DR MARGARET WOLFF (Orcid ID : 0000-0002-3637-2653)

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Coaching to Improve Self-Directed Learning

Abstract:

Background: The continuously changing health care context necesitates medical trainees develop self-directed learning skills. This study examined the effect of coaching on the self-directed learning process in preclerkship medical students.

Methods: We conducted a longitudinal educational intervention using standardized patient assessments to determine the effect of self-assessment, feedback, and coaching on the development and implementation of learning goals (LG) . Students were sorted into control and intervention. Following each assessment, students received performance feedback and created learning goals. Students in the intervention group worked with a faculty coach on their learning goals. Students in the control group developed LG without a coach. Prior to the final assessment, students reported whether they had implemented their learning goals.

Results: Of 171 students enrolled, 167 completed all four assessments and were included. All 167 developed a learning goal after each assessment. Overall, 79% of students reported implementing a learning goal. Of students receiving coaching, 92% implemented a learning goal, whereas only 66% of students in the control group implemented a learning goal (OR 5.7; 95% CI 2.4 to 14.2). Students receiving coaching were more likely to incorporate performance feedback into their learning goal (90.2% versus 38.1%; $p< 0.05$).

Conclusions: For students, faculty coaching facilitated better learning goal development and more frequent implementation compared to students without coaching.

Background

Given the changing field of medicine, numerous studies and accreditation bodies have asserted the importance of developing medical students and physicians-in-training into self-directed learners who drive their continuous learning process.(1–3) Despite this imperative, there is often poor utilization of self-directed learning (SDL) skills by trainees and insufficient faculty and programmatic support to foster SDL skill development.(4,5) Central to SDL process is the development and implementation of appropriate learning goals (LGs). Individual level barriers to this include difficulty with personal reflection, goal generation, and uncertainty about implementing change behavior.(4) Learners often fail to make LGs consistent with their learning needs and few are implemented when they are created.(5,6) Programmatic factors, including limited curricular time, faculty inexperienced in reflection and goal setting, and limited external accountability also contribute to poor LG development and implementation.(4)

Coaching has been proposed as a potential solution to this complex challenge (2) whereby the coach provides individualized, timely feedback after observing clinical performance, partners with the learner to develop an action plan and provides accountability to the learner.(7) The increased emphasis on self-reflection, goal setting and accountability distinguishes coaching from traditional clinical teaching.(7) Although there is growing evidence to support the use of coaching to facilitate improvement in surgical skills, the use of coaching to develop SDL skills in preclerkship medical students has not been explored.(7)

In this study, we examined the effect of coaches on LG implementation. The primary aim was to determine whether developing LGs with a faculty coach increased implementation of LGs; secondary aims were to determine whether learners developing LGs with a coach incorporated performance feedback into their LG more frequently and had larger gains in performance over time.

Methods

We performed a longitudinal educational intervention using a series of four standardized patient (SP) assessments as the basis for self-assessment, feedback, and development of LG. Preclerkship medical students in 2017 at the *** were included in this study. The context was a yearlong practice of medicine course. Students were sorted into control and intervention groups based on their assigned class day. Course faculty worked with their regularly assigned students during this intervention; faculty had either intervention or control students. Our institutional review board determined this study exempt.

Figure 1 outlines the student experience. All students received didactic instruction on the Master Adaptive Learner (MAL) framework as the model for self-directed, adaptive learning to strive for as they developed lifelong learning habits. This is an iterative 4 phased-process: Planning, Learning, Assessing, and Adjusting.(2) Students and faculty also received instruction on SMART (specific, measurable, attainable, relevant, timely) LGs, practiced creating SMART LGs, and received feedback regarding adherence to SMART LG framework.(8)

Students subsequently participated in four formative SP assessments. The presenting symptoms for the cases were: chest pain, abdominal pain, leg weakness, and dysuria. Each assessment consisted of an interview, physical examination, and oral presentation.

Following each encounter, students completed a self-assessment and then received the "usual" feedback: written SP feedback and verbal, individualized feedback from a faculty member. Using checklists, SPs assessed communication skills and faculty assessed history taking, physical examinations, and oral presentation skills. Students worked with the same faculty member for all four encounters. All faculty were trained in the R2C2 feedback model: build the **R**elationship, explore **R**eactions, explore **C**ontent, and **C**oach for performance change.(9) Following this, students created a SMART LG and action plan. Students recorded LG, action plan and LG source(s) (self-assessment, faculty feedback, SP feedback, combination) into an online learning system. After each subsequent SP, they reviewed their previous LG and revised it as needed.

For students in the intervention group, in addition to receiving the feedback described above, each student also received coaching on their LG and action plan from the faculty who observed them. Faculty paired with intervention students received a brief training regarding coaching and coaching skills (e.g. using questioning). Faculty were instructed to provide feedback on LG concordance with performance (did the LG address an area of weakness?), adherence to the SMART criteria and appropriateness of action plan. Students could then revise their LG and action plan, and if revised, would receive additional input from the faculty member. Intervention students and faculty repeated this process after each assessment.

Prior to the final SP encounter, all students completed a survey where they recalled their most recent LG and described any actions taken to achieve this LG for the primary outcome of LG implementation.

For the secondary outcome of incorporation of performance feedback into LGs, we utilized the data entered into the online learning management system for LG source (derived from self-assessment, faculty feedback, SP feedback, or combination of self-assessment and feedback). From this data, LG were categorized as incorporating feedback (faculty feedback, SP feedback, combination self-assessment and feedback) or not incorporating feedback (exclusively from self-assessment). For the secondary outcome of change in performance over time, scores in each of the domains (history, physical, communication skills, oral presentation) from the first and final assessments were utilized.

Analysis included descriptive statistics and logistic regression analysis. All analyses were performed with SPSS 22.0 for Windows (SPSS Inc., Chicago, IL).

Results

Of the 171 students in the course, 4 were excluded for incomplete data leaving 167(82 students in control, 85 in intervention). Baseline characteristics were similar between groups (Table 1).

Learning Goal Implementation: Overall, 79% (132/167) of students reported implementing their LG. Of the students in the intervention group, 92% (78/85) implemented a LG, compared to

66% (54/82) of students in the control group (OR 5.7; 95% CI 2.4-14.2) (Table 2). Female students were more likely to implement LGs than male students (OR=2.8, 95% CI=2.2-14.4). LG implementation was not related to performance on the history taking, physical exam, or oral presentation components. Performance on communication skills was negatively associated with LG implementation (OR=.86, 95% CI 0.75-0.98). Students with a coach implemented more LG after controlling for gender and performance. (OR=5.6, 95% CI= 2.2-14.4).

Incorporation of Performance Feedback into Learning Goal: Students who developed LG with a coach were more likely to incorporate performance feedback into their LG than the control group: 90.2% (74/82) versus 38.1% (32/84); $p< 0.05$ (figure 2).

Performance Improvement: Students developing LGs with a coach had larger gains in oral presentation performance than those without ($p<0.05$). There were no significant differences in performance changes in communication skills, history and physical exam in this group.

Discussion:

In this study, the majority of students implemeted LG after receiving performance feedback utilizing the R2C2 model. The addition of coaching around LG development amplified the effects of feedback with more learners implementing LGs. Further, students who developed LG with a coach were much more likely to incorporate feedback into their learning goals. To our knowledge, this is the first study to evaluate the impact of coaching on SDL development in preclerkship medical students.

Prior studies have highlighted the complexities of LG development and implementation and demonstrated that implementation cannot be predicted by any one factor.(4,6,10) Beneficial strategies included programmatic support and development of relevant LGs that are prioritized by the learner and are specific, measurable, and realistic.(4) Given this prior work, we implemented those elements for all students. Those who worked with a coach on LG development had even higher rates of LG implementation. The reasons for this positive effect are likely multifactorial. First, coaches can guide learners to reflect on available feedback and performance metrics to calibrate with their self-assessment. Coaches can also assist in

establishing appropriate developmental goals using the SMART goal framework, making LG more actionable. Second, coaches can help the learner navigate some of the previously identified barriers such as uncertainty about implementing change behavior by helping learners create an action plan. Finally, coaches can help the students navigate competing demands, assist with prioritization of LG, and hold the student accountable.

This study has important implications for medical education. In the ever-changing health care climate, training SDL who are prepared for future learning is paramount. However, there is limited evidence on the best ways to train learners in SDL. This study demonstrates that the use faculty coaching for development of LG and action plan provides significant improvement in both learning goal implementation and incorporation of feedback. Incorporation of feedback is an essential skill in the SDL process and prior studies have demonstrated that most learners base LGs on self-assessment and do not incorporate feedback.(6,8) Therefore, the use of a coach shows promise in increasing these behaviors.

There are several limitations of this study. Although there were significant differences in LG implementation, this study did not result in significant differences in most areas of performance between the control and intervention groups over the study interval. This may be due in part to the relatively high performance overall of participants, making it difficulty to detect significant performance differences. In addition, although this study demonstrated improvements in these behaviors within the context of the clinical skills, we did not examine if these effects were sustained into clinical rotations. Finally, we did not analyze the quality of the LG and therefore are not able to analzye the impact of the quality of the LG on implementation.

Conclusions

For students, faculty coaching facilitated better learning goal development and more frequent implementation compared to students without coaching Preclerkship student coaching facilitated SDL behaviors.

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Pull-outs

"Learners often fail to make LGs consistent with their learning needs and few are implemented when they are created."

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Table 1: Baseline Demographics

	Intervention (Coach feedback)	Control
Gender (% identifying as female)	56.6%	48.2%
Age (years, mean)	24.2	23.9
% with prior coaching experience	2.4%	2.2%

Table 2: Effect of a Faculty Coach

	Group				
Variable	**Control**		**Intervention**	χ^2 / t	p
Taken any actions to implement clinical skills learning goal? (% yes)	65.9		91.8	16.9**	<.001
Incorporation of clinical performance feedback into LG (% yes)	38.1		90.2	48.9**	<.001
Change in communication skills score (means)	-0.9		0.6	-1.06	0.29
Change in history taking score (means)	-4.8		-3.5	-0.06	0.54
Change in physical exam score (means)	-0.7		0.9	-1.23	0.22
Change in oral presentation score (means)	1.3		8.6	-2.34*	0.02

[a]Percentages are limited to participants who indicated that they incorporated feedback into their learning goals.

*p < .05. **p < .001.

Figure 1: Student Experience by Group

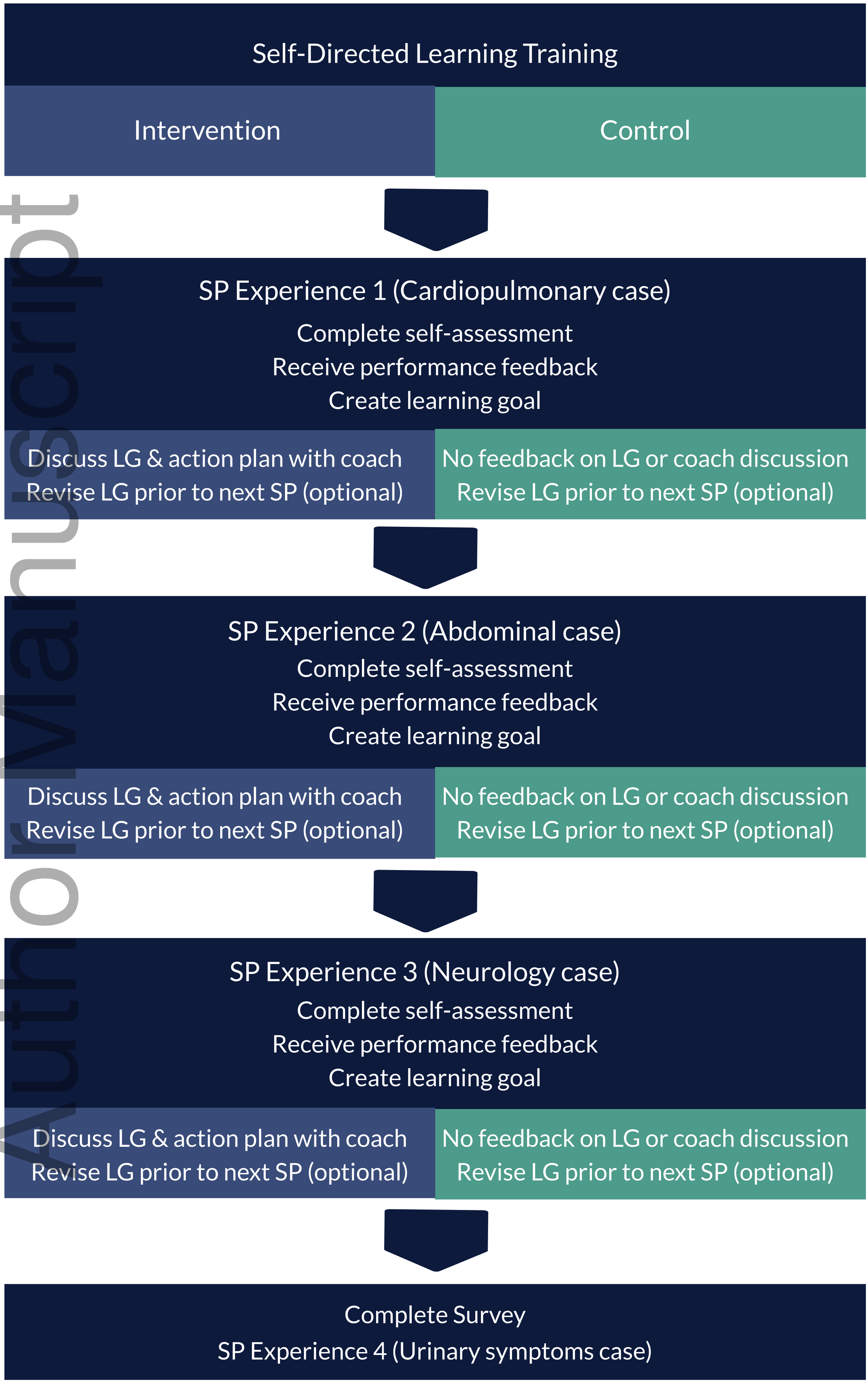

Figure 2: Incorporation of Performance Feedback into Learning Goal