Interdisciplinary Collaborative Learning: Real-World Problem Based Approach

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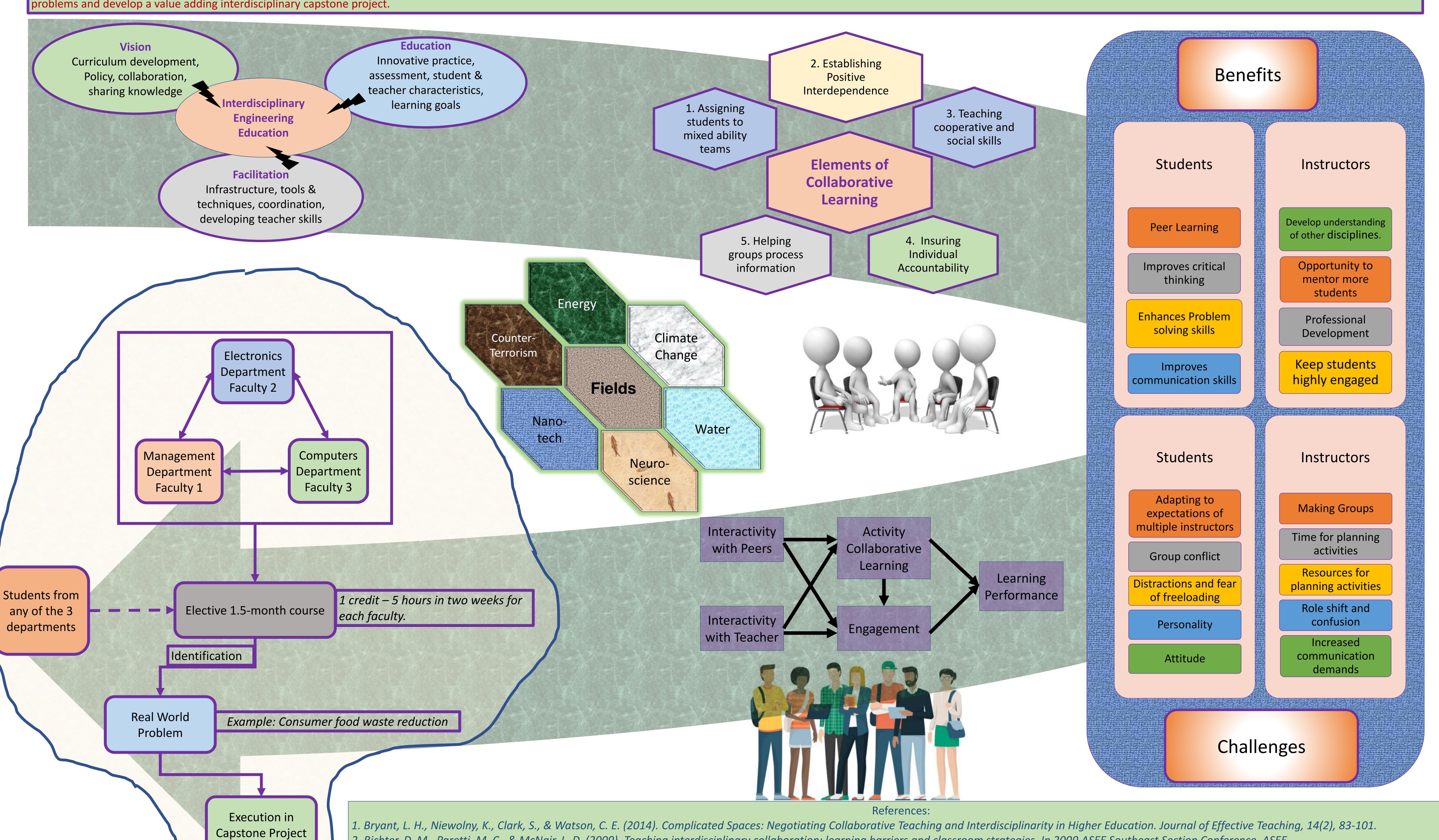
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Interdisciplinary collaborative learning is a method of educational instruction whereby faculties from multiple disciplines come together to facilitate students to learn about a complex issue from a variety of different viewpoints.

Interdisciplinary study allows for synthesis of ideas and the synthesis of characteristics from many disciplines. At the same time, it helps to cope with complexity through developing broader perspective and thus allowing to make scientifically sound decisions to solve a real-world problem in a complex designed system.

An intervention To facilitate such form of learning, faculties from various departments come together to develop an elective course/workshop targeted towards highlighting the inter-connections of these departments. This elective would aid students to identify real-world problems and develop a value adding interdisciplinary capstone project.

Interdisciplinary Engineering Education

Vision
Curriculum development, Policy, collaboration, sharing knowledge

Education
Innovative practice, assessment, student & teacher characteristics, learning goals

Facilitation
Infrastructure, tools & techniques, coordination, developing teacher skills

Elements of Collaborative Learning

1. Assigning students to mixed ability teams
2. Establishing Positive Interdependence
3. Teaching cooperative and social skills
4. Insuring Individual Accountability
5. Helping groups process information

Fields

- Energy
- Counter-Terrorism
- Climate Change
- Nano-tech
- Neuro-science
- Water

Process

Electronics Department Faculty 2

Management Department Faculty 1 ↔ Computers Department Faculty 3

Students from any of the 3 departments --> Elective 1.5-month course — *1 credit – 5 hours in two weeks for each faculty.*

Identification

Real World Problem — *Example: Consumer food waste reduction*

Execution in Capstone Project

Learning Performance Model

Interactivity with Peers
Interactivity with Teacher
→ Activity Collaborative Learning
→ Engagement
→ Learning Performance

Benefits

Students
- Peer Learning
- Improves critical thinking
- Enhances Problem solving skills
- Improves communication skills

Instructors
- Develop understanding of other disciplines.
- Opportunity to mentor more students
- Professional Development
- Keep students highly engaged

Challenges

Students
- Adapting to expectations of multiple instructors
- Group conflict
- Distractions and fear of freeloading
- Personality
- Attitude

Instructors
- Making Groups
- Time for planning activities
- Resources for planning activities
- Role shift and confusion
- Increased communication demands

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