Problem Based Learning: Teaching engineers to tackle the SDGs
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From Participation to Ownership to meet the SDGs

NAADIYA MOOSAJEE
STEM is a future skill requirement yet, only 11% of engineers are women. Even fewer own businesses in STEM.

Can we leverage STEM ownership to meet the SDGs faster?
Demographic spread and business stage of the female founders selected for the Africa Innovation Fellowship.

<table>
<thead>
<tr>
<th>Country</th>
<th>Number of Founders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nigeria</td>
<td>5</td>
</tr>
<tr>
<td>Ethiopia</td>
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</tr>
<tr>
<td>South Africa</td>
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</tr>
<tr>
<td>Cameroon</td>
<td>2</td>
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<tr>
<td>Morocco</td>
<td>3</td>
</tr>
<tr>
<td>Chad</td>
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</tr>
<tr>
<td>Mali</td>
<td>1</td>
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<tr>
<td>Botswana</td>
<td>1</td>
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<tr>
<td>Ghana</td>
<td>1</td>
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<tr>
<td>Zimbabwe</td>
<td>1</td>
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<tr>
<td>Chad</td>
<td>1</td>
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<tr>
<td>Burkina Faso</td>
<td>1</td>
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<td>Tanzania</td>
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<td>Sénégal</td>
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<tr>
<td>Cameroon</td>
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<tr>
<td>South Africa</td>
<td>2</td>
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<tr>
<td>Rwanda</td>
<td>2</td>
</tr>
<tr>
<td>Kenya</td>
<td>3</td>
</tr>
<tr>
<td>Uganda</td>
<td>3</td>
</tr>
</tbody>
</table>

12% are at the Idea stage.
4% are at the Prototype stage.
44% are at the Established stage.
11% are at the Scaling stage.
Tackling the SDGs

Demographic spread of female founders that applied to the Africa Innovation Fellowship.

The Sustainable Development Goals (SDGs) that SSA female founders are working towards.
Top 3 Business Challenges

Funding
Access to funding, loans, knowledge on how to raise funding

Human Resource
Skills development for team (business and technical) + recruitment and retention (a result of funding)

Streamlining Production Processes And Costs
Reducing raw material costs, high upfront costs, improving payment systems with customers
Equipping Women to Own the Industry

People
- Team for programme execution/admin
  - Mentors/facilitators
  - VC Fund managers

Tools
Startups:
- Entrance criteria
- Progress/monthly evaluation (KPIs)
- Exit evaluation (KPIs)
- House rules

Courses:
- Course content
- Facilitators guide

Environment
Working space & meeting rooms
- Tech Gym
  Gadgets, schedule, trainers, access to emerging technologies to tinker with and use for work.
To meet the SDGs we are going to need more women engineers, and the only thing better are women entrepreneurs in STEM

Naadiya Moosajee, WomEng Co-Founder
In several studies, when children were asked to draw a mathematician or scientist, girls were twice as likely to draw men as they were to draw women, while boys almost universally drew men, often in a lab coat. “

Children's Gender Stereotypes About Math: The Role of Stereotype Stratification
Jennifer Steele
Who we are

- Not-for-profit organisation (trust) or Social Enterprise
- Primary Focus: Engineering education – the ‘E’ on STEM
- Also work in underrepresented communities

The objective of the Trust is to work towards the promotion of the study of science, technology, engineering, mathematics and related subjects among young women, girls and children and the empowerment and capacity strengthening of various groups and communities of young women, girls and children in Zimbabwe to enable them to achieve this stated goal.
What we do

Goals:

• 1) To teach engineering at early stages
• 2) To change girls’ perceptions of STEM by emphasising that practice, rather than (innate) ability, improves performance.

*Intelligence is improved through learning.*
How we do it

- Physical computing (or just coding) workshops
- Products that encourage practice (eg. PEEK)
The Purple Early Engineering Kit

Features:

• Low-cost
• Compact for mobility – fits into your school bag
• Comes with a ‘simple language’ manual
• Many (different) difficulty levels using same kit

What does it do?

• Learn foundation principles of robotics
• Learn how to interact with the environment
• Help girls and boys discover their passion (or lack thereof) for STEM-based careers
What we are looking for

• Share experiences – especially from working in disadvantaged communities

• Knowledge transfer – sustainability models for organizations that do the kind of work that we do

• Collaboration – fitting into ‘the bigger picture’

• Opportunities
  • NEF Africa Science Week
  • POTRAZ Smart City Hackathons
  • Other Grants

http://purpletrust.org
Thank you