

A young boy with dark hair, seen from the back, is looking towards a large white airplane on a tarmac. The sky is blue with some clouds. The boy is wearing a light-colored shirt. The airplane's wing and tail are visible. In the background, there are some ground service vehicles and other people on the tarmac.

WELCOME
**Competency-Based
Education & the
Next Generation
of
Aviation Professionals**

**Dr. Suzanne
Kearns**



Engaging the Next Generation Post-Pandemic

COVID-19 has disrupted the aviation sector on a global scale. Aviation professionals are serving essential roles in the supply chain, but the sector is being stretched to the breaking point.

ANC 2020

ICAO's NGAP Programme

Launched

Began as a Task Force,
ICAO initiative, in 2009

2015

ICAO upgraded the
initiative to a
'Programme' in 2015

Vision

Support global aviation to
have sufficient competent
human resources to
support a safe, secure, and
sustainable air transport
system.

States / Regulatory Authorities



International Organizations



Education / Training Providers



Industry/Others



Three Key Considerations

Attract, Educate, and Retain

Promoting Aviation to the Next



Attract

Reach children early on to ‘ignite the spark’ towards aviation careers.

Educate

Optimize training effectiveness and efficiency.

Retain

Reduce attrition, encourage lateral movement, ensure every learner who is capable of achieving competence is supported.

PILOT LOGBOOK

ANC 2020

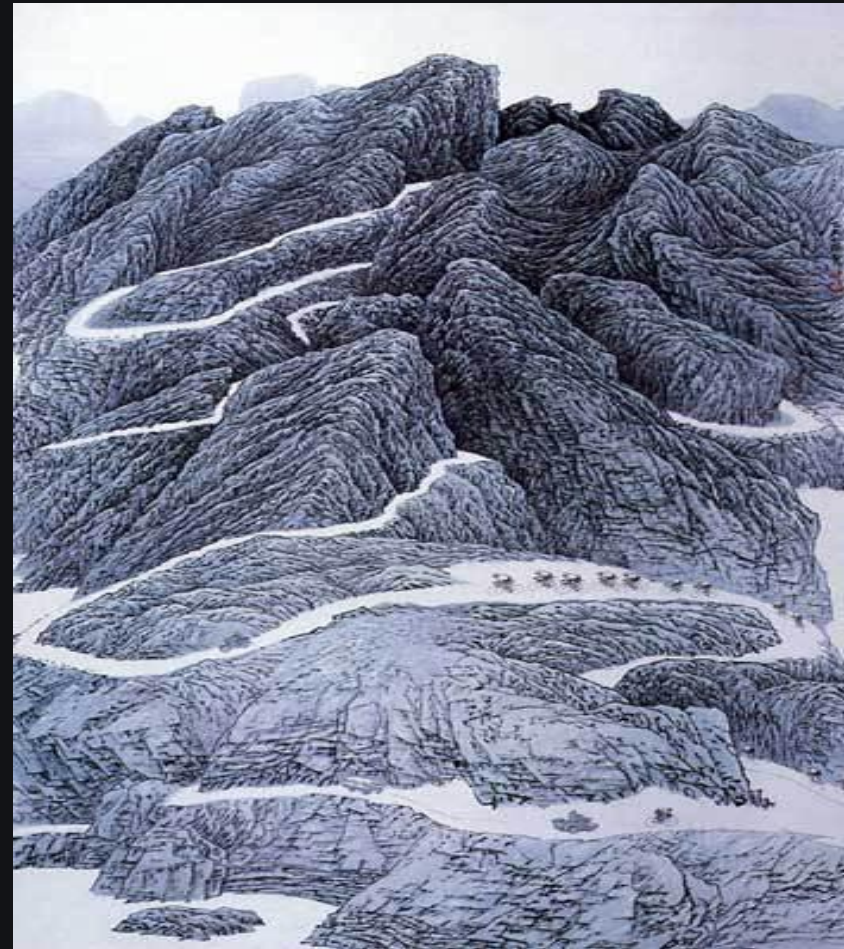
Do Hours = Competence?

- Ask yourself – why do we use 'hours' to measure expertise in aviation?
- You can't expedite a system that is based upon time!
- It can be exploited...

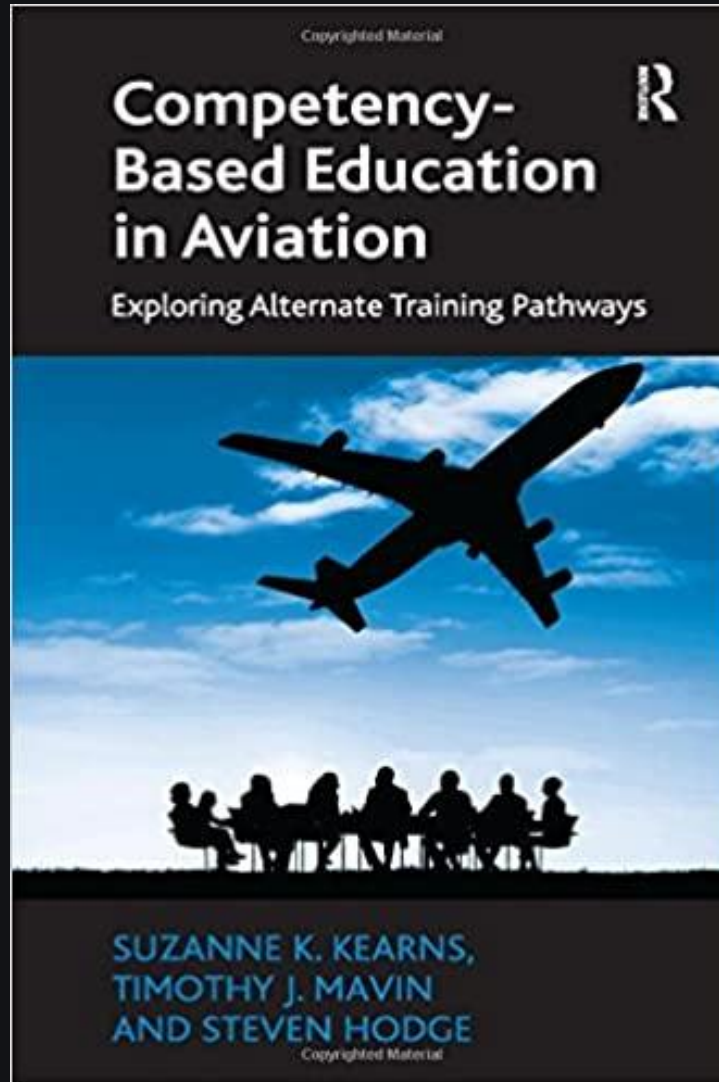
The Limitations of an 'Hours' Approach

Think about it like this:

- Achieving 'competence' as a professional is like reaching the top of the mountain
 - The 'hours' based approach is a winding path – it'll get you there but it's not necessarily the most direct path
 - A 'competence' based approach distills the learning events that are most impactful and charts



What Is Competence?



What Is Competence?



Competency-
Based Education

Competencies

Competence

- What professionals 'do'

What Is Competence?

Competency-Based Education

Competencies

- Written descriptions of what professionals 'do'

Competence

- What professionals 'do'

What Is Competence?



Competency-Based Education	
Competencies	<ul style="list-style-type: none">• Design, Training, and Assessment based on 'Competencies'• Written descriptions of what professionals 'do'
Competence	<ul style="list-style-type: none">• What professionals 'do'

Competency-Based Education

- Design, Training, and Assessment based on 'Competencies'

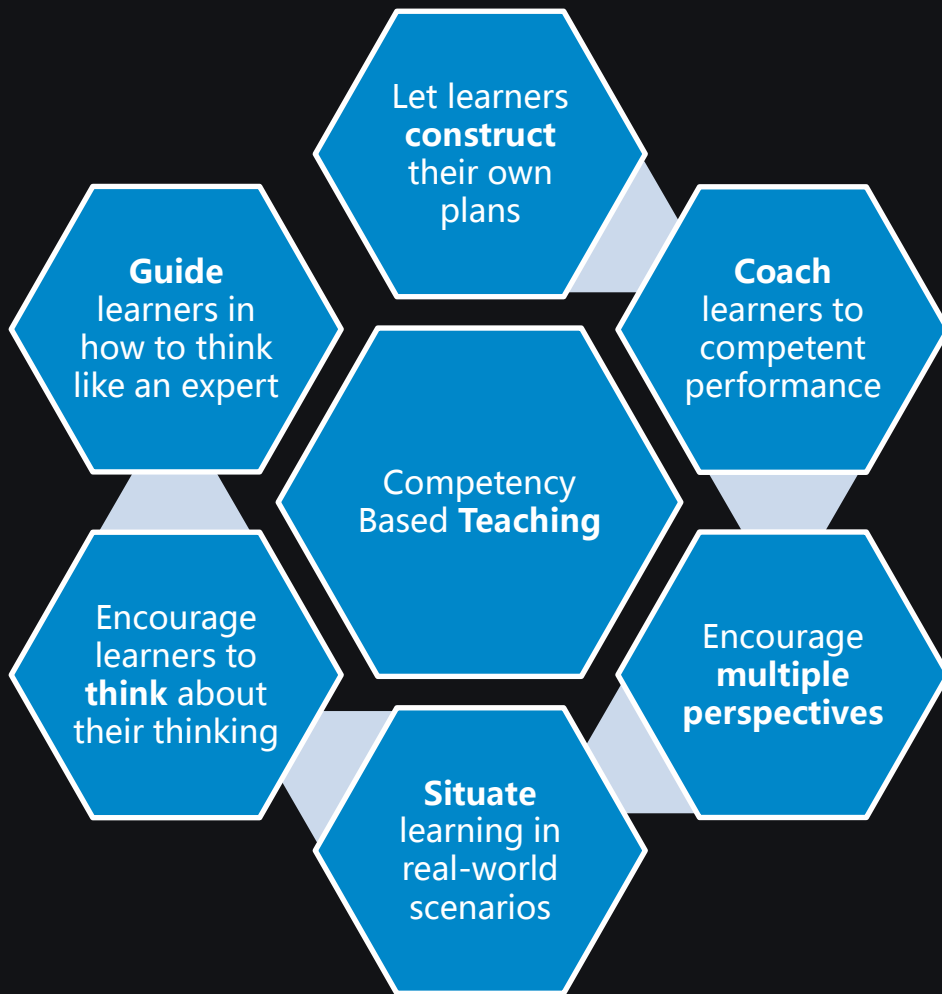
Competencies

- Written descriptions of what professionals 'do'

Competence

- What professionals 'do'

Competency-Based Teaching



“People learn best by confronting intriguing, beautiful, or important problems, authentic tasks that will challenge them to grapple with ideas, rethink their assumptions, and examine their mental models of reality.

These are challenging yet supportive conditions in which learners feel a sense of control over their education; work collaboratively with others; believe their work will be considered fairly and honestly; and try, fail, and receive feedback from expert learners ... [before] judgement of their effort”

(Bain, 2004, p. 18)

ANC 2020

Online Educational Resources

Can we Create Affordable Online Courses?

Traditional aviation training often occurs behind airport fences or within secured buildings.

- Can we create affordable versions of our best educational tools to help attract, recruit, and educate the Next Generation?
- Could we collaborate to stop reinventing the wheel, where training is 'curated' instead of 'created'?



Support the Next
Generation of Aviation
Professionals

Shift training to a 'curated'
model

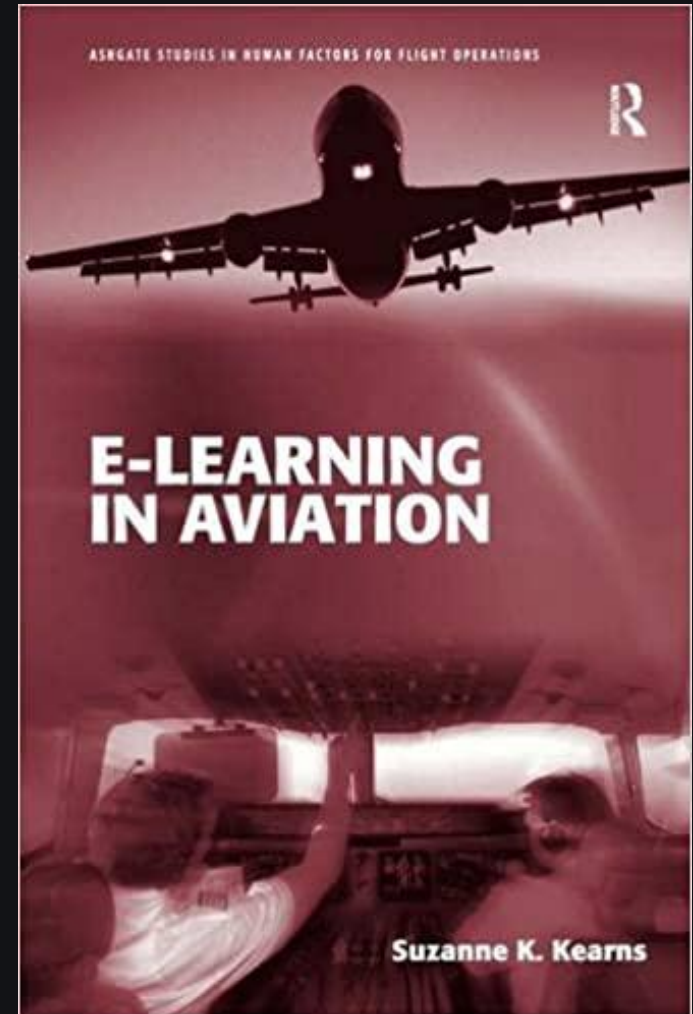
ANC 2020

Online Educational Resources

Can we Create Affordable Online Courses?

Traditional aviation training often occurs behind airport fences or within secured buildings.

- Can we create affordable versions of our best educational tools to help attract, recruit, and educate the Next Generation?
- Could we collaborate to stop reinventing the wheel, where training is 'curated' instead of 'created'?



ANC 2020

Open Educational Resources

ICAO/University of Waterloo –

Aviation Fundamentals (AviFun) 20-hour Online Course



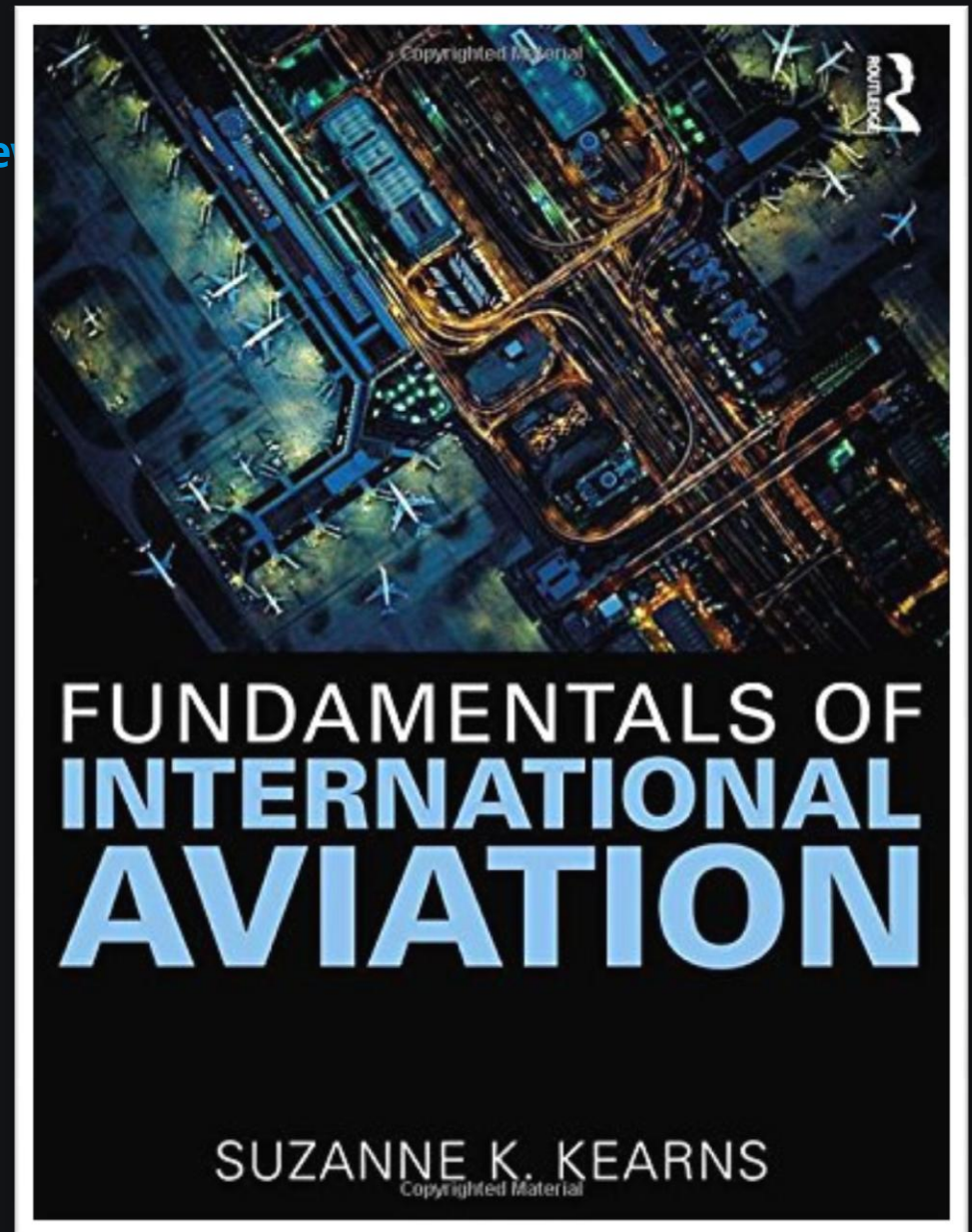
Textbook

Online course is based upon the new textbook:

Fundamentals of International Aviation

10 Chapters

1. Air Law
2. Aircraft
3. Operations
4. Airports
5. Air Navigation
6. Security
7. Environment
8. Accidents
9. Safety
10. Drones



New Research

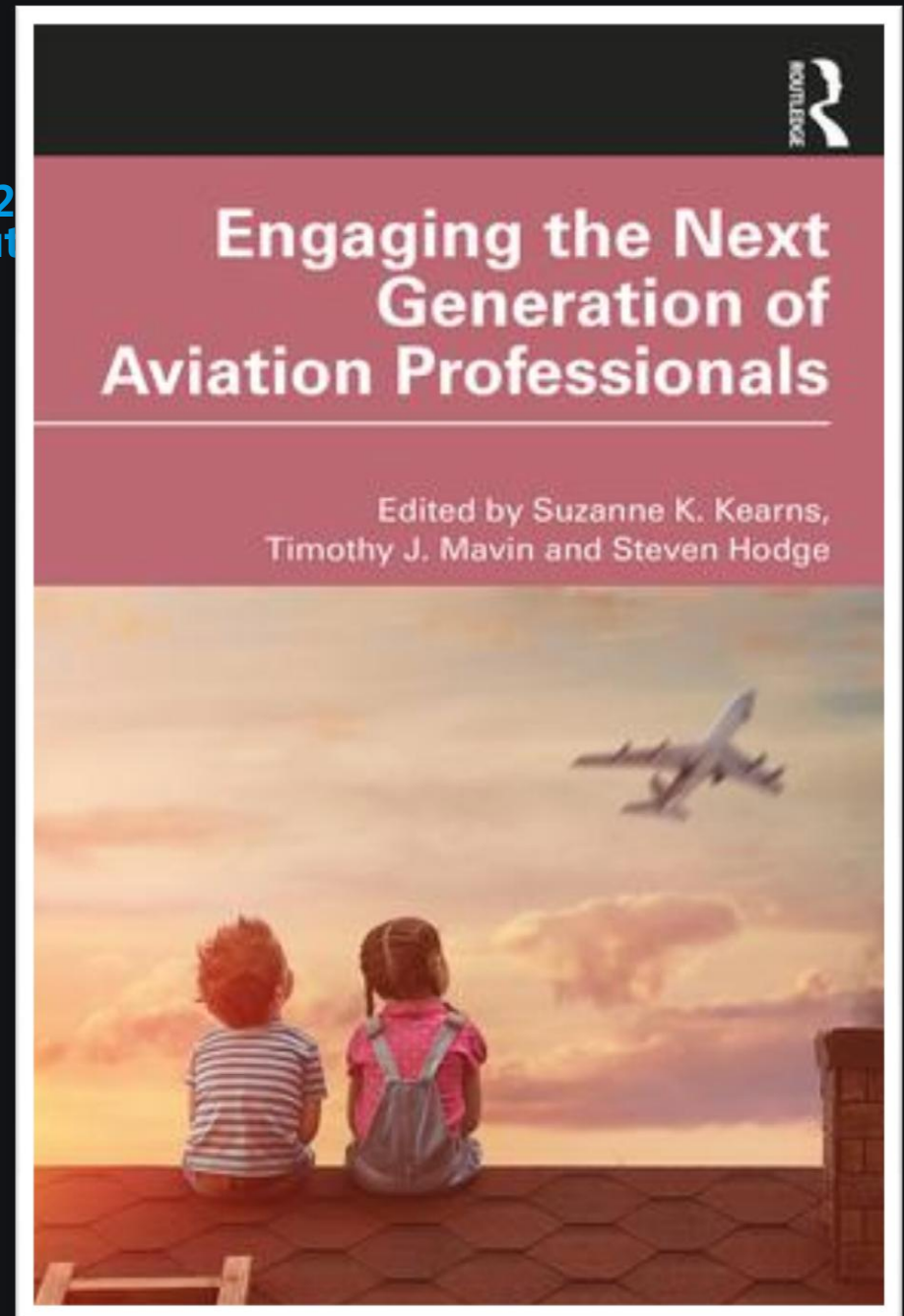
A new book published in March of 2022 is a compilation of works from 50+ authors.

Attracting, Educating, and Retaining the Next Generation of Aviation Professionals

Research into this field is multi-disciplinary:

- Education
- Marketing/Communication
- Outreach
- Economics
- Sustainability
- Human Resources
- Technologies (AR/VR)
- English Training
- Retention
- Safety

Just like human factors emerged from an industry need, so will NGAP emerge as a new field of study!





Solution

ANC 2020

**We cannot solve future
challenges by relying on the
solutions of the past**

MOBILIZING CANADA'S INNOVATION UNIVERSITY to ADDRESS AVIATION CHALLENGES

6 faculties

Arts; Applied Health Sciences; Engineering;
Environment; Mathematics; Science

40K full time and part time,
undergraduate and
graduate students

Undergraduate students:

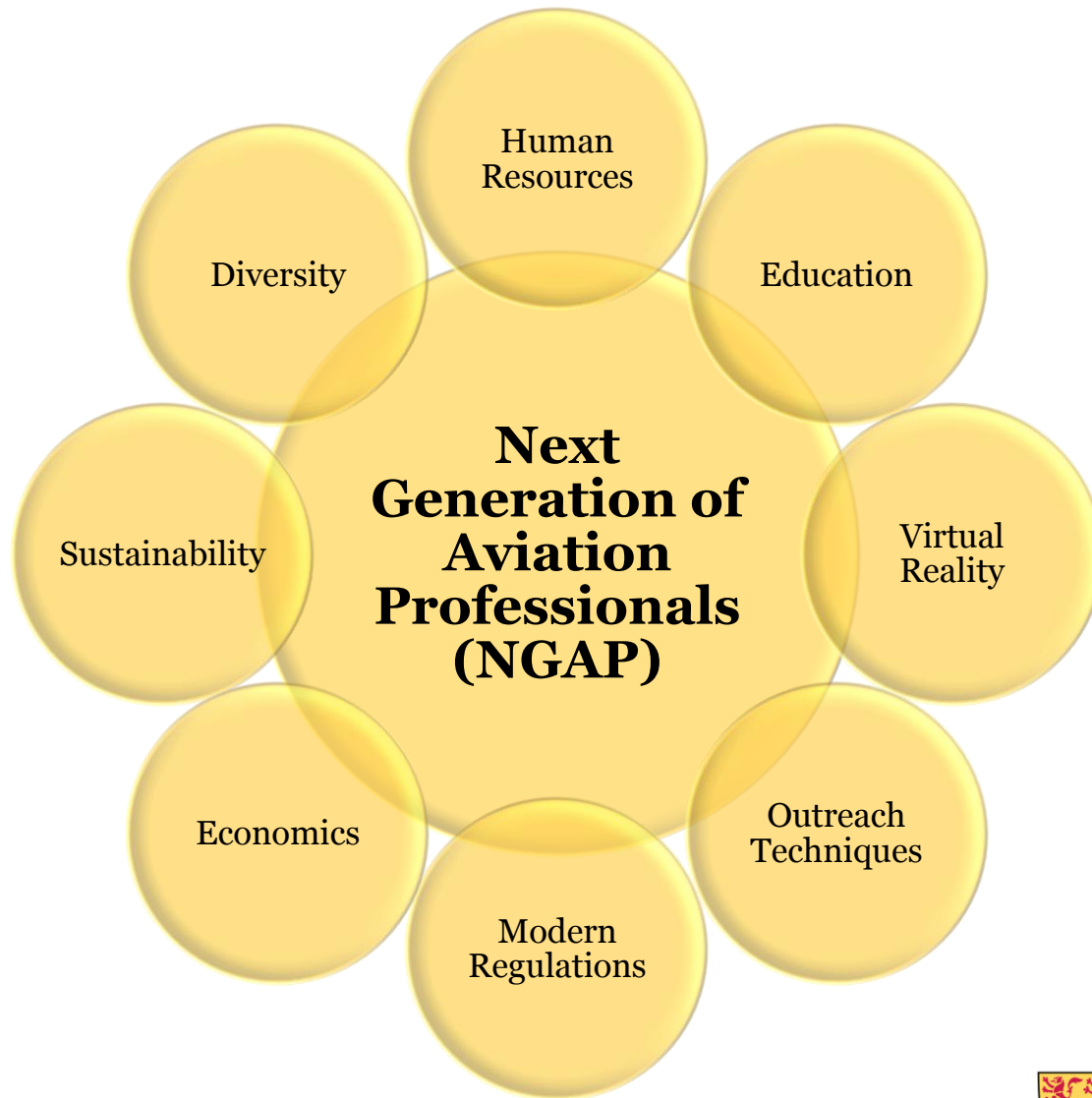
#1 MOST INNOVATIVE
(27 consecutive years)

MACLEAN'S

#1 RESEARCH UNIVERSITY OF THE YEAR
among Canadian comprehensive universities for
10 CONSECUTIVE YEARS

RESEARCH INFOSOURCE

A New Aviation Discipline (NGAP)



Aviation Innovation Lab

Working with researchers across campus to address aviation issues:

- Engineering
- Math
- Health Sciences
- Kinesiology
- Psychology
- Environment

Looking to form an 'industry advisory committee' to guide this work.

Innovative projects applying machine learning, vision science, artificial intelligence and other cutting edge disciplines to



UNIVERSITY OF
WATERLOO



Happy to connect & discuss further...



Waterloo,
Ontario



Suzanne.kearns
@uwaterloo.ca



519-888-4567
x32789



Linkedin/
suzannekearn

s



twitter/
skearns4