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The PEESA Projects: International Collaboration on Engineering Education

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Outline

- **Overview of each of the three PEESA projects**
- **Looking at the**
 - Rationale
 - Activities
 - Outputs
- **Reflections on PEESA**

Overview of the PEESA projects

- Implemented in three phases (2013 -2020)

- PEESA I (2013- 2016)



- PEESA II (2016/17)



- PEESAIII (2017-2020)





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Origins of PEESA I

- Programme on Energy Efficiency in Southern Africa



- 3-year Project funded on the EDULINK programme (2013-15)



- EU funded programme as part of the ACP-EU cooperation



Consortium Members

European Partners

Hochschule Wismar (HSW) -Leader
Hochschule Flensburg (FUAS)
Ernst Abbe Hochschule Jena (EAH)

Associate member

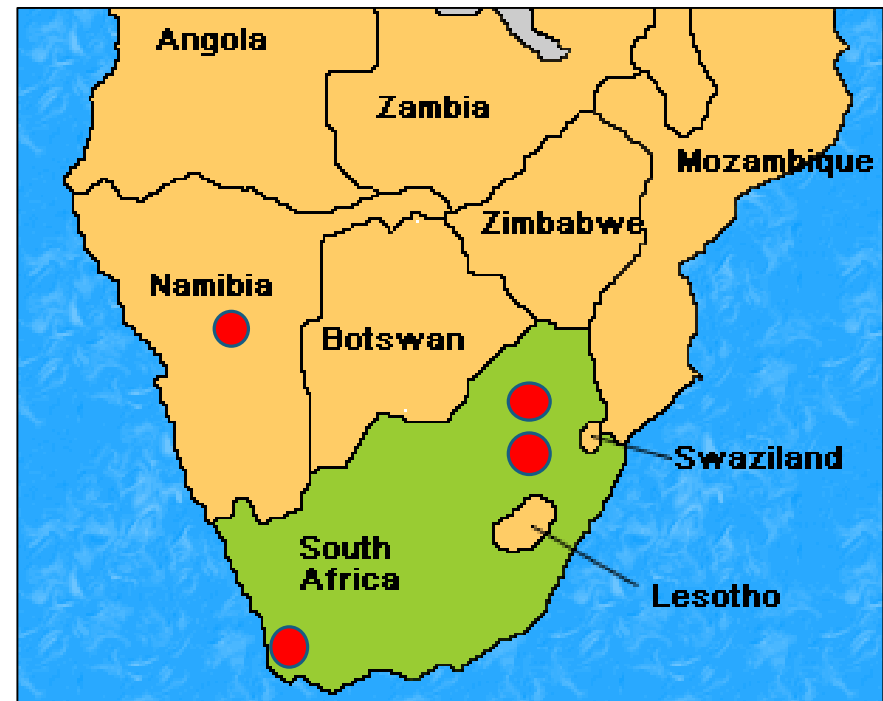
ENAAE (European Network for the
Accreditation of Engineering Education)



Consortium Members

Southern African Partners

- Cape Peninsula University of Technology (CPUT)
- Tshwane University of Technology (TUT)
- Vaal University of Technology (VUT)
- Namibia University of Science and Technology (NUST)



Rationale for PEESA I



The map displays global energy metrics using a color scale from green (low) to red (high). North America and Europe show high levels of energy supply and access (red/orange). Africa shows significantly lower levels, primarily in green and yellow, indicating a major challenge in energy supply, access, and efficiency.

Energy Supply
Energy Access
Energy Efficiency
Remains a Huge Challenge in Africa

Rationale for PEESA I

- **In sub-Saharan Africa (ex SA) more that 50% of the population have no access to electricity**
 - Generating capacity inadequate
 - reliability, affordability is an issue
 - Heavily reliant on diesel generators
- **In South Africa, while more than 80% of population have access to electricity**
 - more than 90% of power comes from coal fired power stations.
 - problem of aging infrastructure, deferred maintenance



Rationale for PEESA I

- **Solution:**

- Increase generating capacity in an environmentally sustainable way (major focus on renewable energy)
- Improve energy efficiency
- Introduce demand side management



- **Challenge:**

- Major shortage of skills to meet future energy needs



Objectives of PEESA I

Master degree in Energy at each partner university

- Professional degree
- Curriculum responding to regional and national needs
- Curriculum developed to EUR-ACE standards

Staff Capacity Building

- Curriculum Development
- On-line learning
- EU-ACE standards

Activities and Outputs

Activities

- Workshop on European and national standard alignment
- Workshops on curriculum development; online learning
- Dissemination conferences
- Industry Visits



Specific Outputs

- New master programme on energy efficiency
- Guidelines on engineering programme design
- Evaluation of programmes against EU-ACE standards







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PEESA II

PEESA II funded by the BMBF (2016)



Programme on Energy Efficiency
in Southern Africa



Federal Ministry
of Education
and Research

Objectives of PEESA II

Add further value to the Master in Engineering programmes developed in PEESA I by focusing on

- **Capacity Development of staff**
 - General didactics
 - Blended learning
- **Multi-cultural and interdisciplinary skills for students**



Consortium Members

- **European Partners**

- Hochschule Flensburg (FUAS) - Leader
- Hochschule Wismar (HSW)
- genio.team GbR, Recklinghausen (service provider for didactic workshops)

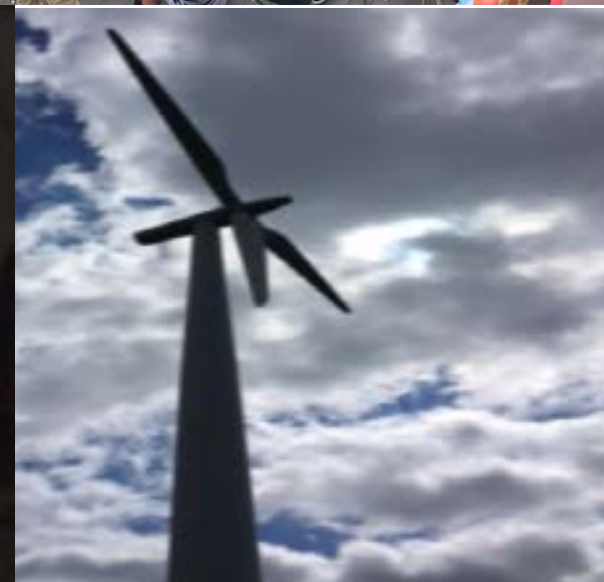
- **Southern African Partners**

- Cape Peninsula University of Technology (CPUT)
- Tshwane University of Technology (TUT)
- Vaal University of Technology (VUT)
- Namibia University of Science and Technology (NUST)

Activities of PEESA II

- **Workshops for staff**
 - 2 sets of workshops at FUAS
 - Focus on subject didactics, curriculum design, qualification frameworks, assessment, credit allocation
- **2 Summer schools for students involving activities and projects**
 - Focusing on bridging cultural differences
 - Promoting multidisciplinary team work
 - Involving students and staff

Summer School



Activities of PEESA II

- **Meetings**
 - Hosted by Southern African partners
- **Dissemination Conference**
 - Held at the Cape Peninsula University of Technology
- **Development of at least one on-line module of the Professional Masters degree in Energy**
- **Activities to create further opportunities for networking and collaboration**

CAPACITY BUILDING FOR SUSTAINABLE DEVELOPMENT



PEESA III

- PEESA III (PERSONALISED ENGINEERING EDUCATION IN SOUTHERN AFRICA)
- Funded on the Erasmus + K2 programme of the European Union



Consortium Members

- **European**
 - Hochschule Wismar (HSW) - leader
 - Hochschule Flensburg (FUAS)
 - University of Szczecin (USZ)
 - Lucian Blaga University of Sibiu (ULBS)
- **Associate member**
 - ASIIN (Accreditation Agency for Degree Programmes in Engineering, Informatics, the Natural Sciences and Mathematics)



Consortium Members

- **South African Partners**

- Cape Peninsula University of Technology (CPUT)
- Tshwane University of Technology (TUT)
- Vaal University of Technology (VUT)
- Durban University of Technology (DUT)



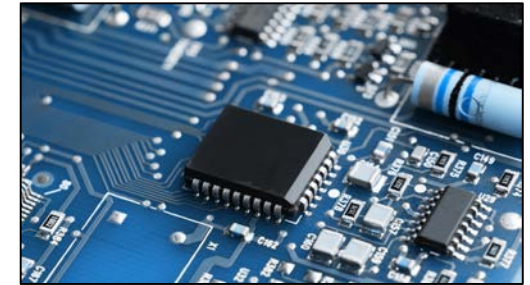
Rationale For PEESA III

**Address the problem of acute shortage
of Engineers in South Africa**

Country	Average population per engineer
South Africa	3166
Malaysia	543
Brazil	227

Serious mismatch in supply and demand of
skills required for a sophisticated economy

Need to prepare engineers for work in
the 21st century



Objectives of PEESA III

- Primary Deliverable:
 - Three professional masters degrees in engineering
 - Mutually recognized by partners (with mutual cooperation agreements)
 - With completed application for EUR-ACE accreditation



Accreditation Agency for Degree Programmes in Engineering, Informatics, the
Natural Sciences and Mathematics

Approach to PEESA III

**To extend Capacity Building initiatives and build
on the outputs of PEESA I and II**

PEESA I

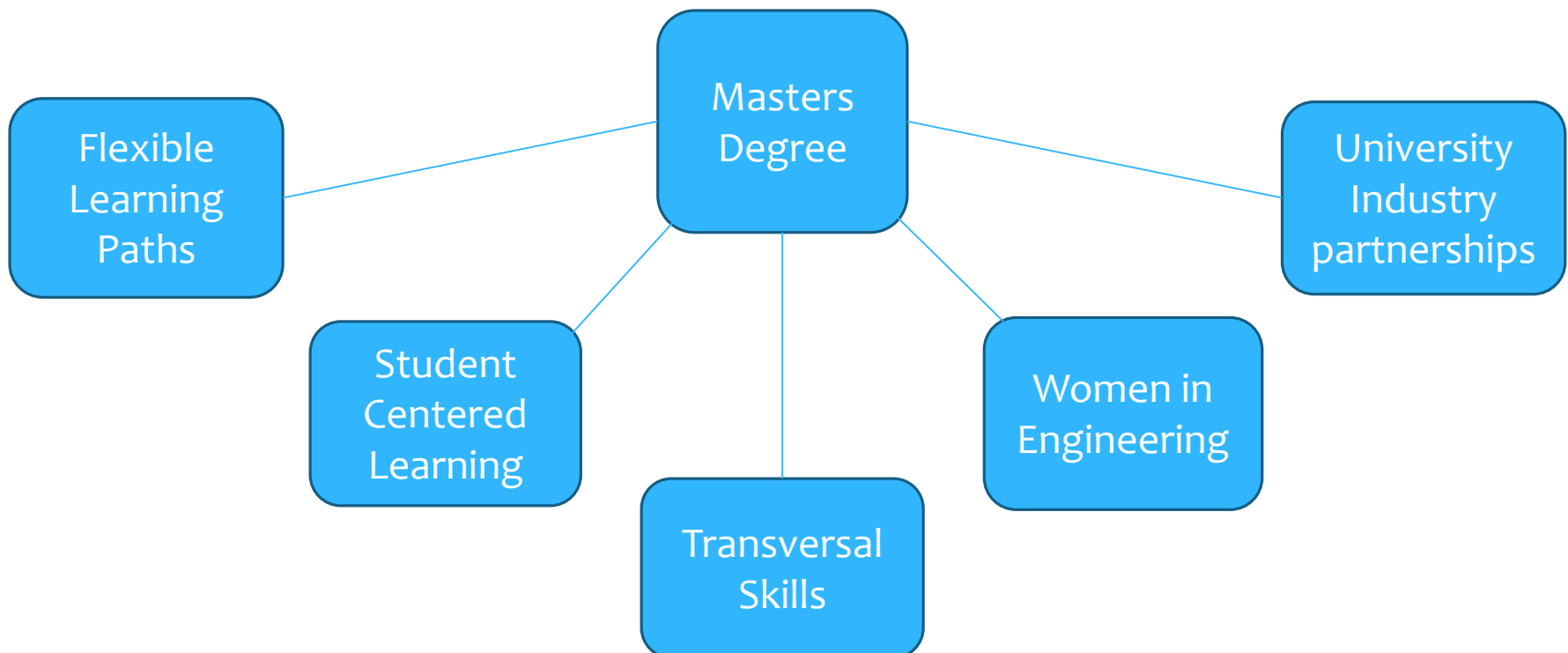
- Curriculum development workshops
- Workshop on European and national standard alignment
 - Guidelines on engineering programme design
 - Evaluation of programmes against EU-ACE standards

PEESA II

- Workshops on subject didactics
- Workshops on blended learning
- Activities to promote multicultural and interdisciplinary teamwork

Additional objectives of PEESA III

To build on the “train-the-trainer” concept and add value to these professional master degrees



Activities of PEESA III

- **Create opportunities for social interaction through meetings/workshops/conferences at each partner institution**
- **Engagement with regional government**
- **Excursions and interactions with industry partners**
- **Presentations and discussions on**
 - EUR-ACE standards and accreditation
 - Good practice in promoting women in engineering
 - Creating flexible learning paths
 - University-Enterprise cooperation
 - Curriculum and programme development

Reflections on PEESA

- **A highly successful consortium**
- **Received funding from 2013 to 2020**
 - Through three separate funding bids in a highly competitive process.
 - PEESA III was one of 149 successful bids out of 833 applications (17,6% success rate)

What were the success factors?

- **Relevance of the topic/theme**
 - **Alignment with Millennium Development Goals/and priorities of the EU**
 - support broad economic development to alleviate poverty and unemployment in partner countries
 - Addressing Energy Challenges is key
- **Addressing Human Resource Capacity Development in Partner Countries**
 - In critical scarce skills areas in Partner Countries
 - In the energy sector
 - In the engineering sector in general

Success Factors

- **Acknowledgement the changing Higher Education context in partner countries**
 - New Higher Education Qualifications Framework making provision for professional masters degrees
 - Need for flexible learning paths to increase access and to cater for a more diverse student body
 - Focus on internationalization
 - Trend towards more “Personalized” education
 - Focus on “softer skills” in engineering

Success Factors

- **Strong project management**
 - Focus on outputs, deliverables, timelines
 - Good understanding of EU funding requirements and contractual obligations
- **Champions at the partner institution**
- **Optimization of Networking opportunities**
 - Workshops/Conferences/Meetings

The support of

- The ACP Edulink programme
- The BMBF
- The Erasmus + K2 programme



Federal Ministry
of Education
and Research



Thank You!



Cape Peninsula
University of Technology

#creatingfutures