LEARNING GAMES

LEARNING EFFECT?

TRAINING TEAMWORK?

SIMULATIONS?

NOTECHS?

BENEFITS OF LEARNING GAMES AND SIMULATIONS IN THE CLASSROOM ENVIRONMENT

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OBJECTIVE

Benefits of introducing Learning Games in Crew Training

- Increase the Learning Effect of Crew Training
- Enhancement of Crew Competencies
- Assessment of Training (NOTECHS)
- Evaluation of Training Efficiency
- Cost effective training
What is CRM?

CRM is the effective utilisation of all available resources (e.g. crew members, aircraft systems, supporting facilities and persons) to achieve safe and efficient operation.

The objective of CRM is to enhance the communication and management skills of the flight crew member concerned. Emphasis is placed on the non-technical knowledge, skills and attitude of flight crew performance.

EASA GM1 ORO.FC.115
What is CRM?

CRM is the effective utilisation of all available resources (e.g. crew members, aircraft systems, supporting facilities and persons) to achieve safe and efficient operation.

The objective of CRM is to enhance the communication and management skills of the crew member, as well as the importance of effective coordination and two-way communication between all crew members.

EASA GM1 ORO.CC.115(e)
Error Management Strategies

• Understanding the nature and extent of error or risk

• Changing the conditions that induce the error

• Determining the behaviours that prevent or mitigate error

Who is at risk?
ABILITY
SYNERGY OF YOUR ATTITUDE, KNOWLEDGE AND SKILLS

ATTITUDE

KNOW WHY

PURPOSE
DISCIPLINE

COMMITMENT
PROFESSIONALISM

ABILITY
or
COMPETENCE

KNOW HOW

PROCEDURES

KNOW WHAT

KNOWLEDGE

SKILLS

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TRAINING

TECHNICAL SKILLS
FLYING SKILLS
Non-technical Skills

NON-TECHNICAL SKILLS
COMPETENCE and ABILITY
TRAINING

SKILLS

TECHNICAL SKILLS
FLYING SKILLS
Non-technical Skills

ABILITY / COMPETENCE

NON-TECHNICAL SKILLS
COMPETENCE and ABILITY

KNOWLEDGE

ATTITUDE
LEARNING
HUMAN REMEMBERS…..

LEARNING ABILITY

LEARNING METHOD

READ  HEAR  SEE  SEE & HEAR  REPEAT  ACTION

LOW
STUDENT INVOLVEMENT
HIGH

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EFFECTIVE LEARNING METHODOLOGIES

LEARNING EFFECT

LOW

STUDENT INVOLVEMENT

HIGH

LEARNING EFFECT
EFFECTIVE LEARNING METHODOLOGIES

<table>
<thead>
<tr>
<th>LOW</th>
<th>STUDENT INVOLVEMENT</th>
<th>HIGH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>Questionnaires</td>
<td>Discussions</td>
</tr>
</tbody>
</table>

LEARNING EFFECT
LEARNING GAMES
ANALOGUE OR DIGITAL
Game-based learning

Game-based learning is a teaching method that utilizes analogue or digital games in instructions. It involves both instructional and participatory acts:

- **Instructional Act** – Instructors reference self-contained systems in analogue or digital games to teach concepts, theories, system-thinking, and design-thinking.

- **Participatory Act** – learners play games and create game systems for experiential learning.
Learning from Feedback

Concrete experience

Observation and reflection

Learning from Feedback

Formation of abstract, concepts and generalizations

Learning from Content

Testing implications of concepts in new situations

Learning from Experience

EXPLORATION
SIMULATION

Learning by Doing or
   Learning by Simulation

Learning is an internal process
Simulation creates a situation where ideas, decisions, or actions can be tried out
It is “OK” to make mistakes
Consequences are visible
No actual risk

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SOCIAL LEARNING

- Safe to be challenged
- Mistakes can be evaluated
- Individual learning → in a dynamic social environment
- Group decisions and evaluation (another set of eyes)
- Enhancement of knowledge and experience (by sharing)
- Platform for future cooperation
Overview of Complex Connections

- Simulation of complex situations and events
- Visual presentation of decisions, consequences and actions
- Easier to see the full picture
ENGAGEMENT and MOTIVATION

- Playing games is generally fun.
- Learning while playing makes it fun to learn.
- Focus must be on the learning.
- Simple simulations.
- High effective output.
- Cost effective.
- Value for money.
PRACTICAL ADVANTAGE

- Less preparation
  - Plug and play
- High activity level
  - People are an active part of their own learning
- High learning effect
  - Fun and educational
- Multiple inputs and solutions
  - Sharing knowledge
- Assessment of performance in real time
  - Comparison to other training
WE NEED TO SIMULATE THE EVENT, GIVE THEM SOME OPTIONS AND THEY NEED TO FIND THE CONSEQUENCE AND SELECT THE ONE THAT IS MOST APPEALING TO THEM.
NOTECHS Categories

SOCIAL SKILLS
- TEAMWORK
- LEADERSHIP & MANAGEMENT SKILLS

COGNITIVE SKILLS
- SITUATION AWARENESS
- DECISION MAKING SKILLS
TRAINING of NOTECHS

Assessment and Feedback of Performance

-operational environment
  - Line training (Normal operation)
  - Simulators (Normal operation / Emergency)
  - Drill Mock-ups (Emergency)

-non-operational environment
  - Classroom → Behaviours – Knowledge – Skills
  - On-line → Knowledge – (Skills)

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POSITIVE behaviour

✓ Assertive and professional
✓ Recognizes signs of stress, fatigue and overload
✓ They are open-minded and listen to others
✓ Discusses crew capabilities / competence
✓ Relaxed, supportive and approachable

NEGATIVE Behaviour

✗ Competes with others
✗ Does not show initiative
✗ Fails to identify potential threats or possible problems
✗ Inappropriate use of humour
✗ Indifferent towards other crew members
POSITIVE behaviour

✓ Ensures SOP compliance
✓ Intervenes if deviation to SOP is observed
✓ Creates an atmosphere for open communication
✓ Keeps calm and makes suggestions
✓ Encourages others to speak up

NEGATIVE Behaviour

✗ Sticks to own opinion without considering a compromise
✗ Does not advocate own position
✗ Ignores suggestions from other crew members
✗ Surprised by consequences they should have anticipated
✗ Unaware of Time
Requirements for Success

✓ Realistic training scenarios
✓ Interactive and fun
✓ Valid constructive assessment of competence
✓ Instructors with good training and assessment skills
✓ Valid feedback and critique based on observations
✓ Suggestions to improve performance

Blocks to Success

✗ Lack of focus on learning
✗ Lack of assessment skills
✗ Lack of self-criticism (Reflection on own performance)
✗ Training scenario too complex
✗ Not providing valid feedback on performance
NOTECHs in Practice

- It is behaviours that are observable and not the actual skills!

- Instructor knowledge of the NOTECHs Behaviour is essential!

- Definition of effective Human Factor behaviour is visible to the crew
  - Helps crew to compare own performance

- In Simulations we are using their technical knowledge to enhance their Non-Technical Skills.

- We focus on "How they do" rather than "What they do"
OBSERVATIONS

- Crew behaviour
- Communication
- Listening skills
- Do they disagree?
- How do they solve that?
- Is there a “leader”?
- Is someone very passive?
- How do they handle conflicts?
- Do they follow SOP?
- Can they foresee the consequences?
- Does everyone give inputs?
- How do they reach an agreement?
- Is someone dominant / controlling?
LIMITATION of Assessment

- Not every aspect of performance and behaviour can be captured:
  - Limited occurrence of some behaviours
    - i.e. Conflict resolution
  - Limitation of human observers
    - Distraction
    - Overload
    - Large groups
    - Lack of knowledge of NOTECHS
    - Own perception of Level of Performance (Standardization)
SUMMARY

• Introduction of Learning Games into crew training will:
  - Enhance learning effect by active participation
  - Enhance the Non-technical Skills of the crew
  - Enhance the knowledge of the operation at many levels
  - Define problem areas for future training (EBT)
  - Enhance instructor’s competence in Assessment
SUMMARY

• Introduction of Learning Games into crew training will:
  - Connect classroom training to real world operation
  - Increase the value of the training
  - Provide cost effective classroom training
  - Engage and motivate the participants
  - Provide possibility for Assessment of CRM Skills in the classroom
Summary

Learning games has to be:

- **Realistic** – a simulation of reality
- **Simple** – simple presentation of complex problems
- **Precise** – clear and precise learning objective
- **Well designed**
- **Measureable** for the learning effect.
THANK YOU FOR YOUR ATTENTION!

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…if everything seems under control, you’re not going fast enough…