RESULTS OF SURVEY AND INTERVIEWS

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DATE?

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Objectives

To gather data through a **survey** and **structured interviews** to explore/identify:

- **facilitators and barriers** associated with adaptation to work settings following a period of study
- **misalignments between educational and labour skill** requirements
- **impact of individual differences** on employees' adaptation to new scenarios
- **risks and opportunities** associated with implementation of new organisational practices and innovative technologies

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Presentation outline

- **Demographic information**
- Gaps/issues in training
- Gaps and challenges experienced in workplace
- Foreseen changes in the workplace
- Looking ahead to 2030

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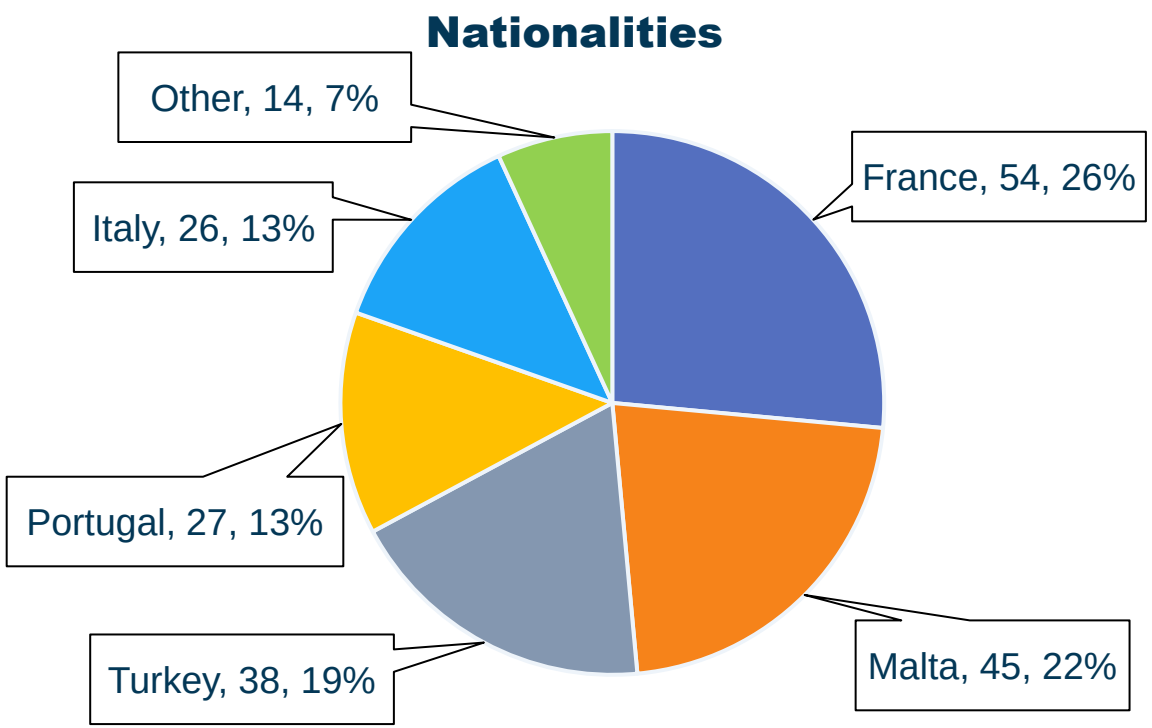
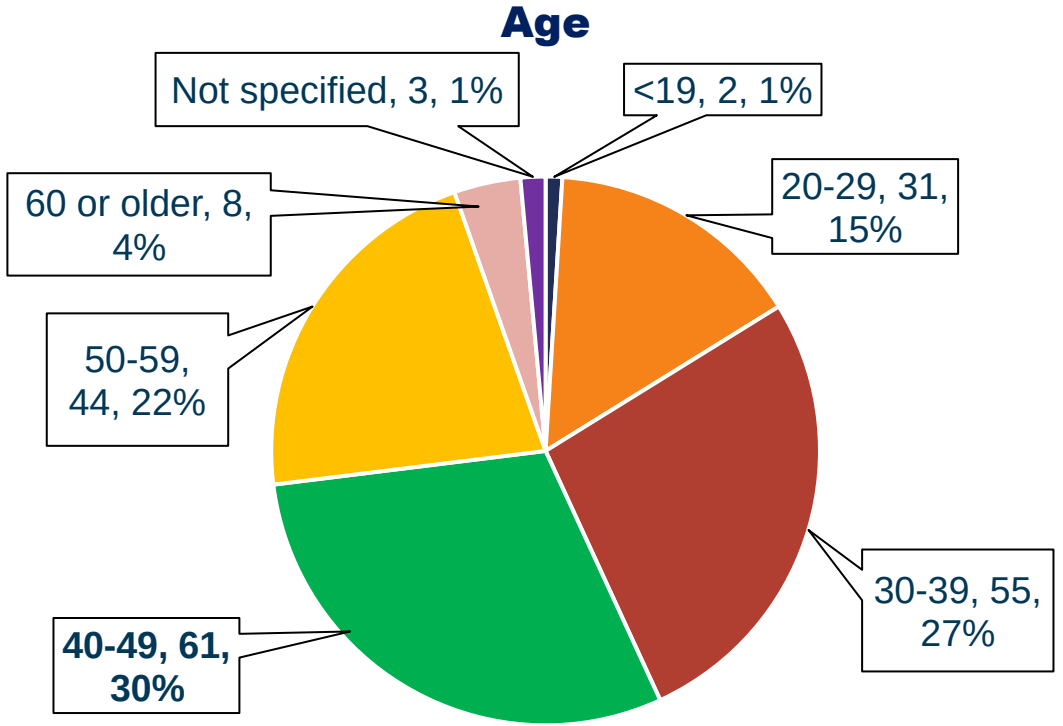
Demographic information

- Number of participants: 204 (Survey: 163, Interviews: 41)





- Gender (survey participants) – Males: 121 (74%), Females: 41 (25%), Other: 1 (1%)

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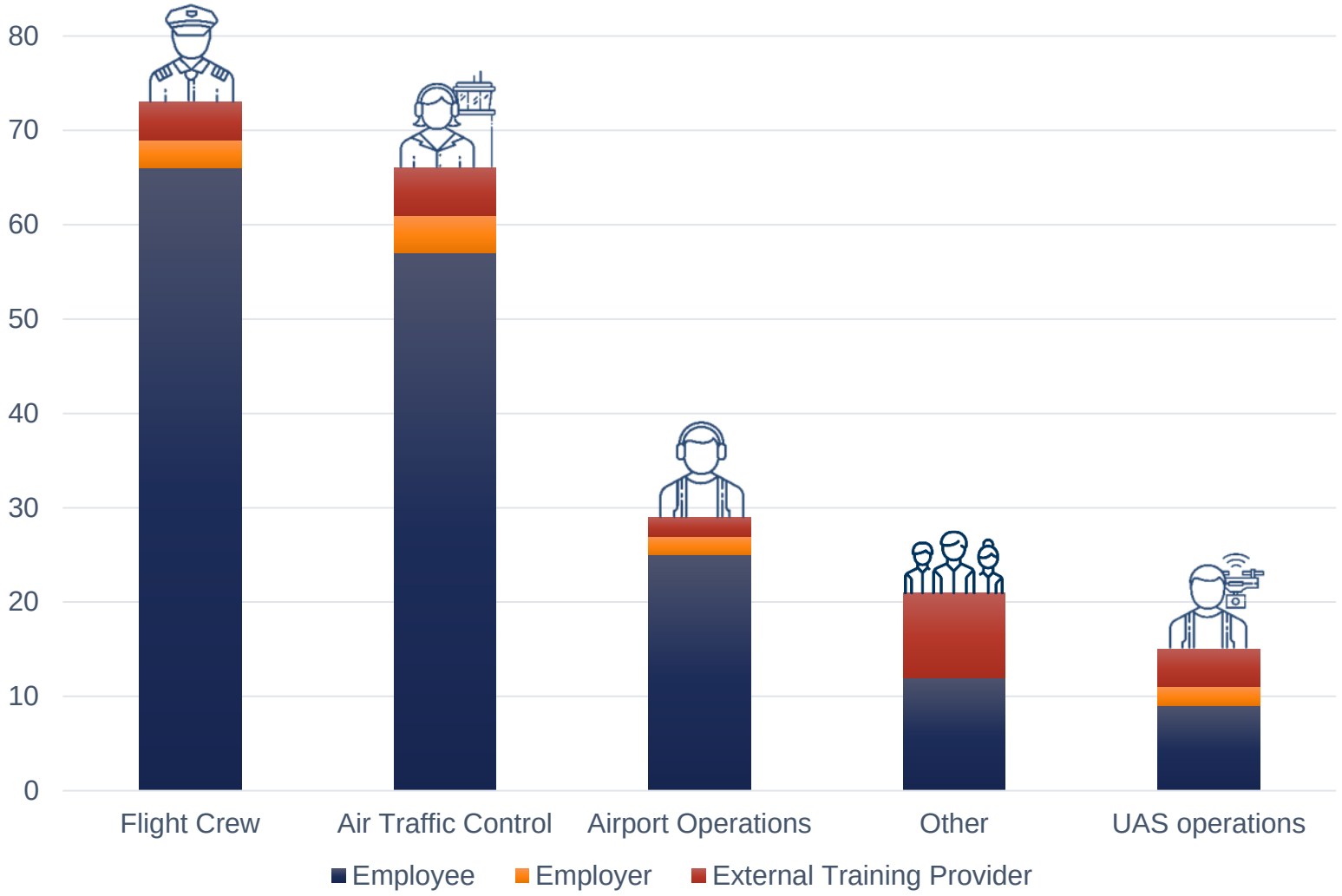
Roles



VET users

- Flight Crew
- Air traffic Control
- Airport Operations
- UAS Operations

Target groups

- Employee
- Employer
- External Training Provider

Variety of roles

- Operational
- Training
- Supervisory
- Managerial
- Executive

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Gaps/issues in training - Flight Crew

- Human factors / Airmanship / Decision-making training
- Initial training focussed on single-pilot skills, MCC only introduced at the end
  - Teamwork training may be insufficient
- Training regulations are too prescriptive
  - Training exercises are repetitive and may become predictable
- Theoretical part may be excessive, more practical work is required
  - Insufficient simulator time limits exposure to abnormal scenarios
- No workplace exposure or training on the reality of airline employment
- Training lags behind technological advancement
- Regulations are outdated
  - Technological advancement
  - Contributory factors in aircraft accidents
- Evidence Based Training - EBT

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Gaps/issues in training – Air Traffic Controllers

- Human Factors training
- Stress and workload management
- Training should be more problem-solving based
- Balance between theory and practice – more simulator training
  - Review theoretical training
- Internships / work exposure
- Aircraft performance should be more realistic in simulator training
- Training scenarios should be more realistic and close to actual operations
  - Reduces further training at local centres

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Gaps/issues in training – Airport Operations

- Immigration issues
  - Document checking and control (passport / VISAs)
- Passenger handling and conflict/complaint resolution
- Manual flight handling – failure of automated systems
- Emergency management
- Training should focus on areas of deficiencies – EBT??

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Gaps/issues in training – UAS Operations

- More practical training is required
- Instructors should be knowledgeable and experienced in UAS operations
  - Retired flight instructors? (Preferably not…)
- Safety related issues including incident management and communication
- Lack of integration of hard skills with soft skills
- Lack of interdisciplinarity in training
- Limited approved training organisations for UAS Operations
  - Quality of training varies amongst different training providers
- Training not necessarily aligned with real-world operations
  - Training needs to be more applied for particular areas of drone operations
- Lack of proper structured training – no regulatory guidance on training material
- No particular gaps in training for military UAS operations

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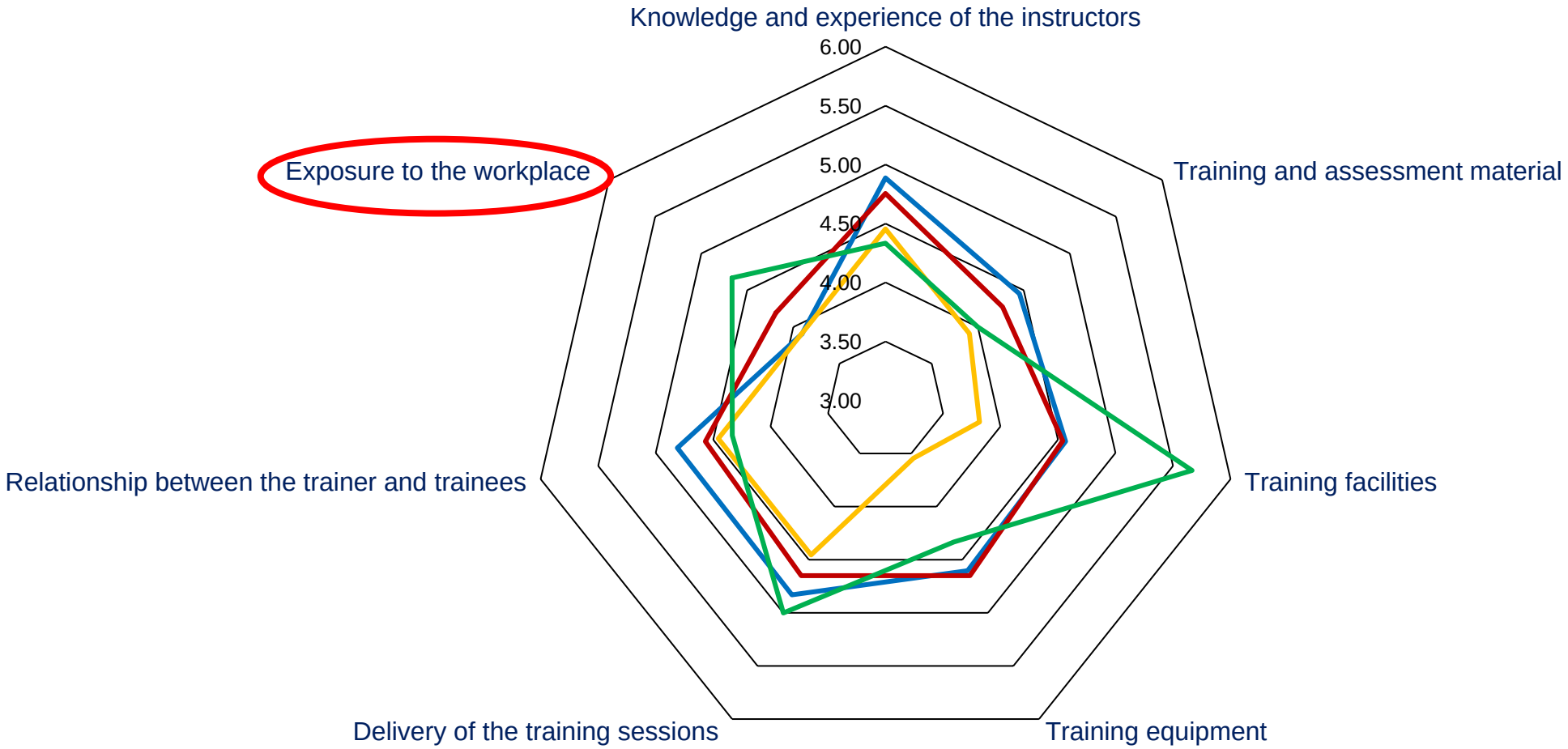
Gaps/issues in training – quality rating of training



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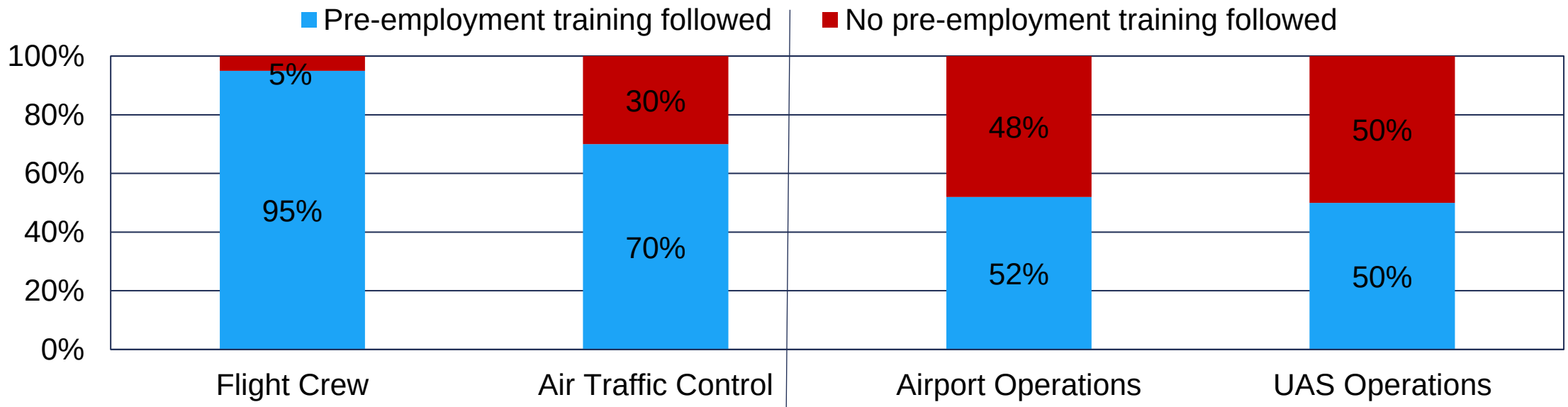
Gaps/issues in training



- Absolute majority stated that training was received prior to employment
- Training is regulated and structured
- Approximately 1.5 to 2 years

- Only around half of respondents stated that training was prior to employment
- Airport Operations personnel are generally trained on the job
- UAS Operations training is not well regulated

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Gaps and challenges experienced in workplace - Flight Crew

- Initially, gaps are mainly due to a lack of experience
  - Aircraft type specific knowledge
  - Transition from piston to jet aircraft
  - Weather and its interpretation
- Commercial and operational aspects of an airline
- Human factors – stress & time management / crew adaptation
- Adaptation to company policies and procedures
- Conflict resolution
- Cultural issues
- Difficulty to assess competencies/attitudes/character of new pilots

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Gaps and challenges experienced in workplace – Air Traffic Controllers

- Initially gaps are mainly due to a lack of experience
  - Technical systems
  - Specific airspace requirements
  - Dynamic weather
- Dealing with high workload situations & multitasking
- Keeping track of frequent regulatory or procedural changes
- Adapting to different characters and mindsets within a team
  - Influence of existing employees and the latter’s resistance to change
- Self-confidence; ultimate responsibility for certain decisions
- Handling non-routine/emergency situations
- Interpersonal skills
- Technology gap

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Gaps and challenges experienced in workplace –Airport Operations

- Systems require on-the-job experience to be properly acquainted to
- Various immigration requirements
- Managerial skills (for respondents in managerial role)
- Handling of flight cancellations and long delays
- Passenger conflict resolution
- Specific airline restrictions
- Knowledge of airport operations – new employees join without specific training
- Fast pace of operations is sometimes overwhelming
- English speaking and writing

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Gaps and challenges experienced in workplace –UAS Operations

- Manual flying skills in challenging wind/weather conditions
- Knowledge of specific software and planning tools
- Task time management and prioritisation
- Frustration over failure
- Lack of understanding of the specific operation

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Foreseen changes in the workplace

- **New technology will be one of the main drivers of change**
  - Flight Crew – Single-Pilot Operations (the speed at which this will happen is debatable)
  - Air Traffic Controllers – Remote Towers
  - Airport Operations – Automated machines / self check-in / mobile technologies
  - UAS Operations – Increased autonomy
- UAS Operations - new technology may be disruptive because of rapid development
- Other target areas – new technology will be more incremental/gradual
- **Changes in regulations will be driven by new technology but will lag behind**
- UAS operations will impact other target areas such as flight crew and ATC
- **Unpredictability of the industry – covid-19**
- **Growth in traffic**
- **<u>All target areas agree that roles will change!</u>**

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Foreseen changes in the workplace

Flight Crew

- Single-pilot ops
  - Reliability & social acceptability
  - Isolated thus more critical
- Pilots will not become obsolete
  - Tasks will be less technical and more managerial
  - Increased automation and decision making aids
  - Artificial Intelligence
- Less human intervention
  - Manual flying skills will still be required for emergencies

Air Traffic Controllers

- Job will continue to evolve, but not become obsolete
  - New technologies – acceptance will be important
  - Transition from purely operations role to a managerial role (ATC → ATM)
  - Increased monitoring and validation of proposed decisions
- Remote towers
  - Broader set of skills
- Emergency situations

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Foreseen changes in the workplace

Airport Operations 

- Jobs requiring human interaction will not change significantly
- Other jobs may become obsolete (self check-in)
- Higher Emotional Intelligence (EQ) will be valued more than higher IQ
  - Harder to automate tasks where EQ is required
- Opportunities for upskilling
  - New technology will require adaptation but not necessarily replacement

UAS Operations 

- Role will require more monitoring of a more autonomous drone
- Situational awareness will become more important
- New roles in areas such as mission planning
- Emergency situations

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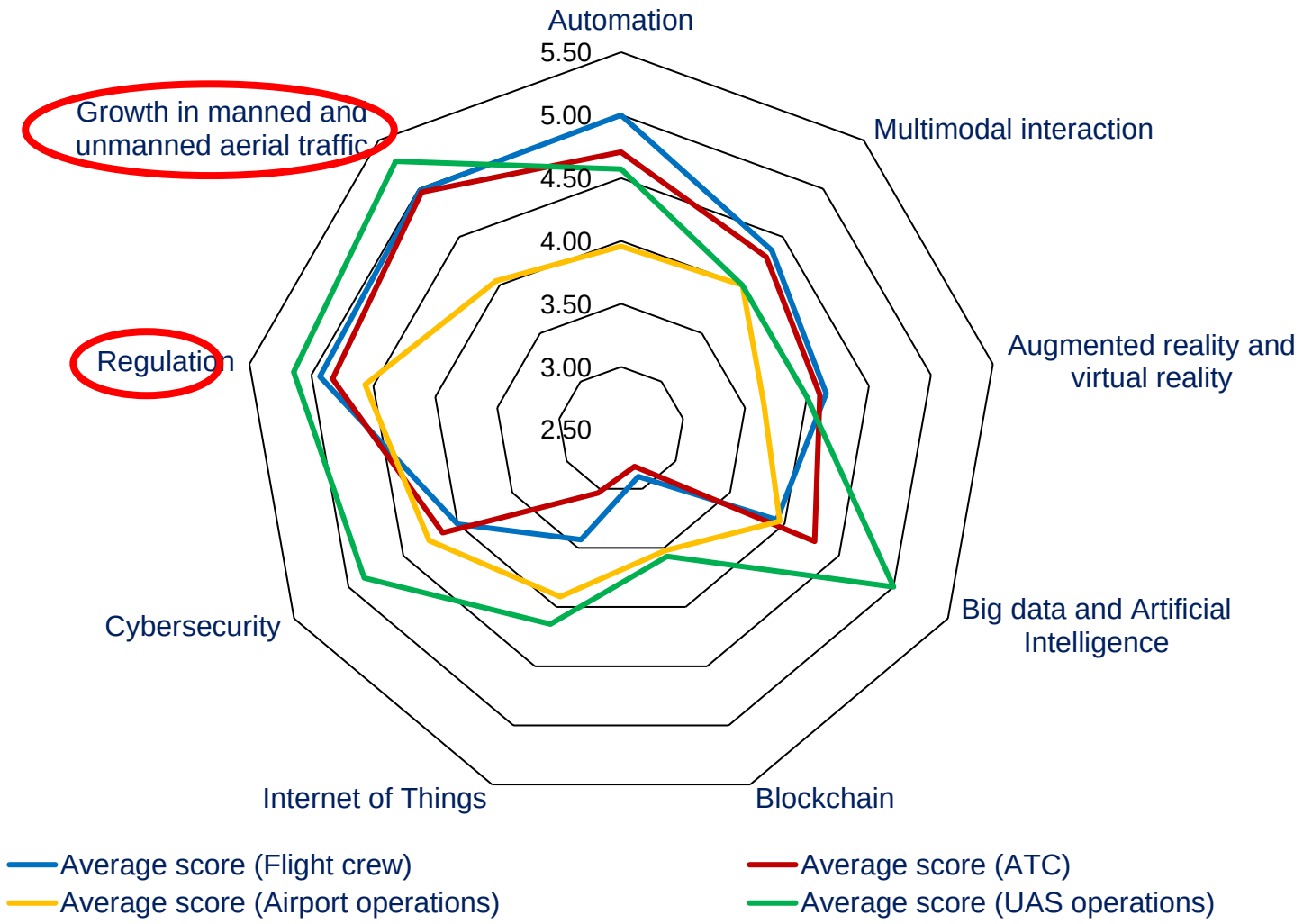
Foreseen changes in the workplace



Flight Crew

1. Automation
2. Growth in manned and unmanned air traffic
3. Regulation

Air Traffic Controllers

1. Growth in manned and unmanned air traffic
2. Regulation
3. Automation

UAS Operations

1. Growth in manned and unmanned air traffic
2. Regulation
3. Big data and Artificial Intelligence

Airport Operations

1. Regulation
2. Cybersecurity
3. Growth in manned and unmanned air traffic

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Most important skills in 2030

FLIGHT CREW

- **Adaptability**
- Technical knowledge/skills
- IT skills
- Interpersonal skills
- Resilience

AIR TRAFFIC CONTROLLERS

- **Adaptability**
- IT and technology-related skills
- Technical expertise
- Compliance with regulations
- Interpersonal skills

AIRPORT OPERATIONS

- **IT and technology-related skills**
- Artificial Intelligence
- Communication
- Adaptability

UAS OPERATIONS

- **IT and computer literacy**
- Technical expertise
- Planning
- Situation awareness
- Decision making

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Increase in importance of different competency areas

FLIGHT CREW

1. Dealing with complexity
2. **Adaptability**
3. **IT/Computer literacy**

AIR TRAFFIC CONTROLLERS

1. **IT/Computer literacy**
2. **Adaptability**
3. **Technical Expertise**

AIRPORT OPERATIONS

1. **IT/Computer literacy**
2. **Technical Expertise**
3. Problem Solving

UAS OPERATIONS

1. **Technical Expertise**
2. Dealing with complexity
3. **Adaptability**

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Conclusions

- Data was gathered through interviews and a survey
  - 204 participants from four different VET user groups
- Several training gaps/issues exist
  - Some issues are common to multiple categories of VET users.
- Several gaps/challenges exist in the workplace
  - Some of these gaps are a result of training deficiencies
  - Some are unique to the particular workplace environment
- Technology is one of the key drivers of change
  - The change will be disruptive for UAS operations
  - For other VET groups, the change will be incremental

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Conclusions

Regulation will have to change

Changes will be partly driven by new technology

Changes still expected to lag behind the technological advancement

Some jobs will possible be made redundant, but others may also be introduced

Automation may completely replace some jobs.

Technological advancement may still give rise to new jobs.

Roles which require human interaction and coordination will change but are less likely to be affected

Some of the most in-demand skills in the future will be:

Adaptability

IT and technology-related skills

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Thank you!

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