Learning Partnership: Students and Faculty Learning Together to Facilitate Reflection and Higher Order Thinking in a Blended Course

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Abstract

This article discusses a learning partnership among faculty and students to influence reflective practice in a blended course. Faculty redesigned a traditional face-to-face (FTF) introductory physician assistant course into a blended course to promote increased reflection and higher order thinking. Early student reflective writing suggested a need for learner familiarization with levels of learning, types of reflection, and levels of reflective practice and for revision of writing prompts to encourage greater depth and breadth of reflection. This article presents results from an analysis of students' writings prior to and after the learning intervention and revision of writing prompts. Writings from Week 1 and Week 8 of the course were analyzed for level of reflective practice, depth and breadth of reflection, and depth of higher order thinking. Results indicate an increase in level, depth, and breadth of reflection post-intervention. Results also indicate an increase in occurrences in higher order thinking post-intervention. Findings suggest that purposive course design, combined with instruction on reflection and appropriate reflective prompts, can influence breadth and depth of reflection and higher order thinking in a blended course.

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The increasing complexity of today's healthcare environment demands that practitioners integrate multiple streams of information in clinical decision making. To meet these demands, future practitioners must be prepared to think critically and integrate knowledge and experience in the resolution of complex problems. The reflective process has been shown to promote critical thinking and knowledge integration (Dunfee, Rindflesch, Driscoll, Hollman, & Plack, 2008; Plack et al., 2007; Plack, Driscoll, Marquez, & Greenberg, 2010; Plack & Santasier, 2004). Recognizing reflection as the cognitive process that facilitates the integration of personal experience to clinical decision making and practice, health professions education has demonstrated increasing focus on developing reflective practitioners (Dannefer, 2013; Kinsella, 2009; Maree & Van Rensburg, 2013). Reflection is considered a professional competency for physical therapists (Commission on Accreditation of Physical Therapy Education, 2014), nurse practitioners (National Organization of Nurse Practitioner Faculties, 2006), and physician assistants (National Commission on the Certification of Physician Assistants, 2012). Reflection can be used to foster clinical reasoning (de Swardt, du Toit, & Botha, 2012; Plack & Santasier, 2004; Mamede, van Gog, van den Berge, van Saase, & Schmidt, 2014) and/or promote professionalism (Baerenstein, Oeschlager, Chang, & Wenrich, 2009; Plack & Santasier, 2004) in health professions education. In health professions

curricula, clinical experiences often occur in the later phase of training, and at that point in the curriculum students are expected to be highly prepared to engage as professionals. Reflection is a skill that must be learned and like any other skill, requires practice. To ensure that students are adequately prepared to maximize their learning and refine their decision-making skills when they enter the clinical environment, the reflective process should be introduced early in the curriculum. The didactic phase of education should promote reflection upon active learning within the classroom and encourage students to anticipate how that learning might apply to future scenarios. Case-based, simulation, and other methods of active-learning problem solving can be used to facilitate reflection.

Adopting active-learning strategies, such as reflective practice, with students traditionally reliant upon teacher-centric models of instruction, however, can prove challenging. Active learning requires both students and teachers to reconsider their roles within the classroom. Faculty and students must share responsibility for the learning process (Baepler, Walker, & Driessen, 2014). Yet students unaccustomed to active-learning processes and faculty reliant upon lecture-based instruction may require time and practice in order to develop new learning and facilitation habits. Adopting course structures allowing action, interaction, and reflection creates an environment conducive to higher order cognitive processes (Jensen, 1998) required for higher levels of learning (Illeris, 2003). Blended models of learning can promote the cycle of action, interaction, and reflection required to promote higher levels of learning (McDonald, 2012). Online journals can allow learners in a blended course to reflect upon classroom experiences (McDonald, Straker, & Lyons, 2014). However, little research has been done on the efficacy of online journals in promoting reflection in the health sciences. This article presents one model of blending to promote reflective practice in a physician assistant (PA) course. Applying a mechanism of journal assessment developed by Plack, Driscoll, Blissett, McKenna, and Plack (2005), researchers questioned whether, and to what level, student online journals demonstrated reflection.

Literature Review

Experiential Learning and the Reflective Process

Reflection or *reflective practice* is an internal process of analyzing experience to build a new or deeper understanding or knowledge. It can entail cognitive and affective functions (Boud, Keogh, & Walker, 1985). Professional education builds upon experience. Often in the later phase of education of health professionals, an apprenticeship model is used, and students are placed in the field to gain experience alongside working professionals. Schön (1983), a reflective theorist, was concerned with professional practice because it requires significant problem solving. He posited that when a professional confronts a unique or anomalous problem or situation, the solution requires new learning and often higher levels of thinking. Schön borrows heavily from experiential learning theory (Dewey, 1916, 1938) in his theory of reflective practice. Experiential learning proposes reflection as a mechanism allowing critical assessment of current problems in comparison to previous experiences to determine appropriate future action (Dewey, 1916, 1938; Kolb, 1984). Schön describes a dialogic relationship between reflection and action as essential to reflective practice, identifying two types of reflection: *reflection-in-action* and *reflection-on-action.* Developing these types of reflection enables practitioners to know how to respond skillfully to complex situations (Schön, 1983). In an educational setting, promoting reflection-in-action requires learning experiences that challenge students to compare a new or surprising situation to previous experiences and existing knowledge in problem solving. Facilitating reflection-on-action necessitates opportunities for students to question how new learning experiences contributed to or altered their understanding of concepts, assumptions, or premises by which they solved a problem (Schön, 1983). Killion and Todnem (1991) extend Schön's model to argue that future practitioners must also be able to use previous experiences and knowledge to anticipate consequences of future actions, or in other words, they must be able to reflect-for-action. Consequently, didactic coursework must be designed to allow opportunities for reflection prior to, during, and after a learning experience. Yet questions remain as to the process by which students reflect in each phase.

While Schön focused on the timing of the reflective process in learning from experience, Mezirow (1991) focused more directly on the nature of the reflection that occurs. He describes the reflective process as critically questioning the content, process, and premise underlying an experience or problem to make meaning of it, or to come to a better understanding. In *content reflection* learners reconsider the "what" of experience, describing and analyzing the situation or problem from multiple perspectives to obtain a deeper understanding (p. 107). *Process reflection* requires learners to analyze the "how" of experience, or the processes or strategies involved, as well as looking at alternative processes or strategies used to understand the situation or solve problems (p. 108). Finally, *premise reflection* focuses learning on the "why" of experience and occurs when learners begin to recognize and critique their own biases, values, beliefs, and assumptions (p. 108). Often premise reflection also occurs when learners begin to examine the existence of problems that stem from unconscious bias. Premise reflection is the most challenging type of reflection to achieve. As a form of transformational learning that requires a higher order, conscious thought process (Plack & Greenberg, 2005), reflection is the process by which individuals can correct assumptions, revise interpretations, and modify behaviors (Mezirow, 1991). It is also the process by which learners can assess gaps in their own knowledge or skill.

Blended Learning Design to Foster Critical Reflection

Blended learning promises to meet the increasing demands of health professions education. Blended learning studies reveal increased student participation in course activities (Geçer & Dag, 2012), student perceptions of improved analytical skills (Chen & Jones, 2007), increased sense of community and connectedness (Carter-Brown, 2009; Comey, 2009; Lotrecchiano, McDonald**,** Lyons, Long, & Farber, 2013), increased ability to apply course concepts in the field (Chen & Jones, 2007), and increased reflection upon action and future reflective practice (Cooner, 2010). In a meta-analysis of online learning studies, Means, Toyama, Murphy, Bakia, and Jones (2009) found that the addition of mechanisms for reflection added to increased learning outcomes in online and blended courses. Health sciences literature is beginning to present research on blended learning, particularly in relation to the nursing profession (Hsu, 2012; Stephens & Hennefer, 2013). Blended learning studies are also beginning to appear in physical therapy (Bello-Haas, Proctor, & Scudds, 2013), pharmacy (Ortega-Rivas, Saorín, de la Torre, & Elsheikha, 2013), and medical education (Duque et al., 2013; Sanchez-Mendiola et al., 2013; Stewart, Inglis, Jardine, Koorts, & Davies, 2013).

While there are many definitions of blended learning, faculty had specific pedagogical goals for course redesign, so we adopted a definition aligned with those goals. Picciano (2007) defines blended learning as the integration of online (OL) and traditional face-to-face (FTF) class activities "in a planned, pedagogically valuable manner" wherein a portion of FTF time is replaced by online activity (p. 10). The thoughtful integration of OL and FTF learning in a blended course can yield higher learning outcomes than either FTF or OL learning in isolation (Garrison & Kanuka, 2004; Garrison & Vaughan, 2008; McDonald, 2012). Students in blended courses have reported higher levels of learning than they have previously experienced in other modalities as a result of the purposive structuring of OL and FTF activities and interactions, which promote a cycles of reflection upon a topic, critical discussion of that topic, application of course concepts and further reflection upon application (McDonald, 2012).

Journals as Mechanisms for Reflection

Reflective writing has been shown to promote student reflection, particularly in health professions education (Plack et al., 2005; Plack et al., 2007; Wald, Borkan, Taylor, Anthony, & Reis, 2012). In blended courses, OL journals can provide a mechanism to allow students to reflect-on-action after learning experiences. However, identifying a method for assessing levels of reflection in students' journals can prove challenging, particularly when the goal is to determine whether the course structure facilitated awareness and questioning of biases and assumptions, which can lead to higher levels of thinking, or premise reflection. Grounded in the reflective processes of both Mezirow and Schön, Plack et al. (2005) designed a tool to assess the breadth of reflective writing in physical therapy student journals.

Educators commonly use Bloom's Taxonomy (1956) in developing objectives and assessing student learning and performance. This taxonomy can be used to differentiate between lower order and higher order thinking. Bloom defined six levels of thinking in the cognitive domain (from lowest to highest): knowledge, comprehension, application, analysis, synthesis, and evaluation. Plack et al. (2007) refined and applied this taxonomy to assess the depth of higher order thinking in the reflective writing of medical students.

Course Design

In 2013, faculty redesigned an introductory physician assistant course from a fully FTF course to a blended course. Health, Justice, and Society (HJS) introduces students to the social determinants of health while also asking them to consider controversial issues, such as bias and ethical dilemmas influencing the decision-making of future practitioners. One of the pedagogical goals in course redesign is to create a structure supportive of critical thinking and reflective practice among our PA students. Faculty integrated OL and FTF activities to allow students to experience reflection-for-action, reflection-in-action, and reflection-on-action (Killion & Todnem, 1991; Schön, 1983). OL activities and interactions have been shown to support reflection on course concepts (McDonald, 2012). OL activities in this course included readings, lectures, discussions, or quizzes prior to FTF class sessions to allow students to reflect upon course concepts prior to applying them in our FTF class sessions. FTF class sessions were then reserved for application of concepts in simulated "real-world" scenarios, such as standardized patients and case-based projects, promoting reflection-in-action among smaller groups of students and among students and instructors. Debriefs following these scenarios promoted reflection-on-action and reflection-for-action. Required online journal entries also promoted further reflection-on-action and reflection-for-action.

In addition to facilitating reflection, faculty designed this blended course to achieve the following objectives: (1) students will reflect on course concepts prior to FTF class sessions to promote awareness of their own biases, beliefs, and assumptions prior to applying concepts to real-world scenarios in FTF settings; (2) journal writing will enable students to become more aware of how they might apply the concepts discussed in their future practice, which is particularly important given that the students will not begin clinical rotations until their second year in the program; (3) the OL journal format will enable students to maintain their journals and perhaps use them once they are in the clinical settings; and (4) students will adopt a formal mode of reflection (such as journaling) as a part of their future clinical practice. Table 1 provides an overview of a week of assignments within the course modeling this adopted structure. It should be noted that journal entries were required only four times during the semester, though students were encouraged to journal as often as they felt necessary.

Table 1 ***Course Overview***

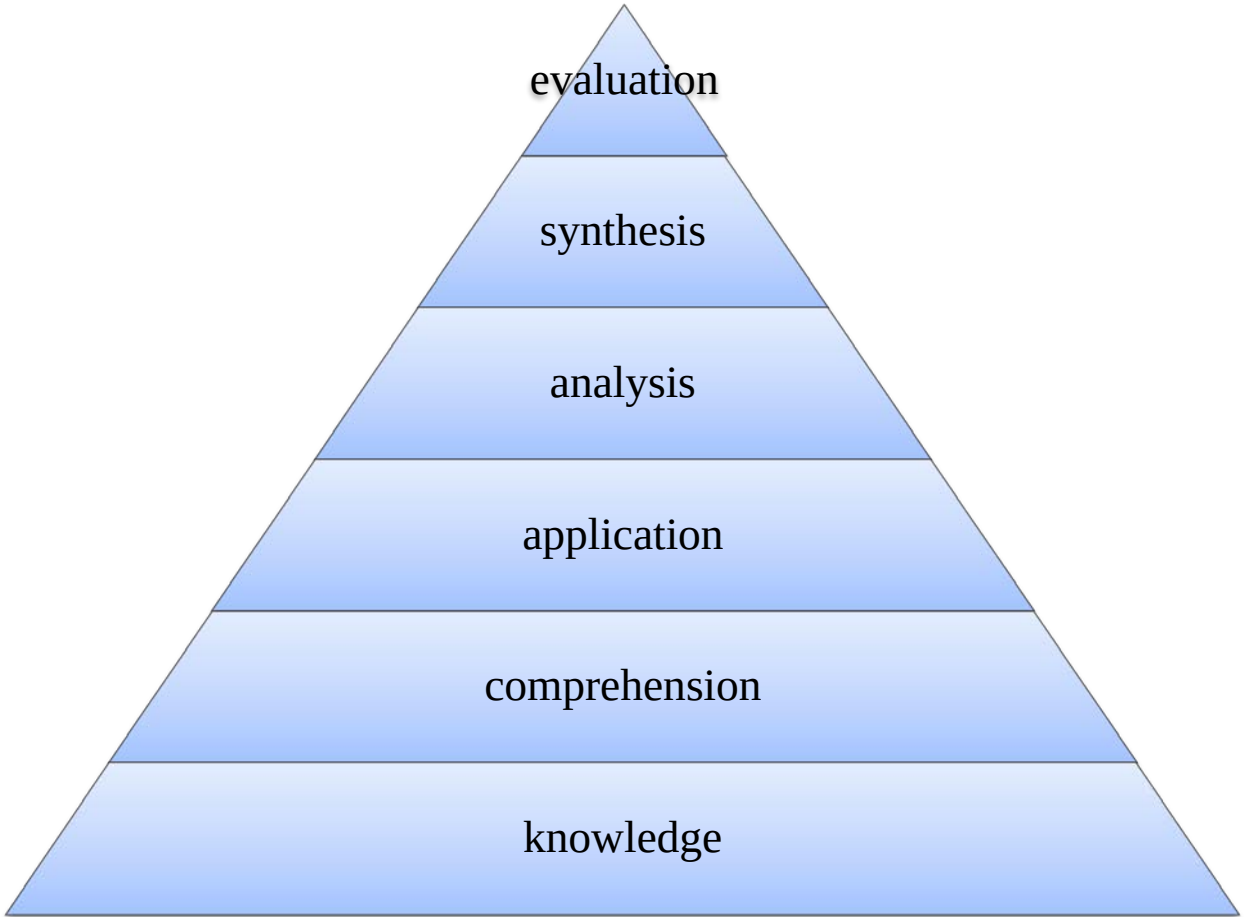
Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**	**Sunday**
Readings and Lectures	Online Discussion/Online Activity/ Online Quiz *(Reflect)*	Online Discussion/ Online Activity/ Online Quiz *(Reflect)*	Online Summary	FTF Class *(Reflect-in-action and reflect-on-action)*		Journal Entry (if required) *(Reflect-in-action and reflect-on-action)*

In the first FTF class session, faculty recognized that course structure alone was not sufficient to facilitate the types and levels of reflection required of future practitioners. On the first day of the course, faculty asked students to reflect on how they thought an assigned reading might relate to the course and to their future practice. The following were questions provided to students:

- What stood out for you from the assigned reading?
- What made that content stand out for you?
- Why might we have assigned the particular reading for today?
- How might this book relate to our course?

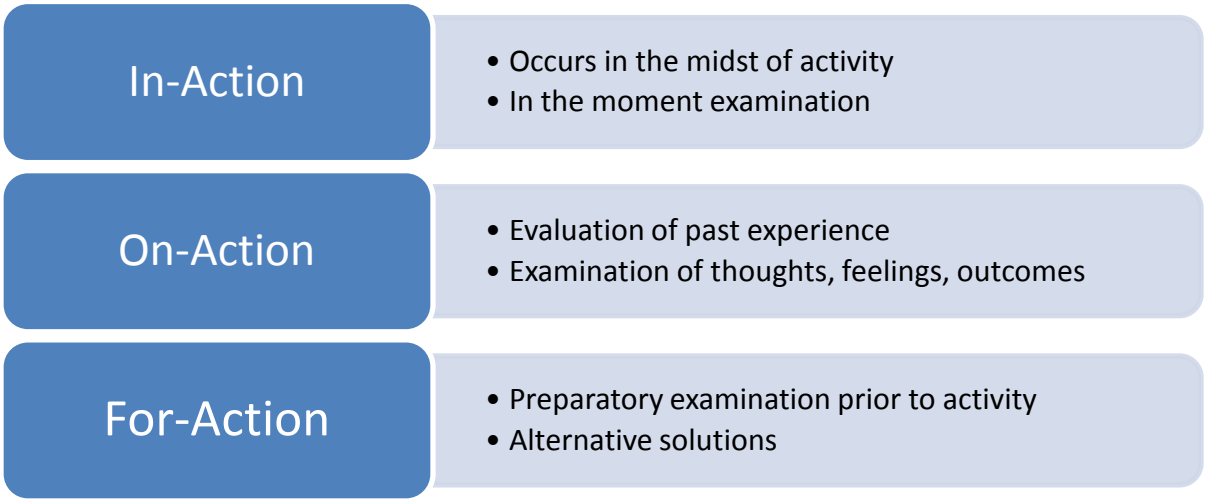
In reviewing student responses to these questions and early journal entries, faculty noted students simply provided a description of their reading and did not go further to reflect upon or think critically about what they were learning through their readings or how they might relate to their future practice. Faculty questioned whether students needed further instruction in the purpose of the reflective process and the types and levels of reflection they should be striving to achieve in future assignments. As a result, in a subsequent FTF class session, faculty provided students an introduction to higher order thinking using and updated model of Bloom's Taxonomy (1956) of learning domains as depicted in Figure 1.

***Figure 1*. Depiction of Bloom's Taxonomy (1956).**



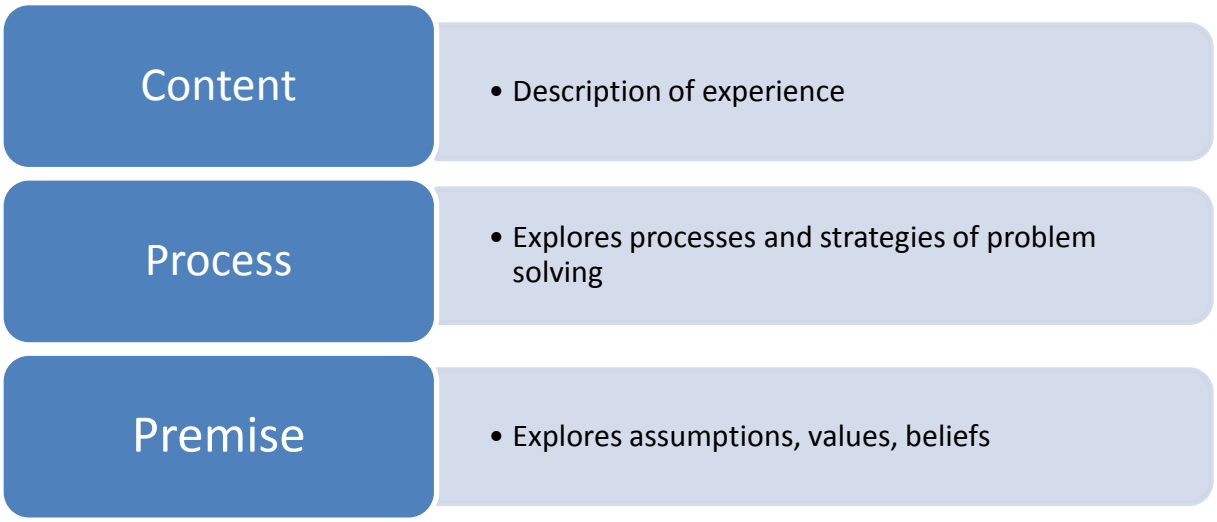
Students were asked to consider course objectives and determine the anticipated levels of learning outcomes in the HJS course. Many students readily recognized the expectation in this course was that the learner would at least achieve the application level of knowledge; few acknowledged that to be prepared for future practice, they would need to achieve higher levels of cognitive processing, including evaluation and creation of knowledge. Using Figures 1 and 2, faculty then explained that the intentional use of cycles of reflection in the course was designed to engage students in the higher order thinking required for future clinical practice (Bloom, 1956; Killion & Todnem, 1991; Schön, 1983).

Figure 2. **Types of reflection (Killion & Todnem, 1991; Schön, 1983).**



In addition to the types of reflection and the concept of higher order thinking, faculty discussed the levels of reflective practice described by Mezirow in 1991 (see Figure 3). Faculty explained how reflective practice enables practitioners to apply existing knowledge to determine potential solutions to new problems while simultaneously creating new knowledge. However, to be most effective, students must move beyond description of experience and the processes or strategies used in solving problems to consider the assumptions, values, and beliefs underlying their decision-making processes.

Figure 3. **Mezirow's (1991) levels of reflective practice.**



Through the reflective process, faculty also recognized how a partnership between student and instructor can develop in the classroom. As they guided students through the different types and levels of reflection, faculty also evaluated the types of questions they were using to prompt depth of thinking and breadth of reflective processing in students. Just as reflection is a skill that must be honed, asking effective questions to prompt deeper thinking and reflective processing is a skill that requires ongoing refinement. While students worked on their reflective skills, faculty worked on their reflective questioning skills. As a result, the following reflective questions were posed to students in their Week 8 journal assignment in which they were asked to respond to one or more of the prompts below:

- Describe a point in the course in which you were most engaged/disengaged in learning and why you think you felt this way. Include your thoughts and feeling at that time.
- Discuss what you learned about yourself: areas of personal strengths, where you need improvement, areas in which you had difficulty, where you felt particularly good about your values, beliefs, etc. Explain.
- Discuss a time when you were working with your classmates (or standardized patient) that made you stop and think, "Wow! That was not what I expected!" What did it make you think? How did it make you feel? What did you do? What did you learn from the experience? Elaborate.
- What has been your greatest challenge so far? Were you able to overcome that challenge? If so, how? If not, why and what would have helped? What did you learn from this challenge? What will you change in the future?
- Describe something you learned that you did not expect to learn or that you had not thought about before. How did you learn that? How might this impact your development as a PA?

Methods

Physician assistant students enrolled in the HJS course (n = 66) during summer 2014 completed various writing assignments as a requirement of the course. The students consisted of 50 females and 16 males. As noted, on the first day of the course, students responded in writing to a series of discussion questions. Again in Week 8, students responded to a series of reflective questions posed by faculty using an online platform.

Three methods of assessment were used to analyze student writing. These methods were drawn from the previous work of one of the authors and are rooted in Mezirow's (Plack et al., 2005; Plack et al., 2007) reflective process and Bloom's Taxonomy of higher order thinking (Plack et al., 2007; Dunfee et al., 2008). Consistent with previous methods, two levels of analysis were performed: (1) the elements of reflection and depth of higher order thinking (content, process, premise, Level I, Level II, Level III) were assessed at the level of the words, sentences, and paragraphs within each written submission, and (2) the overall depth of reflection (no evidence of reflection, evidence of reflection, evidence of critical reflection) of the student's writing was assessed at the level of the written submission (see Table 2).

All submissions were collected or downloaded from Blackboard, matched (i.e., same student submissions for Week 1 and Week 8), and to maintain anonymity and confidentiality were de-identified and assigned a random number by one of the researchers not involved in the analysis. Student writing from Week 1 (n = 62) and Week 8 (n = 66) of a blended PA course was analyzed for evidence of the elements of reflection (content, process, premise) and higher order thinking (Level I, II, III) to determine the extent to which students demonstrated depth and breadth of reflection (see Table 1). To determine the extent to which the students' OL journals demonstrated a progression toward higher levels of reflection as the course progressed, the raters assessed each submission from Week 1 and Week 8 as showing no evidence of reflection, showing evidence of reflection, or showing evidence of critical reflection. Only matched submissions were included in this analysis (n = 61). Descriptive statistics were used to quantify the types of reflection and level(s) of higher order processing evident in each submission as well as the highest level of reflective thinking evident in each submission.

Table 2 ***Rating Checklist for Reflective Journals***

			Brief definition	**Presence**	**Comments**
Analysis I	**Code**	**Element of reflection**	**Unit of analysis: Words, sentences, and paragraphs**		
Breadth	**CON**	Content	The student attempts to explore the problem/experience to better understand it. The student goes beyond just describing an event to exploring the problem or situation. The student may begin to view the problem/experience from different perspectives.		
	PRO C	Process	The student begins to describe the strategies and/or processes involved in an experience. These may include strategies/processes used in learning, problem solving, or managing a situation. The student may begin to explore other strategies available for use.		
	PRE M	Premise	The student recognizes and begins to explore or critique his or her own assumptions, values, beliefs, and biases. The student may begin to seek multiple perspectives and alternative explanations.		
Depth	**I**	Knowledge / comprehension	The student describes the experience/content for the purpose of understanding or making meaning; he or she might explain what happened from his or her perspective; might describe his or her thoughts, feelings, actions; might state the results of his or her actions		
	II	Analysis	The student attempts to deconstruct the experience; analyzes what happens from his or her perspective; differentiates between perceptions, feelings, thoughts, facts, etc.; begins to examine alternative explanations; he or she begins to explore something about the experience that stands out as interesting, different, confusing, unique; he or she begins to raise questions; he or she begins to explore why this particular experience stands out for him or her. The more skillful reflector would analyze the experience from a number of different perspectives beyond the self.		

	III	Synthesis/ evaluation	The student attempts to draw conclusions based on his or her analysis of the experience; he or she might begin to hypothesize different strategies for the future; he or she recognizes learning beyond the description of the experience; he or she articulates what he or she has learned from the experience. The more skillful reflector would base his or her conclusions on synthesis of multiple perspectives.		
Analysis II		**Level of reflection**	**Unit of analysis: The student's writing overall**		
The journal	**NR**	Non-reflection	No evidence of reflection is present within the journal. The writer may describe experiences with no evidence of questioning or evaluation of the experience. Lack of reflection implies a person who acts based on habit or what he or she already knows; makes assumptions, acts mechanically, may not consider the potential for learning or change, and may even reject the possibility of learning something new because he or she is sure he or she is right.		
	R	Reflection	Evidence of reflection is present in the journal. This implies evidence the writer either pauses in action or ex post facto to explore an experience, with the intent of better understanding the situation or to decide how best to perform. This writer moves beyond simply reporting or describing events to attempting to understand, question, or analyze the events on some level.		
	CR	Critical reflection	Evidence of critical reflection is present within the journal. This implies evidence of a writer who stops to explore the existence of the problem, where the problem stems from, or the assumptions underlying the problem. The writer revisits the experience, begins to critique his or her own assumptions and thought processes, shows evidence of recognizing his or her own assumptions, and may begin to show evidence of modifying his or her own biases or assumptions. This person typically shows evidence of premise reflection.		

To optimize objectivity in the analysis of the journal submissions, two researchers independently rated each written submission. The two researchers then shared their ratings for each submission. Any discrepancies were discussed, and consensus was developed.

The Office of Human Subjects Research Institutional Review Board at The George Washington University deemed this project exempt.

Results

Sixty-two submissions from Week 1 and 66 submissions for Week 8 were coded for evidence of reflection. See Appendix A for exemplar quotes from student journals providing evidence of each of the elements of reflection. After coding, essays were matched on subject ID to compare the evidence of reflection between Week 1 and Week 8 submissions. One journal submission from Week 8 was not legible, and four essays from Week 8 did not have a corresponding Week 1 submission. As a result, these five submissions were excluded from this analysis.

Table 3 ***Evidence of the Elements of Reflection and Higher Order Thinking in Student Writing***

Analysis I		**Elements of reflection and higher order thinking**	**Week 1*** ***n* (%)**	**Week 8*** ***n* (%)**	**Number of new occurrences**
Unit of analysis: Words, sentences, and paragraphs	Breadth	Content	22 (36.1%)	52 (85.2%)	31
		Process	11 (18.0%)	46 (75.4%)	35
		Premise	3 (9.9%)	19 (31.1%)	18
	Depth	Level I: Knowledge/comprehension	56 (91.8%)	60 (98.4%)	5
		Level II: Analysis	26 (42.6%)	55 (90.2%)	30
		Level III: Synthesis/evaluation	15 (24.6%)	40 (65.6%)	28

*Percentages do not add up to 100% because each submission may have shown evidence of some or all of the elements of reflection and higher order thinking.

Across all six elements of breadth of reflection and depth of higher ordered thinking, researchers found an increased number of occurrences of reflection and higher order thinking from Week 1 to Week 8 elements of reflection and higher order thinking.

Thirty-one new occurrences of content reflection were observed in Week 8 as compared to Week 1. Process reflection had the largest increase, with 35 new occurrences for a total of 46 out of 61 students demonstrating evidence of process reflection in Week 8. During the first week, three submissions illustrated premise reflection, the most challenging type of reflection, while 18 new occurrences were identified in Week 8 submissions. Of note, two students who showed evidence of content and premise reflection in Week 1 did not show evidence of these elements of reflection in their Week 8 submissions.

Over 90% of the submissions for the Week 1 showed evidence of knowledge and comprehension, the first level of higher order thinking. Five students who did not show evidence of Level I reflection in

Week 1 did show evidence in Week 8. In addition, 30 new occurrences of Level II reflection were observed in Week 8 as compared to Week 1. Over 65% of the Week 8 submissions showed evidence of the highest level of higher order thinking (Level II), an increase of 28 occurrences of synthesis/evaluation. Three students exhibited evidence of synthesis and evaluation (Level III) in their Week 1 submissions but did not show evidence of higher order thinking in Week 8. Additionally, one of the Week 1 student journals showed evidence of the first two levels of learning but did not illustrate comprehension or analysis in the Week 8 submission.

In examining the three levels of reflection (see Table 4), results indicated an overall increase in reflection, with the number of submissions showing no evidence of reflection decreasing and the number of submissions showing both reflection and critical reflection increasing.

Table 4 ***Level of Reflection Achieved in Student Writing***

Analysis II	**Level of reflection**	**Week 1 (*n* = 61)**	**Week 8 (*n* = 61)**
Unit of analysis: The journal submission	Non-reflection	37 (60.6%)	8 (13.1%)
	Reflection	22 (36.1%)	36 (59.0%)
	Critical reflection	2 (3.3%)	17 (27.9%)

While almost 40% of the Week 1 journals showed evidence of reflection or critical reflection, this number more than doubled, with over 85% of the students demonstrating reflection or critical reflection in their Week 8 submissions. Fourteen students stayed at the reflection level from Week 1 to Week 8; one student achieved critical reflection both weeks (results not shown). Over 62% (38 out of 61 students) moved up one or two levels in reflection between Weeks 1 and Week 8. Twenty-two students progressed from nonreflective submissions to reflective submissions, and six students advanced from reflective to critically reflective submissions. Ten students advanced from nonreflective submissions in Week 1 to critically reflective reflections in Week 8 (results not shown). Conversely, two students' writing showed a shift from reflective to nonreflective writing, and one student moved from submitting a critically reflective journal entry in the first week to a nonreflective journal entry in the eighth week.

Discussion

Results of the journal analyses provide evidence that a blended-learning course format in conjunction with instruction on types and levels of reflection can promote reflective thinking. The number of nonreflective journal submissions was 4.5 times smaller, while the number of critically reflective journal submissions was 8.5 times larger from Week 1 to Week 8. The assessment of the elements within each of the journal submissions demonstrates both a substantial increase in depth and breadth of reflections over this period. Content and process elements were present in at least three-fourths of the student's journals in Week 8, while elements of premise reflection increased by almost one third. It is not surprising that evidence of premise reflection, although markedly increased (31.1%), did not increase to the extent that process or content reflection did because premise reflection is the more difficult type of reflection to achieve, particularly when reflecting independently (Mezirow, 1991). Still there was over a fivefold increase in the number of journals with elements of premise reflection at Week 8 as compared to those of Week 1. It is often challenging for individuals to recognize their own assumptions; however, in this case, small-group FTF discussions in class in conjunction with personal reflective writing helped facilitate recognition of personal biases, values, and assumptions. These results are consistent with previous findings that blended learning can support reflection-on-action (Cooner, 2010; Means et al., 2009) and that reflective activities in OL and blended courses can lead to improved learning outcomes (Means et al., 2009).

Several factors may have contributed to the increases in reflection and higher order thinking noted in student submissions. The course was structured to facilitate cycles of reflection and discussion.

FTF discussions augmented by OL journal reflections helped create various learning spaces in which students could engage in the reflective process. Journal writing occurred in close proximity to the activities students reflected on but after a collective FTF debriefing. This practice is consistent with the literature demonstrating how reflective writing can promote student reflection in health professions education (Plack et al., 2005; Plack et al., 2007; Wald et al., 2012) and that an online journals can serve as a mechanism for learners to reflect on classroom experiences in blended courses (McDonald, et al., 2014). Results also confirm that reflective practice can lead to higher levels of learning (Dunfee et al., 2008; Plack et al., 2007; Plack et al., 2010; Plack & Santasier, 2004).

Further, peer discussions enabled students to share their personal values and beliefs, which may have influenced the degree to which students recognized their own biases, as evidenced by this exemplar quote from a student journal:

> I mentioned that my most obvious subconscious bias as both a person and a provider may be against extremely religious people, as I tend to associate certain belief systems (ex: creationism, anti-vaccine) with a lack of education rather than with faith. I stated that I just couldn't understand how someone could believe in creationism, especially if they're involved in the sciences. A classmate (and my personal best friend) then perked up and stated that she, indeed, believed simultaneously in creationism and evolution. The conversation completely threw me off, because I was under the impression that those two belief systems were mutually exclusive…. I was very taken aback by the conversation, but it made me realize my assumptions are often completely incorrect.

The process of peer discussion followed by reflective journaling enabled students to recognize and write about their own biases and assumptions. These results confirm that blended courses can promote a process of action, interaction, and reflection leading to higher levels of learning (McDonald, 2012).

In addition, faculty introduced the levels and types of reflection as a guiding framework for students to use as they moved through the reflective process in their writing, providing them with a target they should be striving to achieve in their reflections. Having a framework of reflective questions students can pose to themselves when preparing their online submissions may have influenced the degree to which they achieved both a depth and breadth of thinking. Finally, as students honed their reflective skills throughout this blended class, faculty also reflected-in-action on their own teaching skills and worked to hone their questions to facilitate deeper and broader thinking. Guldberg and Pilkington (2007) have found that the types of questions researchers pose impact the outcome of online reflections. So it is possible that both students and faculty learned to pose a breadth of reflective questions that ultimately enhanced their thinking, which confirms the shared responsibility for reflective practice as an active learning strategy (Baepler, Walker, & Dreissen, 2014).

Many factors may have contributed to the changes noted between Week 1 and Week 8 submissions. This was an exploratory study, and as a result no conclusions can be drawn as to causality. After reviewing the Week 1 submissions, faculty recognized the students' need for further instruction on the levels and types of reflection, along with their own need to refine the reflective questions they posed. Therefore, the reflective questions posed in Week 1 were not designed as a preassessment of students' ability to engage in reflection, which limits researchers' ability to infer degree of change based on the designed intervention. Future research should incorporate a preassessment of ability aligned with the types and levels of reflection prior to intervention. Also, future research is needed to assess the degree to which each of the potential contributing factors, including blended course structure, components of course design (OL journal submissions, FTF discussions, etc.), course content on the elements of reflection and higher order thinking, and types of reflective questions, contributed to changes noted in types and levels of reflection and higher order thinking achieved by individual students. In addition, while changes in types and levels of reflection were noted after eight weeks, longitudinal studies are needed to determine whether students achieved a habit of reflective practice in subsequent didactic courses and clinical practice. Finally, while changes were noted in the didactic setting, it would be important to evaluate the impact of reflective practice on clinical outcomes.

Conclusions

Reflection is a skill that must be practiced and honed. In this blended learning classroom, facilitating the reflective process became a true partnership between students and instructors. As instructors reflected on their own practice, they learned to ask more refined reflective questions. As students learned about the reflective process and shared their values and beliefs about various components of the course, they too learned to refine their skills in reflection and higher order thinking. Several factors may have influenced the increase in reflection noted in student writing, including the blended course format with FTF peer discussions and online personal journaling, the provision of explicit instruction on reflective frameworks, and the skillful use of reflective questions.

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Appendix A

Exemplary Quotes Illustrating Each Element of Reflection and Level of Higher Order Thinking

Analysis I	**Code**	**Element of reflection**	**Exemplar quotes**
Breadth	**CON**	Content	My topic for the Gardener's Tale was ability-ism. Initially when I got this topic I thought it would be hard to write about. Then as I thought about ability-ism, I realized it is a huge problem. This assignment made me think about my blind friend and the problems he has faced because of ability-ism. He is extremely smart and hard working, and the three forms of ability-ism have influenced his life. So, how do we combat these disparities….(560.8) Previously I viewed my patient connections as a main strength, but I feel like I can lose sight of establishing that in the program so far because I'm trying to balance establishing a connection with getting every question asked and recorded as well as thinking of every test that needs to be done and what knowledge to incorporate…I can definitely see how doctors and other health care providers lose sight of the patient in the midst of the report/untangling the health issues and coming up with an answer an plan. (516A.8) One of the reasons I came to GWU was to diversify my patient interaction and expose myself to a population that is very different than my upbringing, rural America. I never thought of myself as biased, racist, or closed minded, but I knew there were many healthcare groups and disparities that I had never been exposed to. I was skeptical about the Health Justice and Society course at the start of the semester because I didn't think that you could teach someone to be unbiased or non-judgmental. I thought it was more of a "I'm generally a nice, kind, good person, and I'm not biased" thought process or not. I have learned that this is not true at all…(507.8)
	PROC	Process	In preparing for the debates. I definitely grew in confidence as I found my group to be very open to discussion and allowed each and every participant to have a voice. Allowing me this opportunity and having classmates not be critical or judgmental has been essential to my growth in this area. I feel this is where I have had the most amount of growth, because I can freely express and students are interested and have made me feel that I have something worthwhile to say. Having the practice and opportunity most certainly has aided the process of developing verbal skills. I also have found that I have to process thoughts first and either write them down or repeat them in my head before expressing them (632.8) To overcome the challenge, I had to continually remind myself that the patient was in front of me and I should be more worried about the conversation with her than getting everything on my checklist (516A.8)

			The best way to not make judgments about other races or cultures is to get to know people of that culture. I would hope that the majority of our class has patient experience or just plain living experience with a mix of ethnicities, but I'm sure many people have limited experience. How can we use this class to broaden our experiences with other cultures and races? Ideally it would be great to just volunteer at schools and nursing homes…Even better, it would be great to have a little more diversity in class! Then we could have discussions amongst ourselves and share cultural experiences and ask each other questions. (650.8) I haven't earned bad grades in quite some time…Now I am confronted with the conundrum of putting forth a worthy effort and not getting the expected results. I have had to step up my game much more than I anticipated. I also have found that bouncing off issues with others has helped me get to where I need to be. Before now, I was a lone wolf when it came to studying and it worked. Having to make in-stride corrections after the first round of tests was difficult, unanticipated, and necessary. So I have learned to remain flexible with my study habits and continue to adapt to this new intense program of study. (551.8) I have learned that in order to breakdown personal bias you must be actively reflecting and have a heightened sense of awareness about where bias can creep into our daily life. I feel I am able to articulate my opinion easily in a group discussion, but I have realized that I do not readily carve out time for self-reflection. I find it helpful to have to write or share my opinions in class or in a small group. Formulating an opinion, and sharing it, seems to solidify the thought and makes me more aware of my true opinion in relation to lowering disparities on a personal, local, and day-to-day level. I also enjoy hearing other people's opinions so that I can take the pieces that fit my ideals to create a well-rounded moral code of my own. (507.8)
	PREM	Premise	I used to think that I was a relatively unbiased person, but I have a very different view of myself now. I think I actually was pretty biased prior to this program (mostly unconsciously) but now that I am aware of it I am excited to challenge myself to overcome it…I am guilty of forming preconceived notions for many of my classmates. (538.8) I also found that I was judging other classmates as ignorant to religions outside of theirs and insensitive to views of others. I need to not pass judgment on them but accept that that is their opinion and they have a right to their opinion. (612.8) (Continued next page.)

			I mentioned that my most obvious subconscious bias as both a person and a provider may be against extremely religious people, as I tend to associate certain belief systems (ex: creationism, anti-vaccine) with a lack of education rather than with faith. I stated that I just couldn't understand how someone could believe in creationism, especially if they're involved in the sciences. A classmate (and my personal best friend) then perked up and stated that she, indeed, believed simultaneously in creationism and evolution. The conversation completely threw me off, because I was under the impression that those two belief systems were mutually exclusive….I was very taken aback by the conversation, but it made me realize my assumptions are often completely incorrect. (515.8) As I spend more time on intellectual reflection about multiracial/multiethnic disparity, I began to realize that I have been making wrong judgments on peoples' race/ethnicity with my limited scope based on who could fit into what category and who could not…. My knowledge of culture, ethnicity and racial identity had been subconsciously internalized…. This course makes me be able to deeply reflect on my ethnicity, which leads to admit the existence of other cultures and to understand the differences with an open mind. (590.8)
Depth	**I**	Knowledge/ Comprehension	I thought it was a great experience to not only interact with the patient but also to see some of my classmates interact with their patients. It was really interesting to see how they approached the situations differently than I would (606.8) As brought up by Dr. X, regardless of one's religious affiliation, it is important to be honest with your patients. Even if the provider does not share the same beliefs as the patient, they can maintain trust with the patient by being honest about their discomfort with taking part in different religious practices. (564A.8) I actually enjoyed the first debate because my group got to speak, but I thought it was hard to stay focused on a debate that was presented twice and that I didn't take a very active role. (513.8) The worst part of the reading was the medical experimentation on slaves. To think this happened as recently as 150 years ago is truly shocking (588.1) The story about the tattooed woman stood out in my mind because it revealed conceptions that many people have about the type of person someone might be who has tattoos. The shame she had endured in a doctor's office is unacceptable (504.1)
			(Continued next page)

	II	Analysis	I enjoyed the conversations about these topics because I felt things might become part of our lives as clinicians. In a way, I felt like it was the clearest example of applying some of the ideas we had learned in class. I felt like these conversations were mature and insightful and made me feel like we were all growing as medical professionals. (619.8) One of the standardized patients described my personality as relaxed and calm…. Outside of patient encounters, I am a true introvert at heart and tend to be a bit of a loner, which I enjoy to a certain degree. I also found that I am much more well-versed in other cultures and religions than I had originally thought…. However, I need to work on my social skills outside of patient encounters. I found that my introverted-ness is perceived as "off putting" or snobbish to some classmates. Having a good relationship with my peers is just as important as having one with my patient. (612.8) I agreed with X: the question made me very uncomfortable. From the safety of my listening spot outside the room, I think I actually grimaced when X was asked the question. Again, I was impressed by her response, but this only made me think about how I would respond to the question. At first I was simply at a loss for words. I was convinced that if I had been in the room I would have not known what to say and been speechless for a few moments (probably with a rather shocked look on my face!). Once I thought more about it, I realized I probably would have remained composed. I've had a lot of experience with patient asking me question I thought were inappropriate, but probably never one quite so personally uncomfortable. I've also come in contact with a lot of religious patients. …My formal role as a nurse's aide was different than my current/future role as a PA-S/PA-C. As a nurse's aide, I would often have the same patient for weeks – meaning I would spend at least 40 hours a week with this individual. You form a different type of relationship with patients in this type of setting; a very close relationship where your role changes from confidant to caregiver to coach to friend to authority depending on the patient's needs or behaviors at the time. (516B.8) Many people deny or are unaware of the disparities faced by "others" and can be condescending during such conversations as if these people are seeking special favor or excusing personal shortcomings…. Race aside we all have biases we need to be aware of. The story about the girl with the tattoos made me aware of an important fact. As clinicians we see patients in their most vulnerable state. They are stripped of their clothes, privacy, and normal social interaction. In this state it is easy to judge and label a person. (591.1)
			(Continued next page.)

	III	Synthesis/ Evaluation	I am trying to stay positive – to find reasons to be thankful that it didn't go well, as I'd much rather learn through mistakes now than when I am practicing. I know that the next time I walk into the standardized patient experience (on Monday!), I will sit directly in front of the patient to keep the patient's engagement. I'll put down my papers. I'll figure out a way to transfer the nervous energy if/when it appears by focusing on the patient's needs instead of my own. Overall, I learned that I need to forgive myself, release the experience, and channel the energy into performing better on Monday. (568.8) ….I took all this into account when truly considering my response to the standardized patient's question after my initial shocked response. It's true my position is different now with respect to the patient (I now have a lot more authority), but I think the most important thing to hold onto, and indeed the values that are most important to the patient, is the sincerity of the response. (515B.8) I was really surprised by everyone's responses and reasoning when asked whether or not it was appropriate to pray with a patient when asked. I didn't realize there would be so many differing opinions as to why or why not…. It made me think of how important it is to have people from all different backgrounds so that patients can find the providers that are best for them…. I realized that you don't have to all be the same for the best care to be delivered. I learned that I appreciate knowing how others would handle the same situation and seeing how many different opinions there are. (596.8) The story about the girl with the tattoo stood out to me the most. It stood out mostly because I've seen it. Listening to the young woman's story didn't make me feel great about my fellow healthcare workers. I've seen and been on units when my coworkers say "Go walk by room 10 and check out the weird _____(insert abnormal finding here)." I've learned in our sexual health discussion today in Clinical Assessment not to assume anything about a patient. The same can be said for all aspects of the History and Physical, not just sex health. (577.1) What stood out in the reading to me was the prevalence of bias and prejudice in healthcare still today…especially when specific examples were given about unequal care including higher rates of amputation, higher death rates, less preventative care, etc. This is a very important topic in healthcare because the mission is to do no harm and always provide the best care possible. This is obviously not the case when it comes to minorities in medicine…. It introduced us to all of these disparities that exist today…. It is extremely important for us to look into ourselves and examine any bias we might have now, so that we can hopefully address these issues before we become practitioners. (575.1)