

How can residency programs make learning goals meaningful?

By

TAI MARA LOCKSPEISER

B.A., Stanford University, 2001

M.D., University of California, San Francisco, 2006

THESIS

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Defense Committee:

Alan Schwartz PhD, Medical Education, Chair and Advisor

Ilene Harris PhD, Medical Education

Janice Hanson PhD, EdS, University of Colorado

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Su-Ting T. Li MD, MPH²
Ann E. Burke MD³
Adam A. Rosenberg MD¹
Alston E. Dunbar III MD, MBA⁴
Kimberly Gifford MD⁵
Gregory H Gorman MD MHS⁶
John Mahan MD⁷
Michael P. McKenna MD⁸
Suzanne Reed MD⁷
Alan Schwartz PhD⁹
Ilene Harris PhD⁹
Janice L. Hanson PhD, EdS¹

¹Department of Pediatrics, University of Colorado School of Medicine, Aurora, CO

²Department of Pediatrics, University of California, Davis, Sacramento CA

³Department of Pediatrics, Wright State University Boonshoft School of Medicine, Dayton, OH

⁴Our Lady of the Lake Regional Medical Center, Baton Rouge, LA

⁵Department of Pediatrics, Dartmouth School of Medicine, Lebanon, NH

⁶National Capital Consortium Pediatrics Residency, Bethesda, MD

⁷ Department of Pediatrics, The Ohio State University College of Medicine, Columbus OH

⁸Department of Clinical Pediatrics, Indiana University School of Medicine, Indianapolis, IN

⁹Department of Medical Education, University of Illinois, Chicago, Chicago IL

TML

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SUMMARY

Background: Developing physicians' skills in self-directed lifelong learning is a key goal of medical training. Learning goals have been used to develop these skills.

Objective: To use qualitative methods to describe residents' and program directors' perceptions of program characteristics that facilitate or hinder the meaningful use of learning goals.

Design/Methods: Focus groups with residents and interviews with program directors were conducted, audio-recorded, and transcribed. Programs were selected to maximize diversity of size, geography, private vs. public institutions, academic vs. community programs, and current use of learning goals. All transcripts were coded independently by at least two investigators and analyzed using the constant comparative method associated with grounded theory. Member checking with program directors enhanced the trustworthiness of analysis. Through iterative discussions, investigators built a grounded theory.

Results: Ninety-five (95) residents and 12 program directors at 12 pediatric residency programs participated. Saturation of themes was obtained. The analysis identified 21 sub-themes that were grouped into five themes: (1) Goal Characteristics and Purposes (important; specific; measurable; realistic; includes plan; consideration of multiple goal purposes), (2) Resident Attributes (buy-in; reflection; initiative), (3) Faculty Roles (faculty support for reflection, creation of goals, and achieving goals), (4) Accountability (internal and external accountability to help residents accomplish goals), (5) Program Support (orientation to goal-setting, documentation system, frequent use, protected time for goal writing, matching goals to experiences, peer support, and faculty development). The theory that was formulated emerged

from reflection about these themes: all five themes contribute to the meaningful use of goals in a pediatric residency.

Conclusions: This theory provides a description of an ideal approach to using learning goals in pediatric residency education. Meaningful use of goals must be supported by both the explicit and implicit curriculum.

BACKGROUND

Physicians must continue learning long after completing training in order to maintain proficiency in an ever-evolving field.(1) Individualized learning goals are one means of developing skills in self-directed lifelong learning while also allowing learners to focus and guide their learning.(2) Lifelong learning is included in the Accreditation Council for Graduate Medical Education's (ACGME's) requirements for residency programs as well as in the requirements of many specialty boards' maintenance of certification programs.(1) In order to develop lifelong learning, many education programs across the continuum require the use of learning goals.(2) Starting in 2007, the Pediatric Residency Review Committee of the ACGME mandated self-directed lifelong learning in the form of annual individualized learning plans (ILPs) for all residents.(3, 4)

Few learners consistently integrate lifelong learning activities into daily practice. Lack of time and understanding of skills needed are barriers to self-directed learning and use of ILPs.(5-8) In particular, residents struggle with identifying specific goals and formulating effective plans to achieve them.(5) Previous studies have examined characteristics that may contribute to achievement of learning goals.(9) A conceptual model for self-directed learning, based on the ISMART mnemonic (Important, Specific, Measurable, Accountable, Realistic, Timeline) emphasizes specific aspects of the goal itself that lead to success in achieving goals.(10) Learner characteristics and type of goal set have also been identified as factors that influence success in achieving goals.(9, 11) Other factors in the learning environment associated with success in achieving goals are not known.(11)

The specific aims of this study were (1) to describe residents' and program directors' perceptions of the use of learning goals in their program, using qualitative methods and then (2) to develop a grounded theory that suggests how different aspects of the learning environment facilitate or hinder the meaningful use of learning goals.

METHODS

Purposeful sampling was used to select a group of 12 different pediatric residency programs with maximum diversity of size, geography, type of institution (private, public, academic, community), and ways programs used learning goals. Notes from the principal investigator's initial conversations with program directors and during all visits to sites for focus groups as well as copies of all information that the program provides residents about goals were used to assure diversity in the programs' approaches to using goals. Senior residents at each site were invited to participate in focus groups about use of learning goals in residency. All focus groups were led by a researcher trained in qualitative methods. Program directors and those involved in directing the use of goals were not eligible to be focus group leaders.

Within the focus groups, guiding questions addressed the creation and utilization of learning goals in the residency program, strategies that residents used to achieve their goals, resident perceptions of the programmatic factors that facilitated or hindered their success in meaningfully using learning goals, and changes they would make in their program to enhance successful use of goals (Appendix 1). All focus groups were audio-recorded and transcribed. All identifying information was removed from the transcripts. Brief interviews were conducted with the program director or faculty member who taught residents about goals at each program to gather descriptions about how each program utilized goals.

Data were analyzed as they were collected to assure that data collection continued until saturation was achieved (i.e. no new themes were identified). All transcripts from the interviews and focus groups were compiled in one dataset and analyzed iteratively using the

constant comparative method associated with grounded theory.(12, 13) Data were analyzed to identify codes (open coding), relationships among the codes that suggested themes, and relationships among themes that suggested a grounded theory. The grounded theory was developed through iterative discussions throughout data analysis; it comprises themes, relationships among the themes, and hypotheses that can be tested in future studies. At least two investigators separately coded each transcript. Disagreements were resolved with discussion. All investigators were involved in the development of the grounded theory. The final list of themes and sub-themes was reviewed by a subset of the program directors to provide for member-checking to enhance the trustworthiness of the analysis.

This study was approved by the Colorado Multiple Institutional Review Board (COMIRB) and the IRB at each participating site.

RESULTS

Ninety-five (95) residents and 12 program directors at 12 pediatric residency programs participated. Between 3 and 10 residents participated in each focus group and between 1 and 4 focus groups were conducted at each program. Descriptions of the programs and their use of learning goals (Table 1) demonstrate wide diversity in geography, size and type of program, and use of goals. The residents who participated in the focus groups included a diverse sample of residents with allopathic and osteopathic degrees as well as residents participating in combined residencies such as medicine-pediatrics and pediatrics-neurology.

In the analysis, 21 sub-themes were grouped into 5 themes: (1) Goal Characteristics and Purposes (important; specific; measurable; realistic; includes plan; consideration of multiple goal purposes), (2) Resident Attributes (buy-in; reflection; initiative), (3) Faculty Roles (faculty support for reflection, creation of, and achieving goals), (4) Accountability (internal and external accountability to help residents accomplish goals), and (5) Program Support (orientation to goal-setting, documentation system, frequent use, protected time for goals, matching goals to experiences, peer support, and faculty development) (Table 2).

TABLE 1: INVOLVED PROGRAMS

Residency	Total # residents	Academic/Community	Use of goals	Recording System	Orientation/Training
Blank Children's Hospital <i>Des Moines, IA</i>	18	Community	Semiannual PD meetings in PediaLink*; paper every 3 months	PediaLink* and paper forms	No formal introduction
Children's Hospital at Dartmouth-Hitchcock <i>Lebanon NH</i>	21	Academic - Private	Semiannual PD meetings; certain rotations	Paper forms	Conference on learning goals for residents
Our Lady of the Lake <i>Baton Rouge, LA</i>	31	Community	Semiannual PD meetings and quarterly meetings with advisors	PediaLink*	Discuss learning goals in orientation
National Capital Consortium <i>Bethesda, MD</i>	35	Academic - Military	Semiannual PD meetings	PediaLink*	No formal introduction
University of California, Davis <i>Sacramento, CA</i>	37	Academic - Public	Three times a year in first year, two times a year in following years	PediaLink*	Workshop in orientation and feedback on initial goals
Wright State University <i>Dayton, OH</i>	44	Academic - Public	Semiannual PD meetings	PediaLink*	Discuss learning goals in orientation
University of Kentucky <i>Lexington, KY</i>	61	Academic - Public	Semiannual PD meetings	PediaLink*	Workshop on learning goals and learning styles for residents; workshop for faculty advisors
Columbia University <i>New York, NY</i>	75	Academic - Private	Semiannual PD meetings	PediaLink *	No formal introduction
University of Colorado <i>Aurora, CO</i>	87	Academic - Public	Annually for one form and every three months for other	Two paper forms	Workshop on learning goals for residents; on initial goals all receive detailed feedback
Loma Linda University <i>Loma Linda, CA</i>	88	Academic - Private	Semiannual PD meetings; Monthly during part of 3rd year	Paper forms	Program for training advisors, manual for residents and faculty
Nationwide Children's/ Ohio State University <i>Columbus, OH</i>	140	Academic - Public	Semiannual PD meetings	PediaLink*	Learning goal concept presented in orientation and by email
Indiana University <i>Indianapolis, IN</i>	142	Academic - Public	Semiannual PD meetings	Web survey	No formal Introduction

PD = Residency Program Director or associate program director

*PediaLink is a web-based platform for the documentation of learning goals developed and maintained by the American Academy of Pediatrics

TABLE 2. FACTORS RELATED TO MEANINGFUL USE OF LEARNING GOALS, AS EXPRESSED BY 95 THIRD-YEAR PEDIATRIC RESIDENTS

Factor	Examples of Quotes
Goal Characteristics and Purposes	
Important	<i>"Something personal you are invested in that you actually want to achieve."</i>
Specific	<i>Rather than saying I want to get better at procedures. Saying I want to do at least seven circumcisions when I am in the NICU ... I have a goal rather than just like this grandiose idea of a goal.</i>
Measurable	<i>Just planning something that is going to be measureable. What are you going to watch for to know you achieved your goal?</i>
Realistic	<i>First year I was like ok, I'm going to read or study 30 minutes every single day. And then I think wow, I can't do this every day. And so I felt stressed and inadequate like I couldn't meet my goal. And so I tried to ... decrease the time and be a little bit more flexible this year.</i>
Includes Plan	<i>So I created a plan for myself. In the plan I include what kind of books I'm going to use. What kind of courses I'm going to use and how often I'm going to read. How many pages a day. And if I'm going to use the Q-bank, how many questions I will do a day.</i>
Consideration of Multiple Goal Purposes	<i>Recognizing that your career is influenced by your life outside of your career as well. And I think we tend to focus only on our career stuff and that you know, I guess maybe incorporating that into a learning plan is having a personal growth goal, like be more spiritual.</i>
Resident Attributes	
Buy-in	<i>But if they don't see the utility to it and they don't understand it, they are going to just keep not doing it.</i>
Reflection	<i>And so to me, the more important part isn't like the written goal itself, but it is the process between the introspection, self-assessment and the goal. The bridge that happens between those two things is what I think we are trying to teach people. (program director)</i>
Initiative	<i>If you tell them that is something you have been working on and let them know about that early on, I think they are much more apt to give you specific feedback about that. So...I think that is helpful.</i>
Faculty Roles	
Support for Reflection	<i>My Mentor sees weaknesses too and helps me learn from that and grow and concentrate on my strengths rather than weaknesses. So it's been really nice to have somebody just to face to face talk to you about ...what you can do to improve.</i>
Support for Creation of Goals	<i>And it was helpful having the Mentor 'cause the plan that I had, had some flaws and she was able to pick up on that and make modifications that would make it more successful.</i>
Support in Helping Residents Achieve Goals	<i>Because I was lucky enough to be on service with (Attending A) and so he is trained in this. It was ridiculous. It was annoying almost, actually, how often we met and gave feedback and set goals. I was only on for two weeks so before one started. Three days in. Seven days in and at the end</i>

Means to Assure Accountability	
Internal	<i>To me it's nice to be able to check off boxes and for some of us, me especially, it is nice to write things down and see that you've obtained that goal and finished that task.</i>
External	<i>There is just not a lot of accountability for it. So you can do it and just because it is on paper doesn't mean that there is any follow through. I mean not that we need somebody to hold our hands, but sometimes if you know that somebody is going to ask you about it.</i>
Program Support	
Orientation to Goal-setting	<i>I think the idea of spelling out what an ILP is supposed to be and what it's meant to be would be really helpful and make them more useful.</i>
Documentation Systems	<i>After you type them down, my understanding is they just go to the Internet and unless you take the time to print it off yourself, you don't really see those anymore.</i>
Protected Time for Goals	<i>I think we feel very overworked all the time, so this is one of those things that maybe gets put on the back burner.</i>
Frequent Use of Goals	<i>I think we use it too infrequently too. Like I mean if you are going to use it, then you need to use it like and make rotation specific goals rather than like twice a year. Because twice a year I use it and then I do what I think I need to do for each rotation or whatever I'm doing at the time and then I forget about it.</i>
Matching Goals to Learning Experiences	<i>Start connecting their learning goals to their rotations. And not think of it as an outside administrative thing to do, but really, this is how I'm going to get the most out of my rotation.</i>
Peer Support	<i>And it may be worthwhile to do, like something similar to what he said, and put it in work groups or a buddy system, where they buddy you up with other Residents and say ok, you two now, you have each other's backs. You help each other out. You keep each other on task, type of thing. And that can be a little more frequent. Cause we see each other much more often than every three months like you do with your advisor.</i>
Faculty Development	<i>I think that calls for a lot of faculty development, which we haven't done as well as I think we could ...I think our faculty don't really know how to advise them and don't know how to make their learning plan work. (program director)</i>

Goal Characteristics and Purposes

Residents identified goal characteristics that affected their success in achieving goals. These characteristics aligned with aspects of the ISMART mnemonic for the characteristics of useful goals (Important, Specific, Measurable, Accountable, Realistic, Timeline).(10) Residents stated that to be meaningful, the goals must be important. They described “important” as relevant to future career plans, a self-identified gap in knowledge or skill, or a current learning opportunity. One resident stated that goals should be *“something personal you are invested in that you actually want to achieve.”* Goals that were important to the residents also addressed personal growth: *“Recognizing that your career is influenced by your life outside of your career as well. And I think we tend to focus only on our career stuff. . . I guess maybe incorporating that into a learning plan is having a personal growth goal like be more spiritual.”*

Residents emphasized that goals should be specific and include a measurable and realistic outcome: *“If I know I'm going to be in ... the NICU [neonatal intensive care unit] and my goal is I'm going to do umbilical lines this month, it is really easy for me to know what my objective is and how to accomplish that goal.”* Writing a goal in this way may involve breaking a larger, long-term goal into smaller parts. One resident described *“meaningful bite sized chunks”* that can be pursued in short-term increments. Residents and program directors both recognized that a useful goal also includes a description of how to know that the goal has been achieved. *“So if you are going to be learning something, you need to be able to measure it. Am I actually learning this? Being able to apply it?”* Finally, useful goals were described as having a realistic scope that is achievable in a reasonable timeframe. One resident highlighted the *“importance of being very reasonable in your goal setting [be]cause otherwise you just*

get discouraged and you give up." Residents commented that a well-thought out plan for achieving the goal is crucial for success and includes clear action steps. As one resident said, *"An ILP ... would be able to help you delineate the steps that need to be taken in order to achieve a goal."*

Resident Attributes

The skills and attitudes of residents influenced their ability to formulate and achieve meaningful goals. Residents felt that they were more likely to succeed in achieving their goals if they (1) believed that goal-setting was important, (2) used self-reflection to develop goals that were meaningful to them, and (3) took initiative in achieving their goals. Residents who did not believe that the existing goal-setting process was valuable put little effort into the process and did not find the outcomes valuable: *"It's not just an exercise. If you do it once a year, you rush through it 15 minutes late at night. And whatever prints out the next morning you don't revisit it. It's even more worthless than the time you put into it. So you can't just ask someone to do an assignment, especially an assignment that is kind of cerebral and takes some concentration, without real follow up."* Residents who self-reflect on their goals and experiences felt that they were able to develop more meaningful and more successful goals. *"If you take time to think critically about the things that you need to create the goals for yourself, and then create a system to help you achieve them and actually devote yourself to that, then you are going to be more likely to meet those goals and have an end result that you are pleased with."* To meet their goals, residents recognized the importance of *"taking initiative to seek opportunities to learn and practice."*

Faculty Roles

Faculty support was necessary for residents to be successful in formulating and achieving learning goals. A longitudinal partnership between residents and faculty members helped residents reflect on specific deficiencies in their skills, formulate meaningful learning goals, and follow through with achieving these goals. Many residents reported difficulty with independent generation of goals. Confirming residents' reports, a program director commented, *"Sometimes the faculty see things that learners can't see for themselves."* Rapport with faculty members was important to help residents candidly discuss needs and expectations for their learning plans as well as creating strategies to achieve their goals. As one resident commented, *"We together kind of created the plan."*

Residents recognized that learning goals foster dialogue with faculty and help to facilitate individualized learning. Residents appreciated working with faculty who asked about their goals during rotations. As one resident stated, *"Every once in a while there will be an attending who says what are your goals for this rotation."* Another resident commented, *"I like it when faculty ask you at the beginning of the rotation what you want to get out of it."* Residents found it helpful when faculty asked about their progress in achieving their goals or provided feedback specifically related to their goals. This stimulated residents to focus on their goals and encouraged forward momentum in achieving those goals. As one resident stated, *"the most important thing is for the attending to take part in achieving these objectives"*.

Means to Assure Accountability

Means to assure accountability to achieve learning goals included both internal and external factors.

Residents described many different ways they assured internal accountability such as taking time to think about and write down goals. Motivation is another aspect of internal accountability residents commented on: *“Even if we talked about it every month, it doesn't mean I am going to go do it, unless I have some inner motivation to do those things”* and *“There was no one accountable for my learning plan but myself.”* Motivation varied amongst residents and at different points during training.

Residents also supplemented internal accountability with external accountability by discussing the goals with others: *“If I write something down and then I tell other people about it - this is what I want to do, and these people are going to help me stay accountable to it, and also the writing it down helps me personally stay accountable to it.”*

External accountability can be facilitated by program requirements for setting and achieving goals, monitoring by faculty, and support from peers. Many residents commented that more frequent meetings and discussions about their goals would make goals more meaningful. *“After you meet with [Program Director] you are all pumped and feel like 'I'm ready to do this' and you review everything you do for about a week and then 'cause we don't meet with her again for another full year, the moment fades off.”* Faculty engagement was also crucial for residents to learn from their goals. One resident stated, *“While my goals might be individualized, it has helped having faculty provide insight and keep you on task ... That there are other people to help you stick to your goals and work towards obtaining those goals before your Residency is over.”* Some residents described a different approach to assuring external accountability, communicating with the other individuals on their team. One resident stated,

“maybe one month I should make myself more accountable by telling my Interns and second years. Keep me honest and expect me to teach you.” Whether the means of accountability is from the program director, faculty, peers, or medical students, the residents were clear that support from others was crucial to following through on their goals: *“... without human follow up, it doesn't even matter if there are road maps. It is not going to really be successful.”*

Program Support

Program support for the use of learning goals was central to residents’ success in achieving their goals and was integrally related to all other themes. A helpful orientation provides residents with an understanding of how to select, develop, formulate, and use goals. As one resident said, *“I think we also really need to do a better job of...prioritizing this and advertising it and explaining and setting the stage for it rather than...just assuming [the faculty] are going to figure it out.”* Residents also commented about the benefit of having opportunities to discuss the creation and use of goals with peers: *“I think that is ... the point of this ... group process. Is when you hear what other people are talking about, it actually makes you stop and reflect on yourself. So I feel like, in some ways, that makes your individual goals a little more meaningful because you have the chance to...reflect on other people's experience and normalize yourself.”*

Programs must also provide tools for writing and documenting appropriate goals. One resident stated, *“I think making it shorter and easier to access the form that had a way you could refer to it more frequently [would help].”* These tools may include computerized or paper based documentation systems. However, programs should be mindful of how forms influence how goals are written and

used. As one resident said, *“Somehow transferring it to a page makes it more...I don't know, makes you commit more to them.”*

Residents commented that the frequency of goal creation and use impacts their learning and some suggested the potential value of more frequent creation of goals that were specifically related to their rotations. One resident stated, *“I think setting rotation specific goals with the Attending at the beginning of the month and then at the end of the month reviewing whether or not you met those goals is more ... of a real time short thing. And I think that would be more useful.”* Given the competing priorities of residency education, residents need protected time to create, review, and revise goals away from direct patient care responsibilities. As a resident commented, *“If you are on a really busy rotation and you are just exhausted and every minute is patient care and little details, ... it can be really hard to do any specific goal work that's not directed by faculty taking a few minutes to teach on their own.”* Patient-care and other residency responsibilities can be aligned with goals by offering opportunities for residents to select clinical experiences that relate to the goals they develop. One resident said, *“I think our schedule is very pliable. We have a lot of ability to pick your electives and kind of mold your year around what you want ... to get to your ultimate goal.”* Residents should also be encouraged to consider their upcoming rotations and develop goals that allow them to tailor their clinical experiences on required rotations to achieve those goals. As one resident explained:

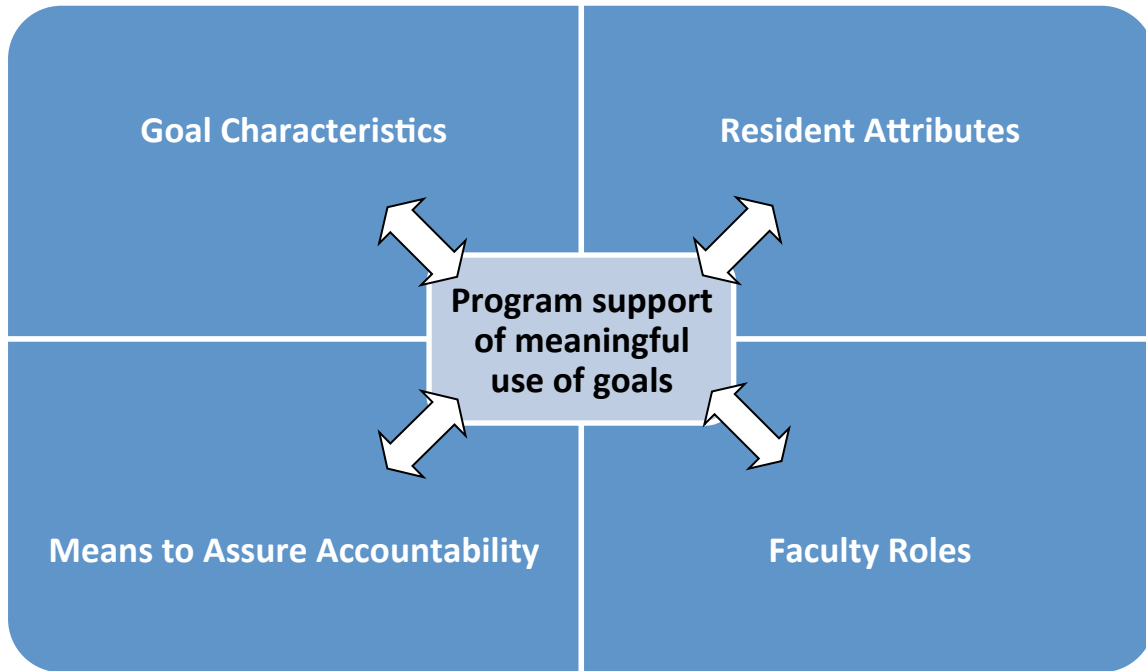
“But to the extent that the Resident is willing to be proactive ... with help from their Mentor, identifying things that are important to learn ...Residents specifically will go to a clinic and say ... What I want to see in dermatology today is kids with eczema and how you manage the kids with eczema. So I think you can slant it with a little bit of effort from the residents and then understanding of the faculty.”

Faculty development on how to develop and use learning goals is crucial to create a shared understanding for using goals. Residents reinforced this point, saying, *“Well, realistically for that to be helpful, the faculty member you are meeting with would have to have training in how the ILP is set up and what the goals of it are.”* Residents described the variability of support from faculty mentors. *“Just from listening to everyone, there sounds like there is a wide variety of things that Mentors provided. ... I understand people are volunteering for this role, but if everyone could be on the same page where they all went to these programs, something that you are volunteering for - I totally understand that is a sacrifice of time - but if you want to do it, let's do it well.”*

Preliminary Grounded Theory

These themes were consistently interrelated in the data, suggesting that there is not one single factor that a program should focus on to facilitate meaningful use of goals for learning e.g., providing an appropriate template for goals or increasing frequency of use will not likely lead to meaningful use of goals if implemented as isolated changes. Given the importance of each of the five factors, the absence of any one may make it more difficult for residents to meaningfully use their goals for learning, and in turn achieve their goals. The central hypothesis of the grounded theory is that broad program support can influence goal characteristics, resident attributes, faculty roles, and accountability in relation to individual learning goals and lead to meaningful use of goals.

FIGURE 1: SUMMARY OF GROUNDED THEORY AND RELATIONSHIP BETWEEN FACTORS THAT SUPPORT THE MEANINGFUL USE OF GOALS



DISCUSSION

Through focus groups and interviews we identified five different factors that can influence the meaningful use of learning goals in a residency program: goal characteristics, resident attributes, faculty roles, accountability, and program support. The theory generated in this study provides a description of an ideal approach for the use of learning goals in a pediatric residency. Our results suggest that there is no single factor that facilitates the meaningful use of learning goals. Rather, program support at multiple levels impacts this process.

Similar to other curricula, our results suggest that attention must be directed to both the explicit and implicit curriculum. The concept of the implicit curriculum emphasizes the difference between what students are taught and what they actually learn, highlighting the impact of organizational and cultural influences on learning.(14-16) Much of what has been discussed previously in the literature regarding learning goals focuses on the explicit curriculum – characteristics of effective goals, how to document them, or even the requirement to complete an ILP twice per year.(5, 9, 11) However, our results suggest that there is also a substantial impact of the implicit curriculum on learning from goals.

Often there was a contrast between what the program directors described and the residents' perceptions. There were several programs in which the program director described well-thought out plans for the use of goals, yet the residents still struggled to use them meaningfully. Throughout all of the programs, residents described feeling that using goals was just an exercise and not something that was truly valuable to their learning. Some perceived that faculty did not buy-in to the use of goals or know how to mentor them through the process. This disconnect highlights the importance of

addressing the implicit curriculum to truly make learning goals a meaningful experience for residents. Practical suggestions for a program will need to address culture change in the institution as well as concrete recommendations for the explicit curriculum.

There were several limitations to this study. Although a purposefully diverse sample of residency programs was used for data collection and saturation of themes was achieved, all of the programs were pediatric residencies, which require the use of an ILP. This may limit transferability to other education programs with learners at different stages of training, in different specialties, or in programs without required ILPs. Because the purpose of this study was to look for commonalities in perspectives of two groups of key stakeholders (residents and program directors), data was not collected about actual learning outcomes related to using ILPs, and analysis for variations among programs was not performed. Finally, residents had different definitions and understanding of the concept of meaningful use of goals that may not have always been clearly elucidated.

This study provides a starting point for understanding how to support the meaningful use of learning goals in a pediatric residency. Following up on this study, it will be interesting to study the approaches that different programs use to support optimal goal characteristics, residents' and faculty roles around goals, and means of accountability. A careful assessment of learning outcomes and better ways to assess meaningful use of learning goals will need to be determined to identify the impact of these factors on successful learning from goals and to determine the impact of using learning goals on achieving skills in self-directed lifelong learning.

APPENDIX 1: FOCUS GROUP GUIDE

Sample questions are included below. Additional probing questions will be developed during the interviews by the facilitator.

1. Think about the learning goal that you have been MOST successful at completing or the goal that was most meaningful to you. Describe that goal and how you worked toward achieving it. (This question would be both on a piece of paper for residents to answer on paper before the focus group starts as a primer and then each resident asked to share to start discussion.)
 - a. What characteristics of the goal contributed to your success?
 - b. How did the structure of the residency impact your success?
2. What factors are important for successful learning from your goals?
 - a. Characteristics of the goal?
 - b. Expectations about using goals?
 - c. Orientation/training re learning goals?
 - d. Time?
 - e. Flexibility in your schedule?
 - f. What role did faculty play in your development of and learning from your goals?
 - g. Are there other specific things that either facilitate or inhibit learning from goals?
3. What is the value for you of using learning goals in your residency? What have you learned from this experience of using learning goals (other than the actual content)?
4. How do you think you might use learning goals or the skills that you gained from using learning goals in the next stage of your career?

5. If you were in charge of the residency and could have three wishes for changes to how learning goals are used to make them more meaningful for you or increase your success at learning from goals, what would they be?

APPENDIX 2: INTERVIEW GUIDE FOR PROGRAM DIRECTORS

Sample questions are included below. Additional probing questions will be developed during the interviews by the facilitator.

1. Think about a specific example of how learning goals have positively contributed to education in your residency program. What made that example a success?
2. Describe how your residency program currently uses learning goals and individualized learning plans.
 - a. What are the specific expectations for using learning goals in your residency?
 - b. How are residents oriented on how to write and use learning goals?
 - c. How are residents expected to document learning goals and progress on meeting them?
 - d. Do residents have protected time to work on goals?
 - e. What amount of flexibility in the schedule is there for residents to match their clinical experiences to what they need to meet their goals?
 - f. Who do residents discuss their learning goals with?
3. What works well at your residency with the use of learning goals?
4. What challenges have you faced in using learning goals in your residency?
5. What do you think the residents are learning from the experience of using learning goals?
6. If you had three wishes for changes to how learning goals are used to make them more meaningful for residents or increase their success at learning from goals, what would they be?

CITED LITERATURE

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VITA

NAME: Tai Mara Lockspeiser
EDUCATION: BA, Psychology, Stanford University, Stanford CA, 2001
 MD, University of California, San Francisco, San Francisco, CA, 2006
 MHPE, University of Illinois Chicago, Chicago IL, 2014
ACADEMIC Medical Education Fellow, University of California San Francisco, 2004-2005
APPOINTMENTS: Clinical Instructor, Pediatrics, University of California San Francisco, 2009-2010
 Assistant Professor, Pediatrics, University of Colorado, 2010-present

James W. Lyons Award for Service, Stanford University, 2000
 Phi Beta Kappa Academic Honor Society, 2001
 UCSF Curriculum Ambassador Grant, 2002
 UCSF Teaching Scholars Program participant, 2004
 Nominated for Essential Core Teaching Award for excellence in small group teaching, UCSF School of Medicine, 2005
 Alpha Omega Alpha Honor Medical Society, 2006
 Best Innovation Oral Paper, Western Group on Educational Affairs (WGEA) conference, April 2006
 UCSF Medical Alumni association Academic Excellence Award, 2006
 Resident Teaching Award, UCSF Department of Pediatrics, 2007
 Nominated for Essential Core Teaching Award for excellence in Foundations of Patient Care teaching, UCSF School of Medicine, 2008
 Excellence in Teaching Award for Housestaff, UCSF School of Medicine, 2008
 Resident Teaching Award, UCSF Department of Pediatrics, 2008
 Recognition on Housestaff Association Annual Survey for outstanding service or education, University of Colorado, 2011
 Recognition on Housestaff Association Annual Survey for outstanding service or education, University of Colorado, 2012
 Invited participant of multi-site faculty development program on humanism, "Passing the torch: Fostering medical humanism through faculty role-models," 2013
 Gary Way award for outstanding teaching, Department of Pediatrics, University of Colorado, 2013

Ray E. Hefler Award for a creative, innovative educator who submits an outstanding abstract to the Pediatric Academic Society meeting, 2014

AAMC Research in Medical Education (RIME) Best Paper Award, 2014

Golden Stethoscope Award for Best Pediatrics Preceptor, University of Colorado School of Medicine, 2014

Selected for membership into the Academy of Medical Educators, University of Colorado, School of Medicine, 2014

PROFESSIONAL
MEMBERSHIP

American Academy of Pediatrics, 2006-present

Academic Pediatrics Association, 2010-present

Association of Pediatric Program Directors, 2012-present

ABSTRACTS

PEER REVIEWED PLATFORM PRESENTATIONS:

1. **Lockspeiser T**, Chen HC, Aagaard E, & Loeser H. The Educator's Narrative: Use of the Educator's Portfolio in a Medical Education Elective. *Oral presentation at UCSF Medical Education Day, April 2005.*
2. Hyland K & **Lockspeiser T**. Integrating themes into an integrated curriculum: Genetics as a model. *Oral presentation at UCSF Medical Education Day, April 2006.*
3. **Lockspeiser T**, Braveman M & de Blank P. A student developed and delivered "Teaching to Teach" program. *Oral presentation at the Western Group on Educational Affairs (WGEA) conference, May 2006.*
4. Niehaus B, O'Sullivan P, **Lockspeiser T** & Irby D. Perceptions on Careers in a Research Intensive Institution: Becoming an Academic Physician. *Oral presentation at American Educational Research Association Annual Meeting, New York NY, March 2008.*
5. **Lockspeiser T**, Rosenberg AA, Schmitter P & Lane JL. Creation of a learning goal scoring rubric. *Platform presentation at Pediatric Academic Societies Meeting, Boston, MA, April 2012.*
6. **Lockspeiser T**. Self-directed learning: It can't be done alone: Application of a conceptual model of self-directed lifelong learning to a residency individualized learning experience. *Platform presentation at UIC MHPE Annual Summer Conference, Chicago, IL, July 2012*
7. Wolf S, **Lockspeiser T**, Gong J, Valley M, Petroff E, Guiton G. The non-clinical competencies of medical school: A modified Delphi study of medical education experts. *Oral presentation at Education Research and Innovation Day, University of Colorado, Aurora CO, November 2012.*
8. **Lockspeiser TM**, Schmitter PA, Lane JL, Rosenberg AA, Hanson JL, Park YS. Validity Evidence for a learning goal scoring rubric. *Platform presentation at*

UIC MHPE Annual Summer Conference, Chicago, IL, July 2013.

9. **Lockspeiser TM**, Schmitter PA, Lane JL, Rosenberg AA, Hanson JL, Park YS. Validity Evidence for a learning goal scoring rubric. *Platform presentation at Research in Medical Education at Association of American Medical Colleges Meeting, Philadelphia PA, November 2013.*
10. **Lockspeiser T**, Li ST, Rosenberg A, Burke A, Hanson J. In Pursuit of Meaningful Use of Learning Goals in Pediatric Residency: What Can a Program Do? *Platform presentation at Pediatric Academic Societies Meeting, Vancouver BC, May 2014.*

PEER REVIEWED POSTER PRESENTATIONS:

1. **Lockspeiser T**, Chen HC, Aagaard E, & Loeser H. The Educator's Narrative: Use of the Educator's Portfolio in a Medical Education Elective. *Poster presentation at the Western Group on Educational Affairs (WGEA) conference, April 2005.*
2. Chen HC, **Lockspeiser T**, Aagaard E, & Loeser H. Grooming the Next Generation of Medical Educators: Use of the Educator's Portfolio. *Poster presentation at the Council on Medical Student Education in Pediatrics (COMSEP) conference, April 2005.*
3. **Lockspeiser T**, Braveman M & de Blank P. A student developed and delivered "Teaching to Teach" program. *Poster presentation at UCSF Medical Education Day, April 2006.*
4. **Lockspeiser T** & Braveman M. A program for improving peer-teaching confidence. *Poster presentation at UCSF Medical Education Day, April 2006.*
5. Hyland K & **Lockspeiser T**. Integrating themes into an integrated curriculum: Genetics as a model. *Poster presentation at International Association of Medical Science Educators meeting, June 2006.*
6. **Lockspeiser T**, Burgis, J, Stumpf E & Wilson S. Hospitalists Support Resident Autonomy in a Complex Tertiary Care Training Environment. *Poster presentation at Pediatric Academic Societies Meeting, Denver CO, May 2011.*
7. **Lockspeiser T**, Lane JL, Jones MJ & Rosenberg AA. Lessons Learned from Implementation of a Career Focused Longitudinal Block for Third Year Residents. *Poster presentation at Pediatric Educational Excellence Across the Continuum Conference, Washington DC, September, 2011*
8. **Lockspeiser T**, Lane JL, Jones MJ & Rosenberg AA. Lessons Learned from Implementation of a Career Focused Longitudinal Block for Third Year Residents. *Poster presentation at Association for Pediatric Program Directors Conference, San Antonio, TX, March 2012*
9. **Lockspeiser T**, Lane JL. "Bucking the norms": Resident perceptions of a longitudinal block experience. *Poster presentation at Association for Pediatric*

Program Directors Conference, San Antonio, TX, March 2012.

10. **Lockspeiser T**, Rosenberg AA, Schmitter P & Lane JL. Creation of a learning goal scoring rubric. *Poster presentation at Association for Pediatric Program Directors Conference, San Antonio, TX, March 2012.*
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12. **Lockspeiser T**, Hanson J, Lane JL. Factors Leading to Successful Use of Learning Goals in a Pediatric Residency. *Poster presentation at Association for Medical Education in Europe Meeting, Lyon France, August 2012.*
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15. **Lockspeiser T**, Schmitter P, Lane JL, Rosenberg A & Hanson J. Does the Quality of Written Learning Goals Correlate with Self-Reported Success at Learning? *Poster presentation at Pediatric Academic Societies Meeting, Washington DC, May 2013.*
16. **Lockspeiser T**, Li ST, Rosenberg A, Burke A, Hanson J. In Pursuit of Meaningful Use of Learning Goals in Pediatric Residency: What Can a Program Do? *Poster presentation at Association of Pediatric Program Directors meeting, Chicago IL, April 2014.*

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