Combining Technology and Human Interaction in STEM through Innovation to Drive Passion for the Next Generation of Aviation Professionals

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Girls Fly Programme Africa Foundation

NACO Netherlands Airport Consulting Organization South Africa

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Combining Technology and Human Interaction in STEM to Inspire the Next Generation of Aviation Professionals

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Hutamo, K. Girls Fly Program Africa (GFPA), South Africa
Smith, R. Netherlands Airport Consulting Organization (NACO) South Africa
Progress on inspiring girls into Science, Technology, Engineering and Mathematics (STEM) careers has been extremely slow (similar to aviation)

We could see a shortage of skilled employees in STEM fields over the next 5 years

Recent emphasis on STEM education (K-12) to address the potential shortage and lack of diversity
Addressing the Problem

• Outreach through Embry Riddle Aeronautical University (ERAU) Worldwide Women in Aviation International Chapter developed a Massive Online Open Course (MOOC) geared towards girls and boys between the ages of 8 and 17.
  • Could this be done in person as well?
Combining computer-based training with live mentors/role models in the classroom in South Africa

- Background of situation
- Students background
- School, faculty and parent involvement
- Future eligibility for mentoring and participation in programs
GIAD SA 2019 - Aviation Fun Days
MOOC with mentoring in Johannesburg at McAuley House School

Linda Weiland (ERAU-WW-WAI)
Kutlwano Hutamo (GFPA Foundation)
Concept

• Born out of a conference discussion on diversity inclusion
• Network created between several aviation organizations
• Clear opportunities
Collaboration

• Different organizations
  – GFPA Foundations
  – NACO
  – ERAU-WW-WAI

• Sharing ideas and resources

• Not gender exclusive

• Pursuit of aviation professionals for the next generation
Project Overview

- Girls in Aviation Day
- Introduced Mentored MOOC
  - Bringing a human element to online learning
  - Develop concept of giving back by paying it forward
- Application
  - Buy-in from the students
  - Academic results are relevant but not driving force—the girls had to apply for the mentoring MOOC
  - Important for parental buy-in, commitment to providing means for students to turn up
## Volunteers

<table>
<thead>
<tr>
<th>Name</th>
<th>Roles/Designations with GFPA</th>
<th>Company</th>
<th>Fun Day</th>
<th>MDOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renee Smith</td>
<td>Airport Designer</td>
<td>NACO</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Linda Welzien</td>
<td>Professor</td>
<td>ERAU-WW</td>
<td>x</td>
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<tr>
<td>Jody Klasper</td>
<td>Airport Engineer</td>
<td>NACO</td>
<td>x</td>
<td>x</td>
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<tr>
<td>Marcel Langenegag</td>
<td>Director Aviation</td>
<td>NACO</td>
<td>x</td>
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<tr>
<td>Kreanta Moodfrey</td>
<td>Aviation Systems Consultant</td>
<td>NACO</td>
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<tr>
<td>Rumal Ramasop</td>
<td>Airport Designer</td>
<td>NACO</td>
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<tr>
<td>Adel Meare</td>
<td>Airport Designer</td>
<td>NACO</td>
<td>x</td>
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<tr>
<td>Nicholas O Gorman</td>
<td>Designer (Water)</td>
<td>RHDI</td>
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<tr>
<td>Tendai Churelk</td>
<td>Aiside Systems Engineer</td>
<td>NACO</td>
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<tr>
<td>Elise Rateva</td>
<td>Key Accounts Manager - Business Strategy Development</td>
<td>ACSA</td>
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<tr>
<td>GFPA - Linda Ngwazana</td>
<td>Aeronautical Engineer</td>
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<td>GFPA - Kuthane</td>
<td>Managing Director</td>
<td>GFPA</td>
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<tr>
<td>GFPA - Kenele Lekalela</td>
<td>Director of Operations</td>
<td>GFPA</td>
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<tr>
<td>GFPA - Nompumele Masinga</td>
<td>Operations Manager</td>
<td>GFPA</td>
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<tr>
<td>GFPA - Chemane Nape</td>
<td>Volunteer</td>
<td>GFPA</td>
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<tr>
<td>GFPA - Rekhe Leghotse</td>
<td>Volunteer</td>
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<tr>
<td>GFPA - Nandi</td>
<td>Volunteer</td>
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<tr>
<td>GFPA - Rekhe Ledwabe</td>
<td>Pilot I Social Entrepreneur I Founder GFPA Foundation I Emerging leader @TechWomen</td>
<td>GFPA</td>
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<tr>
<td>MCA - Zita Jurgens</td>
<td>IT Teacher</td>
<td>MCA</td>
<td>x</td>
<td>x</td>
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<tr>
<td>MCA - Ross Davis</td>
<td>Head Principal</td>
<td>MCA</td>
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Planes at Fun Day and MOOC

- Paper plane competition at Fun Day
- Theory of flight
- Bottle plane
- Reengineered drawing/design
- Emphasis on aircraft parts and theories
Human Interaction and Involvement
Budget and Logistics

• Pilot depended on donations

• Sponsorships
  – NACO
  – GFPA
  – WW ERAU WAI
  – McAuley House
    • All facilities
  – University of Witwatersrand
Thank you McAuley House School!
Next Steps

• New memberships with WAI (1 year) = Growth in ERAU-WW at WAI Chapter
• Build a MOOC in a BOX Kit for global use
  – Continuous development of MOOC (industry relevance)
  – Working with WAI to offer the MOOC throughout the year
• Pilot course – will follow all 27 girls through high school to determine if there was a significant impact in their career choice
• Continuous collaboration with South Africa
Conclusion and Recommendation

• The event shows that combining technology and human interaction in STEM can inspire the next generation of aviation professionals in South Africa

• A longitudinal study will be conducted to follow the students through high school and college to determine if the program led to a career in aviation

• Continue outreach and MOOC program through ERAU WW WAI Chapters and our partners
Questions ?