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

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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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# STEM Snapshot

- 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?



# Research Approach/Pilot Program

- 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

Science, Technology, Engineering, Art and Mathematics

Girls IN AVIATION DAY  
A Women in Aviation International® Event

AVIATION FUN DAY  
Friday 4<sup>th</sup> October 2019  
All Grade 6 to 9 students

Johannesburg South Africa

**'AVIATION IS YOUR FUTURE' COURSE**  
Saturday 12, 19 and 26 October 2019  
9am to 11am Grade 9 Students only

McTuley House | Women in Aviation International | NACO | GFPA FOUNDATION



## Volunteers

Name		Volunteer List	Company	Fish Day			
Roles/Designations with GFPA				4	12	19	26
1	Renee Smith	Airport Designer	NACO	x	x	x	x
2	Linda Weiland	Professor	ERAU-WWV	x	x	x	x
3	Jody Klaasen	Airport Engineer	NACO	x	x		
4	Marcel Langedag	Director Aviation	NACO	x			
5	Kreanta Moodley	Aviation Systems Consultant	NACO	x			
6	Rumal Ramsaroop	Airport Designer	NACO	x			
7	Adel Marais	Airport Designer	NACO	x			
8	Nicholas 'D' Gorman	Designer (Water)	RHDHV	x			
9	Tendayi Chireki	Airside Systems Engineer	NACO		x		
10	Elsie Ratewa	Key Accounts Manager - Business Strategy Development	ACSA	x			
11	GFPA - Linda Ngozwana	Aeronautical Engineer	GFPA	x			x
12	GFPA - Kutlwano	Managing Director	GFPA	x	x	x	x
13	GFPA - Keneilwe Letselala	Director of Operations	GFPA		x		x
14	GFPA - Nompumelelo Masinga	Operations Manager	GFPA		x		x
15	GFPA - Charmaine Nape	Volunteer	GFPA		x		
16	GFPA - Refilwe Ledwaba	Volunteer	GFPA		x		x
17	GFPA - Nandi	Volunteer	GFPA	x			x
18	GFPA - Refilwe Ledwaba	Pilot   Social Entrepreneur   Founder GFPA Foundation   Emerging leader @Techwomen	GFPA				
19	MCA - Zita Jurgens	IT Teacher	MCA	x	x	x	x
20	MCA - Ross Davis	Head Principal	MCA	x			x



# 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!



### McAuley House School Initiative – Kwanele Kwanele



<https://www.biancoandsonthafuca.com/play-your-part-category/play-your-part-news/enough-is-enough-say-mcauley-house-students>



# 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 ?