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Issues in Organisation and Management of Multidisciplinary Group Design Projects

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ISSUES IN ORGANISATION AND MANAGEMENT OF MULTIDISCIPLINARY GROUP DESIGN PROJECTS

Ken Keating, Claire Brougham, Graham Gavin, Ger Reilly

SCHOOL OF MANUFACTURING AND DESIGN ENGINEERING
DUBLIN INSTITUTE OF TECHNOLOGY, IRELAND

The BSc in Medical Device Innovation

Dublin Institute of Technology

Different to a typical undergraduate programme.

- Varied age, experience, and demographic profiles

Provides up-skilling for the unemployed from various educational backgrounds

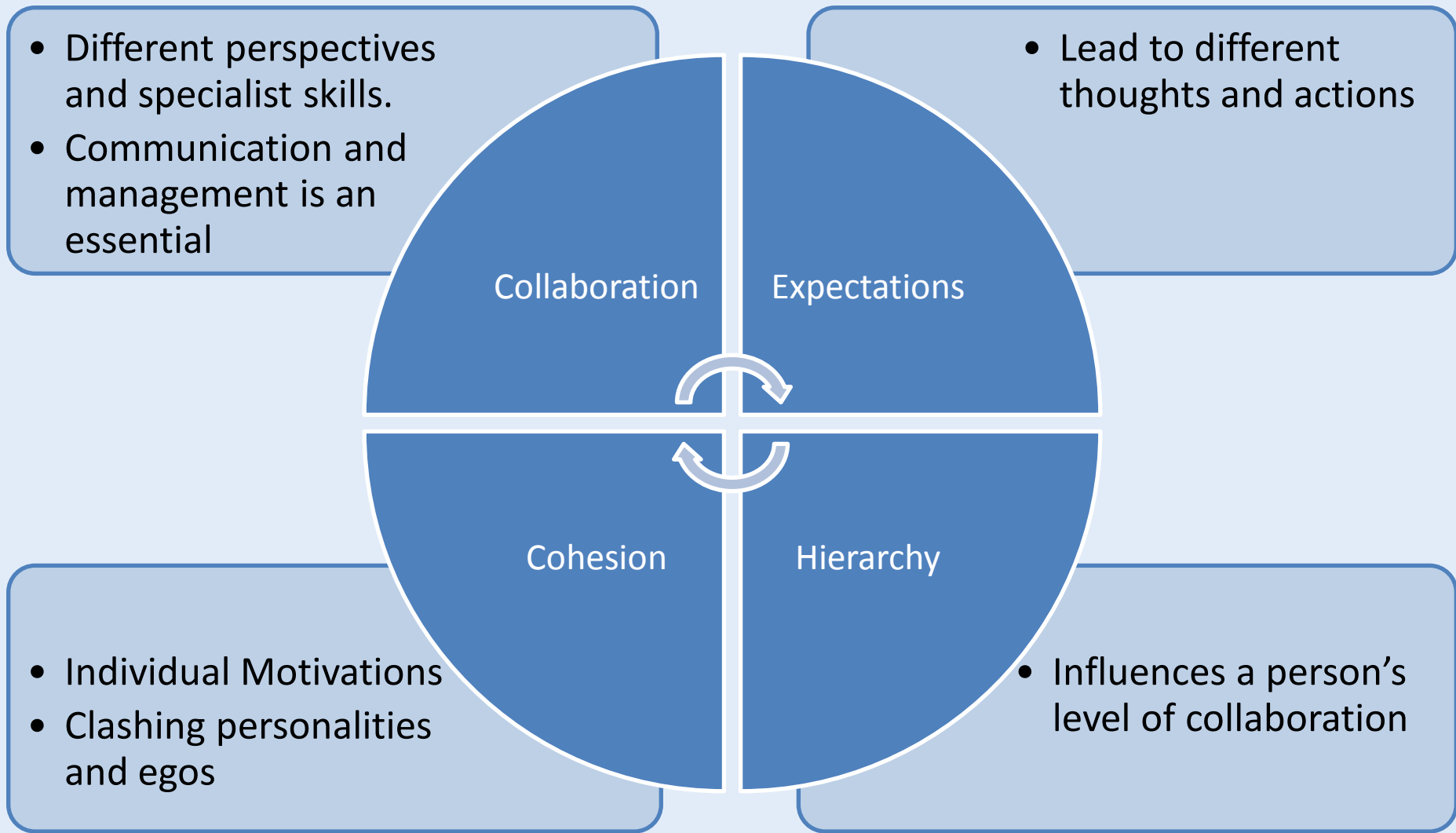
- Design, science and engineering

The traditional working boundaries involve

- Engineers, designers, scientists, medical professionals and business professionals

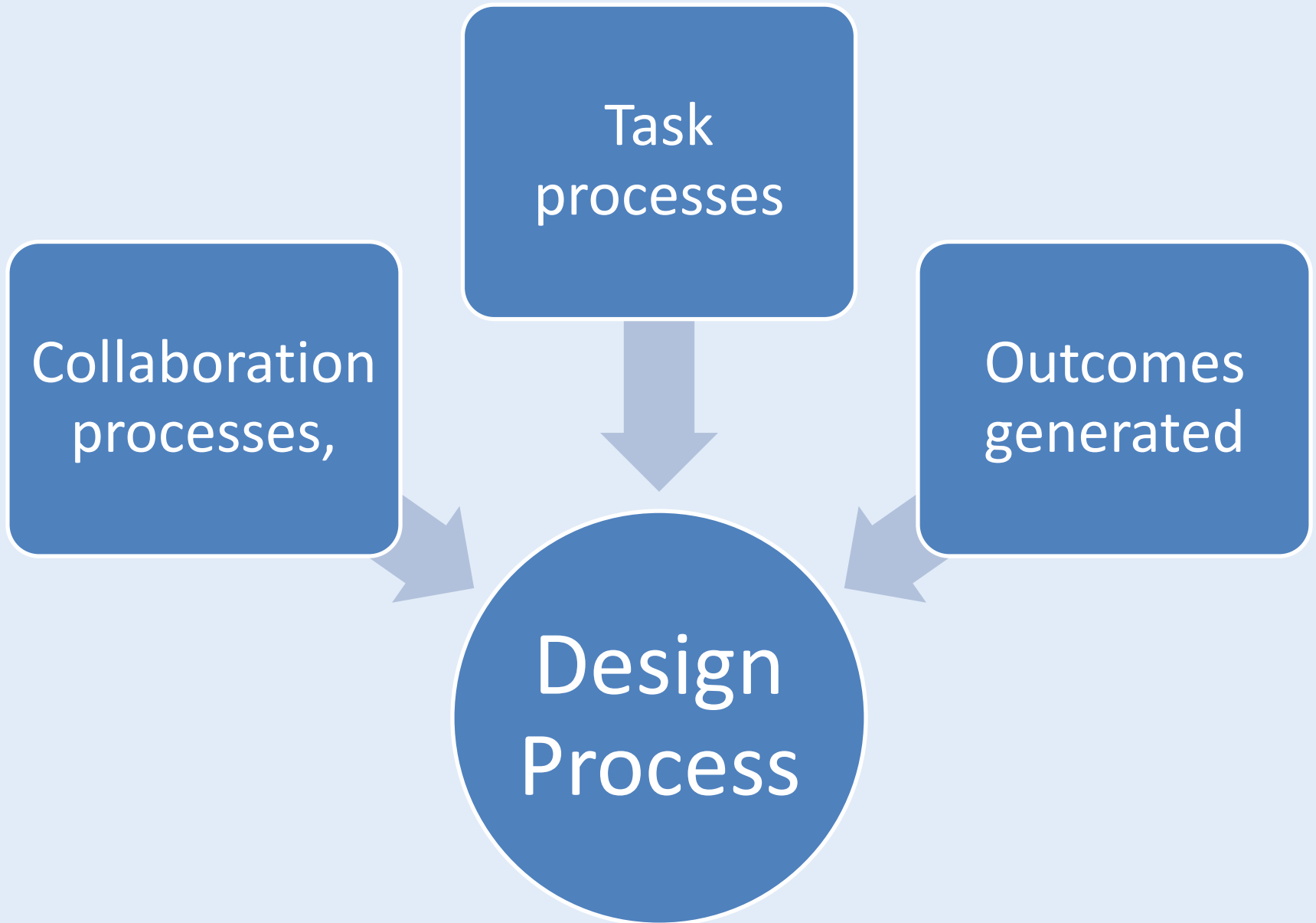
Multidisciplinary Groups in Biomedical Device Design Industry

- Crossover between science, design and engineering
- May be geographically disparate from each other and may initiate, exist, evolve and devolve over the life of A project.
- Exchange and interaction of knowledge within the team is a central component of effective team working

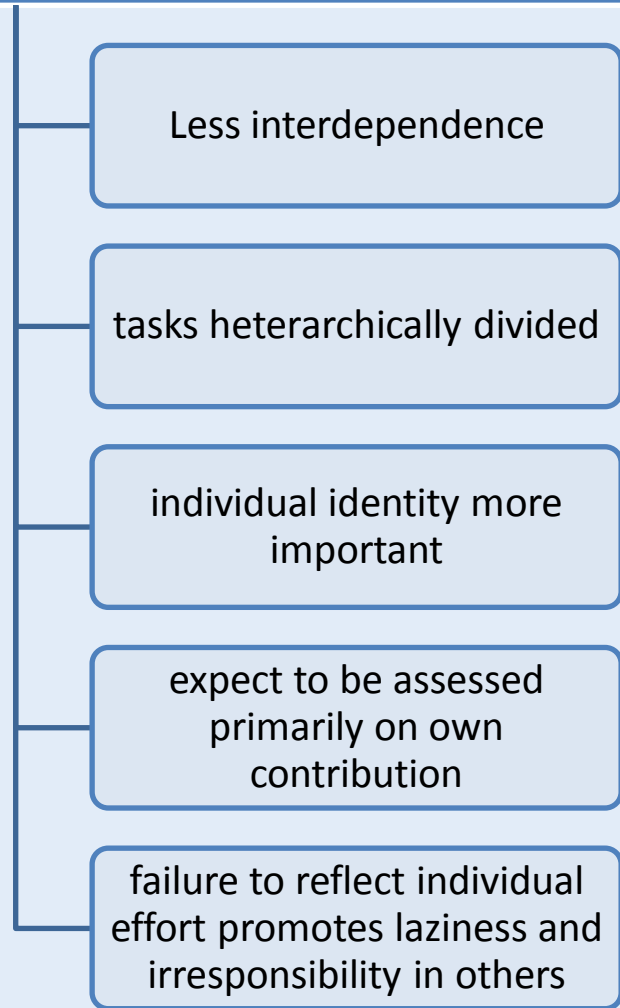


Détienne F., Baker M., and Burkhardt J.-M. Perspectives on quality of collaboration in design, *CoDesign: International Journal of CoCreation in Design and the Arts*, 2012, 8(4), pp. 197-199.

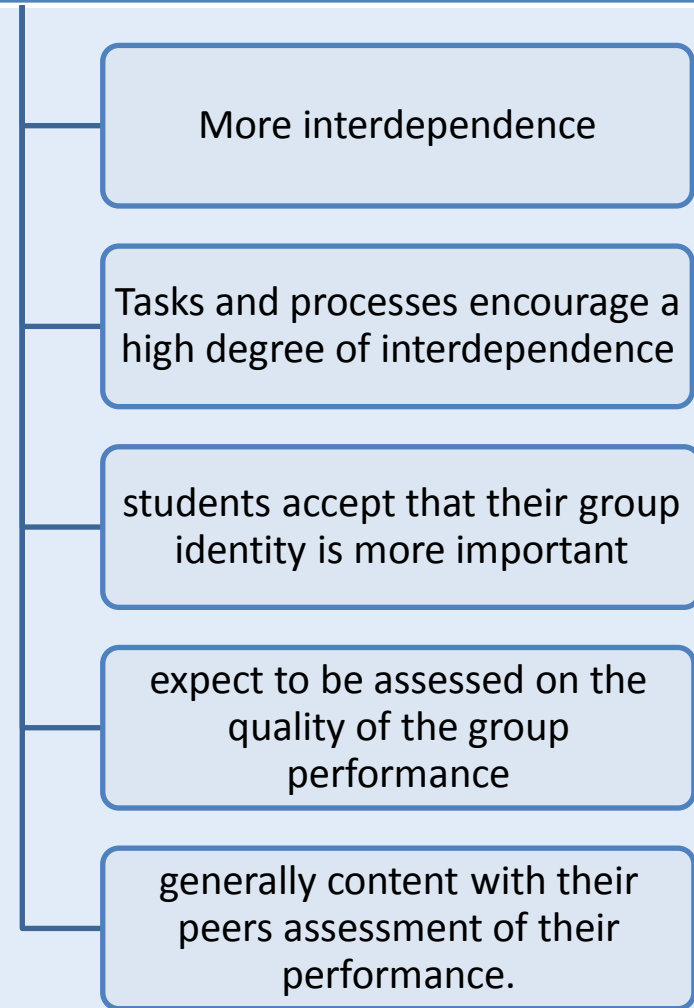
Feast L. Professional perspectives on collaborative design work, *CoDesign: International Journal of CoCreation in Design and the Arts*, 2012, 8(4), pp. 215-230.

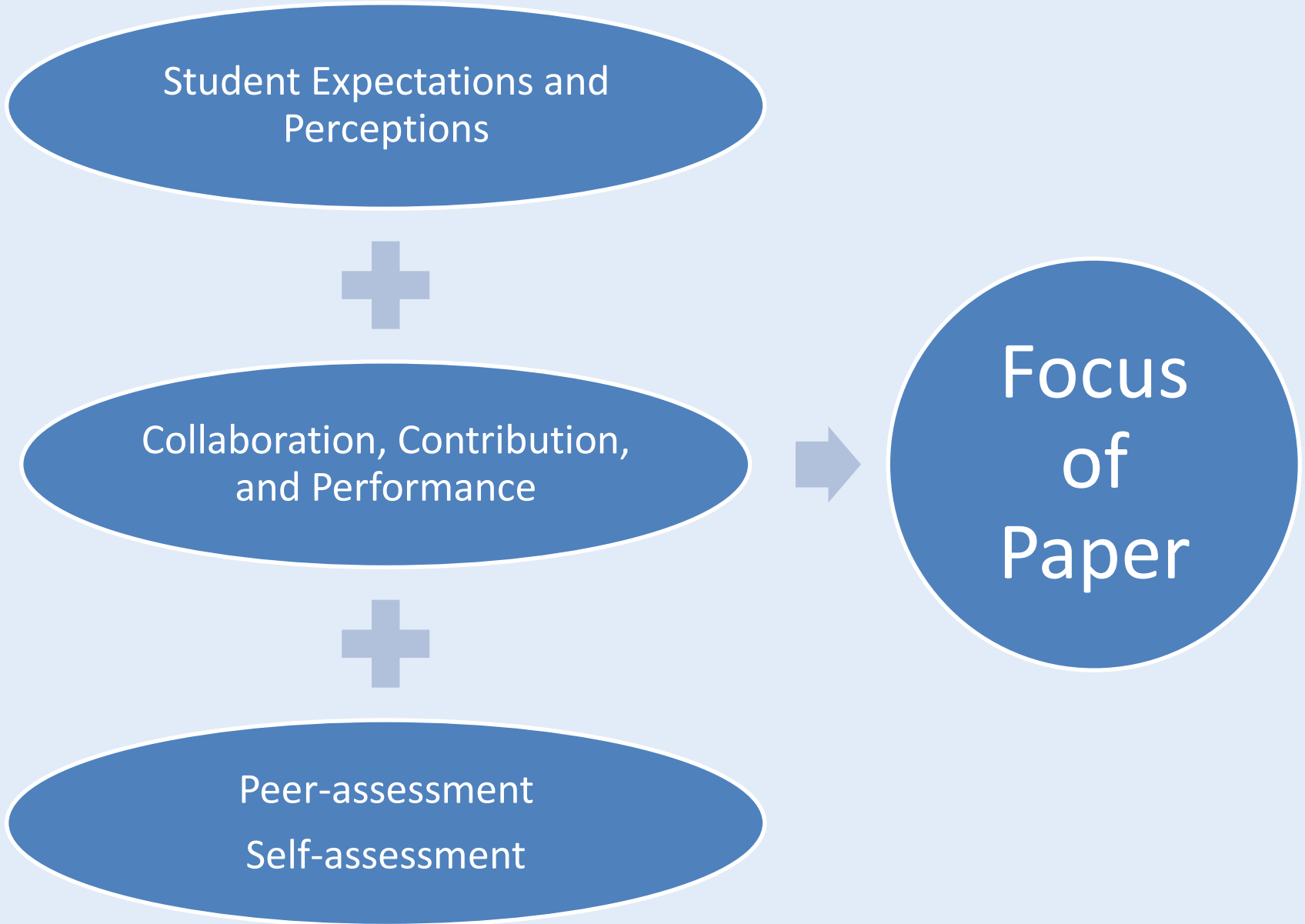


Cooperative learning



Collaborative learning



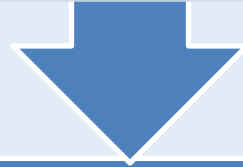


Statements, Observations and Comments Extracted from

Project Stage Reports

Performance Appraisals

Interview Reports



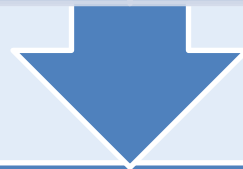
Data Collated Under The Following Categories

Collaboration,
Contribution

Interpersonal
Dynamics

Expectations,
Motivations

Evaluation
Perceptions



Questionnaire Developed Asking Questions on the Following Themes

Collaborative
Activities

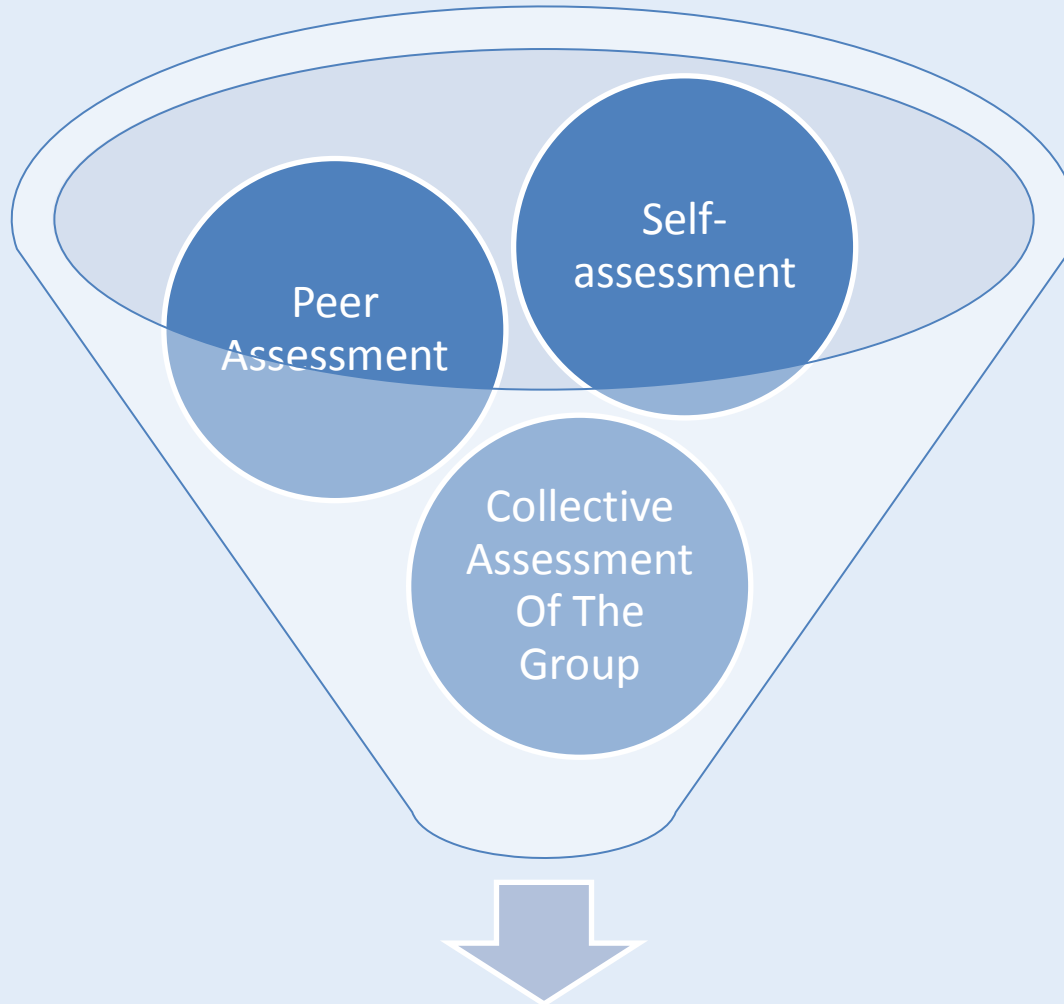
Group Skills
Developed

Personal
Expectations


Difficulties
Encountered

Conflict
Management

Freedom of
Expression



Qualitative Comments and Quantitative
Evaluation of Contribution and Performance



Students Assessment *Process*

- Distributed 100 points between the group
- Peer marked each stage of the design process

Students Assessment *Product*

- Perceptions of group performance
- Comments on individuals contribution to tasks

Tutors Assessment

- Marks for group/individual team performance
- Marks for each stage of the Design process

Data
Apportioned
to the
Following
Categories

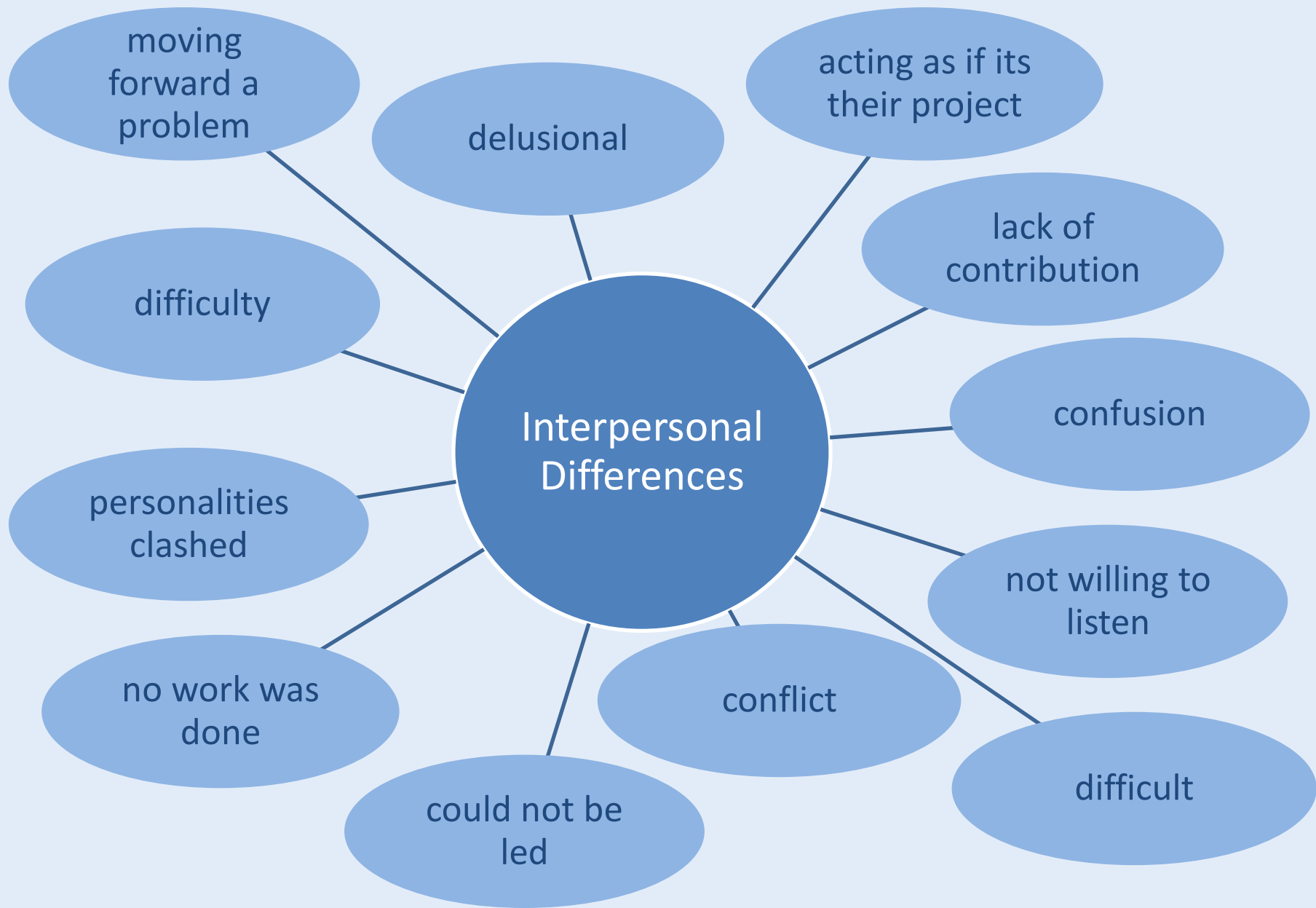
- Expectation
- Perception of performance
- Perceived contribution
- Assessment

THEY EXPECTED


- *work to be allocated equally*
- *hard working groups people attending meetings, handing work in on time*
- *members to be polite, show respect to one another*
- *everyone to work away on their own tasks*
- *groups to be well organised and efficient*
- *everyone sharing the same goals and standards*
- *better communications, agreed leadership*
- *everyone would have a similar level of interest*

THEY DID NOT EXPECT


- *collaboration to be so much hard work*
- *lazy people doing very little work*
- *conflict*
- *everyone having a different perspective*
- *so much time wasting*
- *everyone needed to be treated differently and let be themselves*



Groups that fell into this category had a poor correlation between the individual self-assessment of their performance and their performance as assessed by their peers in the group

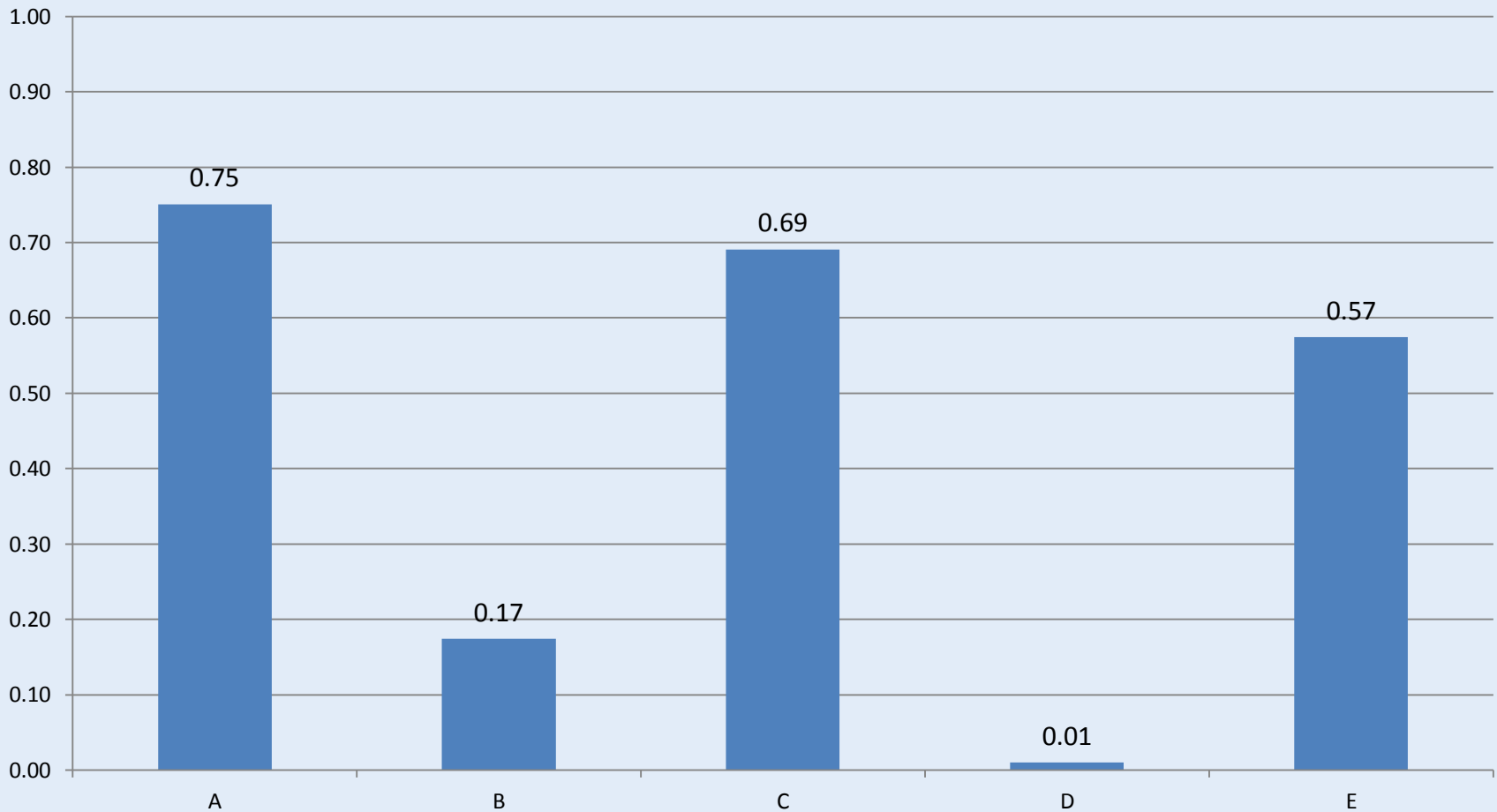


Leadership inadequacies became significant barriers to successful collaboration in setting and achieving group targets



Poorly managed groups had difficulty performing and poor communication appeared to be the most serious impediment to good group management.

Correlation between Group and Individual Perception of Performance



Large Impact

- experience, particularly experience in relevant technical skills

No Impact.

- Gender, age, and culture
- Group Size (3-5)

Issues arising

- leadership,
- cliques,
- exclusion
- perceived position in the group hierarchy

Group Members
Recognised The
Absence Of Leadership

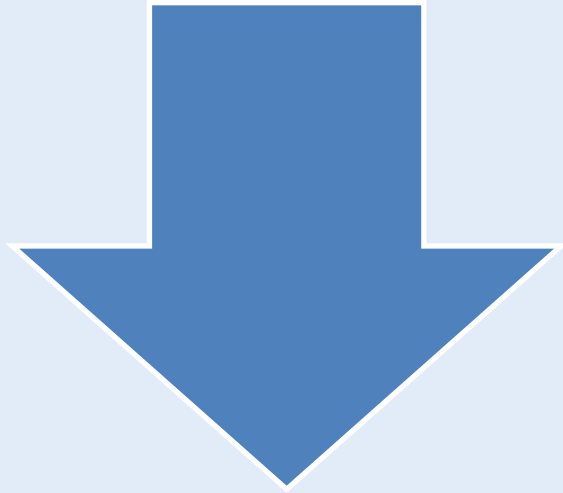
Confused Control with
Leadership

'after six years in industry I
know what I am doing and
they don't'.

'it is impossible to lead
this team'

'taking control
was required',

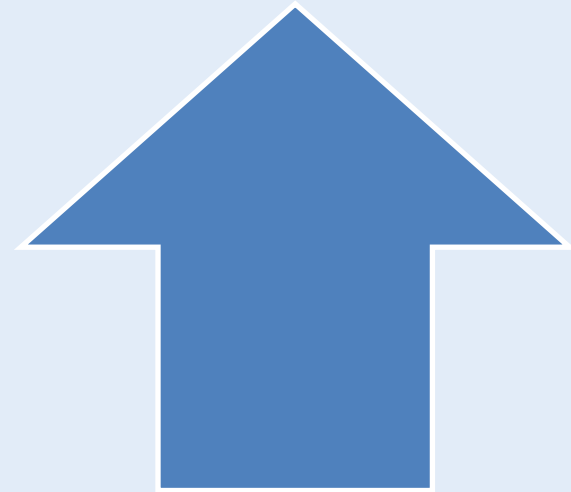
'I am not going to let a
group go down a path I
believe is incorrect or
inaccurate'.



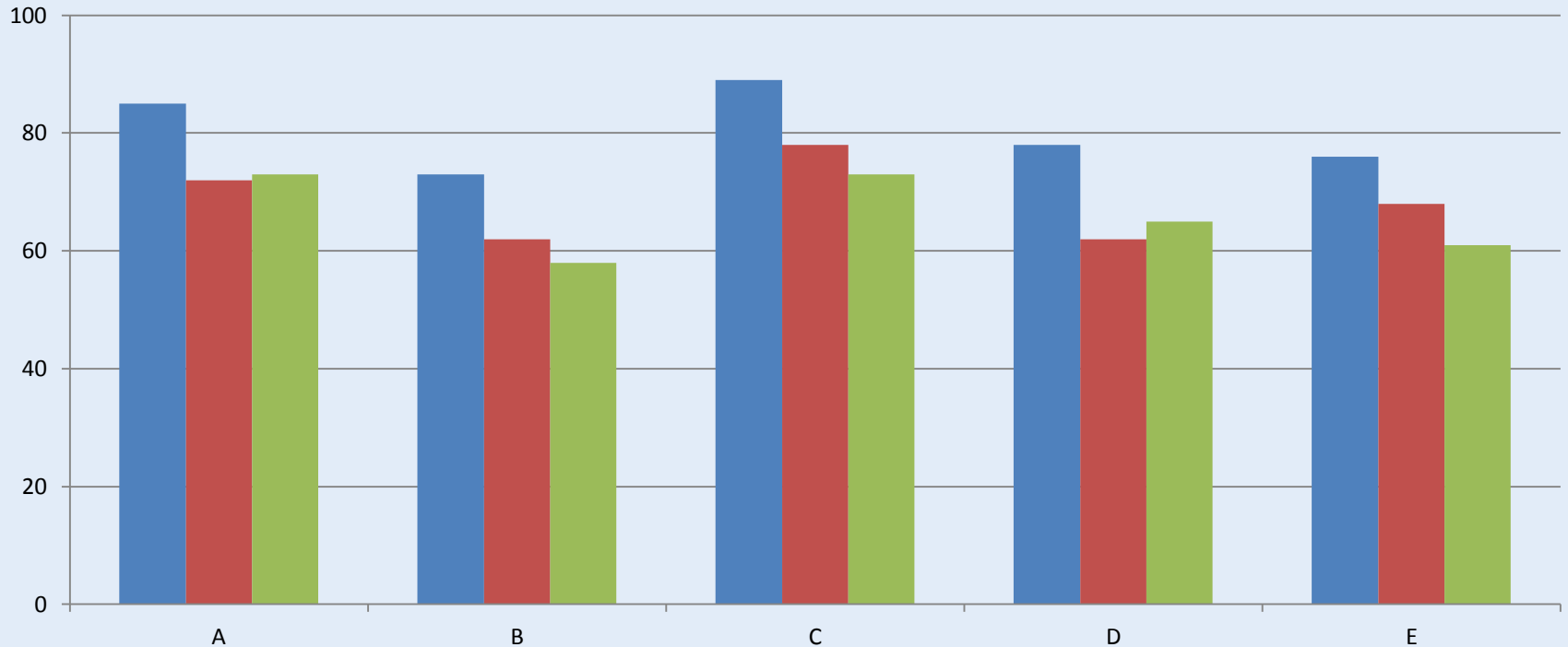
Group's
Collective Self-
assessment



Average of
Student's
Individual Self-
assessment



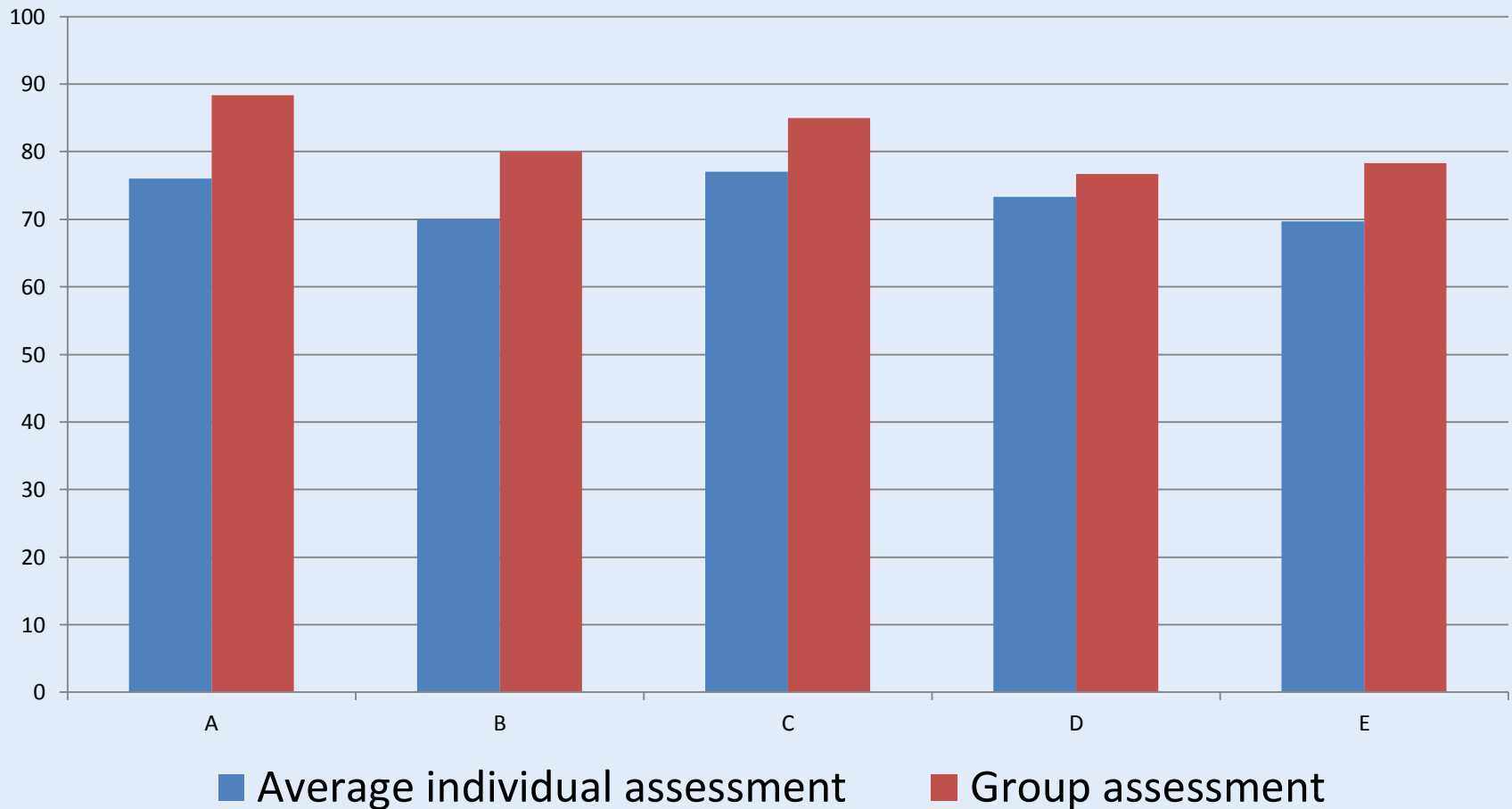
Assessment



- Group assessment of group performance
- Average of student's individual self-assessment
- Tutor's assessment of group performance

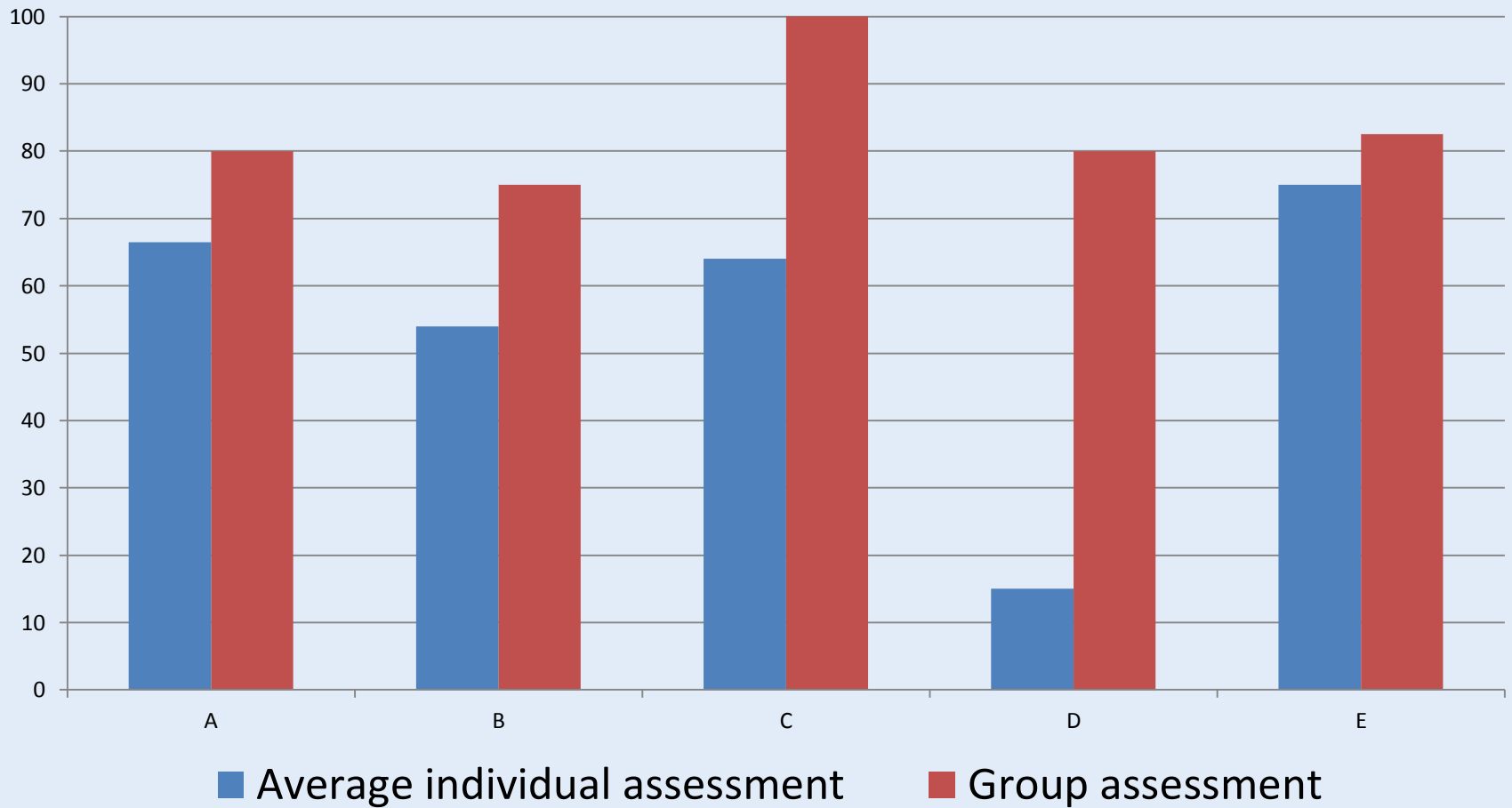
Team and Individual Assessment

Research & Concept Generation Stage



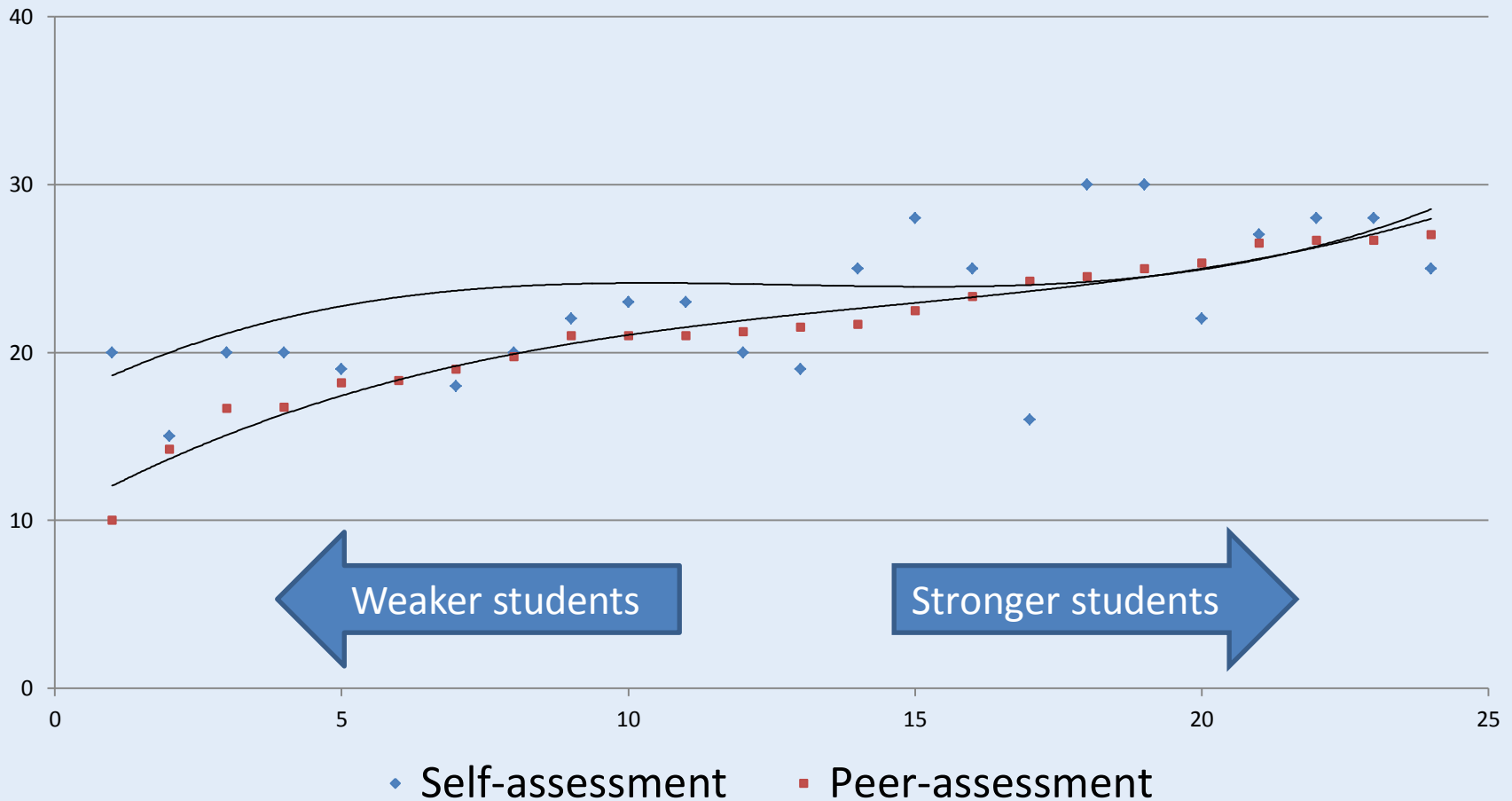
Team and Individual Assessment

Detailed Design and Prototyping Stage

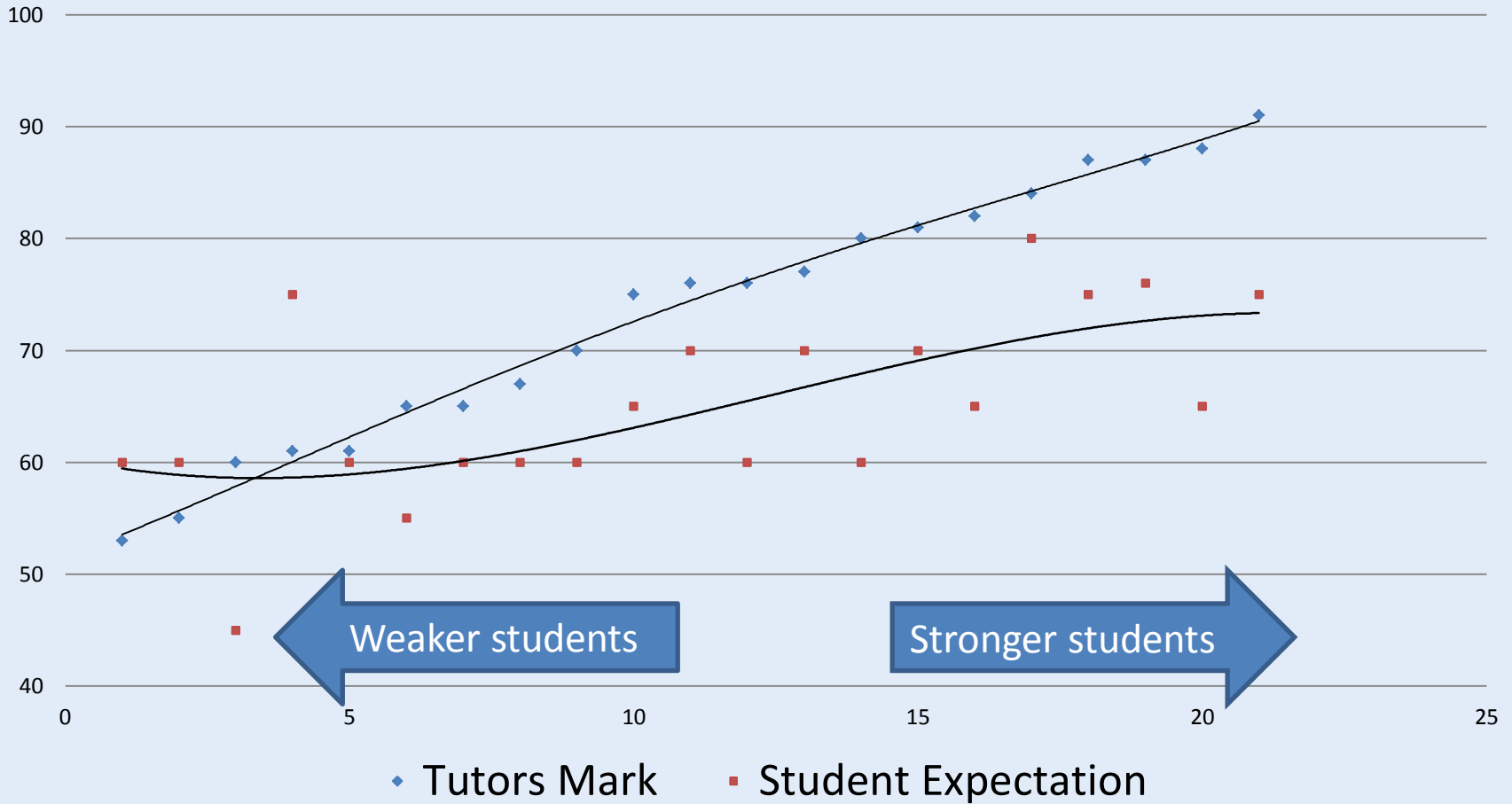


Project

Self- compared to Peer-Assessment



Module Exam



Makes the case
for transparent
assessment

- The learning process
- The design process
- The design product

Intended to
inform
practitioners

- The principle issues encountered

Enhance the
collaborative
experience

- Through the recognition
- Communication
- Reflection of the issues



Fewer issues in traditional problem areas such as

- Student motivation
- Initiative
- Quality of individual work



More issues related to

- Interpersonal relationships,
- Personal expectations in group-work
- Group dynamics
- Group management/decision making
- Pacing of the group project against a characteristic time schedule

Groups that collaborated well often performed well and achieved more than the sum of their parts.

DECISIONS

Strong leaders could manage or dominate depending on the level of the collaboration in the group.

Less emphasis on the product or outcome



More emphasis on the learning processes



Otherwise Students May.....

Inadequately understand the processes and criteria involved in learning and assessment.

Be poor at evaluating their own performance

Overestimate their contribution to group activities

For Successful Collaborative Work

- Reward contribution and encourage peer learning
- Acknowledge that group learning is messy, appreciate the difficulties
- Allow time for reflection and non-thinking time for ideas to evolve and grow
- Structure assessment processes with clear guidelines, and prompt feedback
- Developing a shared interpretation of the design problem and the design process
- Share the passion for the practice of design
- Promote realistic expectations and performance evaluation
- Intervene to correct and moderate unrealistic expectations or distorted self-evaluation where necessary

Tasks a tutor must perform in collaborative learning include

- Helping the group to formulate a coherent picture of the topic
- Sometimes redirecting the focus of discussion
- Encouraging and supporting contributions from the group


Roles a tutor must play to accomplish this task include

- Observer
- Leader/instructor
- Neutral chair
- Facilitator
- Counsellor
- Commentator


Skills a tutor needs to carry out these roles include

- Asking
- Testing
- Clarifying/elaborating
- Bringing in and shutting out contributors
- Turning questions back on the group


David Jaques summarised group learning as 'learning to be' rather than 'learning about'



Collaborative group learning requires the creation of an all embracing context, the stage, for the individual 'to be' on



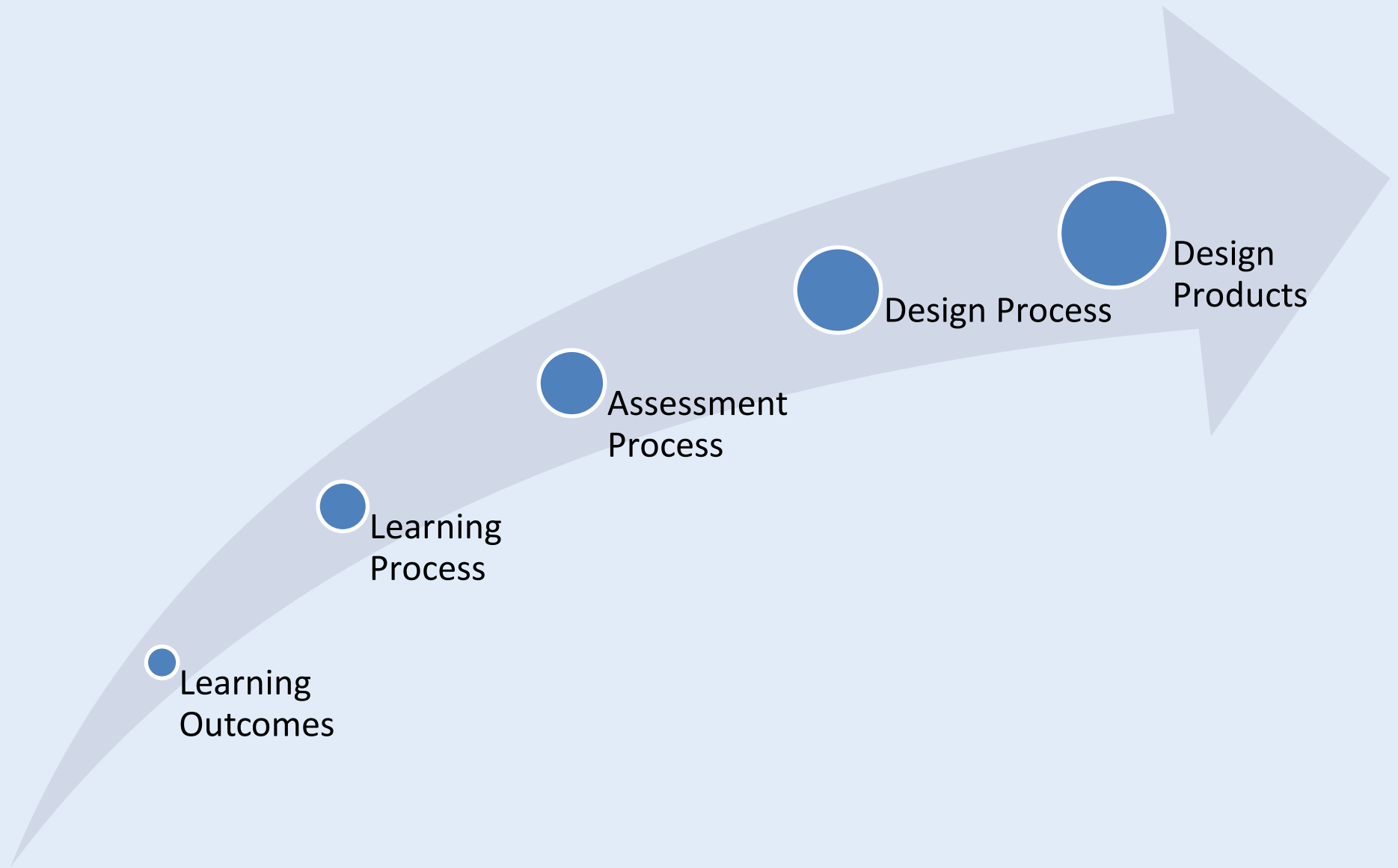
The set must be designed to encourage the development requisite behaviours, skills, and sensibilities needed to collaborate successfully



The roles are interchangeable, and the dialogue does not exist but will develop as the plot unfolds



The tutor gives the stage directions and writes the reviews



Learning
Outcomes

Learning
Process

Assessment
Process

Design Process

Design
Products



Thank You