How to Think out Quality Designs

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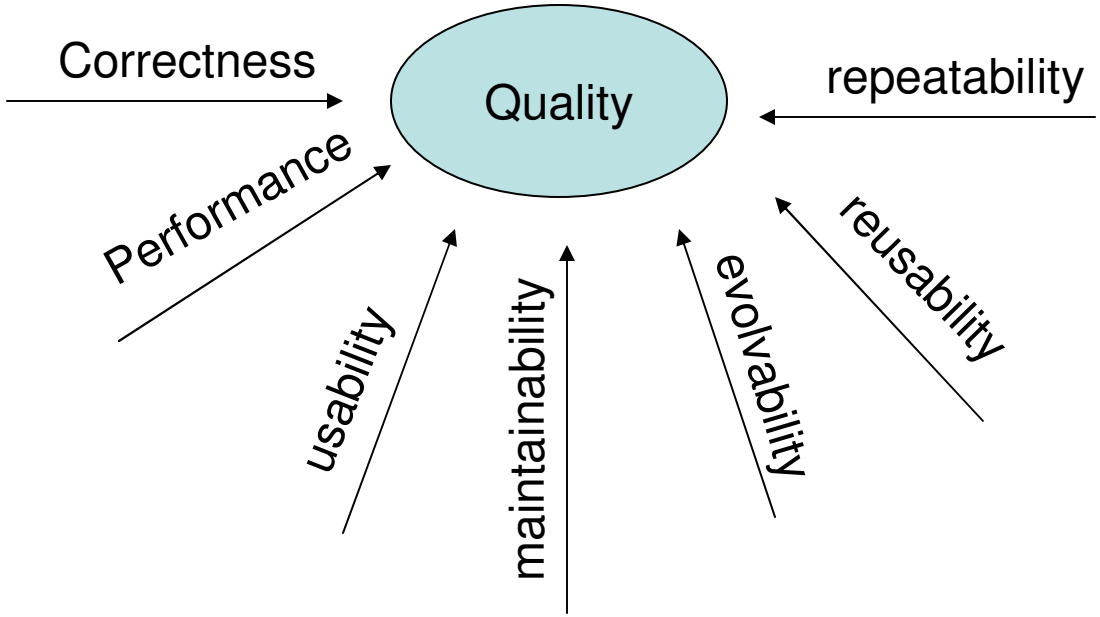
Software Quality

- A Reality that cannot be truly captured in words!
- But its attributes can be measured through close quantification
  - Correctness
  - Performance
  - Usability
  - Maintainability
  - Evolovability
  - Reusability
  - Repeatability ..


Correctness
Quality
repeatability
Performance
usability
maintainability
evolvability
reusability

Our experiments in cs686 (Object Oriented Systems)

- Taught to masters students of CSE
- Students have basic CSE background

The process of learning quality designing?

- Insight into ends
  - Thorough understanding of the problem statement
- Insight into means
  - Mastery over solution methods

How to Acquire it?

- Repeated practice
  - Exposure to ends and means is obtained
- Self observation
  - Our understanding of ends and means gets refined

Finally, a generic problem solving process must develop

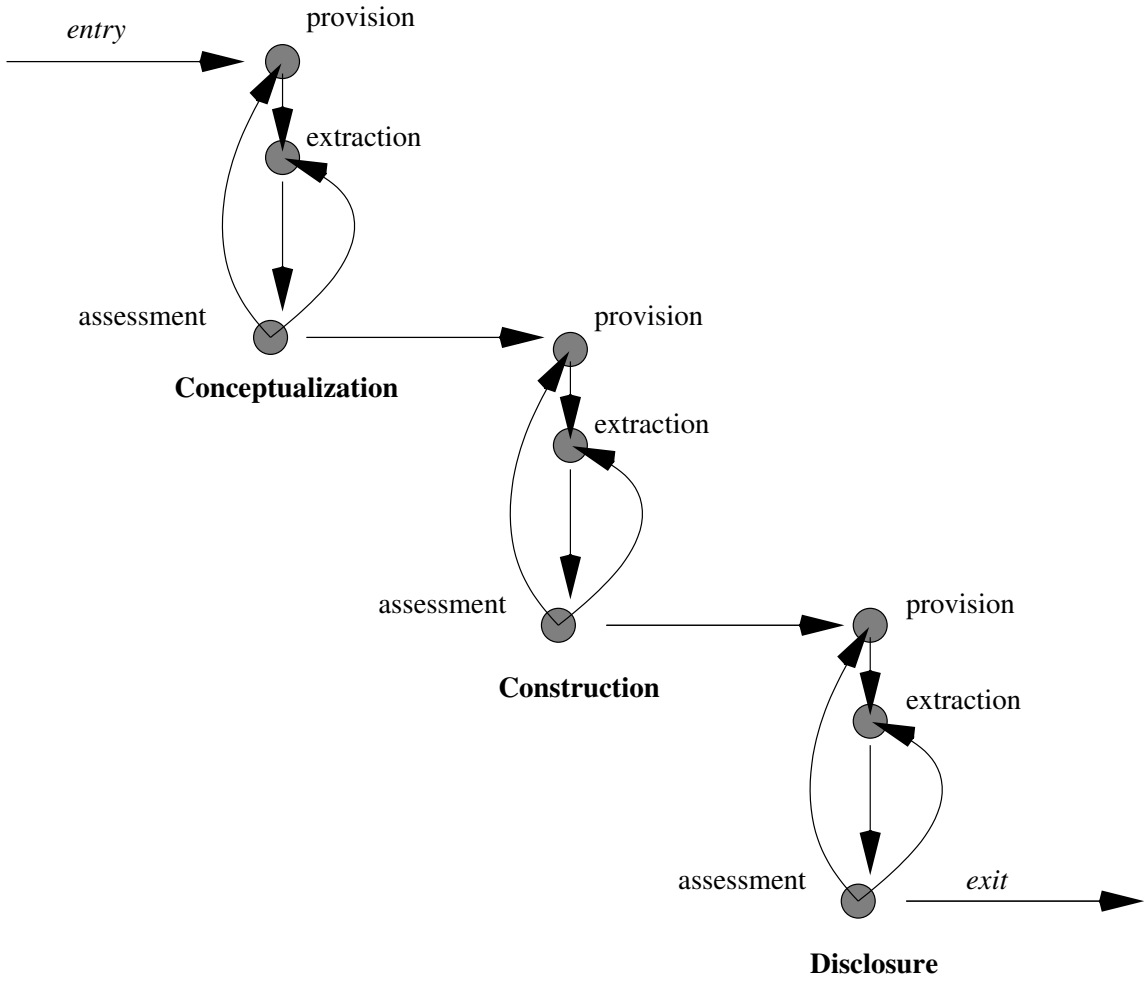
so that one can deal with newer domains with ease

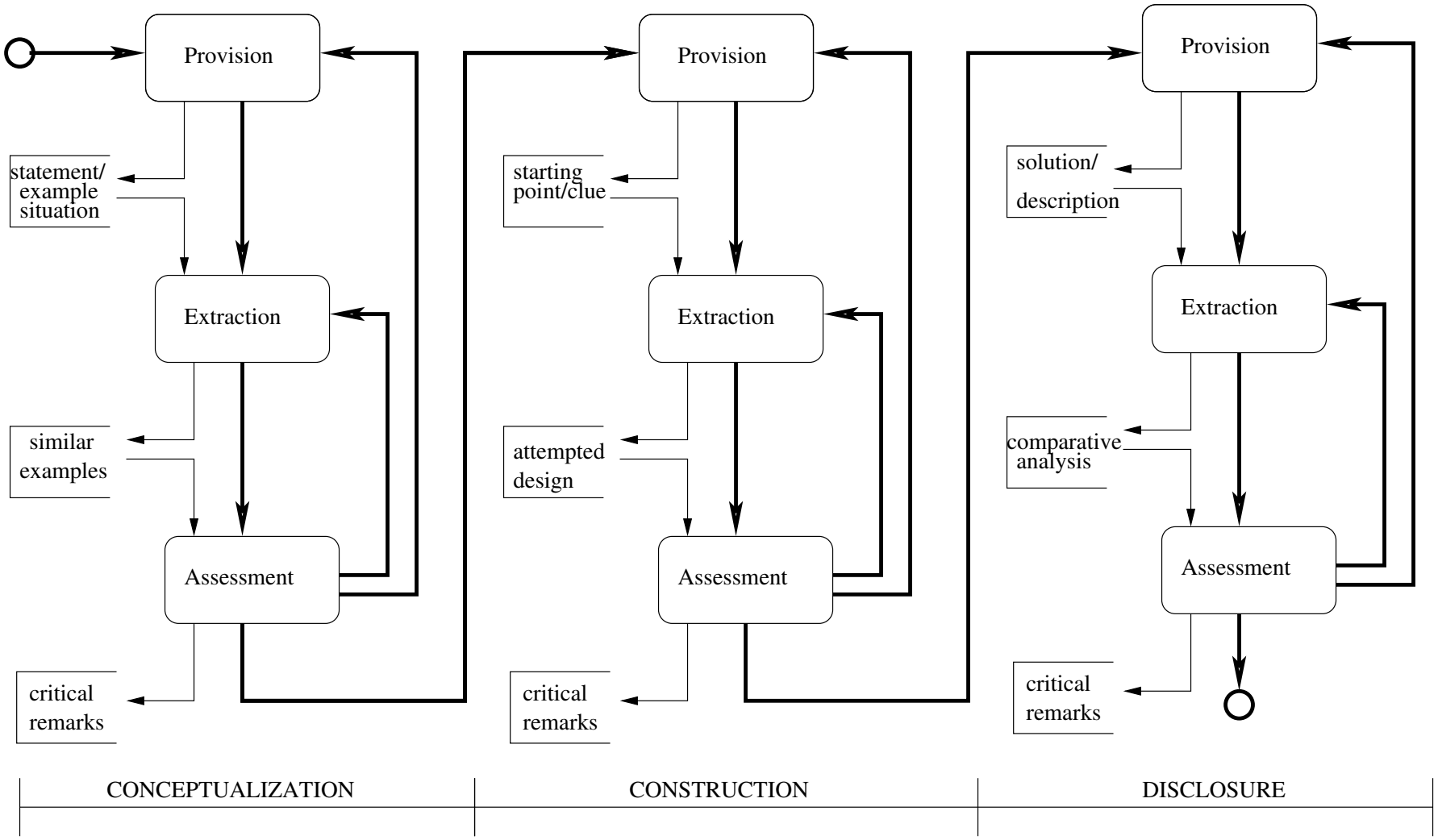
The model

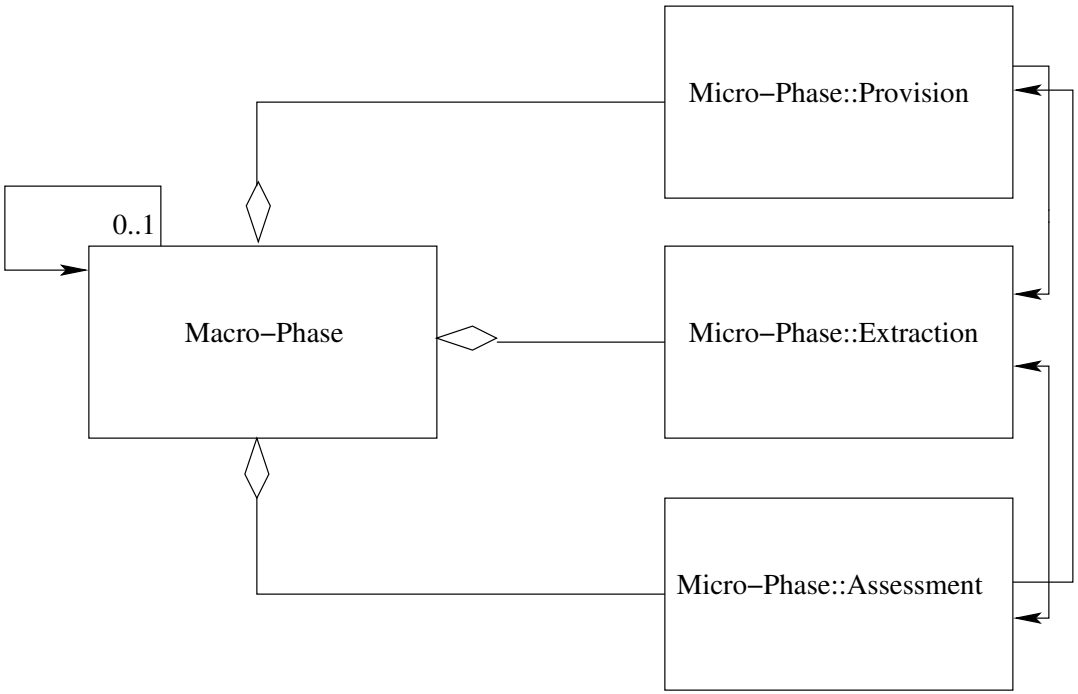
- A 3-stage model
  - Conceptualization
  - Construction
  - Disclosure
- Feedback at every stage

Composition of each stage

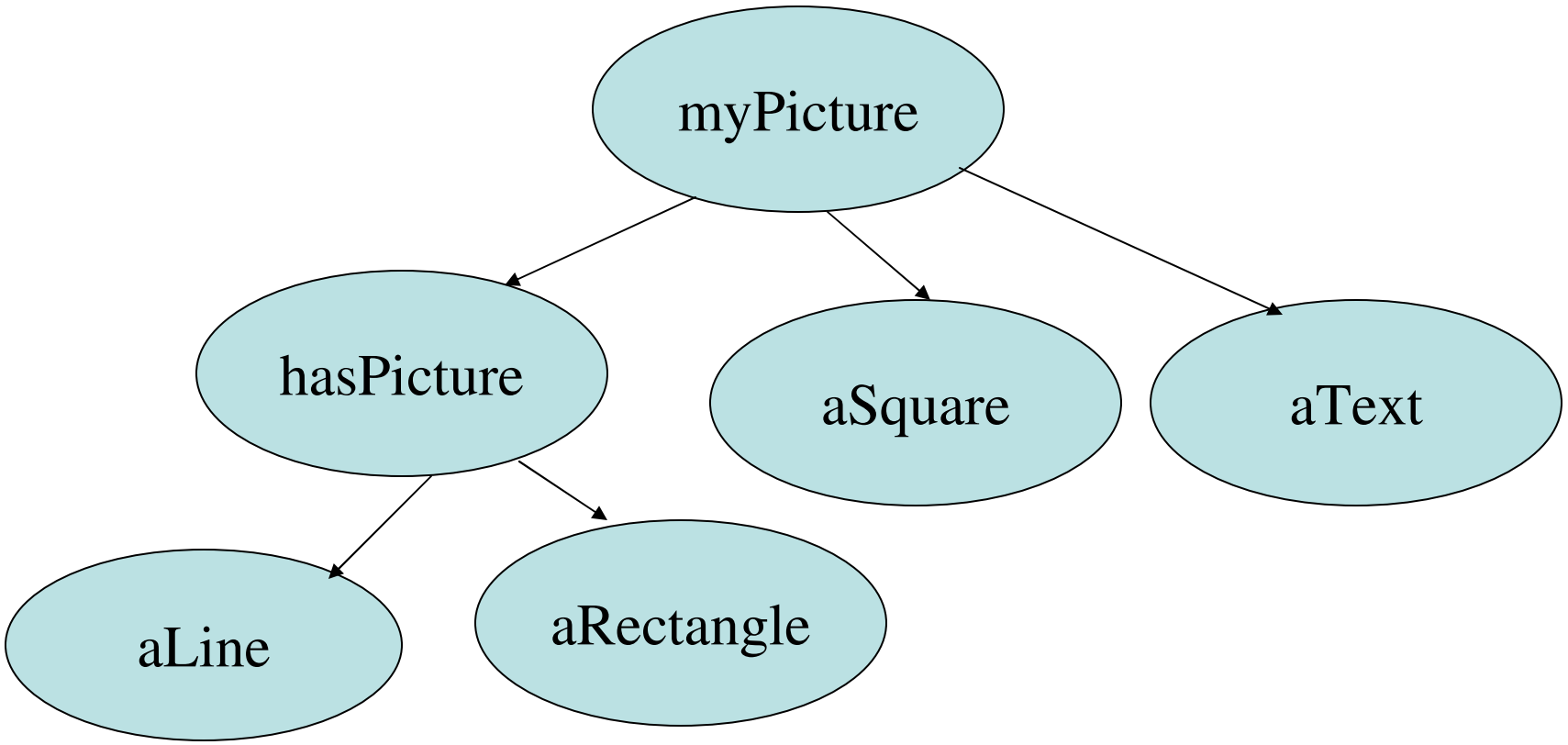
- Provision
- Extraction
- Assessment


entry
provision
extraction
assessment
Conceptualization
provision
extraction
assessment
Construction
provision
extraction
assessment
exit
Disclosure

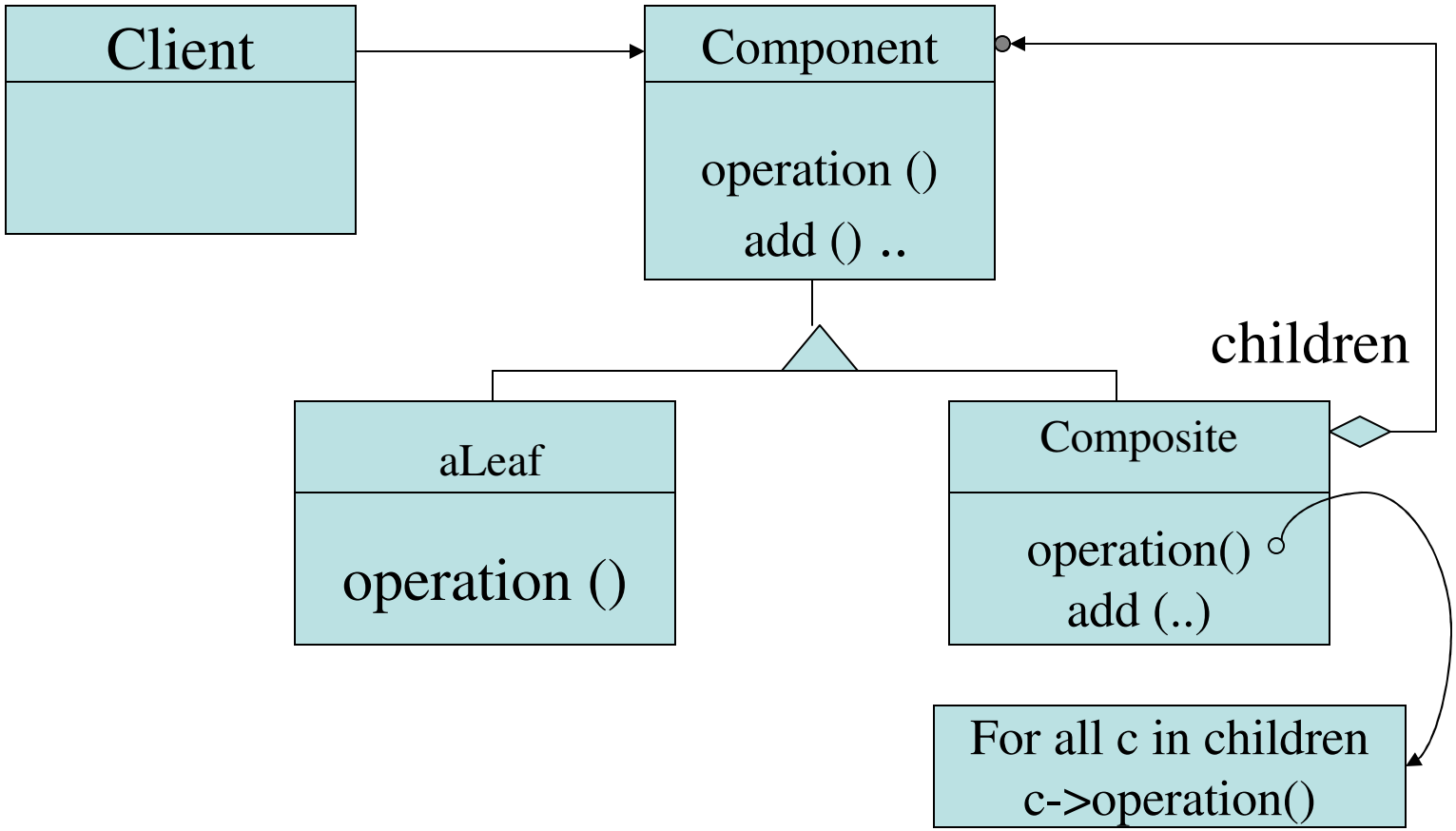

Provision
statement/ example situation
Extraction
similar examples
Assessment
critical remarks
Provision
starting point/clue
Extraction
attempted design
Assessment
critical remarks
Provision
solution/ description
Extraction
comparative analysis
Assessment
critical remarks
CONCEPTUALIZATION
CONSTRUCTION
DISCLOSURE


Micro−Phase::Provision
0..1
Macro−Phase
Micro−Phase::Extraction
Micro−Phase::Assessment

An example starting point



The end design



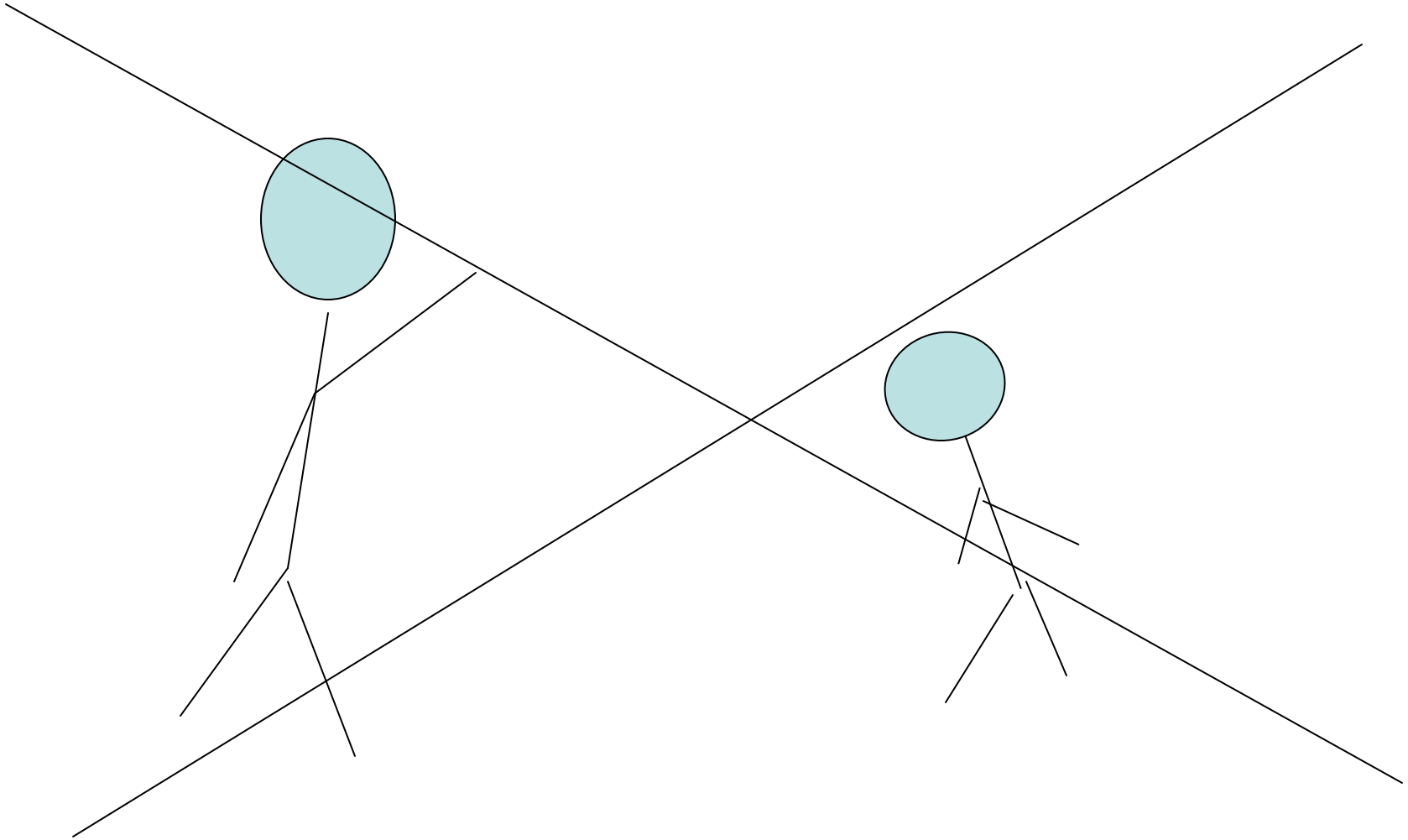
Results and Observations

- Some designs were cracked once in 3 years!
- Discuss the wrong designs openly
- Students encouraged to interact, discuss alternatives and evolve their designs through interaction

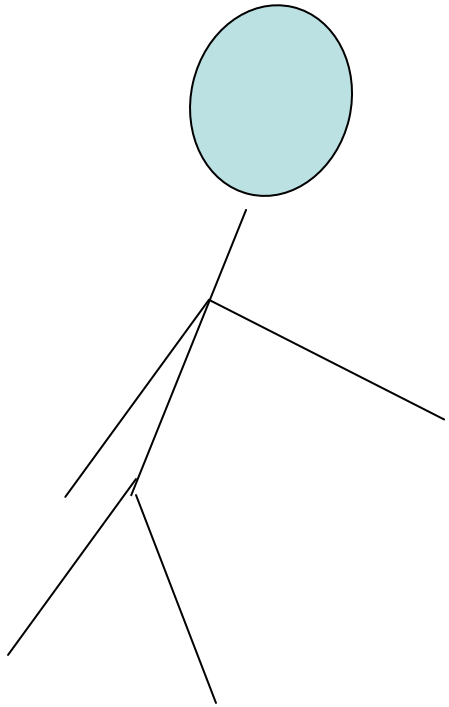
Results and Observations

- Feedback with self-assessment leads to good results
- The learning process is a continuous one

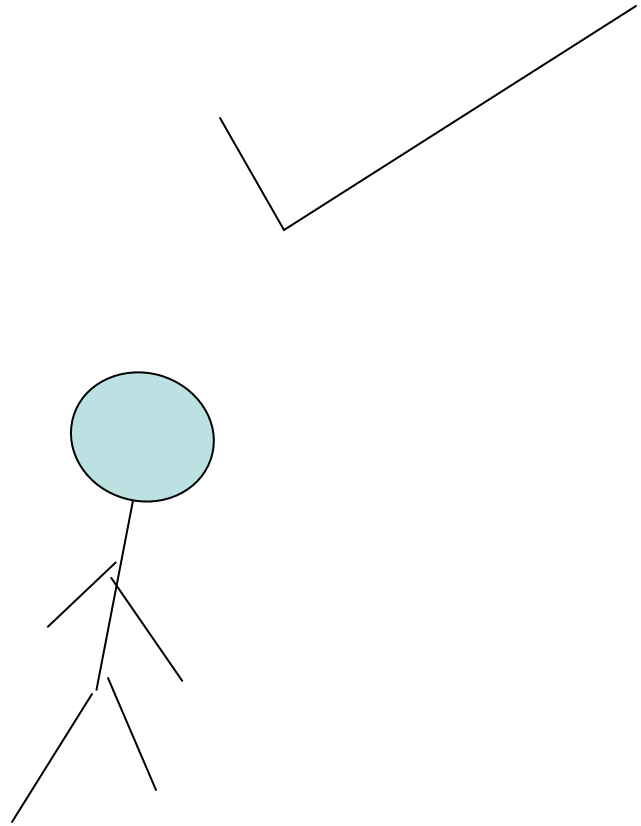
Unidirectional instruction



Bidirectional Flow in instruction



Instruction + Feedback



Self correction →Quality
→ Confidence