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Goal-Oriented and Habit-Oriented Reflective Models to Support Professional Identity Formation and Metacognitive Thinking.

Permalink

<https://escholarship.org/uc/item/0g51271v>

Journal

Medical science educator, 33(2)

ISSN

2156-8650

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Publication Date

2023-04-01

DOI

10.1007/s40670-023-01752-9

Peer reviewed



Goal-Oriented and Habit-Oriented Reflective Models to Support Professional Identity Formation and Metacognitive Thinking

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Accepted: 9 February 2023

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Abstract

Professional identity formation (PIF) is a multi-year, complex, social, and intellectual process that culminates in trainees “thinking, acting, and feeling like a doctor.” Some of the processes of PIF, particularly the Hidden Curriculum, may result in suboptimal outcomes in student’s cognition, including implicit bias and poor clinical decision-making. Many have recognized the importance of reflective writing, particularly metacognition, in undergraduate medical education. However, there are few concrete examples and explanations for fully integrating reflective writing exercises across multiple situations, experiences, and levels of growth. The authors provide conceptual frameworks, concrete curricular structures, and reflective tools used at two medical schools.

Keywords Metacognition · Professional identify formation · Reflection · Coaching · Portfolios

Introduction

Reflection is not new to health professions education; it has long been used to manage the complex process of becoming a doctor, or professional identity formation (PIF), the multi-year, social and intellectual process that culminates in trainees “thinking, acting, and feeling like a doctor” [1–3]. Several studies have documented the varied history and uses of reflection in medical education [4–7]. Many programs use writing to foster reflection and metacognition (thinking about thinking), in hopes that when students monitor their PIF and practice critical thinking about their thoughts and actions, they can optimize the process of PIF [8–10].

These studies suggest that not all programs use best reflective practices. Since students begin developing their professional identity at the beginning of Year 1 and continue throughout their career [11–16], reflection works best if, rather than occurring in an isolated part of a curriculum, it is integrated throughout the formal and particularly the implicit

instruction that occurs through behaviors and implied values during the “Hidden Curriculum” [17, 18]. Yet while some have implemented longitudinal programs [7, 19], many others are limited to short-term interventions. Others suggest PIF portfolios, but offer little concrete guidance for strategies to coach students in the challenging task of metacognitively analyzing their portfolios in the many shifting contexts of PIF [10, 20].

Also, most reflections are focused on self-assessment (student experiences with complex issues) [20], rather than a deeper, more complex reflective process called *critical reflection*, during which students consider social and systemic factors that implicitly and explicitly influence one’s beliefs and behaviors [5]. Ng et al. [5] raise the concern that if student reflection remains superficial, it may not have value. Others have pointed out that students at times perform a “zombie” reflection that does not involve true critical analysis and self-discovery, but instead is a display of students’ sense of faculty expectations [21] in which the reflection becomes a mere learning activity [6]. When reflection is fully integrated into medical students’ experiences, it has the potential to mitigate the factors of PIF that may lead to undesirable outcomes for students [13], particularly that of the hidden curriculum. To achieve this deeper critical reflection, students must ask not just *what* they experienced, but *how* they responded to it, *why* they responded that way, and *what* that suggests about how they have been consciously and unconsciously shaped by the social structures around them.

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When students conduct this rigorous critical reflection, they can foster a way of seeing and being [6], a metacognitive stance toward their own thinking, and toward the structures and forces that are not always positively shaping their PIF [13, 17, 22–24]. As they interrogate their own cognition, they must investigate their prior socialization, which can lead to students making uncomfortable discoveries, including negative realizations about unconscious biases. As they reflect on their PIF, they may also come to recognize and, at times question, established power relations within medical education. Students must become humble and open to this vulnerable inward review, no matter how weakening it may feel, and they must do it regularly, in a structured format, so that it becomes a habit of mind [1, 11].

Such deep reflection does not come intuitively or naturally to many students. Yet, Uygur et al. [10] noted that “many educators were using reflection without teaching students how to reflect,” and others noted that without such instruction, students failed to improve in their self-reflection [19]. While some programs in reflective writing do provide feedback, they do so on the *product* itself, assessing the quality and depth [25] of the artifact of the thinking. Little instruction is given on the internal cognitive processes necessary to *generate* the written reflection. Students are left to formulate their own strategies for managing the complex internal process necessary to generate critically reflective writing. This is analogous to a student being critiqued on their SOAP note without ever being taught the diagnostic thinking that must be conducted to write the note. When writing reflectively, students need to know the internal questions they must ask about their own mind.

Educators, therefore, need strategies to help them become more effective at supporting PIF in learners. This manuscript aims to address this gap, first by providing a theoretical framework and then by offering curricular structures and strategic reflective tools students can use to manage the cognitive process of internal inquiry. These question-based tools are simple and can easily be integrated into any part of the longitudinal, multivariate process of PIF. Educators can use the theoretical framework to coach the students on the importance of the critical reflection and the strategic tools to coach them on the cognitive processes necessary to conduct their internal investigations of their own minds.

A Theoretical Framework for Reflective Writing: Professional Identity Formation and Dual-Process Cognition

Sternszus et al. found that clinical teachers cannot articulate how they might influence students’ PIF, because they lack a framework for understanding how physician identities form [1]. When asked to describe PIF, they tended

to describe it in terms of various behaviors (e.g., health advocate, communicator, collaborator) and tended to conflate PIF with professionalism. This presents a barrier to coaching reflective writing, as students would ideally be conducting a critical reflection on PIF, including its negative aspects, and would need the support of informed coaches who would encourage the discovery of undesirable traits like implicit bias. Educators need a theoretical framework to help students understand what they are investigating. The authors propose Identity Formation as a useful framework.

Identity formation is a “cycle of socialization” (COS). COS is a process in which we are socialized to certain ideals based on our differences in gender, ethnicity, skin color, first language, age, ability, status, religion, sexual orientation, economic class, etc. COS can be thought of as a bridge between who we are as individuals and how we place ourselves within social circles [26]. There are various socializing agents in one’s life (e.g., family, schools, and churches) that reinforce and perpetuate socialization in a cyclical, pervasive, self-reinforcing process. As children grow, the number of sources multiplies, and some of their results are negative. The agents of COS may promote, enforce, and perpetuate biases, stereotypes, automatic judgments, and other undesirable cognitive attributes. Unfortunately, an individual’s negative experiences, such as dysfunction, crime, inequality, etc., can also insert negative aspects into one’s identity [26].

If the cycle of socialization is a process of learning what an identity means and how it should drive behavior, dual processing theory (DPT) describes the cognitive processes underlying this social learning. The two processes in DPT are *fast processing* (type 1), which is automatic, unconscious, emotional, and intuitive, and *slow processing* (type 2), which is conscious, effortful, and analytic. The human brain defaults to type 1 for cognition that doesn’t need conscious attention. Thus, when beliefs, biases, values, and behaviors learned through COS are eventually shifted to type 1, they become unconscious [27, 28]. One type of processing is not better than the other, because both can be useful in different contexts. When beliefs and behaviors are optimal and positive, this type 1 is useful, as it frees the more effortful cognitive type 2 processing for tasks that require our full attention. But behaviors and beliefs can be negative, and we may behave in ways that are expressions of unconscious bias, even when those behaviors and biases are counter to our declared, conscious belief systems, such as with implicit bias [22].

Students enter medical school as socialized individuals who have been shaped by COS. They carry biases, prejudices, pre-assumptions, and habitual actions, controlled by the unconscious mechanisms of type 1. These can affect their thinking and decisions not just in clinical

practice, as some might postulate, but throughout their PIF, from interactions with their peers and faculty, to how they study, to how they approach extracurricular activities, etc. Therefore, many have argued for reflective writing to begin early, particularly metacognition.

Students learn by what they see, including individual educator's behaviors and the underlying values and biases they sometimes suggest, a Hidden Curriculum that can teach students values and behaviors that are counter to the explicit curriculum [13, 17, 18]. The medical system's structures also communicate a Hidden Curriculum that directly contradicts the explicit curriculum, as when students are told to value health, but then the "firehose of information" in the first year leaves them no time for exercise, healthy eating, or adequate sleep. At times, students must choose between their pre-existing identities and their developing identity as a physician (e.g., when they value family, but study instead of being with loved ones). At other times, they must choose between their conscious value systems (what they believe a good doctor should be) and the conflicting behavioral norms and behaviors expressed (often unconsciously) by the educators around them. The tension between the hidden and explicit curriculum can be overwhelming and distressing [24], and left unexamined and unmonitored, undesirable lessons of the Hidden Curriculum can shift into automatic type 1 processes without the learner noticing. Reflective writing can help students navigate this maze of contradictions and give them a mechanism to alleviate the negative consequences and elevate the positive consequences of PIF.

Coaches can teach students simple questions that become tools for them to consciously use their analytic type 2 processing to interrogate the automatic processes of type 1 [8, 27, 28]. When students do not push their inquiry into critical reflection, coaches can help them to ask more questions, so that they can become more adept at monitoring type 1 [30] and intervening when it is dysfunctional [27–30]. Croskerry writes, "The beauty of the human mind is that it can toggle between the two systems and select which mode is most appropriate to the task at hand" [28]. In fact, research suggests that struggling with metacognition can activate type 2 [31], and reflective writing programs report that students can improve their reflective capacity [10], suggesting they have improved in Croskerry's "toggling."

Learning metacognitive skill early allows the students to be more prepared for the clinical years, when the cognitive challenges and consequences of the Hidden Curriculum are even greater and when they will need to catch diagnostic errors [28], which are a direct mechanism of dual processing. type 1 uses *heuristics* (mental short cuts, rules of thumb, pattern recognition). When they are appropriate, heuristics are fast, intuitive processes that allow physicians to be more efficient in a clinical setting when time and resources may

be limited. Unfortunately, type 1 is also prone to error [8], making clinicians vulnerable to heuristic errors (inappropriately applied mental short cuts, such as availability error), overconfidence, implicit bias, and other reasoning errors [8, 32, 33]. Physicians must monitor their thinking and switch to type 2 when a more deliberate, analytic process is warranted. This monitoring requires practice, as it is not the default relationship between type 1 and type 2 cognition [27].

To achieve this complex, difficult skill, students need instruction on the thought processes themselves. How might type 2 investigate type 1 in written reflection? Models for using questions during reflection have been reported in the literature but can vary in complexity [34]. We offer three *question tools* for metacognitive inquiry that students might use. They are presented with descriptions of the programs where they were deployed.

Overview of Two Institutions' Frameworks

Two institutions (West Virginia School of Osteopathic Medicine and University of California- Riverside School of Medicine) developed easy reflection tools that assist learners in the generation of reflection writing. Both programs trigger questions to initiate reflection, although students in both groups were permitted to choose their own topics. Both groups received regular coaching. Both programs established a purpose with students. WVSOM had a goal-oriented purpose, in which students set goals for themselves and wrote reflectively to nurture their progress toward their goals. UCR SOM used a habit-oriented approach, in which students wrote regularly to nurture progress toward a metacognitive habit of mind, in which students would automatically ask the metacognitive questions throughout their PIF.

While the two programs had specific learning objectives (individual student goals and habit of mind, respectively), any reflective program can teach students to use the question tools to manage their cognitive toggling between type 1 and type 2 processes.

- **Tool One (WVSOM).** Driscoll [35] offered an easy model for reflection that was based on Kolb's cycle of action and reflection [36]. It included three questions: *What? So what? Now what?* This basic model is easy to remember, can be adapted to most reflective situations, and helps guide the cognitive process of reflection with three easy, sequential questions. These are used in *Tool One*.
- **Tool Two (UCRSOM).** Nguyen et al. provide a more detailed set of components from a review of definitions and models of the 15 most cited authors on reflection [34]. The five components synthesized by the authors of that study can easily overlay the questions of the Driskoll model with the addition of one question: *Why do I think that?* *Tool Two* adds this question.

- **Tool Three** is a proposal for a hybrid model that integrates features from the two programs.

The Conceptual Framework for the Questions

What When students respond to “What?”, they should return to the situation they are reflecting on and discuss the context, experiences, knowledge, ideas, actions, etc. Students may be encouraged to think about the situation using their major senses of seeing, touching, tasting, hearing, smelling, etc. They should reflect on what occurred, what they did, what others did, what their reaction was, and key aspects of the situation. From Nguyen et al., this would be the thoughts and actions or TA component [34].

So What When students are responding to “So What?”, they should reflect on their meaning or understanding of the situation such as why does it matter, what troubled them about it, what were the effects of what they did or did not do, what are the reasons for feeling differently, are their feelings different from colleagues, and so on. This component is where the critical look at their thoughts and actions happen. It is more than just describing the situation but now looking at why it matters. From Nguyen et al., this would be the attentive, critical, exploratory, and interactive component (ACEI) [34]. It is thinking about the situation and their thoughts and actions in a more critical way.

Why Do I Think That When students are responding to “Why do I think that?”, they should move into thinking about the conscious or unconscious framework that supports their thoughts and actions. They should consider how their core values and type 1 processing are implicated in their initial thoughts about the experience. They should become aware of the reasons why they think a certain way and feel or act the way they do and begin scrutinizing their thinking. From Nguyen et al., this would be the conceptual framework component (CF) [34]. When students make an absolute statement of value judgment or belief, they are encouraged to question the statement. For example, a student might write, “Obese people don’t care about their health”. In a powerwrite, they would follow with “Why do I think that?” and then an exploration of the underpinnings of that belief. Students are encouraged to push themselves to keep asking using the “Five Why Technique” [37]. Students learn to ask themselves “Why” at least five times, until the answers no longer provide insight or access to root causes. This allows them to push beyond their preconceptions and to discover underlying unconscious (i.e., Type I) cognitive patterns.

Now What When students are responding to “Now what?”, they should reflect on modifications they will make in similar situations in the future or what they will/need to change

going forward. They should think about what they might do differently if faced with a similar situation, what information they may need to help them face a similar situation, what they need to do to alter a situation in the future, and so on. For Nguyen et al., this would be the view on change component (VC) and self-component (S) [34]. It is envisioning how to change and making a plan for change. The “Now what?” could be done both formatively (immediately after a situation or event) or summatively (at an appropriate transition point such as end of the semester, end of the academic year, end of pre-clerkship years, and so on).

Goal-Oriented Reflective Writing Using Tool One

At West Virginia School of Osteopathic Medicine, the students in years 1–3 of a 4-year undergraduate curriculum (with didactics in years 1 and 2 and clinical experiences in years 3 and 4) were asked to complete goal-oriented reflections 2–4 times per year. The goal-oriented framework is about helping students identify areas that they would like to work on with their coach over a specific reflection period. In choosing this goal, students can reflect on guiding questions, or they can pick a topic of their own. Students are asked to reflect on academic performance as well as well-being, professionalism, career trajectory, extramural projects, etc. Students use the question tool, *What? So what? Now what?* and sub-questions (see Supplement 1), to guide their metacognitive reflective writing.

Since implementation in 2019–2020, around 800 students have participated in the reflection process. Survey responses from 193 students indicated that students feel the coaching/reflection program is positive and beneficial. The meetings with coaches to discuss their reflections was rated the highest.

Habit-Oriented Reflective Writing Using Tool Two

At University of California Riverside School of Medicine, students in years 1–3 of a 4-year undergraduate curriculum (with didactics in years 1 and 2 and clinical experiences in years 3 and 4) were trained in a writing technique, *Powerwriting* (PW, described below), and then asked to complete short (10 min each) but frequent PW to develop a habit of mind of asking questions about their type 1 processing. Frequency was as follows: Y1, weekly, excluding pre-exams and holidays; Y2, biweekly; and Y3, once per month. Students used *Tool Two* questions (*What? So What? Why do I think that?*) during the reflective writing to toggle between type 1 and type 2 cognition.

Powerwriting is designed to circumvent the social filters that can cause students to “perform” a “Zombie Reflection” [24] that meets perceived institutional expectations, a facet of the Hidden Curriculum. Formal essay writing can

perpetuate this performance, as formal essays are written for an audience and students are accustomed to being evaluated on the product. Since this program emphasizes insight into type 1 cognition, powerwriting is designed to resist markers of formality and audience. Students are asked to follow these rules:

- **Write without stopping for 10 min.** This encourages type 1 to emerge automatically.
- **Ignore errors**, such as typos, grammatical errors, etc., which can interrupt the emergence of type 1 processing.
- **Join your sentences with “and” or a dash.** This encourages non-stop writing, as students never encounter the stopping signal of a period (a “full stop”).
- **Allow your mind to digress**, which encourages type 1 to emerge, until you notice (with type 2) that your digression is not producing insight
- **Refocus by typing metacognitive questions (Why do I think that?)** and then answering them. This engages type 2 to ask the question and encourages type 1 to answer.

Students are not evaluated on content. Students receive written coaching from trained readers on all PW, but the coaching focuses on the technique. For example, students might receive a comment, “Thank you for reflecting on this experience in your PIF. As you continue working on your powerwriting, be sure to type yourself the question “why do I think that?” to help you use type 1 to analyze type 2.” The coaching is progressive; as students master one rule of PW, other elements are coached.

While some reflective writing is a recounting of events, UCR SOM’s program moves students into metacognitive analysis by first focusing on the question “Why do I think that?” After students master this question, other questions are introduced and then sub-questions (see Supplement 2),

which are linked to heuristic errors common in students’ clinical reasoning [33].

Students also conduct a summative self-assessment at the ends of year 1 and 2. They analyze their portfolio of powerwrites for insight into patterns of their type 1 cognition, and to set goals for cognitive inquiry for the subsequent year. This regular, recursive process is designed to develop metacognitive habits of mind that are critical for resisting undesirable features of the Hidden Curriculum and to optimize clinical reasoning..

Since implementation in 2014, around 800 students have participated in the UCR reflection process. Survey responses from the most recent Y1 class (63 students) indicated that students strongly agreed that they were more likely to ask themselves “Why do I think that?” in a clinical setting after practicing asking that in their reflective powerwrites. They also strongly agreed that written coaching was very useful for learning the powerwriting technique. An example student powerwrite is included in Appendix 1.

Table 1 compares the characteristics of both institutional frameworks/tools in more detail for comparison.

A Hybrid: A Proposed Tool Three

The UCR SOM program would benefit from the addition of a goal-setting exercise at the beginning of the program. Such goal setting can contribute to intrinsic motivation, and given the well-documented resistance to reflective writing due to time and workload constraints [10], this personalization is merited.

The WVSOM program would benefit from the addition of the “Why do I think that?” question to their cognitive tool. Students might benefit from training in powerwriting to circumvent any social filters or performative reflections.

Table 1 Goal-oriented versus habit-oriented reflections

	Goal-oriented reflection/Tool One	Habit-oriented reflection/Tool Two
Purpose	Reflections result in 2–3 goals that the student will work on from one reflection period to the next	Reflections result in student analysis of their hidden “closet” invokes change in thinking or analysis of their personal and professional experiences/identities
Timing	Less frequent (2–4 times per year) due to the time needed to implement their goals into daily practice and monitor their effect more genuinely	Frequent due to the importance of continued analysis across contexts and experiences. These can be from weekly to monthly depending on the year in school
Stakeholders	1 Director, ~ 75 faculty coaches, and ~ 600 students	4 trained readers and 240 students
Context	Undergraduate osteopathic medical education courses or rotations	Undergraduate allopathic medical education courses or rotations
Sub-questions	Yes, see Supplement 1	Yes, see Supplement 2
Formative versus summative	Formative, course or rotation requirement but not a part of the student’s grade; students get an incomplete until the requirement is fulfilled	Formative, required of all students, but not part of the student’s grade; Students must meet a 70% (passing) threshold; students notified when they are at risk

Table 2 Comparison of goal-oriented, habit-oriented, and hybrid frameworks for reflections

	Driskoll [35]	Nguyen et al. [34]	Goal-oriented/ Tool One	Habit-oriented/ Tool Two	Hybrid
What?		Thoughts and actions (TA)	Included	Included	Included
So What?		Attentive, critical, exploratory, and interactive component (ACEI)	Included	Included	Included
Why do I think that? (New)		Conceptual framework component (CF)		Included	Included
Now what?		View on change component (VC) and self-component (S)	Included		Included

The hybrid is suggested as a method to incorporate both frameworks where a learner not only reflects on their own hidden “closet” but sets goals for how to change or improve going forward especially as they journey to becoming fully immersed in the profession. Table 2 outlines the basic differences between all three of the proposed frameworks/tools.

Conclusion

While the importance of reflective writing in medical education has been noted in recent years, there are few concrete examples and explanations of processes for fully integrating reflective writing exercises across the entire trajectory of students’ professional identity formation in undergraduate medical education. The frameworks, tools, and strategies presented here are an easy, adaptable, and useful structure that can be integrated in multiple situations, experiences, and levels of growth. There has historically been a lack in examples to support critical reflection emphasizing not just self-assessment but promoting a change in seeing and being which these frameworks support. This manuscript has highlighted models and processes from two medical schools using slightly different purposes (goal-oriented versus habit-oriented) for reflection. The authors hope that the strategies and tools included in this guide can give others a reasonable start at incorporating reflective writing into their own educational context.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s40670-023-01752-9>.

Author Contribution Both authors were responsible for this manuscript; have participated fully in the conceptualizing, drafting, or revising of the manuscript; and have seen and approved this manuscript as submitted.

Availability of Data and Material Not applicable.

Declarations

Ethics Approval and Consent to Participate Not applicable.

Consent for Publication The authors consent to publication.

Competing Interests Dr. Linsenmeyer is an Associate Editor for Medical Science Educator and should be excused from any responsibility of the peer review process. None of the authors have any disclosures or competing interests to declare that are relevant to the content of this article. The authors have no relevant financial or non-financial interests to disclose.

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