Teaching & Learning Using Simulation

Working With CARL; Your Perfect Patient

What is Simulation?

Simulation allows instructors to provide an enriching and more comprehensive experience so that learners are not simply memorizing information but are able to apply it in situations outlined by the instructor.

Simulation permits experiential learning of concepts in a safe and controlled environment where students are free to make purposeful or accidental mistakes. Simulation encompasses deep learning (University of Windsor, n.d.) rather than superficial/surface learning which, in turn, allows students to work out their own ideas and perspectives.

Why Use Simulation?

Simulation has been used in many other fields including business, healthcare, military, and aviation. In audiology, simulation is used in research settings, simulated real-ear measurements (S-REM), and in mock patient interactions such as those with standardized patients.

Figure 1. Experiential Learning Cycle. This figure illustrates the four phases of learning. National University of Ireland Maynooth. (n.d.).

According to Kolb & Kolb (2017), the creator of the Experiential Learning Theory (ELT) in 1984, classes that do not incorporate all four areas of the learning cycle, as shown in *Figure 1*, make it difficult for students to connect or bridge the gap between what was learned and the real life applications. Simulation, of course, allows for active experimentation and implementation of concepts learned.

Some of the well-known benefits of experiential learning include applying knowledge and connecting the material to realistic situations, strengthening understanding by engaging students critical thinking and problem solving skills, outcomes and

consequences are seen firsthand, satisfies different learning styles, and the teacher is able to directly observe and provide feedback on the students skills (Kerner, 2018).

One of the most important considerations for the use of simulation is that it protects patients from risk due to lack of experience and even, lack of confidence.

Using simulation in the learning environment allows for consistency in testing and practice, greater control over learning objectives, ability to practice frequently, creating rare/unique situations, and increased confidence of the teacher and student regarding the proper application of skills and techniques (Alanazi et al., 2017; Lateef, 2010).

Otoblock placement with CARL

Simulation is the bridge between learning a concept and applying the skill on a real patient. Being able to apply the knowledge prior to engaging with real patients allows students to rehearse the steps for procedures and transfer their intangible knowledge to real-life use (Koch et al., 2020) which, in turn, creates better student clinician to patient interactions (Brown 2017). Simulation can take the 'pressure off' and as McDougall (2015) fittingly explained, "For health care trainees, simulation permits a uniquely learner-centred educational experience rather than a patient-centred experience in which the trainee is attempting to acquire complex clinical skills while caring for a patient.".

More recently, CARL has played an integral role in providing a safe learning environment in a pandemic by allowing students to practice while physically distancing themselves, improved infection control by using a manikin rather than a real person, elevating remote learning by using CARL on one or both sides of the screen, decreasing the need for supervision and increasing student autonomy, and allowing for students to gain simulated clinical hours during clinical practicum shortages (Koch, 2021).

Important Considerations

While experiential learning by the use of simulation provides a much more immersive experience for students, it does come with some important considerations.

Using simulation in the classroom can take more time and resources, at least initially, since it requires the teacher to obtain the simulator and create a lesson that effectively utilizes the simulator and achieves the learning goals. Furthermore, ensuring that the learning objectives were achieved can be more complicated to assess (University of New South Wales [UNSW], 2018) .

Prebriefing is a way the instructor can set the framework for the purpose and the goals of the simulation. Prebriefing allows the instructor to set the tone of the exercise and create an environment where learners feel comfortable and free to engage in the activity without fear of judgement or criticism (Fanning, 2007). Simon et al. (2010) explain that “Healthcare professionals take psychological risks when they allow their performance to be watched and analyzed by peers and instructors.”

Referring back to Kolb’s Learning Cycle, another important area is reflective observation, where the student thinks about their experience and their knowledge. This is why it is important to debrief after a simulation to ensure that learning has not only taken place but also that the students have met the learning goals and, if not, this is also an opportunity for the instructor to reflect on how to improve the lesson to achieve the desired objectives. Debriefing discussions provide an opportunity for students to review and examine their entire experience, thoughts and actions, and use this insight to further develop their skills and transfer them during encounters with real patients. Turner (2018) states that “Debriefing is a fundamental aspect within simulation. It is crucial to maximize learning and to translate the lessons learnt to improve real clinical performance, and thus to reduced medical error.”

The instructor can also consider having the students create a ‘Learning Portfolio’ as described by Zubizarreta (n.d.). The learning portfolio is a “flexible tool that engages students in a process of continuous reflection and collaboration” (Zubizarreta, n.d.). Zubizarreta (n.d.) recommends that the learning portfolio follow a simple layout, as shown in *Figure 2*, involving these core components: Reflection, documentation, and collaboration.

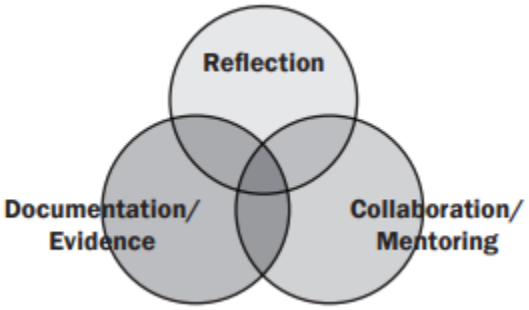


Figure 2. The Learning Portfolio Model. There are 3 interconnected areas involved with the learning portfolio. Zubizarreta, J. (n.d.)

Since a learning portfolio is a tool, how it is used and for what purpose is completely up to the individual. The portfolio can also exist in any format such as electronically or written. For a detailed guide on how to create a learning portfolio see the resources section.

How to Incorporate Simulation?

A detailed document prepared by Schwartz (2012, as cited in Cantor, 1995, p.82) suggests a framework to use, which involves contemplating the following questions:

- Are there areas in the course where simulation can be used effectively?
- Are there simulated activities that will meet learning goals?
- Will the simulated activity balance with other parts of the course?
- How will the activity be evaluated?

In regards to audiology, we suggest considering whether;

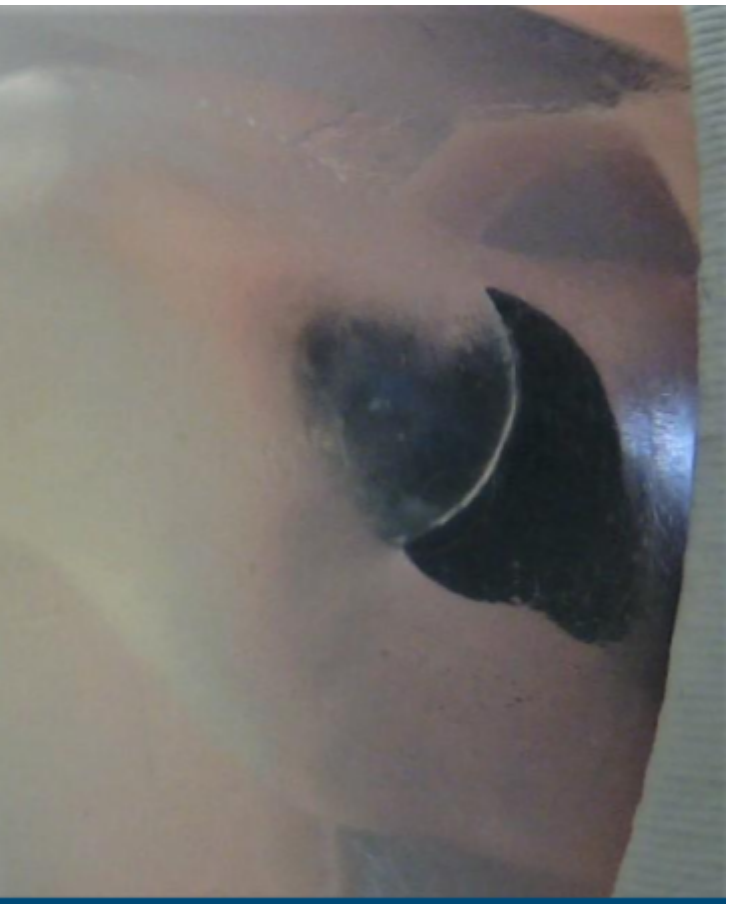
- A particular lesson/training in which learners are being put at risk?
- A particular lesson/training that learners are having difficulty understanding and implementing?
- A particular lesson/training that is always difficult for trainers to teach effectively? (Koch, 2021)

There are numerous resources available that provide instructions on how to incorporate simulation into learning. To help you get started the following are guidelines to assist in setting up your experiential learning activity.

Creating a Simulation Exercise	
1) Lesson	Determine skill/technique being taught.
2) Materials	Consider the equipment needed and whether the students will need to share.
3) Assessment	Define the evaluation criteria.
4) Pre-brief	Ensure that the students understand the goals of the simulation, why this activity is important and what the simulation will be able to provide, and are comfortable with the exercise. This includes knowing who will be observing the activity (i.e. instructor only, small group, or entire class).
5) Action	During the simulation, the instructor should monitor the students progress (this could also involve probing questions), ensure that they are able to follow the instructions outlined in the prebriefing, and whether additional activities are necessary to supplement/enrich the students learning.
6) Debrief	Just as important as the actual learning experience is the student's reflection on the activity. It may be necessary to guide the students through reflection so that they can get the most out of this exercise. In addition to the student's own thoughts about the exercise is the instructor's feedback on the activity.

Where to Begin?

Try starting off with a more 'basic' skill. For your first lesson, try something simple like otoscopy. Create the lesson using the guidelines mentioned previously. Using this experience, you can expand and build other lessons using the students feedback and your own thoughts on how the lesson went.



View inside CARLs ear with improper otoscopy technique

Final Thoughts

The important thing to remember is to remind your students that it's okay to make mistakes. The great thing about using a simulator like CARL is that he does not notice your mistakes and that he is available to help you work on those skills until you feel confident enough to transition to a real person.

In order to provide you with more information, we have compiled a short and informative resources section, found on the next page.

Resources

Brown (2017) provides audiology-specific guidance for creating simulation experiences. For more information, refer to:

- Brown, D. (2017). Simulation before clinical practice: The educational advantages. https://www.audiology.org/audiology-today-septemberoctober-2017/simulation-clinical-practice-educational-advantages

For more information on Zubizarreta's Learning Portfolio, refer to:

Zubizarreta, J. (n.d.). The Learning Portfolio: A Powerful Idea for Significant Learning.

- https://ideacontent.blob.core.windows.net/content/sites/2/2020/01/IDEA_Paper_44.pdf

The Post-Graduate Medical Education Centres at Western Sussex Hospitals NHS Foundation Trust have a variety of simulation resources aimed toward a medical audience. Their *Debriefing Guidance* document provides numerous examples of debriefing styles. For more information, refer to:

- Turner. J. (2018 April, 6). PGME Debriefing Guidance. Accessed May 11, 2021, from https://pgme.info/wp-content/uploads/2018/04/debrief-guidance-all-FINAL.pdf

Another great resource created by the Center for Health Sciences Interprofessional Education Research and Practice at the University of Washington is a free, eight-module course that guides you through the entire process of getting to know more about simulation and creating simulation lessons. The target audience is within the nursing field but it still has lots of great material for audiology. For more information, refer to:

- University of Washington. (2021). Teaching with simulation lessons. Accessed May 11, 2021, from https://collaborate.uw.edu/online-training-and-resources/teaching-with-simulation -lessons/

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