

Mar 4th, 10:45 AM - 12:15 PM

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

Linda Weiland M.A.S., M.B.A.
Embry-Riddle Aeronautical University, weila8f3@erau.edu

Bettina Mrusek Ph.D.
Embry-Riddle Aeronautical University, mrusekb@erau.edu

Girls Fly Programme Africa Foundation

NACO Netherlands Airport Consulting Organization South Africa

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Weiland, Linda M.A.S., M.B.A.; Mrusek, Bettina Ph.D.; Girls Fly Programme Africa Foundation; and NACO Netherlands Airport Consulting Organization South Africa, "Combining Technology and Human Interaction in STEM through Innovation to Drive Passion for the Next Generation of Aviation Professionals" (2020). *National Training Aircraft Symposium (NTAS)*. 69.
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Combining Technology and Human Interaction in STEM to Inspire the Next Generation of Aviation Professionals

Dr. Mrusek, B. Embry Riddle Aeronautical University (ERAU) WW College of Aeronautics

Weiland, L. ERAU WW College of Aeronautics

Hutamo, K. Girls Fly Program Africa (GFPA), South Africa

Smith, R. Netherlands Airport Consulting Organization (NACO) South Africa



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 4th 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 (a company of Royal HaskoningDHV) | 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 Ramsarop	Airport Designer	NACO	x			
7	Adel Marais	Airport Designer	NACO	x			
8	Nicholas 'D Gorman	Designer (Water)	RHDHV	x			
9	Tendayi Chureki	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 - Kenoilwe 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.biancoandson.it/ica.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 ?