Empirical Validation of RE and SE Methods

e.g., Hypothesis: using method M allows the production of better SW than using method N

first must decide what is "better SW"

extremes

Controlled Experiment
in lab
e.g.
20 groups apply M
20 groups apply N
to problem p to produce SW s

control
make groups as indistinguishable as possible so that ONLY possible cause of difference in SW produced by the groups is the difference between M and N.

Case Study
in industry
e.g.
get an industrial group to apply M to their next problem P to produce SW S as group in order
compare what happens now to what happened in the past possibly using N

internal validity

+s & -s

+ statistical validity
- toyness

external validity

+s & -s

+ realism
- no statistical strength

in the middle
Mining an organization's project database for data about lots of projects to answer questions
- no control

+ in lieu of control, might be able to find enough data to isolate an issue
+ realism
+ might get statistical validity and strength if there are enough data points for any issue

Be careful of drawing invalid conclusions from experiment and data
Look at Sobel & Clarkson paper.