May 16th, 11:30 AM - 1:30 PM

Guided Mentorship: Enhancing Pediatric Resident's Skills in Cardiopulmonary Resuscitation

Alyssa Stoner
Children's Mercy Hospital

Guided Mentorship: Enhancing Pediatric Resident's Skills in Cardiopulmonary Resuscitation

Primary Investigator:
Alyssa Stoner, MS, DO
Additional Investigators/Mentors:
Jenna Miller, MD
Jennifer Flint, MD
Shekinah Hensley, MSN, RN, CCRN
Brian Lee, PhD
Kadriye O. Lewis, Ed. D

IRB Number:
17040249

Background:
Simulation-based learning has become a popular training method in healthcare education. Literature supports multiple aspects of simulation-based training for technical skills and behavioral skills, however the effects of different pedagogies have not been investigated in this educational method. This study implemented a guided mentorship approach to develop pediatric residents' confidence and competence in procedural tasks, individual and team performance in our in-situ simulation experience Code LITE (Low-tech, Internal, Training Experience) with in a pediatric intensive care (PICU) setting. This has been an important initiative to help pediatric residents supplement their minimal exposure to pediatric cardiopulmonary arrests due to the restrictions in resident work hours and increasing quality and safety initiatives.

Objectives:
Examine the effects of guided mentorship during simulated event on pediatric residents' learning experience.

Methods:
This descriptive case study utilized a quasi-experimental with a pre/post interventional survey(09/ 2017-08/2018). The intervention/exposure was a just-in-time simulation program that combines interprofessional education in an in-situ environment, Code LITE. The interprofessional team included nursing staff, respiratory therapists, pharmacists, attending physicians, and pediatric residents. Senior PICU fellows or attending physicians served as the mentors. Each Code LITE session covered a 20 minute scenario based on the principles of cognitive apprenticeship educational framework (Figure 1). Mentors served as the content expert acting in the team leader role and guided the pediatric residents through the scenario (exposed group) by modeling skills in the following domains; problem solving, situational awareness, resource utilization, leadership and communication. Direct observation was performed for 30 of the simulation scenarios utilizing an observational tool created based on review of current literature regarding crisis resource management check list tools, and educational approaches. The observations were completed by one trained Code LITE member focusing on the interaction between the participant and the mentor, while assessing the mentor's approach to teaching. Three measures within a pre/post survey format were created aligned with the framework of Kirkpatrick's model of training evaluation; learning, reaction, behavior and results. The survey addressed the first two levels of the model with a written knowledge exam, self-efficacy confidence scores and learning preferences. Statistical analysis utilized descriptive statistics with differences in proportions analyzed with Fisher's Exact test while the Kruskal-Wallis test was used to compare continuous outcomes.

Results:

There was a 78% of Code LITE sessions completions rate, with 36 residents in the exposed group. 63/89 residents completed the pre survey and 42/89 completed the post-survey (26 exposed; 16 unexposed).Observational data demonstrated mentors were more likely than residents to demonstrate behaviors in the following domains; delegation of tasks, active decision-making, and closed-loop communication (Figure 2)**.** Comparison of teaching styles to level of participation from residents suggests residents that were encouraged to participate or exposed to an active teaching model were more deeply engaged during the educational session. There was less variation in resident engagement based on the type of questions asked by the different mentors 65.4% of residents strongly agreed to prefer guided mentorship during simulation, (Figure 4, Table2). Post intervention self-efficacy confidence scores in 4/6 categories are improved (Table 1, Figure 5). No differences were identified in the exposed versus unexposed group in knowledge gain or confidence level (Table 2).

Conclusions:

The results suggests the guided mentorship approach within an in-situ simulation program is feasible within our PICU. Observational data suggests this educational model is well-aligned with the framework of cognitive apprenticeship and can aid residents' learning behaviors necessary to lead a pediatric resuscitation of acute decompensation scenario. Survey data convey that participants not only have an increase in confidence level after participation, but that the educational model is well-received by the learner.

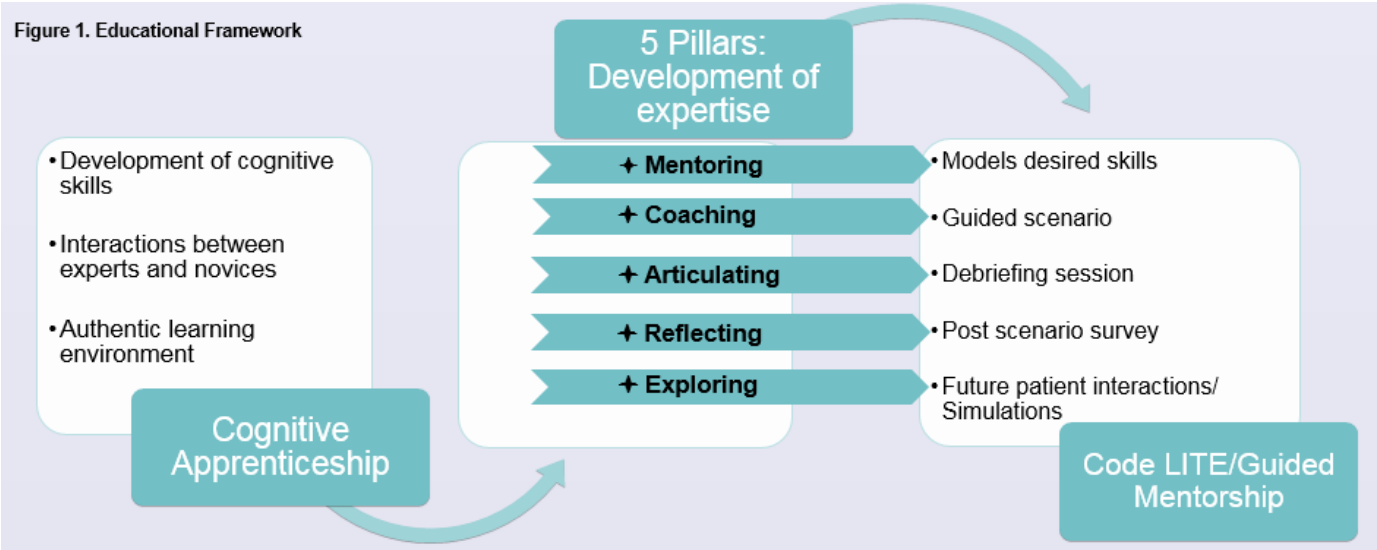

Figure 1. Cognitive Apprenticeship educational framework; development of cognitive skills via interaction between experts and novices while completing a task within an authentic learning environment utilized to develop Guided Mentorship within Code LITE.

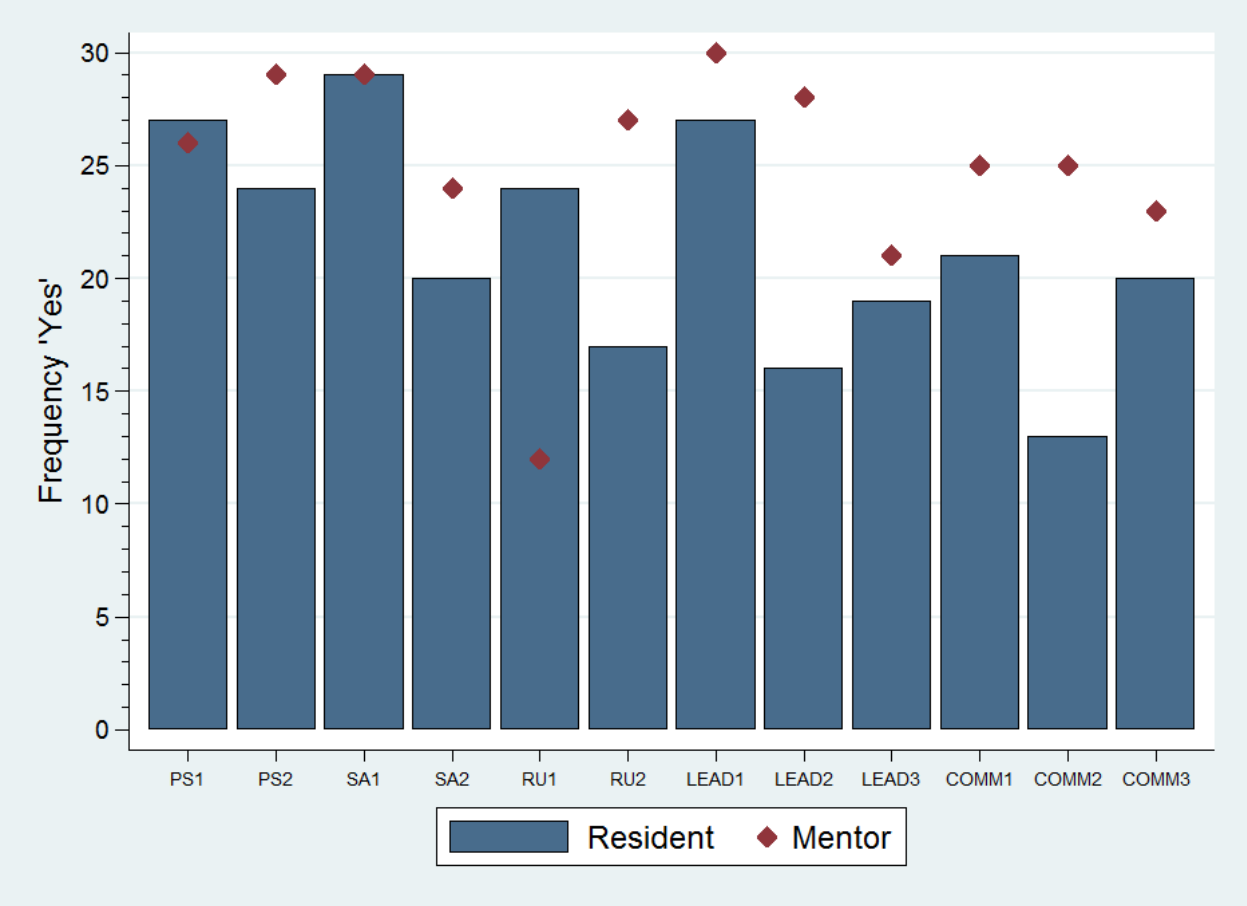

Figure 2. Resident vs. Mentor Domains

PS1- Prompt Assessment, PS2-Implements management approach, SA1-Identifies abnormal vital signs, SA2-Re-assesses patient after intervention, RU1-Calls for help when indicated, RU2-Delegates and directs tasks, Lead1-Maintain calm demeanor, Lead2-Acts decisively and maintains control of crisis, Lead3-Provides summary statement: "shared mental modeling", Comm1-Communicates clearly and concisely, Comm2-Closes the loop, Comm3-Listens to team input.

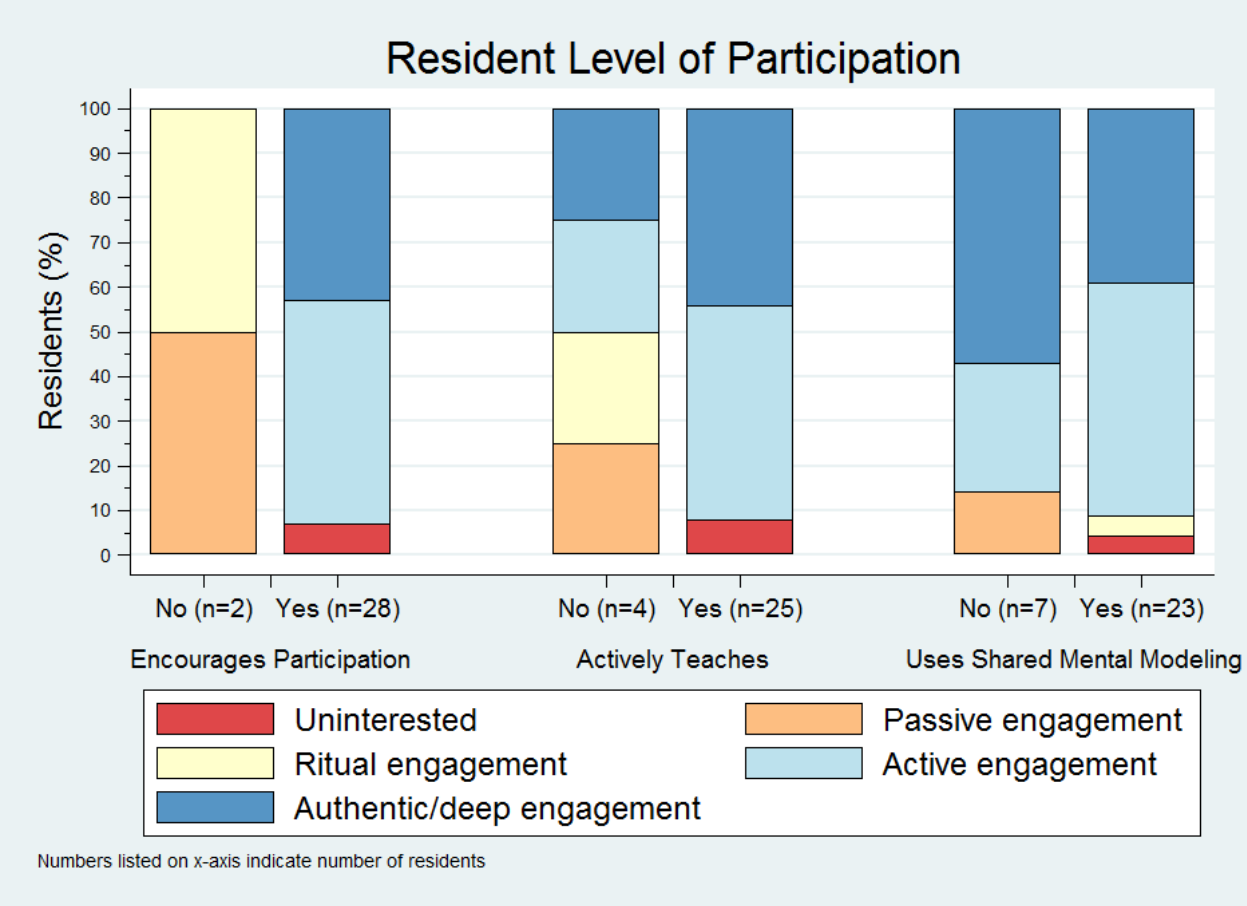

Figure 3. Mentor Teaching Styles compared to level of participation of resident

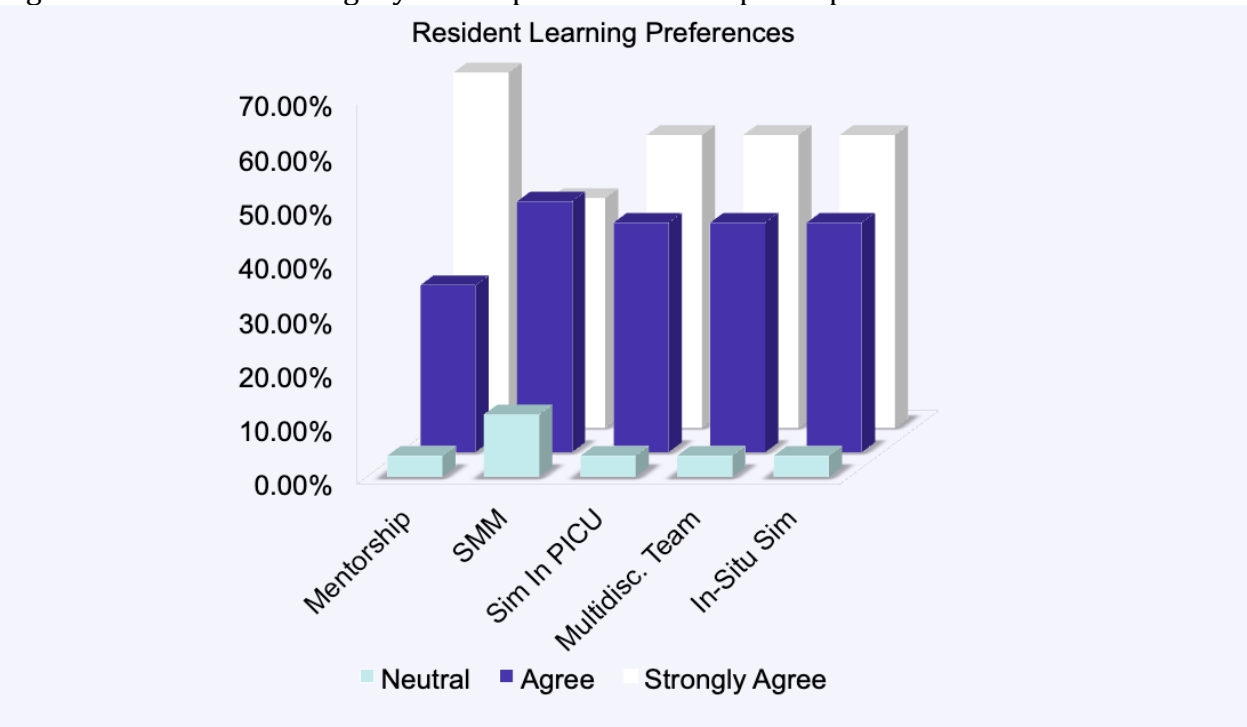

Figure 4. Learning preferences post Code LITE exposure

Comparison of confidence levels (scale 1 ["not confident"] to 5 ["very confident"])					
	Pre-Survey		Post-Survey		
How confident are you in.... N=38	*Median*	*Interquartile range*	*Median*	*Interquartile range*	*p-value*
assuming the role of team leader during a pediatric code blue event	2	2, 3	3	2, 3	0.0002
delegating tasks to the appropriate team member during a pediatric code blue	2	2, 3	3	3, 3	<.0001
recognizing your limitations	4	4, 4	4	4, 5	0.079
providing closed loop communication during a pediatric code blue	3	3, 3	4	3, 4	<.0001
ordering code medications at the correct dose during a pediatric code blue	2	2, 2	3	2, 3	0.0005
thinking out loud provided a share mental model with the care team	3	2, 3	3	3, 4	0.0023

Table 1. Comparison of confidence level pre/post survey

Figure 5. Confidence level scores Pre/Post survey with and without exposure to intervention: Code LITE.

Comparison of confidence levels (scale: 1 ["not confident"] to 5 ["very confident"])								
		Exposed N=24				Unexposed N=16		
How confident are you in....		*Median*	*Interquartile range*	*p-value*		*Median*	*Interquartile range*	*p-value*
assuming the role of team								
	Pre-survey	2	1, 3	0.0077		2	2, 3	0.1242
	Post-survey	3	2, 3			3	2, 3	
delegating tasks								
	Pre-survey	2	2, 3	0.0002		2	2, 3	0.027
	Post-survey	3	3, 3			3	3, 3	
recognizing your limitations								
	Pre-survey	4	4, 4	0.3755		4	3.5, 4	0.3121
	Post-survey	4	4, 5			4	3.5, 5	
providing closed loop								
	Pre-survey	3	3, 3	0.0071		3	3, 3	0.0314
	Post-survey	4	3, 4			4	3, 4	
ordering code medications								
	Pre-survey	2	1.5, 2	0.0215		2	2, 2	0.0284
	Post-survey	3	2, 3			3	2, 3	
share mental model								
	Pre-survey	2.5	2, 3	0.0223		3	2, 3	0.3028
	Post-survey	3	3, 4			3	2.5, 3.5	

Table 2. Comparison of exposed group to unexposed group with pre/post survey comparison