# Teaching and Learning Strategies in Engineering Education from the "University of the Future" Perspective

——

**Naseer Ahmed, PhD**

**Vice Chancellor, CECOS University**

**Peshawar, Pakistan**

# Scenario

- Outcome Based Education (OBE)
- Arrival of Covid 19
- Widespread usage of Social Media
- Demand for Skills rather Degrees

# Challenges

- Focus/Interest
- Trust in certain technologies
- Changing market demands
- Motivation: Money vs Passion - Skill vs Degree
- The future of education institutes specifically Universities

# University of the Future

- Teacher
- Student
- Curriculum
- Assessment
- Governance
- Physical Dimensions

# University of the Future: Teacher

- No contract
- Faculty competes for slots
- Whatever activities (credits) they serve, this forms the salary
- Credits will be defined for every Academic/Admin/Research/Community Service

# University of the Future: Student

- Minimum Education is Secondary School
- No age limit
- Can choose their own instructor

# University of the Future: Curriculum

- Industry demand + Future trends
- SBE: Skills based Education
    - Rest of the pattern the same as OBE with CLOs, PLOs and PEOs
- A collection of skills will be a degree

# University of the Future: Assessment

- No assessment
- Surveys to gauge understanding
- The economic pressure will drive learning

# University of the Future: Governance

- Decentralized toward departments
- Base registration fee
- Rent out sources model
- Board of Innovators
  - Coordinators
    - Manager IT
    - Manager Finance
    - Manager HR
    - Manager Academics
    - Manager Media

# University of the Future: Physical Dimensions

- No boundaries
- Education happening inside and outside the class
- META Campus
  - Labs in VR
  - Synchronous/asynchronous models

# Teaching and Learning Strategies

- Student centered
- Placement time be increased, 3+1, 2+2 models, preferably teaching facilities on industrial sites
- Effective use of
  - Project Based Learning
  - Problem Based Learning
  - Inquiry Based Learning
- Pre-Categorization of Institutions
  - Teaching Institute
  - Research Institute
- Problem lead department/programs, Precision Education

# Teaching and Learning Strategies

- Self Paced
- Emphasising on learning 'how to learn'
- Facilitation of students toward Independent Learning
  - Communication skills
  - Analytical skills
  - Critical thinking
  - IT literary
- Gamification of courses and use of technology that they like and know
  - VR and AR
  - Simulators
  - Maker's Labs

# Teaching and Learning Strategies

- Team teaching
  - Cross subject projects
- Interdisciplinary Projects
- Project to Product
  - Entrepreneurship
  - Introducing incentive for faculty
  - Capstone Design Project: Customer oriented problem solving
- Engaging professional societies like ASME, ASHRAE
  - Can offer skill based courses along side the curricula

# Teaching and Learning Strategies

- An era of hackable human beings: creation of algorithms which understands you better than you understand yourself
- For career path selection
  - A common first year
  - AI based career planning: aptitude assessment
  - Project/problem based domain allocation from 2nd year
  - Planning electives that will integrate the performance

# Conclusion

- A thorough understanding of faculty about the OBE process (Not just the paperwork) is needed
- Understanding the changing socio-economic demands and adjusting the systems accordingly
- Emphasis on learning how to learn
- Early adoption of technological advancement

Q & A

Thank you