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# Four overall criteria for quality teaching - an international accreditation perspective

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Faculty of Engineering





# Overview

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- What is good/excellent teaching?
- Background: ECSA and Washington Accord
- Programme composition
- Programme and module outcomes
  - Graduate attributes
- Effective learning process
- Sustainability
- Conclusion



# What is good/excellent teaching?





# What is good/excellent teaching?

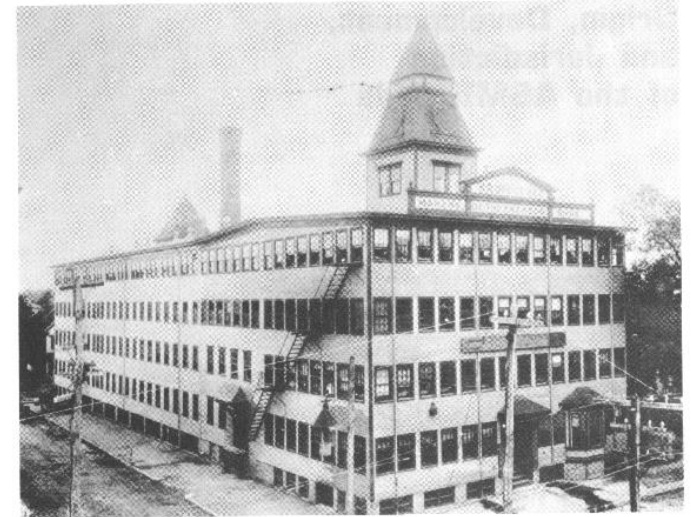


Fig. 1.1 The Brockton, Massachusetts shoe factory.





# What is result of poor teaching



**Fig. 1.2** Shoe factory after the boiler explosion of March 20, 1905 which led to the adoption of many state boiler codes and the *ASME Boiler and Pressure Vessel Code*.  
(Courtesy of Hartford Steam Boiler Inspection & Insurance Company)



# What is good teaching?

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- Facilitates effective, active **learning**
  - learning that leads to high student success rates and achieving outcomes (of modules and programmes) at a high standard
- and, at same time,
- requires an affordable level of **resources**
  - such as staff time, student time and physical infrastructure,
  - also taking requirements of research and community interaction into account



# What is excellent teaching?

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- Includes all elements of good teaching
- Influence beyond classroom, **a role model**
- Draws on and contributes to **research** on T&L
  - Deep reflection on theories that underpin T&L
- Makes **demonstrated contribution to effective learning** in a local, national and/or international context
  - Provides meaningful access to knowledge
  - Awareness of diversity of students and world



# ECSA and Washington Accord



- **Engineering Council of SA**
  - Accredits BEng and BScEng programmes
    - 5-year cycle
    - University must show that each graduate meets all requirements, and is likely to maintain that for next 5 years
    - Checking quality assurance processes, with only samples of checking quality itself
  - Registers professional engineers
- **Washington Accord**
  - Signatories: SA, USA, Canada, Ireland, UK, Australia, Hong Kong, Japan, Korea, New Zealand, Russia, Malaysia, Singapore, Turkey, ...
  - Mutual recognition of accreditation of educational programmes
  - Observers regularly attend accreditation visits



# Overall ECSA accreditation criteria

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- Credits, Knowledge Profile and Coherent Design
- Assessment of Exit-level Outcomes
- Quality of Teaching and Learning
- Resourcing and Sustainability of Programme



# Credits, Knowledge Profile and Coherent Design



- **Programme level**
  - Meets educational requirements for identified role
  - Total credits
  - Knowledge profile
    - Engineering: mathematics, basic science, engineering science, design, complementary
  - Coherent, appropriate core
  - Specialist study as required
  - Explicit rules of combination and progression
  - Explicit horizontal and vertical articulation options





# Credits, Knowledge Profile and Coherent Design



- **Module level**
  - Credits
    - Aim for correct workload on students
  - Knowledge profile, Coherent, appropriate core, Specialist study as required, Explicit rules of combination and progression
    - What preceding knowledge/skills is expected
    - What knowledge/skills developed for following modules
  - Explicit horizontal and vertical articulation options
    - Prior learning assumed
    - Diversity of students' backgrounds
    - Further applications can be diverse too





# Exit-level Outcomes





# Exit-level Outcomes



- **ECSA E-02-PE**

- Level Descriptor: **Complex engineering problems**
- ELO1: Problem solving
- ELO2: Application of scientific and engineering knowledge
- ELO3: Engineering design
- ELO4: Investigations, experiments and data analysis
- ELO5: Engineering methods, skills and tools, including IT
- ELO6: Professional and technical communication
- ELO7: Sustainability and impact of engineering activity
- ELO8: Individual, team and multidisciplinary working
- ELO9: Independent learning ability
- ELO10: Engineering professionalism
- ELO11: Engineering management





# Exit-level Outcomes



- **Stellenbosch Univ Graduate Attributes**

- **An enquiring mind**
  - Lifelong learner
  - Critical and creative thinker
  - Exercises responsibility for learning and using knowledge
- **An engaged citizen**
  - Leader and collaborator
  - Social entrepreneur
  - Effective in a diverse environment
- **A dynamic professional**
  - Problem solver
  - Uses sustainable and effective technology
  - Innovative
- **A well-rounded individual**
  - Exposed to cultural, intellectual and sporting life
  - Takes responsibility for own development
  - Takes informed and considered decisions



University of Sydney Graduate Attributes



# Exit-level Outcomes



- **Botho University**
  - Centre of excellence, innovation and leadership in higher learning
  - A driver for positive social and economic change
  - Produce well-rounded, employable graduates for global market
  - Graduate ... who can contribute to nation building and community development



**BOTHO**  
**UNIVERSITY**  
EXCELLENCE | LEADERSHIP | INNOVATION



# Exit-level Outcomes

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- **Module-level**
  - Know which ELOs are assessed or which ELOs are being developed in module
    - Lecturers, assessors, students
  - Ensure assessments aligned with ELOs
  - SU Eng: passing ELO is prerequisite to passing module
  - ECSA: ELO assessments must be externally moderated



# Quality of Teaching and Learning



- Teaching right things is as important as teaching it well
- (maybe even more important than?)



<http://pixabay.com/en/quality-time-money-449367/>



[http://upload.wikimedia.org/wikipedia/commons/3/3e/Quality\\_Street\\_1.jpg](http://upload.wikimedia.org/wikipedia/commons/3/3e/Quality_Street_1.jpg)



# Quality of Teaching and Learning

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- **ECSA E-03-P**
  - Content, learning objectives, expected outcomes and method of assessment for each module defined and **documented and are available** to staff and students
    - Which ELOs assessed
    - Method of assessing ELOs
    - Level of achievement required of students
    - Consequence for student of not satisfying ELO
  - Programme is effectively co-ordinated
- **SU Eng**
  - Module framework for each module
  - Module framework signed off by programme coordinator
    - Assessments, ELOs and knowledge areas checked
  - Module framework provided to all students
  - Module framework provided to external moderator



# Quality of Teaching and Learning

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- **ECSA E-03-P**
  - Teaching and learning strategy and methodology is **designed to achieve outcomes** of programme with students who meet stated **admission criteria**
  - Suitable **learning opportunities** are provided to facilitate acquisition of knowledge and skills
  - Learning process encourages **independent learning attitudes and abilities**
    - Appropriate mix and balance between different teaching and learning
    - Encourage active participation of students in teaching and learning process



# Quality of Teaching and Learning

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- **ECSA E-03-P**
  - Learning progress of students is appropriately **monitored** and where necessary, **academic development support** is provided
  - Assessment practices and procedures provide **feedback to students at regular** intervals
  - An **internal process including moderation** ensures that all forms of summative assessment of student performance within programme are **effective, fair, rigorous and address stated learning objectives and outcomes**.
  - ELO assessment is subject to **external moderation**



# Quality of Teaching and Learning

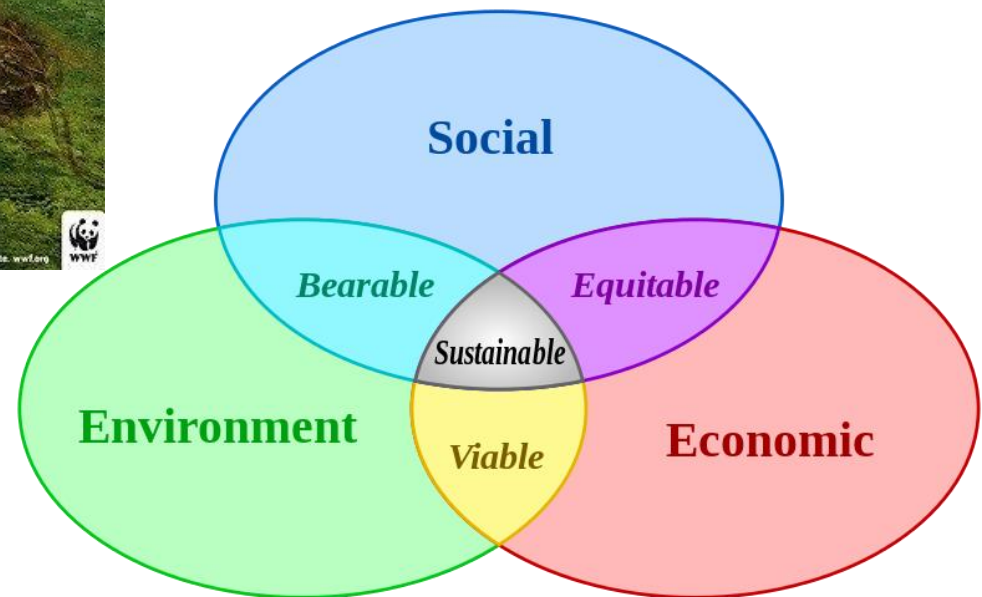
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- **ECSA E-03-P**
  - T&L process monitored by an effective quality assurance process that supports **continuous improvement**
  - Student **retention** and **throughput** rates are monitored and corrective measures taken as needed
    - Overall and for distinct groups



# Resourcing and Sustainability



[http://commons.wikimedia.org/wiki/File:Sustainable\\_development.svg](http://commons.wikimedia.org/wiki/File:Sustainable_development.svg)



# Resourcing and Sustainability

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- **ECSA E-03-P**
  - Selection of students  $\approx$  programme's academic requirements
  - Number of students admitted  $\approx$  capacity to offer good quality education
    - Linked to institution's equity and diversity plans.
    - Number of academic and support staff is sufficient for programme.
  - **Staff members**
    - Competent leadership, planning and management of assessment
    - **Suitably qualified**, have sufficient relevant experience and teaching and assessment competence.
    - Strategy for recruitment, development and retention of academic staff
    - Range of specialities and abilities to teach at specialist and fundamental level
    - **Research profiles** relevant to programme; appropriate research development opportunities



# Resourcing and Sustainability

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- **ECSA E-03-P**
  - Budgetary allocations for programme are adequate and are effectively utilised
    - Staffing budgets and resulting packages
    - Laboratory equipment
    - Computing and networking
    - Operating expenses
    - Library facilities
  - Office, teaching and laboratory accommodation and equipment are adequate



# Resourcing and Sustainability

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- **ECSA E-03-P**
  - Studies on effectiveness of programme in meeting its objectives are undertaken at regular intervals
  - Academic development programmes
    - Designed to match student state of preparation and progression toward main programme
    - Staff responsible adequately qualified, experienced and skilled
    - Funding for programme is adequate
    - Realistic criteria are applied for acceptance of students into programme
    - Is quality assured



# Conclusions





# What is good teaching?

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- Facilitates effective, active **learning**
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- and, at same time,
- requires an affordable level of **resources**
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- **Critical success factors**
  - "Never deny students their right to fail"
  - **Module framework**
    - Student, assessors, lectures
    - Knowledge areas, credits, outcomes
  - **NB: assessments**
    - Students start their approach to a module with assessments
  - **Research for disciplinary expertise**
    - Research teaches the teacher
  - **Performance management**
    - Reward good teaching, i.e. teaching that results in good learning
  - **Discourage "good teaching" that leads to bad learning**
    - Too much help can be bad
    - Not enough self-development
    - Excessive resources



# Acknowledgements

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