The Science of Simulation-Based Training (SBT): Seven Observations

Eduardo Salas, Ph.D.

Department of Psychology &
Institute of Simulation & Training
University of Central Florida

esalas@ist.ucf.edu
This morning...

Give you some advice—**observations**—on the **design & delivery** of SBT

- Based on science of learning, training & simulation...
- Based on the science of teamwork & collaboration
- Plus 30 years of experience...
Observation 1

We know what effective teams do, feel & think...leverage the findings!
What effective teams do...

1. Have clear **roles & responsibilities**
2. Driven by compelling **purpose** – goal, vision
3. Guided by team **coach (leader)** – promotes, develops, reinforces
4. Have mutual **trust** – familiarity
5. Develop team **norms** – clear, known & appropriate
What effective teams do...

6. Hold **shared understanding** of task, mission & goals – hold shared mental models

7. They **self-correct** – huddles, debriefs

8. Set **expectations** – clear, understood

9. Shared **unique** information – efficient information protocols

10. Surrounded by optimal **organizational conditions** – policies, procedures, signals
Observation 2

Focus on 5 C’s...IPT must focus on communication, coordination, cooperation, cognition & coaching
5 C’s

- Critical for effective collaboration
  - **Communicate** from prebrief to debrief
    - Share critical information with all
  - **Coordinate** to complete tasks
    - Monitor performance of team members
    - Provide backup when others need help
  - **Cooperate** with team members
    - Desire to work as a team
    - Believe teamwork will lead to success
5 C’s

- **Cognition**, shared understanding
  - Promote shared mental models
- **Coaching**, leaders matter
  - Promote, develop team members
  - Create a *shared leadership* environment
Observation 3

Build interprofessional training on the science of training & learning...
Before Interprofessional Training...

1. Consider Your Trainee
2. Create a IP Environment Conducive to Training Goals
3. Create a Supportive Learning Environment
4. Create Conditions that Support Transfer of Training
5. Conduct a Team Needs Analysis
During Interprofessional Training...

6. Develop Content for Team-Focused Training
7. Utilize Appropriate Content Delivery Methods
8. Provide Team Development Aids
After Interprofessional Training...

9. Evaluate IP Training
10. Create positive Transfer of IP Training Environment
11. Seek supervisory support
12. Create opportunities to practice
Bottom Line…

- Send signals **before, during & after** IPT that **collaboration matters**
- Provide **time** & **resources** for training
- Management & resource support, a **must**
- Reinforce collaboration on the job
- Avoid “Killers” of training transfer
  - Lack of supervisory **support**
  - No **opportunities** to **perform**
  - **Poor climate** to apply new skills
    - Foster motivation to apply skills
Observation 4

IPT must go **beyond** awareness...it must be **practice-based**, use simulation!
Simulation alone ≠ learning

Practice must be guided
- **Script** scenarios to elicit desired behaviors
- Provide **feedback** in a timely manner
- Reward and reinforce positive behaviors

Avoid myths...
- “High fidelity is better”
- “Learning will translate into behavioral changes”
- “Task experts can articulate training needs”
- “Reactions to training = learning”
Observation 5

Of course... **feedback matters** and so does **diagnostic measures**
Feedback matters...

- Focus on **processes** not just outcomes
- Address both strengths and weaknesses
- Provide feedback that is **supportive**, not threatening
- Create opportunities for **reflection**
- Set expectations & **goals**
Observation 6

Create instructional connections – From learning objectives to scenarios (and “triggers”) to measures to feedback…
SBT Works Best With...

1. ...Clear & Precise Learning Outcomes
2. ...Carefully Crafted Scenarios
3. ...A Realistic Immersive Environment
4. ...Diagnostic Measures
SBT Works Best With...

5. ...Robust Observations Protocols
6. ...Providing Diagnostic & Developmental Feedback (AAR)
7. ...An Organized Pedagogical System
SBT Works Best With...

8. ...Thinking About What Happens Before, During, and After SBT
9. ... Evaluating What Works (or Not)
10. ...Personalization, Reflection, and Guidance
Needed Links in Simulation-Based Team Training...
Observation 7

Debrief!

- Teach how to **debrief & huddle**!
Debrief...

- **Powerful**, yet underutilized
- Create the **discipline**
- Focus on:
  - What worked
  - What can be improved
  - Leader discloses first
- Create checklists
- **It works!**
  - 25% improvement (Tannebaum & Cerasoli, 2012)
Conclusion...

- **Use** the **science** as a **guide**
  - Teamwork, collaboration
  - Simulation, learning & training
- It's about the **instructional features**, not the “bells & whistles”
- Think of SBT for IPC as a **system**, not event
References

12. CATMEcite
As of July 1, 2015

Eduardo Salas, Ph.D.
Professor of Psychology
Department of Psychology
Rice University
Houston, TX