis, particularly its purpose, method and findings, but this

need not be more than a few sentences each if you do the creative part well.

- A fourth, that is a variant of the second and third, is to write a so-called elevator pitch. When an entrepreneur is bidding for venture capital or a novelist is pitching to a literary agent, what is expected is a very concise, pithy summary of the essence of the work or idea. It should be short and punchy enough to be communicated start to finish in a short elevator ride. No-one ever got marked down or failed for their abstract or first slide, so why not be adventurous. The potential gains from doing something more adventurous are greater than the potential losses. In this respect, one caveat: if your thesis or talk or report has serious weaknesses or gaps, you may not want to expose them in this way. They will be that much clearer if you present an elevator pitch – which is why you should always try to keep an elevator pitch updated as you progress through your thesis writing, so that at all times, you are confident that you have a good story to tell. If you do not have a good story to tell, you probably need to switch track a little (or a lot).

#### **d. Introduction:**

- Research background, objectives and significance
- Keep this as short and concise as possible. It is an elaboration of the elevator pitch narrative abstract, but your aim is to unpack this to become more systematic. You are advised not to do what many students feel compelled to do: start with aims, move to objectives, then move to research questions and finally hypotheses. Better to start with the strongest narrative you can devise and then crystallise this into a few simple research questions that can be communicated to intelligent friends from any discipline over dinner. If your method requires you systematically construct testable hypotheses, then these can be elaborated in a methodology chapter.
- Social science and STEM research mostly takes its cue from previously published research (as well as from the basic research question). So an introduction is likely to need a reference to the work you are attempting to advance.
- Humanities research may also seek to expand and reinterpret disciplinary knowledge but is often concerned with filling a gap and introducing a seminal or new line of inquiry into the field and its methods, for example, no one has written an analytical study of modern Western cathedrals before. Some evidencing of the gap should be in the introduction, but it is not quite the same as demonstrating your platform for scientific research.
- Design scholars will need to be clear about the scholarship embedded in their design thesis. This is typically done with reference to gaps in previous scholarship or related subjects and is therefore much like the Humanities approach. But the design-focused research project could be research *on* design, *for* design or *through* design. It may be focused on design method, history, theory, or design evaluation. It is crucial that you understand and make yourself explicit, where the research is placed in your design project. What questions is the research aimed at answering in the design project, issue or process?

**e. Literature review:**

- Approaches to reviewing existing research findings vary by subject, purpose, method and tradition. Some of what has been said under abstract and introduction is obviously relevant.
- Whatever your subject or tradition, you should provide a close-up and expert engagement with international debates on the topic or question that you have in focus. You are now an expert in this specialist field. Absorb it, make it yours, understand its length and depth. As far as you can, narrate it in your own words. Even better, put your own theoretical or logical spin on it.
- You do not have to review all of the fields your study touches upon and for any one, you do not have to provide a comprehensive review of the entire history of the field. The purpose of reviewing past research is at least two-fold: (a) to show that you are a subject expert; and (b) to document what has already been said and discovered about your research question. The very best way to do this is to keep the review as narrow as you possibly can. Here's a good test: when presenting, say two PPT slides of literature review to friends, can they see what relevance these previous studies have to clarifying and shaping your research? If they get lost, then you've probably gone too far or too deep. It is easier to go too far than too deep. Deep is generally good, for a PhD study. Going deep to find out what has been said and discovered about your topic in the past can only improve your own research focus. Going too far back or too broad, is the most common mistake in PhD literature reviews.
- The purpose is to identify the research gap, position your own research in the ongoing debates, and justify your original contributions, be it conceptual, methodological or empirical. The literature review, in this sense is the section of your thesis where you externally validate the topic.
- There are different approaches to reviewing existing research. Here are some of them.
  - (a) An annotated bibliography tends to work well in STEM and some (arguably all) social science theses. This is increasingly slipping into common use in quantitative social science journal papers. Decide on your keyword search terms, do the search, report how many papers have been published. If the trawl is too wide, narrow it. Select the papers that most closely relate to your own (ideally highly cited papers) and then write a descriptive, reflective and, as appropriate, critical summary of these. An effective literature review on the effect of the size and shape of urban green spaces on healthy behaviour and health outcomes, may trawls, for example, 20 good studies on healthy behaviour such as walking and sporting activities and 5 good studies on objectively measured health. Reviewing these in detail will make you an expert on the subject, and identifying very specific gaps will make you aware of weakness and pitfalls in researching this issue and so on.
  - (b) A theory-led literature review can be effective but difficult to pull off well. One version goes like this. Identify a theoretical model that you can argue is efficacious for abstracting your research problem in order to answer your

research question. Or indeed, your research question might be a theoretical or methodological one. Next, you will need to describe, reflect upon and where appropriate critique the theory or theories. Then you review the theories, explaining them, their antecedents and derivatives, strengths and weaknesses, and applying them to your problem.

- (c) A literature review for a humanities thesis might take an approach equivalent to (a) or (b). On the other hand, it may well be more of a wide-ranging review of selected topics that you need to have covered in making your particular critique. For example, if you are critiquing elitism in famous school of modernist Mexican architects, you will want to cite other works that critique elitism in architecture; specifically focus on those critiquing modernist architects or architectural movements; focus further on Latin-influenced architecture; the socialist or Marxist Mexican post WW1 architecture; and then review other commentators on the specific school. Note that approach (c) is much less determined in terms of structure. For this reason, although it works well for humanities, it can make for the very worst style of literature review in a social science thesis, and it is almost never appropriate, on its own, for a STEM thesis.

- Note that these styles and others can be mixed. If you do so, do it carefully and in a way that clearly signals what you are doing and why. For example, in the Mexican architectural thesis, you may feel that you want a short chapter reviewing Latin American inspired artists in general, using for example, a lens of Foucauldian power theory, or indeed through the lens of Marxism. You are very unlikely to want to do both, unless you plan to bring the two theories together as an analytical framework. Another tip: if you want to write a really bad literature review that confuses yourself, your readers and your examiners, try writing a thin review of multiple relevant theories and then selecting one to use in your analysis. This is pointless and misses the point of a literature review, which, unfortunately, is not uncommon.

- Remember: only review what is useful for answering your research question, or defining your knowledge gap, or providing you with thinking tools for your research. If it's not of demonstrable use (as a positive or negative lesson), don't review it.

**f. Conceptual and analytical frameworks or models:**

- These are the skeleton of your research that connects your study with existing literature and glues different elements of your study together;
- A conceptual framework deals with abstract theories/ideas while an analytical framework helps you operationalise your research ideas;
- These two frameworks can be incorporated or presented separately.
- For empirical research in economics/finance, conceptual and analytical frameworks are not commonly used. Yet theories or models that aim to derive hypotheses from underlying assumptions and logic need to be specified.
- The conceptual framework is in fact an abstraction or a model. All intellectual conversations require models. Otherwise we are forever repeating ourselves and

re-describing base-line elements of view of the problem we are studying. A model can be expressed in words; in graphs; in 3D digital; in mathematical equations; in a set of rules; in logic; in predicate calculus logic; in Reverse-Polish logic; in images and sketches; and so on. The power of an abstraction lies in its ability to convey and develop abstract reasoning about some phenomenon or idea or concept in a way that allows the further development, testing, illustration, and perhaps refutation of those ideas. Even if you don't think you are working with a model, you undoubtedly are. The challenge is to articulate it and formalise it in some way. Commit to it. If you can't do that, you probably don't have a PhD thesis in your hands.

- The conceptual framework for your thesis can be presented in alternative ways. The worst option is to bury it in the literature review or not to explicate it at all. One good approach is to have a short chapter or to be incorporated into the research design chapter, usually following the literature review, where you present the abstraction that will guide the remainder of the thesis. If your thesis is heavily theoretical or methodological, you may develop your own model. For example, you have reviewed the empirical studies on China's sub-divided micro-housing phenomenon (for example, giving an annotated bibliographical review of, say, 25 studies that come close your own). Then you present two theories that you will be using in your research: hedonic house price theory and labour-market migration theory. These conceptual models are presented as graphs or perhaps, if you are a skilful writer, in pure text, illustrated by photos or even cartoons, if you wish. Then at the end of this chapter, you might bring these two models together in a simple diagram, or if you are so inclined, a set of equations. This is your own conceptual model that both builds theory and which you use to structure your empirical chapters. Your model is a simple but powerful depiction of how a new style of internal labour migration, of graduates from third-tier Chinese universities in secondary and tertiary cities, is creating a new market in professional class renters for micro-units in the basements and subdivided city centre apartments of Shanghai and other first tier cities.

- For STEM or social science theses, your analytical framework is your analytical strategy. It states how you intend to move from the conceptual framework to investigating the real world. In the above example, it might involve specifying a set of regression models that seek to deconstruct the value placed by different age/job/gender groups on features of micro-homes (number of beds, distance from centre, gender segregation, etc.). You might develop this analytical framework either in your theoretical chapter or in a methodology chapter.

- Analytical frameworks are equally valuable for humanities and design-related research. Having demonstrated your expertise in early-mid 20<sup>th</sup> century Mexican Marxist art and architecture and identified a Foucauldian framework for explaining the influence on Detroit car manufacturing HQ architecture of Diego Rivera's *Detroit Industry Murals* and his expulsion from the Communist Party. How are you then going to implement this research? You need an analytical strategy to turn concepts into something you can observe, document or measure, and you

cannot do this haphazardly. You might employ, among other methods, systematic word analysis from press coverage of the time. This gives you a start in thinking about the analytical framework. Data analysis techniques have a strong influence on analytical strategy. They determine the analytical structure. The other part of an analytical framework or strategy is how to process that structure. So in all research, even qualitative or archival research, there is an analytical structure and analytical algorithm (what you do with that structure).

- In a design project that experiments with ceramic structures extruded from a robotically controlled device, your analytical framework will follow your conceptual framework, however you articulate these. Concepts will involve stability of extruded structure, texture, weathering performance, tessellation geometry, fixture mechanics and materials and so on. These may come together in an elegant set of theories borrowed from analytical geometry, fluid dynamics, ceramic science, structural engineering, and architectural theories of form. Your analytical framework will bring all these together in a way that allows you to systematically produce, analyse, compare and evaluate a set of new designs.

**g. Research questions and hypotheses** (if applicable):

- Research questions could be presented either in the introduction chapter or after the literature review.

- STEM and social science researchers will naturally find themselves working with a research question. If you do not, then you will need find the question(s).

- Science is all about finding answers to unresolved questions. Sometimes more theoretically inclined students find themselves wanting to explore a theoretical issue and do not have clear question to drive the research at the initial stage. That's fine, but the question(s) should be crystallised before long.

- Many humanities and design researchers may not find it so natural to drive their research by a question. Some science-sceptic qualitative social science researchers might fall into this category too, because their works are more closely aligned with arts-humanities rather than social science. In fact, having a clear empirical question to answer (or not) is a good definition of the boundary between social science and arts. Do humanities and design scholars need to formulate a driving research question? Some will say no for ideological or philosophical reasons. Practically speaking, a research question usually makes undertaking and communicating a research project easier and more efficient. "What question are you trying to answer in your research? Well I'm not actually trying to answer any specific." is not the best start to a conversation about your work!

- But here's a warning: if you are not undertaking empirical research in the science mode, do not frame your research question as an empirical question. This is misleading. If you are working on the Mexican artist topic, what kind of research question might help focus, guide and communicate? You might end up with a very empirical study: looking forensically in the details of the architecture of post 1920s Detroit car-maker architecture for signs of communist-inspired mural art. You would need an appropriate conceptual and analytical design protocol to collect, record, 'measure', analyse and summarise your observation of

features. Any number of precise research questions can be imagined to guide this effort. If the research turns into archival historical research the same can be said. What if the research becomes more of a deep dive into the complex influence of Diego Rivera's third wife Frida Kahlo's indigenous Mexican folk art, her 1929 expulsion from the Mexican communist party, and her German cultural roots? Your research is also becoming forensically exciting but you do not need a scientific style research question. The question you are clearly on to is something like: "how did the insurgent Mexican Left manage to subtly infiltrate the Fordist architecture of American establishment?" Perfect. Your research question doubles up as the slimmest of elevator pitches.

- Regardless of the type of research questions, you need to formulate them precisely and concisely to address the research gap you have identified. It will help operationalise your research ideas (turning abstract concepts/theories into concrete questions)

- You should have "why" questions (explanatory and exploratory) in addition to "what" and "how" questions (descriptive). The why questions often make the difference between PhD-level research and something lesser (not always, but often). STEM and social science questions are often both exploratory and explanatory. Arts-Humanities and design research can often be more fundamentally exploratory. A PhD that uncovers how a communist party member ended up on the board of the Ford motor company during the McCarthyist era (and all through architecture!) is exploratory. You started off with a hunch and end up with a novel historical tale. You leave it to someone else's PhD to probe the deeper explanations of the links you have uncovered.

- If you are a social or STEM scientist you may want to propose hypotheses (hypothetical answers to research questions) if applicable. Hypotheses testing is usually applicable to positivist approach, but not interpretivist approach or socio-critical inquiry. If you are using empirically collected data to answer a research question, then it will nearly always be helpful to try formulating specific hypotheses, since this forces sharper thinking. But only present your hypotheses formally if you intend to test them formally. Remember you cannot *prove* a hypothesis. There may always be some other cases that present counter evidence. An exhaustive study of swans in England finding that they are all white does not prove the hypothesis 'All swans are white'. Extend the study to Australia and you find black swans. It is a widely accepted scientific practice (following Karl Popper, who raise the whole black swan issue) to convert a hypothesis (referred to as the alternative hypothesis) into a null hypothesis and then seek to reject it. You can reject a null hypothesis (or fail to reject it). But if you fail to reject it, you cannot conclude that your alternative hypothesis (the one you are really interested in) is 'true' or 'proven'. Only use hypotheses if your data and method allows you to abide by accepted rules of the philosophy of science.

- Case studies are not outside of the scope of the philosophy of scientific discovery. Read Bent Flyvbjerg on the subject. A case study can powerfully reject a hypothesis. In a case study, you find the first black swan and reject the



hypothesis that all swans are white. Case studies also help you identify candidate mechanisms of explanation and candidate hypotheses for testing. They thus help build theory – conceptual frameworks – that can be used to frame new hypotheses to be tested.

#### **h. Data source and methodologies**

- Choices of data collection and methodologies depend on the research paradigm that your study follows (e.g. positivism, interpretivism, socio-critical inquiry, scientific investigation, research by design), and the scope and specific focus.

- Social sciences and humanities research students often collect raw data themselves via qualitative methods, e.g. desktop research, interviews, ethnographic and observational methods, archival work, and/or quantitative survey methods, e.g. self-administered questionnaire survey. STEM and more quantitative social science researchers may be more likely to use data collected by someone else, for example, remote sensing data (un- or pre-processed), longitudinal social surveys, housing transaction data, spatially coded health research cohorts, professionally-organised traffic surveys, social media data and so on. Researchers should specify the data source and present the descriptive statistics, so others could replicate the research if needed.

- Where existing, professionally constructed and managed data sources exist, they may well be a better source than collecting your own data. Their data will be better quality and therefore your research will go further. Only collect your own data if what you want does not exist already – either in sufficient quality, quantity, sample-base or variable specificity. For example, for a study into the relationship between urban design (density, connectivity, green space and mixed use) and mental health, it is far better to utilise data from a massive national study than to collect your own. You will never compete in terms of data quality and statistical power and you will only be able to publish in low-tier journals. Use the national study and your research will be publishable in much more widely-read journals. On the other hand, if you want to test a specific hypotheses about the impact on apartment building height on the mental health of relocated villagers in China, you may want to conduct your own natural-experimental design that interviews and administers a standard mental health interview tool to the population of several adjacent villages who have relocated into diverse housing morphologies. Design and undertake your own sample survey only if your research question demands it, not as a training exercise. A PhD trains you in applying a philosophical mind to your subject. Training in social surveys comes at bachelors and masters level. Of course if you undertake a survey, you will become even more expert, but the foremost goal is shaping up your PhD to get the best data to analyse and philosophise about.

- It is hard to think of a research project that would not benefit from mixed methods. Qualitative research via key-informant interviews, for example, will always improve the quality of a survey-based study. An experimental study of low-cost energy-efficient housing morphology for displaced persons in arid climates may be mainly focusing on understanding shelter morphology and

experimenting with novel forms. But it will only be improved by the addition of ethnographic research (with users, traditional house builders etc.), for example, or an in-situ lab-style experiment that wires up the prototype and monitors performance scientifically.

- Average PhD research limits methodology to the skills the researcher already has, or otherwise feels comfortable with. A good PhD research selects the methods and data that best answer the question. Do this and you can publish and present your work to almost any audience. Do not do this, and you can only disseminate your work to the small community of researchers who also want to limit their enquiries by sticking with just one kind of methodology, technique or approach.

- There are no strictly defined boundaries between different research paradigms and disciplines. Pluralism, multi/inter/trans-disciplinarily and mixed-methods are encouraged, as long as you can justify your originality and contribution. But don't be pluralistic for the sake of it, or because your supervisor has told you to be, or worst of all, to demonstrate some kind of 'fairness' in approach that avoid 'privileging one kind of research over another'. Research is not politics. Research methods are tools for collecting data in pursuit of a research agenda. Pick the most efficacious and powerful for your quest.

**i. Analysis**

- When a STEM researcher writes a bid for research funding, such as to Hong Kong's Research Grant Council (RGC), s/he will typically specify in detail, in advance, the analytical strategy they propose to adopt and justify this right down to the degree of statistical inference power they expect to be able to achieve with the proposed research design. This can also happen in well-structured social science. For example, a political science PhD student planning to poll non-Chinese HK residents on their view of HK's national security law, will be able, under certain assumptions to specify the standard error of the estimate expected from the result, given a certain size. On a bi-polar issue (agree/disagree), political pollers rarely survey more than 2000 subjects to get a margin of error of 2% (i.e. to be able to say that '63% of non-Chinese HK residents are in favour of the new national security law, +/- 2% at 95% certainty, giving a range of 61%-65%). Not all STEM research can be so specific, but since this is what is expected of professional research grants and papers in top scientific journals, this sets a kind of gold standard. A bit like a randomised control trial is the gold standard of STEM research design; but is not always suitable by virtue of the data or the research problem addressed. The point is, it is always good to think in advance about how you plan to analyse your data. The more detailed the analytical plan, the better you can design your data collection stage.

- The arid-zone displaced person architectural research might decide that the morphological research will be analysed by a detailed study of photographs and architectural drawings. Perhaps this involves the development of a novel mix of axonometric projections, ethnographic and structural notes. A new methodology emerges in the process and the result is a systematic way or comparing

performance, function and social acceptance of different morphologies. The ethnographic part of the project will generate photo and textural descriptions and these will be analysed by a mixture of reflective review that pulls out and explores the themes arising in displaced peoples' own conversations about their shelters. The energy-performance research collects data on energy input and output, inside and outside temperature, thermal comfort and household budget for a whole year, for the prototype construction. It will be analysed, perhaps, by constructing a household expenditure and energy budget for the year, and then published as a referenceable case study. Or thermal comfort measures, including twitter-feed data and regularly collected survey question data, might be collected daily and correlated with inside and outside temperature and analysed in a time-series regression model – also presented as a case study.

- Some supervisors are well-published theoreticians. They may encourage you to pursue strongly theoretical interpretations of your research results and make clear linkages with theoretical debates. Critical social or cultural theorists in the humanities and the humanities end of social sciences emphasise theory as a driver. Before you accept this route for your PhD, make sure your supervisor is a leading figure in your application or development of theory. If s/he is, then this can be a good way to publishing academically impactful work. Be wary, however, of spending a lot of time dressing up an empirical research question in high-level theory. It is easy to do this just for the sake of presenting yourself as academic. Theory is to be used to make sense of the complex world. Your analysis might use theories to make sense of social phenomena, to structure a statistical model, or to make connections between one architectural tradition and another. The best theories could be simple and surprise you with the clarity that they cast on a subject, or complex and difficult to follow at first glance but could open up new horizons and renew your understanding at a deeper level once you grasp the essence. If you find yourself on a not-so fruitful path then you should think of retracing your steps to firmer ground with better signposts.

- Analysis, whatever the subject and paradigm, is usually improved by creating an analytical model. Models abstract the core ideas and help you relate them to each other. A table is an analytical model. A simple two-by-two contingency table can be a powerful model for any number of enquiries, for example (yes/no on horizontal and vertical axes). A graphical version of the same, using quadrant analysis, extends this if you have two continuous 'dimensions' in your conceptual framework. A four-quadrant graph of loss vs gain and negative vs. positive value defines one of the most powerful economic concepts of recent times: Prospect Theory. Our own HKU President developed his Potter-esque invisible cloak material by first using a quadrant model to observe that there were not naturally occurring materials that perform in the bottom left quadrant of a graph that plots light refraction against electro-magnetism. He sets about designing an artificial molecule that performed in this quadrant.

- In the arts, analytical structures have been used for millennia. For example, meter in poetry, scales and tonics in music, symmetry in architecture. Analytical

structures tend to allow movement from coarser to finer levels of discussion: a landscape is beautiful or not (categorical verbal analytical device). It has degrees of beauty, measured on a Likert scale (ordinal verbal analytical model). It has continuous degrees of value, measured by willingness-to-pay (\$), implemented by a stated preference or contingent valuation survey analytical structure. A tree is beautiful because of its reflective symmetry (oak in summer or pine), or because of its self-repetitive fractal symmetry (tropical hardwood, or oak in winter).

- Your research will be better, the more you can be explicit about your analytical frameworks. Clear analytical frameworks help link analysis to purpose and theory; they make your work more understandable and replicable; they produce clearer results and more incisive discussion and conclusions.

**j. Results, discussion and conclusions**

- In many social science and humanities projects, it will be difficult to separate results from discussion. If you can do so, it will probably enhance the clarity of the thesis, both for you and your readers. But if this doesn't work, don't try to force it. In quantitative social science and STEM project, one convention is to first present results (e.g. GIS analytical maps, regression or AoV models etc.) in one chapter and then discuss them in another. Another is to present results and then discuss as you go along. This can work just as well.

- Generally speaking, the more exploratory your research, the more you will probably find yourself interweaving results and discussion. If this is the necessary style for you, make sure you are clear in your narrative about when you are presenting empirical observations, analytical results; when you are using other people's results; when you are engaging in your own reflective discussion; and when you are making novel syntheses and conclusions. Explanatory studies may well find it more efficient to first present results and then discuss.

- In the discussion, however it is ordered, you should refer back to the literature review (you are extending an agenda established by others and so you will need to reflect back on what you have been able to add). You may find it necessary to. Introduce new ideas from other researchers, and although you could write these into the literature review, sometimes it is good style to make connections to other ideas as a result of what you have found. If your work challenges something in the established literature, this might merit a whole section of the discussion – a kind of literature reprise on the particular issue.

- Conclusions, like the abstract, can have several styles. Most tedious is a section-by-section summary of what you have written. An overarching narrative approach is a good way of closing down the thesis in a general way but doesn't always effectively convey the most important achievements. A more creative approach is as welcome here as it is in the abstract, although if you do this, unlike the abstract, you must always summarise the main contributions and findings and say why and how they are significant. It is fine to open up the discourse to speculate by the time you have got this far, but make it clear where you are doing this, so you cannot be accused of concluding something without researching it. Conclude about what you have investigated and then speculate if you want to.

## k. References

- Proper referencing is essential in order to avoid plagiarism issues

## 3. Expectations for a MPhil/PhD thesis:

- An original piece of research developed independently under the supervision of experienced researchers (supervisors);
- An in-depth study & critical examination of a specific topic generating new knowledge and meaningful discoveries;
- A comprehensive research project presented in a clear, coherent, logical, and convincing manner;
- Thinking beyond specific cases or phenomena: develop a clear focus on matters that are grounded in specific contexts while contributing to wider theoretical/conceptual, methodological or policy debates;
- Preferably comprising research work of publishable quality in international-refereed journals or conferences.
- What makes a good MPhil/PhD thesis: Originality, Significance, and Rigour (REF 2021, pp35-36)<sup>2</sup>

**Originality** will be understood as the extent to which the output makes an important and innovative contribution to understanding and knowledge in the field. Research outputs that demonstrate originality may do one or more of the following: produce and interpret new empirical findings or new material; engage with new and/or complex problems; develop innovative research methods, methodologies and analytical techniques; show imaginative and creative scope; provide new arguments and/or new forms of expression, formal innovations, interpretations and/or insights; collect and engage with novel types of data; and/or advance theory or the analysis of doctrine, policy or practice, and new forms of expression.

**Significance** will be understood as the extent to which the work has influenced, or has the capacity to influence, knowledge and scholarly thought, or the development and understanding of policy and/or practice.

**Rigour** will be understood as the extent to which the work demonstrates intellectual coherence and integrity, and adopts robust and appropriate concepts, analyses, sources, theories and/or methodologies.’

## 4. Publications

- In HKU FoA we encourage you to be writing and submitting for publication as part of your PhD training, especially for social sciences and STEM researchers.
- Ideally, this should start in your first year of studies, or second year at the latest.
- This does not mean that all students will have published papers before graduating, since publication is to some degree out of your hands.
- You may want to write papers for publication in parallel to writing chapters. Write up the work in two versions – requirements for a chapter and a free-standing

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<sup>2</sup> Source: [https://www.ref.ac.uk/media/1084/ref-2019\\_02-panel-criteria-and-working-methods.pdf](https://www.ref.ac.uk/media/1084/ref-2019_02-panel-criteria-and-working-methods.pdf)

paper are generally different to each other.

- Publishing chapter material with your supervisor(s) and/or including some published works (co-)authored by you in your thesis with clear declaration is fine; as is co-authoring on other papers with your supervisor(s) that may not end up in your thesis. You and your supervisor(s) need to negotiate the balance of time and academic ownership of particular bits of work.
- If you have opportunities to co-author with other students or professors, do so, as long as you preserve time and academic territory for your own work.
- The same applies to joint design work or design criticism. Make sure everyone is clear who has the Intellectual Property Right (IPR) and the claim on being first-named.
- Be selective in the conferences you present at. Don't spend too much time on writing conference papers, unless you are in a field where peer-reviewed conferences are an important dissemination route. Better to present with flexible ideas and use the conference to help refine them and to focus your writing on journal dissemination. The same goes for book chapters. You are advised to prioritise publishing in reputable journals if possible. Only publish your work in an edited book if the editor(s) and publisher are well regarded in your field and you have judged this the best outlet available.

## 5. Time Management

- Make a checklist & timeline for major contents of your thesis and admin/logistic issues;
- Plan well ahead and always budget sufficient time.
- If you can, it saves a lot of time and angst later on if you can draft early chapters in your first two years. A literature review is easier drafted in the first year and refined as you go on.
- Aim to have a viable research project identified and planned out (research questions, conceptual and analytical framework, methodology, data sources etc.) well before the end of the first 12 months.
- The most ambitious might want to plan for securing a book contract and submitting a book version of your thesis before or shortly after graduation.
- Make a separate plan for your paper writing.

## 6. Useful tips

- RPg is a meandering journey, don't be afraid of mistakes—many seminal works start from mistakes.
- Developing skills to navigate the unknown.
- Most of you are expected to conduct your work independently—a certain percentage of collaborative work with clear declaration is acceptable, especially for STEM research.
- You're not alone, be proactive in consulting your supervisors and other professors, and networking with your peers and senior colleagues.
- There is no perfect research— discussing the strengths and limitations of your

research project frankly.

- Developing good writing skills and improve the readability of your thesis with the help of professional copyeditors.
- Using good illustrations and present your work in interesting and stimulating ways if possible.

#### 7. Useful links

- <https://www.gradsch.hku.hk/gradsch/current-students/thesis-submission>
- [https://gsas.harvard.edu/sites/default/files/atoms/files/14th%20FINAL\\_Scholarly%20Pursuits%20Fall%202018.pdf](https://gsas.harvard.edu/sites/default/files/atoms/files/14th%20FINAL_Scholarly%20Pursuits%20Fall%202018.pdf)
- <https://www.imperial.ac.uk/media/imperial-college/medicine/sph/current-student-forms/How-to-write-a-PhD.pdf>

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