

# Learning-On-the-Fly: How Residents Become Clinical Teachers: A Qualitative Study

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## Background

- Residents are key teachers for interns and students across specialties. How residents develop as teachers through workplace-based experiences is incompletely studied.<sup>1-6</sup>
- Shulman’s pedagogical content knowledge (PCK) framework can be a model for understanding residents’ development as teachers.<sup>7-8</sup>

## Research Questions

- How do residents learn through workplace-based experiences to teach students and junior residents?

## Methods

- Two focus groups and thirteen interviews were conducted with senior residents in emergency medicine, general surgery and internal medicine at a tertiary academic medical center exploring:
  - How residents teach and learn to teach
  - How residents adapt their teaching to learner’s needs and demands of the clinical learning environment

- Thematic analysis is currently ongoing

## Results

- Role Modeling:** Residents’ teaching foundation is based on the positive and negative examples they experienced as junior learners from seniors and attendings.
- Adaptability:** Residents develop their teaching approach through an informal on-the-job process rooted in trial-and-error and feedback.
- Signature Pedagogy:** With clinical and teaching experience, residents develop a unique set of teaching scripts specific to their clinical context.



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|                       | Definition                                                                            | Across All Specialties (N=18)                                                                                                                                                                                                              | Internal Medicine (N=8)                                                                                                                                                                                                                                                                                                                                             | General Surgery (N=4)                                                                                                                                                                                                                                                                                                                                           | Emergency Medicine (N=6)                                                                                                                                                                                                                                                                                  |
|-----------------------|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Knowledge of Content  | Residents’ medical, procedural, system-based knowledge and clinical reasoning skills. | Residents develop content knowledge for teaching through their own experiences as clinicians.<br><br>They focus on topics that were challenging for them as junior learners and that enable safe and effective completion of patient care. | <ul style="list-style-type: none"><li>Residents focus on system-based content (e.g., discharging, task and time management) early in the academic year and teach more clinical knowledge as the year progresses.</li><li>Residents develop a repertoire of teaching points based on commonly encountered topics to be easily delivered while on the wards</li></ul> | <ul style="list-style-type: none"><li>Residents focus on teaching surgical skills in the operating room (OR), focusing on areas that were challenging when they learned surgical skills.</li><li>Outside the OR, residents focus on medical and systems-based knowledge for completing clinical care tasks (e.g., managing patients, seeing consults)</li></ul> | <ul style="list-style-type: none"><li>Residents vary widely on the content they choose to teach. The content of their teaching is primarily based on their knowledge gaps, challenges they encountered as junior learners, individual preferences, and cases encountered in the Emergency Room.</li></ul> |
| Knowledge of Learners | Residents’ understanding of learners’ interests, knowledge and skills.                | Residents’ knowledge of learners is informed by reflection on their own learning experiences and experiences working with and teaching learners.                                                                                           | Developed through longitudinal relationships and direct observation (primarily on rounds, occasionally at the bedside).                                                                                                                                                                                                                                             | Developed through longitudinal relationships and direct observation of procedural skills in the OR and completion of patient care tasks (e.g., seeing and presenting patients or consults)                                                                                                                                                                      | Minimal continuity with learners. Developed through rapid in-the-moment of assessment via observation of patient care (e.g., seeing and presenting patients) and procedural skills.                                                                                                                       |
| Knowledge of Context  | Residents’ knowledge of their clinical environment, and specialty.                    | Residents develop nuanced understanding of their practice context and learn to adapt their teaching to various factors of the clinical environment.                                                                                        | Residents learn to integrate their teaching into rounds, when the whole team is together, and the call schedule, which requires them to adapt to time constraints, varying patient acuity and team census.                                                                                                                                                          | Residents primary teaching environment is the OR and they must manage patient safety and OR flow as they identify and support learner participation in cases.                                                                                                                                                                                                   | Residents adapt what, how, and how much they teach to the department flow, patient census, and presence of critically ill patients.                                                                                                                                                                       |
| Knowledge of Teaching | Residents’ knowledge and usage of various teaching approaches and style.              | Through trial-and-error, reflection and feedback residents develop dexterity with a limited number of teaching strategies that will reliably support teaching amidst the execution of patient care responsibilities.                       | <ul style="list-style-type: none"><li>Most residents develop a preference for teaching-on-the fly to facilitate learning directly from cases in a time-limited setting.</li><li>Some residents develop premade chalk talks that they can deliver when there is time for formal, structured teaching</li></ul>                                                       | <ul style="list-style-type: none"><li>Residents augment learner’s participation in cases based on their observation of learner’s skillset and relationship with learner.</li></ul>                                                                                                                                                                              | <ul style="list-style-type: none"><li>Residents use a combination of dialogue, observation, and reflection alongside clinical care to facilitate learning while minimizing disruption to patient flow</li><li>Residents deliver chalk talks or structured teaching during sign-out.</li></ul>             |

## Discussion

- Residents’ development as clinical teachers is shaped by their clinical learning environment (CLE), which requires them to adapt their teaching to their practice context.
- Incorporating resident-as-teacher development directly into the CLE may enhance how residents learn to teach within their clinical context.
- Residents are expected to teach often with minimal guidance on how to teach; residents would benefit from a cognitive apprenticeship model in their development as teachers.

## Limitations

- Unequal representation of residents across all three specialties
- This study was completed at a single academic institution and experiences may vary at other academic centers
- We did not corroborate resident’s experiences with observational data

## References

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