

Introduction

Research Grant Proposal Writing: Attaining Essential Quality for Success

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Workshop on Research Grant Proposal Writing: Attaining Essential Quality for Success, Research Clusters, IPPP, University of Malaya, 11 Nov 2020

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Steps in research

1. Identify research topic
2. Initial review of literature
3. Identify research question
4. Continued review of literature
5. Formulation of research question, hypothesis
6. Identify aims and objectives

7. Determine research approach
8. Design research/experimental plan

9. Implement research plan
10. Interpret results
11. Write papers /reports

- Write a proposal
- Seek for funds

Groundwork

Know your field:

- What is the current state-of-the-art
- Who are the top ten researchers
 - What they are doing right now
 - What they consider to be key research issues
 - Where they get their funding

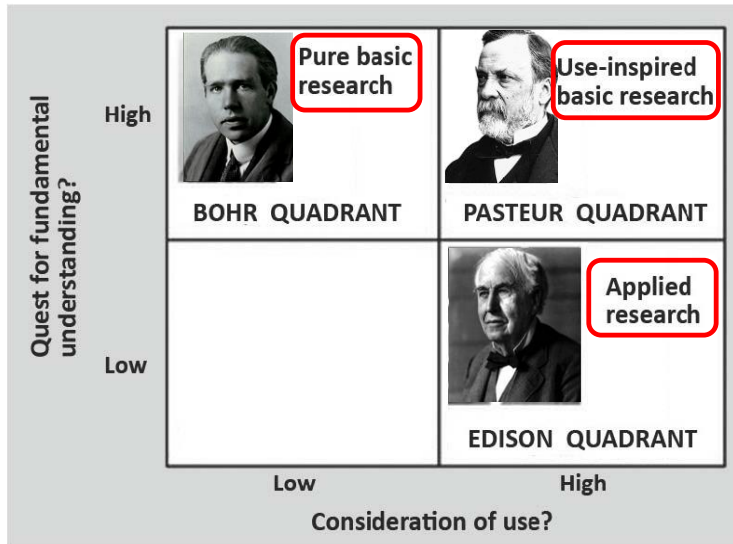
Contents

- Research & Development Spectrum and Research Funding Schemes
- Proposal Evaluation and Audience
- Overview of the Workshop

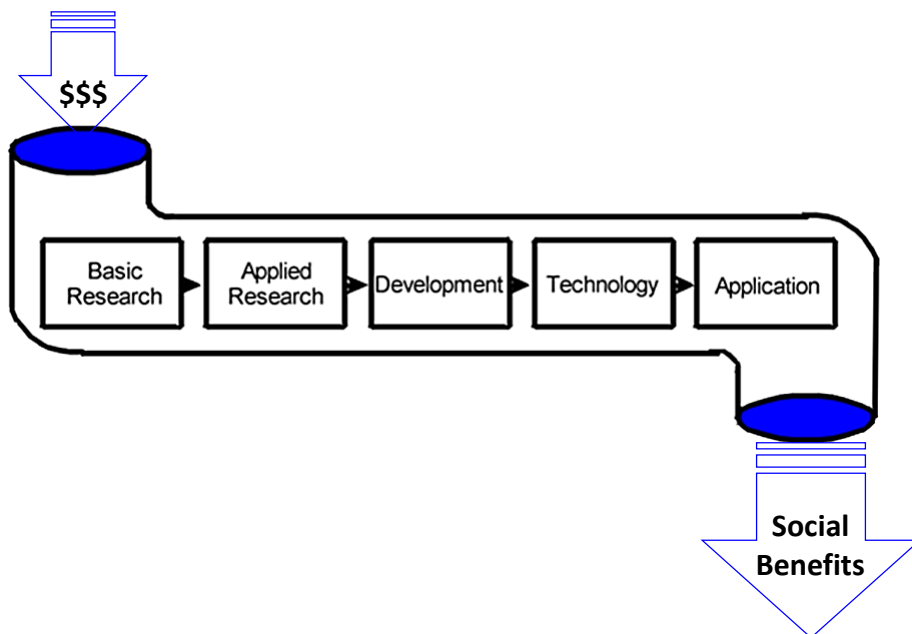
Research and Development

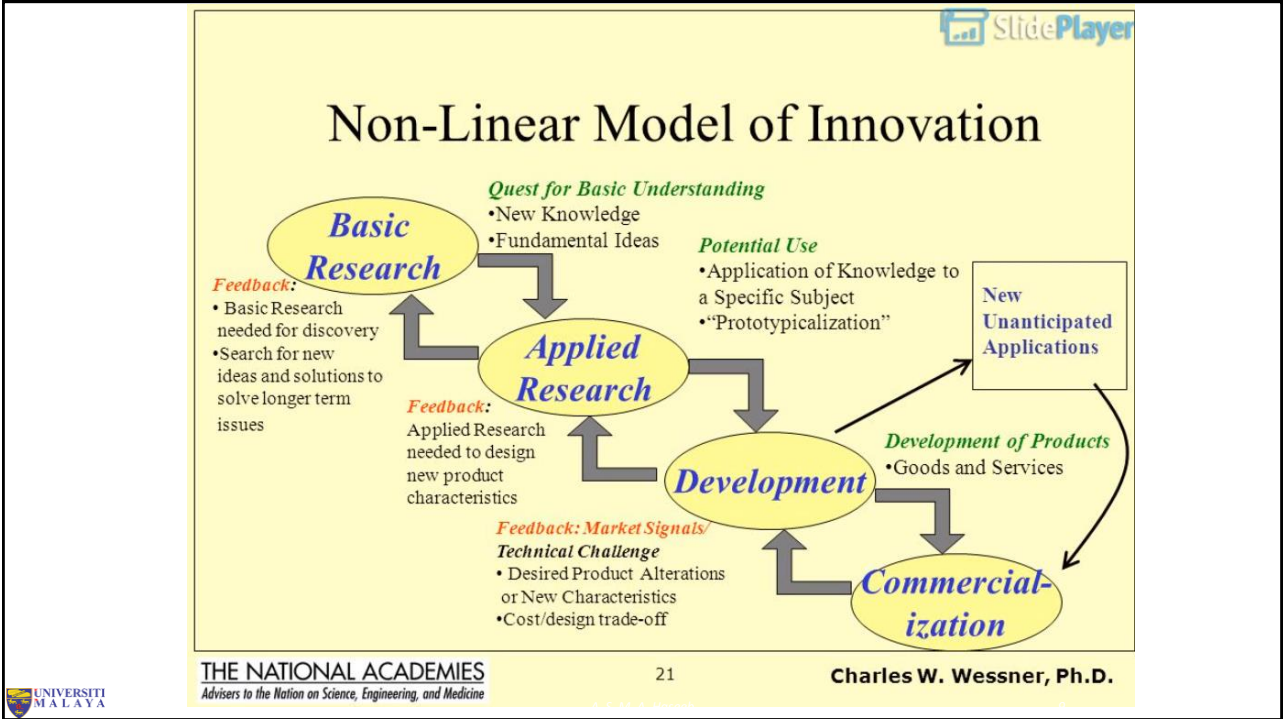
- Research and Development – Covers a wide spectrum
- Defined by technology readiness level
- Identify the stage where your proposal is

Pasteur Quadrant



Linear model of research





Technology Push vs Market Pull

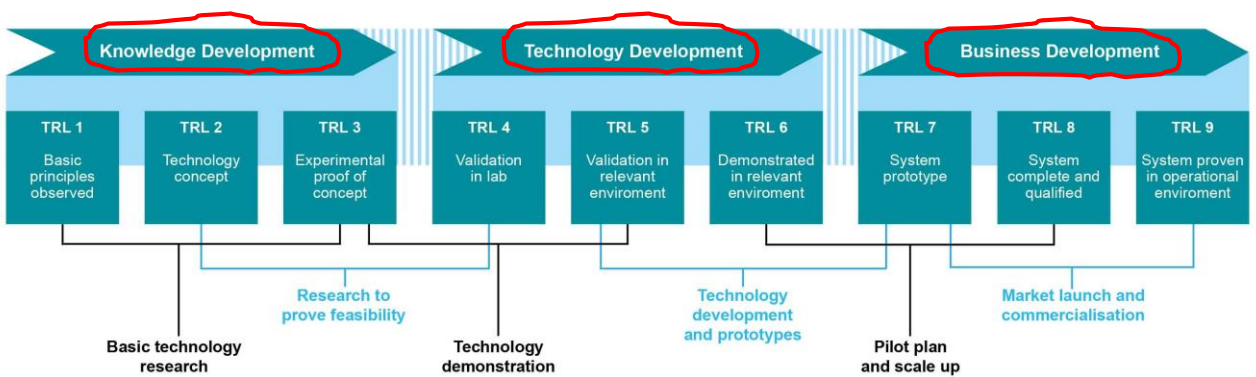
Technology Push (1950/60s)



Market Pull (1970)



Development pathway for new technologies: Technology readiness levels (TRLs)



- If your proposal focuses an artifact/product → probably development
- If it focuses on knowledge → Research



Primary emphasis: Exactly what will your research contribute to knowledge base?

Priority for universities should be to identify research with industry needs, market potential, and to transfer innovation to the marketplace (Bansi, 2012)



Strategic focus of innovation effort
(adapted from Wolson 2007)

Funding schemes

University of Malaya

- IPPP
- IIRG

Ministry of Higher Education (MOHE)

- Fundamental Research Grant Scheme (FRGS)
- Long Term Research Grant Scheme LRGS
- Transdisciplinary Research Grant Scheme TRGS
- Prototype Research Grant Scheme PRGS

Ministry of MESTECC

...

Others...

Fundamental Research Grant Scheme (FRGS)

Scope of Funding

The objective is the development of good quality human capital and encourage the **generation of theories, concepts and new ideas** that can accelerate new discoveries and innovative creations.

Qualification Criteria

1. The research must be able to generate **new ideas/theories/concepts/methods/models/processes**; and
2. The research has to **improve a policy, methodology and existing solution model**; or
3. The research covers humanitarian and community issues with the purpose of increasing the value of life in the country and the world; or
4. The research has a potential to contribute to the country's strategic agenda.

Long Term Research Grant Scheme (LRGS)

Scope of Funding

LRGS is a fundamental research, involving more extensive scope, a long period of time and requires a high commitment. LRGS can *generate theories and new ideas* that advanced in a strategic niche to *expand the boundaries of knowledge*.

Qualification Criteria

1. The research must be a *fundamental research* that is able to produce a theory, new ideas and innovative creations heading towards a strategic niche for the development of frontier knowledge; and
2. The research is able to strengthen excellence and *expand knowledge, especially in cutting edge fields*, specifically the niche that have been identified; and
3. The research covers humanity and community issues with the purpose of increasing the value of life in the country and the world; or
4. The research has a potential to contribute to the country's strategic agenda

Trans-Disciplinary Research Grant Scheme (TRGS)

Scope of Funding

Trans-disciplinary Research Grant Scheme of the Ministry of Education (TRGS-KPM) aims to boost the *generation of theories*, concepts and new ideas that can accelerate new break-through discoveries which surpasses the boundaries of knowledge and innovative creation.

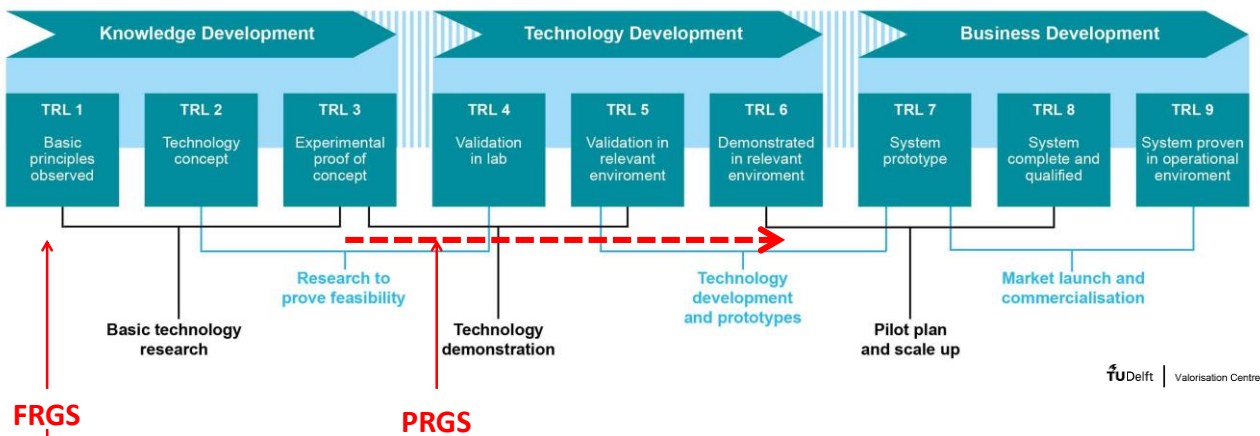
Qualification Criteria

1. The research must be able to generate *new ideas/theories/concepts/methods/models/processes*; and
2. The research has to *improve a policy, methodology and existing solution model*; or
3. The research covers humanitarian and community issues with the purpose of increasing the value of life in the country and the world; or
4. The research has a potential to contribute to the country's strategic agenda.

Prototype Development Research Grant Scheme (PRGS)

The PRGS Research Grant Scheme was established for the development of prototypes for bridging the gaps between laboratory discoveries and research up to pre-commercialization. This includes **proof of concept, evaluation, up-scaling, pre-clinical testing and field testing.**

Development pathway for new technologies: Technology readiness levels (TRLs)



FRGS

PRGS

These words **MUST NOT** be in your objectives → “develop,” “design,” “optimize,” “control,” “manage,” and so on.

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- Research grant application → **highly competitive**
- Number of proposals → much higher than grants available
- Only **top** proposals are funded
- A **lot** of **efforts** are necessary to be at the top

Proposals are evaluated by

- *Peer Reviewers*
- *Funding agency*

Audience of your proposal

- Peer Reviewer
- Funding agency



Write your proposal to satisfy the audience

Funding agency as your audience

- Understand the philosophy/ **expectation** of the funding agency
- Read the funding agency mission/guidelines **very very carefully**
- Look closely at priorities of funding body
- Read the eligibility rules
- Follow strictly the guidelines /instructions



Tailor proposal to meet funder's criteria

Group discussion

1. Do you think you very carefully read funding agencies' guidelines in the past and made a focused effort to strictly follow them ?
2. Can you improve on this in the future ? Share with your group members.

Peer Reviewers as your Audience

- Write proposal not for yourself but for reviewers
- Must convince the reviewers (and of course funding agency)

In simple terms reviewers would want to know:

- What is it about (research objective)?
- How will you do it (approach)?
- Can you do it (you and your facilities)?
- Is it worth doing (intellectual merit and broader impact)?

Reviewers will critically judge your proposal in detail based on funder's criteria

Who are reviewers

Reviewers likely to have mixed background:

- May have general background in your area, but not expert or have depth of knowledge on your topic
- Others may have expert knowledge in your specific topic

You need to satisfy both groups

They work under tight time schedule:

- Have to evaluate tens of proposals in a couple of days
- Exhausted, under pressure

You need to convince reviewers:

- Make proposal so compelling → reviewers get excited
- Persuade reviewers → your ideas are so important that they will give you taxpayers' money
- Anything that makes your proposal difficult to read → work against you

Basic Questions Reviewers Ask

- Intellectual quality and merit of the study?
- Potential impact?
- How novel is the proposal?
- Is hypothesis valid and is presented with supporting evidence ?
- Are aims logical?
- Are procedures appropriate, adequate, and feasible ?
- Are investigators qualified? Their competence, credentials, and experience?
- Are facilities adequate and environment conducive to research?

Make reviewers' job easier: Make them happy

- Do not make reviewers work hard to understand your proposal
- Help reviewers to easily understand : your idea, why it is important, why feasible
- Develop logical sequence → use headings, subheadings for them to follow
- Clearly indicate key elements → not make to them work hard to find answers
- Do not make them: synthesize your ideas, figure out anything for themselves...
- Address all review criteria
- Reviewers will not assume that you know things that you failed to say
- Use plain language → simple, short sentence

Characteristics of a Good Proposal

- Scientifically sound
- Reviewers like it → they understand it, agree with it
- Responsive to mission /guidelines of funding agency → instructions were followed, in terms of **content** and **format**
- Likely to succeed

Elements of success

- Good research ideas
- Spend adequate time to prepare
- Good proposals
- Satisfied reviewers
- Good luck !

“Slot machine” approach does not help

Group discussion

1. Did you put dedicated efforts to satisfy the need of reviewers in the past ?
2. Can you improve on this in the future ? Share with your group members.

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Example from FRGS Detailed proposal of research project

(a) Research background including Hypothesis /Research Questions and Literature Reviews

(b) Objective(s) of the Research

(c) Methodology

Description of Methodology

Flow Chart of Research Activities (Please enclose in the Appendix)

Gantt Chart of Research Activities (Please enclose in the Appendix)

Milestones and Dates

(d) Expected Results/Benefit

Novel theories/New findings/Knowledge

Research Publications

Specific or Potential Applications

Number of PhD and Masters (by research) Students

Topics to be covered in this workshop

- Introduction
- Different sections of a typical research proposal will be discussed in detail:
 - Title
 - Executive summary/abstract
 - Introduction/literature review
 - Research questions, hypothesis, objectives; novelty; significance
 - Research methodology
 - Research planning: activities, Gantt chart, milestones
 - Expected results/benefits
- Useful tips on proposal writing will also be shared