How Does Experimental Learning Increase Skills and Knowledge Acquisition and Retention in the Non-Traditional Adult Learner?

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Abstract

In today's educational and workforce settings, the desire is for students to not only have "book knowledge" but also the ability to implement that knowledge into skills and abilities. Those desires are often met with decreasing time and money in order to help foster those knowledge, skills, and abilities (KSA). Experimental Learning is a critical learning step to bridge that gap. In high-stakes settings, like healthcare and military education, where non-traditional learners are often found, experimental learning can help build the confidence and KSAs, ensuring skills and knowledge acquisition and retention in non-traditional adult learners. Experimental learning is an avenue to ensure non-traditional adult learners are able to put into practice knowledge learned to develop sound and critical skills and abilities.

Keywords: *Experimental Learning, Healthcare Education, Military Medicine*

As the demand for top-notch graduates and employees continues to increase, while budgets, training and education time shorten, we are continuously looking for ways to maximize a students' education and training. To help do so, experimental learning—specifically utilizing modeling and simulation—to increase skill and knowledge acquisition and retention in healthcare and military education is becoming more common. Increasingly, the overuse of platforms such as Blackboard are solely used to determine student success. To determine if the use of experimental learning was effective in healthcare education, a literature review on the use of simulation (high or low fidelity) for student acquisition of medical knowledge, skills, and abilities (KSA) was conducted.

Literature Review

The background of the problem is reflected in the research, which has demonstrated the need to utilize simulation (high-fidelity) for healthcare education, as well as the gap in research in this area. The literature showed the use of low- and high-fidelity in healthcare education but lacked formal research to support those uses. Most of the data for the use of simulation were anecdotal findings and outcomes.

Throughout the literature, there were several recurring themes that emerged. These topics include the benefit of high-fidelity simulation over low-fidelity simulation, the lack of research in the benefits of high-fidelity simulation, and the lack of consistent use or frequent use. The studies that were examined were a combination of meta-analysis, quasi-experimental study, systematic review, qualitative, and quantitative research methods. These broad research studies have yielded promising results, a way ahead, as well as identifying areas of improvement in literature and practice.

Several studies show there is a growing use and need for simulation (high-fidelity), especially in the healthcare, and other high-risk/stakes professions (Boyde, Cooper, Putland, Stanton, Harding, Learmont, & Nicholls, 2018; Cant & Cooper, 2012; Cook, Hatala, Brydges, Zendejas, Szostek, Wang, & Hamstra, 2011; DeForest, Blackman, Alex, Reeves, Mora, Pere, & Walrath, 2018; McGaghie, Issenberg, Cohen, Barsuk, & Wayne, 2011; Perkins & Beekley, 2017; Zapko, Ferranto, Blasiman, & Shelestak, 2018). This type of hands on critical thinking-type training can be tied to higher retention of knowledge, skills, and abilities (Cant & Cooper, 2017; DeForest et al., 2018; Nauman, Bowley, Midwinter, Walker, & Pallister, 2016; Tivener & Gloe, 2015; Zinsmaster & Vliem, 2016). Successful use of high-fidelity simulation has shown to build confidence to participants who might otherwise only encounter a similar situation for the first time in real life, thereby decreasing their ability to perform and act as desired or trained to (Beekley, 2012; Cant & Cooper, 2017; Boyde et al., 2018; McGaghie et al., 2011; Perkins & Beekley, 2012; Tivener & Gloe, 2015; Zapko et al., 2018).

Many of the studies looked at healthcare professionals, such as nurses, doctors, dentists, athletic trainers, and other allied health professionals (Boyde et al., 2018; Cook et al., 2011; DeForest et al., 2018; Tivener & Gloe, 2015; Zapko et al., 2018). There were minimal studies completed on military medicine, pre-hospital, or combat medicine training and simulation (American College of Surgeons, 2016; DeForest et al., 2018; Military Health System, 2018; Perkins & Beekley, 2012). A lack of literature in the military medicine sector revealed a current gap in the literature and practice, despite current use and dedication to it from these communities of practice.

Another trend in the research and in practice is that lack of consistency and frequency of the use of simulation, including high-fidelity simulation. Several studies have shown that high-fidelity simulation is being used to some extent, but it is often done sporadically and haphazardly, leaving key learning objectives missed, not touched upon, or negatively reinforced (Boyde et al., 2018; Cant & Cooper, 2017; DeForest et al., 2018; Stamper, Jones, Thompson, 2008; Zinsmaster &Vleim, 2016). There was also significant inconsistency amongst the studies that were reviewed in the areas of clinical topics, modes, designs, learner groups, and outcome measurements (Boyde et al., 2018; Cant & Cooper, 2012; Cook et al., 2011; DeForest at al., 2018; McGaghie et al., 2011; Mumann et al., 2016; Perkins & Beekley, 2017; Stamper et al., 2008; Tivener & Gloe, 2015; Zapko et al., 2018; Zinsmaster & Vliem, 2016). Reasons for these results included the lack of dedicated staff, support, or services to augment the training (Boyde, et al., 2018; Cant & Cooper, 2017; Zapko et al., 20018; Zinsmaster & Vleim, 2016). There was also not a push to utilize these services unless something bad happened in the healthcare field, and it became more of an afterthought (Boyde, et al., 2018; Cant & Cooper, 2017; Zapko et al., 20018; Zinsmaster & Vleim, 2016).

The literature has also identified several common gaps, either in research or practice. One of the gaps that was identified was in the timeframe of the conducted studies and re-assessment of the skills. Previous studies are either short in duration, have a small sample size, or only examine a niche part of medical or nursing training (Boyde et al., 2018; Cant & Cooper, 2017; DeForset et al., 2018; Tivener & Gloe, 2015; Zapko et al., 20018; Zinsmaster & Vleim, 2016). There are also gaps in the methods for the studies were conducted, some used written pre-, post-, and retention tests, where others just used demonstrated abilities at the time of simulation and shortly after (Boyde, et al., 2018; Cant & Cooper, 2017; Zapko et al., 20018; Zinsmaster & Vleim,

2016). Most studies were done using qualitative methods, finding attitudes, feelings, confidence, and satisfaction, leaving only a few using quantitative methods. As there is a gap in research and practice; several studies suggested that a more detailed, large, and statistical-based study needs to be done to help promote the use of simulation; at the same time, these studies stated that anecdotal evidence already supports the move (Boyde, et al., 2018; Cant & Cooper, 2017; Zapko et al., 20018; Zinsmaster & Vleim, 2016).

There are studies looking at low-fidelity simulation that are more than 15 years old. They only promote the use of "dummies," "Rescue Randy's," and so on, and suggest a time where simulation materials be more lifelike and more able to provide a better learning experience for the student. The studies that did mention low-fidelity simulation suggested its use in settings where high-fidelity simulators were not available or could not be taken; they may also be useful in basic or static simulation in entry-level or basic courses (Boyde, et al., 2018; Cant & Cooper, 2017; Zapko et al., 20018; Zinsmaster & Vleim, 2016).

All the studies suggest more research is needed to validate this strategy, but weak evidence supports the frequency and routine use of simulation in all areas that require maintenance or acquisition of medical skills. Despite the lack of research in military medicine, the literature review would suggest that this skill is a critical element to learning.

The writer believes the current research does favorably support the utilization of simulation to influence the acquisition and retention of KSAs of the adult learner in healthcare and military settings. With those generalities and anecdotal (or weak) evidence, there is a firm basis to implement the use of simulation in healthcare and military medical training.

Theoretical Framework

Experimental Learning Theory is the theory of making sense of experiences, which can be supported and guided by the Adult Learning Theory by Malcom Knowles (Merriam, Caffarella, & Baumgartner, 2007). Knowles' five Assumptions of Adult Learners and four Principles of Andragogy, coupled with Constructivism and Cognitive Apprenticeship Phase Theory provide the foundation and support for implementation experimental learning in the classroom (Merriam et al., 2007).

Conclusion

The implementation of experimental learning activities and practices are, and continue, to be a vital aspect of any educational program or course. It makes sense that putting students in the element they are preparing for can increase anxiety and allow them to answer questions in a safe, controlled setting. This will build confidence and experience and help ensure a successful adult learner. Failure to do so decreases confidence and productivity, while increasing time on task and re-training or learning of knowledge. This deliberate use and implementation are reciprocal. When students are more confident in the knowledge and its application to the real world, they continue to graduation, then graduate as a confident and competent assets to the workforce. This leads to a program that is valued and sought after by both students and faculty, which in turn leads to a better experience for the non-traditional adult learner, setting them up for future

success. Non-traditional and traditional adult learners alike benefit from experimental learning practices and experiences and should be integrated and implemented at every opportunity.

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