Simulation as a Unifying Educational Intervention

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Presentation Objectives

- Give consideration to simulation terminology and modalities.
- Describe the steps required to design meaningful and engaging multiprofessional scenarios.
- Discuss examples of simulation-based experiential learning activities in different settings and with diverse groups of participants.
- Present concrete arguments in the favour of interprofessional simulation-based education for pre- and post-registration participants.

What is simulation?

- **Technique** (Not the technology) used to:
  - Undertake research.
  - Test systems and processes.
  - Orient team to an environment.
  - Acquire skills and experience.
  - Test competencies.
  - Promote teamwork and patient safety.

(Gaba, 2004, Quality & Safety in Healthcare)

Simulation modalities & terminology

- Tabletop simulation
- Screen-based simulation
- Virtual reality simulation
- Visually enhanced mental simulation (VEMS)
- Part-task trainers
- Patient simulators
- Standardised/Simulated patients
- Hybrid simulation

(Alinier, 2007a, Medical Teacher; Beaubien & Baker, 2004, Qual Safety Health Care; Tun et al, 2015, Simulation and Gaming)

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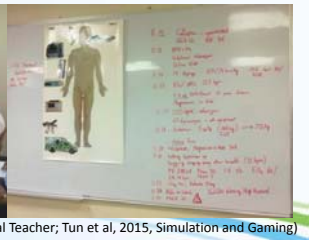
- 

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Simulation modalities & terminology


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Simulation modalities & terminology

- Hybrid simulation

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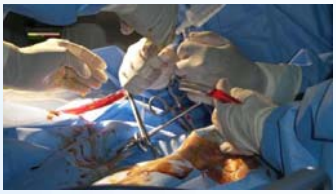
Simulation modalities & terminology

Simulation fidelity

The degree of realism with which something is represented.

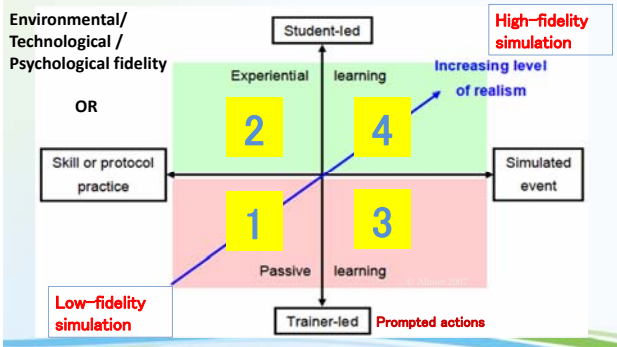


- Environmental fidelity
- Technological fidelity
- Psychological fidelity

(Beaubien & Baker, 2004, Qual Safety Health Care; Tun et al, 2015, Simulation and Gaming)

Simulation modalities & terminology

Simulation fidelity



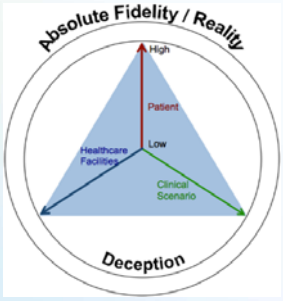
(Alinier, 2011, Simulation and Gaming)

Simulation modalities & terminology

Simulation fidelity

Environmental/
Technological /
Psychological fidelity

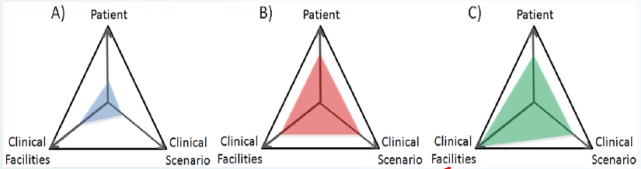
OR



(Beaubien & Baker, 2004, Qual Safety Health Care; Tun et al, 2015, Simulation and Gaming)

Simulation modalities & terminology

Simulation fidelity



Higher fidelity is not always better

(Beaubien & Baker, 2004, Qual Safety Health Care; Tun et al, 2015, Simulation and Gaming)

Making simulation a meaningful and engaging learning activity

Considering scenario-based simulation

- Irrespective of the modality

- Based on adult learning and instructional design principles:
  - Learner-centered
  - Relevant
  - Challenging enough

...

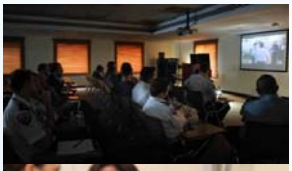
Making simulation a meaningful and engaging learning activity

- Scenario
- Facilitators
- Actor(s)
- Confederate(s)
- Props
- Orientation/Familiarisation
- Scenario briefing
- …

(Alinier, 2011, Simulation & Gaming; Lioce et al., 2015, Clinical Simulation in Nursing)

Making simulation a meaningful and engaging learning activity

- Observers
- On the fly vs Pre-programmed
- Debriefing (≠ from Feedback)



(Alinier, 2011, Simulation & Gaming; Lioce et al., 2015, Clinical Simulation in Nursing; Meakim et al., 2013, Clinical Simulation in Nursing)

Making simulation a meaningful and engaging learning activity

- International Nursing Association for Clinical Simulation Learning simulation design standard's 11 criteria:
  - 1. Needs assessment
  - 2. Measurable objectives
  - 3. Format of simulation
  - 4. Clinical scenario or case
  - 5. Fidelity
  - 6. Facilitator/Facilitative approach
  - 7. Briefing
  - 8. Debriefing and/or feedback
  - 9. Evaluation
  - 10. Participant preparation
  - 11. Test of the design

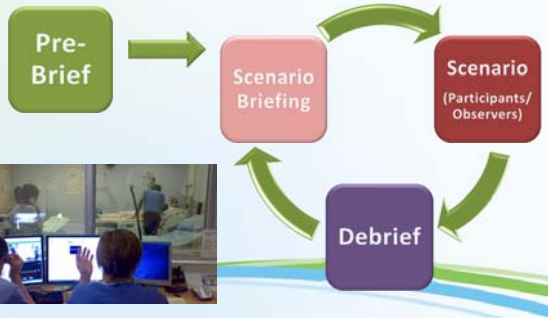
(Lioce et al., 2015, Clinical Simulation in Nursing)

Making simulation a meaningful and engaging learning activity

- Building Trust between facilitators and participants.
- Encouraging participants to "suspend" disbelief.
- Setting clear expectations.

Making simulation a meaningful and engaging learning activity

… followed by debriefing!



Making simulation a meaningful and engaging learning activity

… followed by debriefing!

- Establish ground rules.
- Involve everyone.
- Follow a structured approach.
- Protect participants from insensitive questioning.
- Encourage reflection through appropriate questioning.
- Ensure the learning objectives are covered.
- Get participant to summarise their learning points.

(Der Sahakian et al., 2015, Simulation & Gaming)

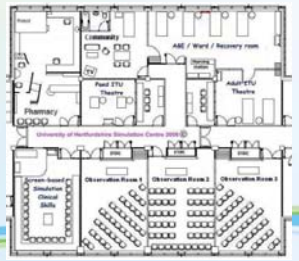
Some personal examples

- Running IPE simulation sessions in UG education.
- Multi-agency major incident response exercises.
- Setting up a patient retrieval and transfer programme.
- Setting up an ECMO programme in Qatar.

IPE simulation in UG education

Context:

- UK university with 10 AHPs…
- 700 final year students undertaking IPE module.
- Multiprofessional clinical simulation centre.



- Grant funding.
- Voluntary student participation in IPE simulation.

(Alinier et al., 2014, Clinical Simulation in Nursing
Alinier, 2007b, British Journal of Anaesthetic and Recovery Nursing)

IPE simulation in UG education

- Delivered 30 x 3h sessions

Random assignment of students to teams							
Team A	Q1	Scenario 1	Debriefing	Observers	Debriefing	Q3+2
	Q1+2					Q3
Team B	Q1	Observers		Scenario 2		Q3+2
	Q1+2					Q3

Q1 and 3: Feedback forms
Q2: Discipline knowledge questionnaire, 40 items (4 x 10 disciplines)

Q1 – Q2+3: Experimental group, n=119
Q1+2 – Q3: Control group, n=118

(Alinier et al., 2014, Clinical Simulation in Nursing)

IPE simulation in UG education

- 6 -12 students per session
- 3-4 disciplines represented
- Assessed over 12-16 MCQ items

Control grp	Experimental grp	
72.69%	75.92%	(p=0.3)

(Alinier et al., 2014, Clinical Simulation in Nursing)

IPE simulation in UG education

Table 2 Number of Participants from Each Profession in the Control and Experimental Groups of the Study

Discipline	Control Group Number (%)	Experimental Group Number (%)	Total
Adult nursing	54 (45.76)	50 (42.02)	104 (43.88)
Radiography	27 (22.88)	29 (24.37)	56 (23.63)
Physiotherapy	11 (9.32)	9 (7.56)	20 (8.44)
Paramedic	5 (4.24)	8 (6.72)	13 (5.49)
Learning disability nursing	8 (6.78)	8 (6.72)	16 (6.75)
Pediatric nursing	6 (5.08)	6 (5.04)	12 (5.06)
Mental health nursing	7 (5.93)	8 (6.72)	15 (6.33)
Midwifery	0 (0)	0 (0)	0 (0)
Pharmacy	0 (0)	1 (0.84)	1 (0.42)
Total	118 (100)	119 (100)	237

(Alinier et al., 2014, Clinical Simulation in Nursing)

IPE simulation in UG education

Table 5 Responses to the Questionnaire 2 Statements with Regards to Students' View of Multidisciplinary Team Working and Inter-professional Learning (with 1 = Strongly Disagree to 5 = Strongly Agree)

Statements (1 = Strongly Disagree to 5 = Strongly Agree)	Control Group, SD	Experimental Group, SD	p Value
I am confident about working as part of a multidisciplinary team	3.46, 0.86	3.94, 0.81	<.001
Working as part of a multidisciplinary team would make me feel anxious	2.60, 1.09	2.30, 1.04	.033
I feel I know what other professionals can and cannot do	2.99, 0.89	3.27, 0.84	.013
Learning with other health care students before qualification improves relationships after qualification	4.09, 1.13	4.27, 0.83	.167
Interprofessional learning before qualification helps me become a better team worker	4.02, 1.14	4.35, 0.82	.011

Note. SD = standard deviation.

(Alinier et al., 2014, Clinical Simulation in Nursing)

Simulation in UG healthcare programmes

- Students see IPE simulation as relevant to their future clinical practice.
- IPE simulation and debriefing helps students acquire knowledge and understanding of each other's role.

but

- Challenging to organise.

(Alinier et al., 2014, Clinical Simulation in Nursing; Baker et al, 2008, Journal of Advanced Nursing; Reese et al, 2010, Nursing Education Perspectives)

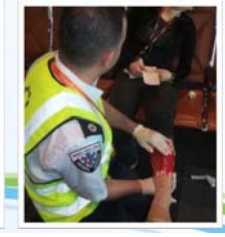
Multi-agency major incident response exercises

- Purpose:
  - Promote collaboration among responders and agencies
  - Familiarisation with new equipment
  - Refinement of response plan
  - Test capacity

Multi-agency major incident response exercises

- Increasing level of complexity
  - Table tops with runners
  - Table tops, outdoor, with radios!
  - Full scale
  - System wide (Pre/hospital), high number of patients!
- Followed by debriefing
- Action points
  - Revise response plan
  - More training!!!

Multi-agency major incident response exercises



Setting up a patient retrieval and transfer programme

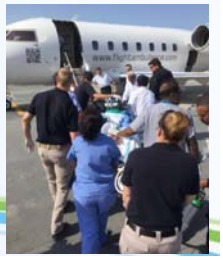
- 2-day multiprofessional course involving workshops, VEMS, and full-scale simulation.
  - Make high acuity patient transfers safe.
  - Familiarising staff with ≠ settings & equipment.
  - Forming the team (AP, CCP, RN, Dr).

Setting up an ECMO programme in Qatar

- 2-day multiprofessional course involving workshops and full-scale simulation.
  - Cannulation, circuit change, troubleshooting….
  - Forming the team (ICU Dr, RN, Perfusionist, RT, Pharmacologist, CCP).

Latest IPE development

- Simulated ECMO patient transfer!
  - 2 weeks ago, the first international ECMO patient transfer from Qatar to India!!!
- On our way to becoming regional ECMO training centre



The ECMO team video

Common components of these course:

- Human factors
- Teamwork
- Patient safety
- Crisis Resource Management principles

Mutual support
Leadership
Situation awareness
Communication

and importantly:

- Facilitated by a multiprofessional team that trained TOGETHER to deliver simulation-based education.

(Rall & Dieckmann, 2005, Best Practice & Research Clinical Anaesthesiology)
(Clancy & Tornberg, 2007, American Journal of Medical Quality)

http://teamstepps.ahrq.gov/

Teamwork Competencies	Behaviors and Skills	Tools and Strategies
Leadership *ability to direct and coordinate, assign tasks, motivate team members, resource, and facilitate optimal team performance.*	Clarify team member roles; provide performance expectations; engage in team events (e.g., brief, huddle, debrief), facilitate team problem solving.	• Resource Management • Delegation • Brief • Huddle • Debrief
Situation Monitoring *ability to develop common understandings of the team environment and apply appropriate strategies to accurately monitor teammate performance; maintain a shared mental model.*	Anticipate and predict each other's needs through cross monitoring the actions of fellow team members; provide feedback early which allows a team member to self-correct; establish a safety net; watch each other's back.	• Situation Awareness • Cross Monitoring • STEP • I'M SAFE
Mutual Support *ability to anticipate other team member's needs through accurate knowledge, and shift workload to achieve balance during high periods of workload or pressure.*	Correct deficiencies in workload distribution through shifting of responsibilities to underutilized team members; give and receive constructive and evaluative feedback; resolve conflict; advocate and assert.	• Task Assistance • Feedback • Advocacy & Assertion • Two-Challenge Rule • CUS • DESC Script • Collaboration
Communication *ability to effectively exchange information among team members; irrespective of the medium.*	Communicate critical information through structured communication techniques; ensure information conveyed is understood through follow-up and acknowledgement.	• SBAR • Call-Out • Check-Back • Handoff • I PASS THE BATON

Aspiration

IPE Simulation programmes (& Pit stop video)

What they share in common?

- Exposure to:
  - Responsibility
  - Accountability
  - Coordination
  - Communication
  - Co-operation
  - Assertiveness
  - Autonomy
  - Mutual trust and respect

(Bridges et al., 2011, Medical Education Online)

Conclusion

- No single best simulation approach.
- “Simulation” is still in a developmental phase.
- It can promote collaborative practice at all levels.
- It should be mandatory in all UG programmes and for licensure of clinicians.
- It requires thoughtful planning and a measured supportive approach.

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- I simulate!

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Thank you!

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