

Disain Riset

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🚦 RISET = RESEARCH

🚦 RISET = RE + SEARCH

🚦 *there is no guaranteed recipe for success at research*



🚦 *Research \neq experiment*

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The strength of the US science is **not** the quality of individual researcher, **nor** the sophistication of equipment and computers, **nor** the availability of research funds, **but** the ability to **aggregate** all of these resources to focus on one problem, study, identify, solve dan then **disaggregate** and move to new target.
The secret is management of science and engineering resources -necessary for high science. (Beemer, 2000)



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~ ~ DESIGN OF RESEARCH :
•necessary for high science
•increase rate of success



Research Design:

"If you don't have the time to do it right, you must have the time to do it over."

- Author unknown



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Anatomi Disain Riset

- Latar belakang : ide/topik/batasan?
- Tujuan dan ukuran keberhasilan (*what is the objective and what constitutes success*)?
- Metodologi : bagaimana melakukannya (*how to proceed*)?
- bagaimana mengetahui bahwa riset telah berjalan dengan baik ~ hasil yang ingin dicapai (*expected results : how to measure progress*)
- *Wrap up* : Signifikansi?

LATAR BELAKANG

Ide/topik dan batasan kegiatan riset

- Ide/topik riset ~ interest periset.
 - *Nothing will keep you going in doing research more than research topic you are passionate about.*
- Belajar dari pengalaman : studi pustaka.
 - *Many "big bosses in the field" have accomplished a great deal and they've completely screwed up. They've had deep insights and they've been unbelievably blind. They've been heroes and cowards. And all of this at the same time.*
 - *What's wrong with them.*
 - basis pustaka yang lemah : topik terlalu lebar, terlalu luas, terlalu kecil, dan *nobody will be able to understand it.*

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LATAR BELAKANG

Ide/topik dan batasan kegiatan riset

- Batasan kegiatan riset :
cut your idea down to a solvable size while keeping it big enough to be interesting.
- Jawab pertanyaan
 - (i) *what's the thesis of your research?*
 - (ii) *what are you trying to show/do/accomplish?*
- *If you don't know where you are going, people won't take you seriously, and, worse, you'll end up wandering around in circles.*

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LATAR BELAKANG

Ide/topik dan batasan kegiatan riset

IDE/TOPIK RISET :

- Paling sulit dan penting dalam riset
- Topik atau ide yang baik :
 - menunjukkan visi periset
 - menunjukkan konsultasi intens dengan literatur mutakhir.
 - memudahkan penyusunan batasan riset

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TUJUAN

~ ukuran keberhasilan

- Kapan riset tersebut selesai?
- Topik riset :
 - memberikan gambaran tentang akhir dari riset yang berhasil.
 - perlu ukuran keberhasilan



Metodologi: how to proceed

- Tata cara melakukan
 -> untuk mencapai tujuan
- Kenali tujuan dengan baik
 -> faktor yang mempengaruhi (pencapaian) tujuan
 -> alternatif pencapaian tujuan
 -> biaya, ketersediaan bahan, dll
 -> plan A, plan B

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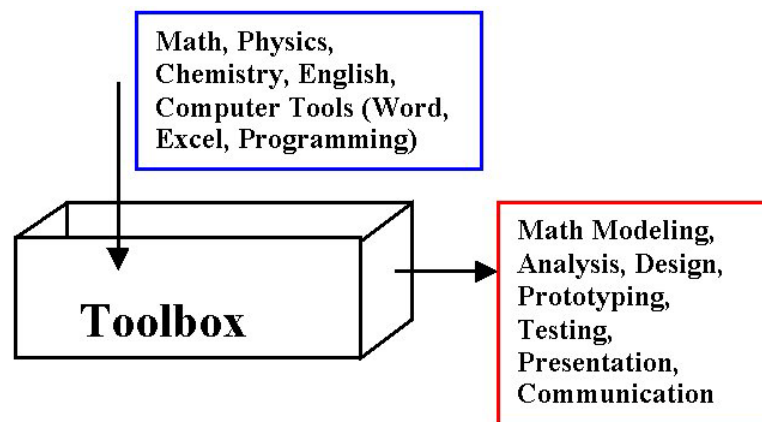
Metodologi: how to proceed

- *Experimental design : teknis*
- Prasyarat :
 - kuasai bidang riset :
"physical/chemical/biological phenomena behind the idea/topic"
 - unsur terpenting : logika dan teori

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Metodologi: how to proceed

- *Experimental design : teknis*
- Prasyarat :



Metodologi: how to proceed

- *Experimental design : teknis*
- Prasyarat :
 - Contoh : "*minimal experimental design*" yang diperlukan, dll.
- "*garbage in garbage out*".
 - *I have one good news and one bad news. The good news is that statistical analysis is now easy to perform. The bad news is that statistical analysis is now easy to perform (Sastroasmoro, 2000)*

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Minimal Experimental Design?

- hati-hati dengan transformasi data
- hati-hati dengan ekstrapolasi
- hati-hati dengan "minimum set of data" yang diperlukan :
 - well established model :
 - kinetika,
 - reologi,
 - dll

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How to measure progress?



- tujuan riset telah tercapai?
 - Kualitatif
 - kuantitatif : will it works and how much it will cost
- Tool analisis dan pengambilan kesimpulan
 - anova?
 - regresi ?
 - survei?
 - interview?
 - skoring?
 - pengamatan?
 - dll

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SIGNIFIKANSI

- So what?
- Jawab dengan baik
 - menyakinkan reviewer
 - tunjukkan you really know what you are doing*
 - memberikan motivasi periset itu sendiri.
- Jika perlu:
 - nyatakan signifikansi secara kuantitatif (risk/benefit analysis, \$, dll).

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Disain Riset



- Disain riset bisa berubah
 - ▣ Studi (pustaka), diskusi, konsultasi, evaluasi hasil, dll
 - ▣ “pembuktian”, verifikasi, validasi argumentasi, dll
 - ▣ penemuan baru
 - ▣ dll

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Disain Riset



- Disain yang baik :
 - menyajikan data yang baik sehingga memudahkan kesimpulan dengan menyakinkan
-> fakta/data yang dapat dipercaya dan diverifikasi.
-> Data primer atau pun data sekunder:
 - data statistik, demonstrasi,
 - *testimonials*, kejadian, or pameran.

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Ingat : Anatomi Disain Riset

- Latar belakang?
- Tujuan?
- Metodologi?
- Hasil yang ingin dicapai (expected results)
- Signifikansi?

Satu kesatuan yang utuh

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**Akhirnya.....
selamat melakukan riset**



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