

Getting to the Root of the Problem in Experiential Learning: Using Problem Solving and Collective Reflection to Improve Learning Outcomes

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Abstract

Experiential learning alone does not guarantee that students will accurately conceptualize content, or meet course outcomes in subsequent active experimentation stages. In an effort to more effectively meet learning objectives, the experiential learning cycle was modified with a unique combination of the 5 Whys root cause problem-solving tool and a collective reflection step. Applying these modifications through multiple iterations of in-class exercises, students in lean operations and leadership courses were able to move beyond treating symptoms of problems and generate more viable alternative actions for future applications of their learning. Improved grades, greater achievement of learning objectives, and positive student reactions provide evidence of the modified experiential learning cycle's success. A generalized framework for using the modified learning cycle in other management courses is also presented.

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Introduction

The acquisition of knowledge and the transfer of learning can be maximized for adult learners when they are actively involved in the learning process and are able to see the relevancy of what they are learning (Knowles, 1990). This pedagogical outcome is often achieved in the management classroom with experiential learning—a cycle that consists of a concrete experience, reflective observation, abstract conceptualization, and active experimentation (Berdrow & Evers, 2011; Cunliffe & Easterby-Smith, 2004; Kolb, 1984). This does not guarantee, however, that students' reflective observations will lead to accurate abstract conceptualizations and therefore there are no assurances that students will realize improvements in the next active experimentation phase. This issue surfaced during an experiential learning activity in an MBA lean operations course when one author observed that students were reacting to symptoms, that is, observations that are spurious or correlational in nature. Therefore, the professor modified the experiential exercise by requiring students to perform a root cause problem-solving (RCPS) analysis and to reflect collectively on the problem to produce a team reflection paper. These modifications allowed students to further develop their ability to reflect, deepen their understanding of the observations they made about their own thinking and acting (Berdrow & Evers, 2011; Williams & Dickinson, 2000), and subsequently identify root causes of problems rather than merely symptoms. As a result, students formulated more precise abstract conceptualizations about their concrete learning experience and they developed more practical plans for the application of learning (Kleiman & Kass, 2007) in subsequent active experimentation phases (Kolb, 1984).

The respective literatures bear out the success of using experiential learning in the management classroom (Kolb, 1984; Reynolds & Vince, 2004), RCPS in operations management (Sarkar, Mukhopadhyay, & Ghosh, 2013), and collective reflection in adult learning (Garavan & McCarthy, 2008; Ramsey, 2005). Using these methods as a single learning methodology, however, is unique. Adding RCPS allows students to realize the benefits of differentiating between symptoms and causes during the reflective observation phase. This helps them not only solve the problem at hand but also can minimize the likelihood of repeating the same mistakes in the future (Emiliani, 2004), whether that is in the next classroom activity or in the workplace.

Modifying the experiential learning cycle to include a collective reflection step helps students more accurately assess the phenomena experienced in the concrete experience phase of the experiential learning cycle and propose a number of possible solutions to apply in the next active experimentation phase.

The objective of this article is to provide a framework for incorporating RCPS and team reflections into the experiential learning process in a variety of management courses, including lean operations, leadership, organization development (OD), and ethics. It begins with a brief overview of experiential learning, RCPS, and collective reflection. Next is a description of the successful implementation of these modifications to a Lego-style vehicle-building simulation in a graduate-level lean operations course and an account of how the modified process was successfully applied in a graduate leadership course. These examples present evidence of how the modified process has helped students achieve specific course-learning objectives. Potential extensions of the modified experiential learning process to other management disciplines are then discussed, using OD and ethics courses as examples. The final section offers closing thoughts about the benefits of applying the modified experiential learning process.

Background and Overview of Key Concepts

Experiential Learning as a Cycle

Experiential learning in management education—the cyclical process of linking education, work, and personal development—has evolved from the work of several education theorists over the past century (Dewey, 1938; Kolb, 1984; Mezirow, 2000; Revans, 1976). For educational pioneer John Dewey, learning happened through a series of experiences whereby each experience drew something from the previous experience and was used to modify future experiences in some way (Merriam & Caffarella, 1999). The educational process was later envisioned by Lewin as an action research cycle that included not only an initial experience but also, just as importantly, the “collection of data and observations about that experience” that are then analyzed. “The conclusions of this analysis are fed back to the actors in the experience for their use in the modification of their behavior and choice of new experiences” (Kolb, 1984, p. 9).

A principle of Revans’s (1976) action learning theory suggests that learners will “check individual perceptions of the problem, to clarify and render it more manageable, and to create and explore alternatives for action” (Pedler, 1997, p. 249). Mezirow’s (2000) transformational learning theory posits that

learning takes place when students are able to reflect on the disconnection between previously held assumptions and what they actually experience in a classroom activity. Developing the ability to do this allows students to revise their underlying assumptions so as not to limit future actions (Collin, 1996). Kolb's (1984) experiential learning cycle integrates the key elements from all of these theories; it views learning as a cycle, wherein students reflect on and gather data about each experience. After completing these steps, students are able to draw conclusions that will guide them in formulating new assumptions, which, in turn, allows them to make more accurate modifications to their applications in subsequent experiences.

The operations management and lean literatures reveal a similar learning cycle in the Deming model: Plan–Do–Check–Act (PDCA; Gupta, 2006). PDCA also has its origin in Lewin's action research theory (Kim, 1993; Roth & Senge, 1996) and it follows a similar pattern as Kolb's experiential learning cycle (Kumar, 2012). While these two methods are not identical in each phase, the similarities of driving improvements in each successive cycle can provide important insight into how to improve both processes as learning mechanisms. As with Kolb's active experimentation stage, a key element in PDCA is Check—to verify the selection of the correct method and capture accurate information for subsequent phases. However, an implicit limitation in both the Kolb and Deming models is that there is no confirmation that the issues identified in the reflective observation/check phases are in fact root causes rather than merely symptoms. Thus, there is no guarantee that subsequent phases will result in effective learning and meeting outcomes.

Root Cause Problem Solving

Managers employing PDCA address this limitation by including a RCPS step to produce a greater probability of a more effective “Do” step during the next cycle. There are many RCPS procedures available for use in the operations management field (cf. Liker & Meier, 2006; Sarkar et al., 2013) and the 5 Whys is a method that is frequently used in industry. For example, Toyota mandates that its suppliers perform a 5 Whys analysis for any corrective action needed from their supply chain partners (T. Harter, personal communication, February 14, 2015). The advantage of the 5 Whys is that it is a relatively easy tool to teach and provides timely feedback on the identification of a root cause.

The application of the 5 Whys to a problem, as its name suggests, involves asking the question “why?” approximately five times to discover the root cause of a problem. When used in the classroom, once students identify the root cause, they propose an actionable event to prevent the problem from

reoccurring. The tie-in to the actionable event forces students to develop feasible solutions to the problem that they can implement. If the actionable event prevents the original problem from reoccurring, then the causal relationship may be present. We use the term *may*, because without direct experimentation, assuming the key variables can be isolated and controlled, there is no guarantee of causality. An example of a 5 Whys is provided in a later section.

Reflective Thinking

A higher level of learning occurs when learners engage in *intensive* reflection (Peltier, Hay, & Drago, 2005, 2006) during the experiential learning and RCPS processes. Reflection involves an examination of assumptions and consideration of alternative courses of action, while intensive reflection is deeper. It involves “changing conceptual meanings, altering internal perspectives, and modifying future behaviors” (Peltier et al., 2006, p. 6). Another way to understand this is through Argyris and Schön’s (1974) lenses of single-loop and double-loop learning. The process of reflection allows students to engage in single-loop learning, which typically results in minimal behavioral changes that reinforce their current fixed frames of reference. Intensive reflection is more likely to prompt students to engage in double-loop learning, whereby they will surface and examine underlying assumptions; this helps them create new frames of reference that are more inclusive, open to other viewpoints, and capable of real change (Argyris & Schön, 1974).

Student reflections often occur as an individual process. However, recent studies have suggested that collective reflection, or team learning, is also effective (Garavan & McCarthy, 2008; Gear, Russ, Read, & Minkes, 2003; Knapp, 2010; Ohlsson, 2013). Team reflection has been shown to enhance students’ learning experiences as it appears that greater competence is developed via the social interaction and dialogue that occurs as students think together and share their individual understanding in the process of examining their collective assumptions (Garavan & McCarthy, 2008; Gear et al., 2003; Knapp, 2010). As shown in Figure 1, the reflective observation phase can be augmented when RCPS is combined with team reflection.

Ramsey’s (2005) model of a narrative reflective cycle of experiential learning further supports the value of collective reflection. She contends that the “individualism of conventional reflective learning cycles” (p. 229) offers only one person’s tacit view of reality—one that is not available for discussion or critique. The social constructivist view of experiential learning that her theory proposes indicates that “different assumptions about reality are possible” (Ramsey, 2005, p. 221) when individuals share their reflections

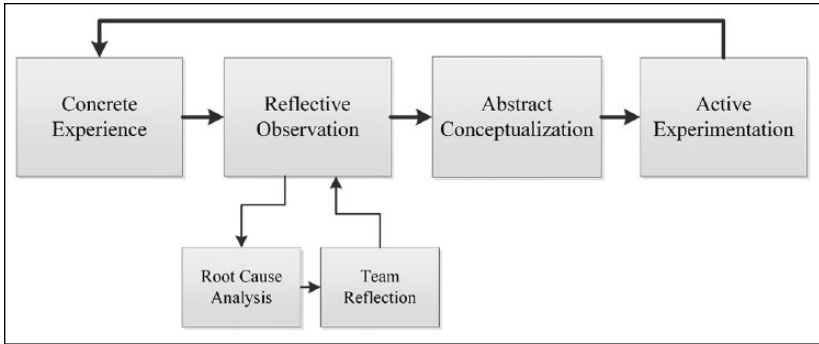


Figure 1. Modified experiential learning cycle.

with others. The increased meaning and deeper understanding that result from this collective reflection process leads to a larger range of options from which reflectors can choose to make subsequent changes and improvements to the activity at hand.

Support for the importance of the team reflection step also comes from research rooted in social constructionist theory. This research suggests that students must move beyond simple reflection to what is known as practical reflexivity (Berman Brown & McCartney, 1999; Cunliffe & Easterby-Smith, 2004; Reynolds & Vince, 2004). Reflexivity requires “a shift in our understanding of reflection from being a cognitive activity . . . to a dialogical and relational activity” (Reynolds & Vince, 2004, p. 7). The idea that true reflection occurs only when it moves from an individual, cognitive activity to a social interaction supports the effectiveness of the process that is required for a team reflection activity. The benefit of this shift and the advantage of discussing various approaches to conceptualization is that it better prepares students to take action in the next active experimentation stage (Reynolds & Vince, 2004). Gosling and Mintzberg (2004, p. 20) also support the use of a team reflection activity with their belief that students must “be engaged, curious and alert on a personal level and in a social process” and that they “have to share their reflections to learn from one another’s ideas and experiences.” This active team reflection also helps students transfer their learning from an experiential exercise in the classroom to real-world problems in the workplace.

Improving Experiential Learning in the Classroom

The following example illustrates how the traditional experiential learning cycle is enhanced when students also have tools that allow them to evaluate

the accuracy of their previous observations and reflections to determine whether they will improve the outcome of the next experiential cycle. The example comes from a graduate-level lean operations course that has been offered in an MBA program for the past 7 years. The example begins with an overview of a Lego-style vehicle-building simulation and a discussion about the initial reflection paper assignments. It then illustrates how the addition of RCPS and collective reflection steps improved the experiential learning cycle for the students. The purpose of using the Lego-style vehicle simulation example is not to show how it can be replicated; rather we use it to demonstrate how we identified the limitations of the experiential learning cycle and subsequently implemented improvements to address them.

Experiential Learning Simulation Overview

One of the key fundamentals of lean is the reduction of wastes such as waiting time, inventory, movement, and defects. A common method for teaching students to identify and reduce waste is through the use of a simulation (Arenas-Márquez, José, & Medina-López, 2012; Lewis & Maylor, 2007; Shannon, Krumwiede, & Street, 2010; Sheehan & Gamble, 2010). The simulation used in the lean operations course is structured around an extended project of creating and improving a vehicle assembly system (Drake & Mawhinney, 2006; Satzler & Sheu, 2002). This experience enhances learning beyond using case studies alone (P. R. McCarthy & McCarthy, 2006). The specifics of the vehicle assembly exercise are provided in Rosen and Rawski (2011). During the simulation, the students work in teams to design, create, and run a production system to assemble Lego-type vehicles during 7 of 12 class meetings. The simulation involves teams of five to seven students operating as material handlers and assemblers to produce as many vehicles as possible in 8 minutes. The learning objectives of this course are as follows:

1. Differentiate root causes from symptoms in a production process.
2. Synthesize individual viewpoints to arrive at consensus about the most effective problem solution.
3. Identify and resolve issues in a production process to improve production throughput, first time quality, and inventory management.

Initial Reflection Paper Assignments

Individual reflection papers were a component of the assignment from the outset of the course as a primary method of achieving the learning objectives. Originally, students wrote seven reflection papers, one for each set of in-class

Table 1. Implemented Changes to Lean Operations Course.

Course offering	Observed issue	Change implemented
First	Instructor feedback not in time for students to incorporate into next exercise iteration	Returned papers before next iteration of the assembly exercise
Second	Students relied too heavily on instructor feedback for process improvements	Required students to perform a 5 Whys analysis
Third	Lack of consensus for team's action plan	Team reflection paper assignment added

vehicle assembly activities during the seven class sessions in which vehicles were produced. These papers recorded the student's observations, their plans to apply learning from the assignment to the principles of lean, and the changes they wanted to make to the system for the next round of the exercise. The papers also served the purpose of helping the students conceptualize lean by allowing for professor feedback about concepts that are counterintuitive to the common conceptualization of manufacturing or service-centric assembly-line processes. An example of this misconception by students is their belief that having more inventory is beneficial, when in fact having as little inventory as possible is a goal of lean. Reading and commenting on the individual reflection papers gave the professor an opportunity to illustrate how lean concepts can differ from what students might have previously learned. Thus, the feedback on the papers helped the students develop a new lens and a process whereby they could develop the ability to self-reflect (Berdrow & Evers, 2011).

The professor's observations, as well as the accuracy of the reflection papers and the students' performance of the vehicle assembly activities, served as the basis for evaluating students' progress toward the learning objectives. The professor made changes to the exercise during the next three semesters in which the course was offered, for the purpose of continually improving students' attainment of the learning outcomes. Table 1 provides a summary of the professor's observations and the subsequent changes made to the exercise during successive offerings of the course.

During the initial offering of the course, the professor realized that individual reflection papers alone were not adequate for helping the students achieve the course-learning objectives. While students regularly received direct feedback on their individual reflection papers from the professor, the timing of the feedback did not allow students to incorporate it in the next

iteration of the vehicle-building simulation, which diminished the significance of the learning experience. During the second semester the course was offered, the professor changed the timing for the submission and return of the individual reflection papers so students could incorporate feedback in the next iteration of the simulation. Unfortunately, this did not improve the accuracy of the students' individual reflections relative to the root causes of the problems they experienced in the exercise because they were engaged in single-loop learning (Argyris & Schön, 1974). Students were conceptualizing the problem within the constraints of the exercise (Korth, 2000) and attempting to solve the problem using only the alternatives that fell within the framework of their current mental models about how lean works (Cartwright, 2002). In this offering of the course, they relied too heavily on the professor's feedback and did not develop the ability to evaluate whether or not their proposed changes would improve the next vehicle assembly.

Based on the students' engagement in single- versus double-loop learning, the professor concluded that the students would need to learn how to evaluate their own reflections and conceptualizations (the second and third phases of the experiential learning process). However, before self-evaluation was possible, students would need to learn how to identify the underlying problem rather than attempting to solve the problem based on the symptoms of the problem they had already identified (Fulmer & Keys, 1998). The topic of RCPS, and specifically the 5 Whys method, had always been addressed in the course; however, it was merely a discussion topic that was introduced during the second half of the semester and it was not a requirement for the reflection papers associated with the exercise. In order to provide students with a method for self-evaluation, the third offering of the course required them to conduct a 5 Whys analysis prior to writing their individual reflection papers. The following section highlights that understanding RCPS is important from the outset of the semester.

Distinguishing Symptoms From Root Causes

During initial iterations of the exercise, students focused on the mechanics of actually producing the vehicles and began to create the information processes of communicating who needed what parts and how many were required. The initial issues were relatively easy to observe and the primary activity of the students was determining which ideas to implement, such as retraining and practicing their assigned activities. The subsequent issues typically had identifiable symptoms, but the root causes were more difficult to identify. As a result, the students' individual reflection papers still addressed only the symptoms of the problems rather than the root causes, which indicated that

Initial Problem Statement: Incorrect number of parts were received	
Why?	Too many parts were delivered
Why?	The verbal communication was not received properly
Why?	The warehouse misheard the number of parts requested
Why?	There was no written order form
Why?	One had not been made
ACTION:	Make an order form to inform warehouse worker about the number of pieces required.

Figure 2. Example of 5 Whys exercise for communication issues.

students had not moved beyond single-loop learning (Argyris & Schön, 1974). They had not questioned their underlying assumptions about the process to the extent that would enable them to see errors in their reflective observations and abstract conceptualizations.

The result of the single-loop learning was that the rate of the team’s improvements slowed down as they needed several iterations to identify the root cause of the problem. A typical example of this issue is the communication and transfer of information about the number of various parts that are required for building the vehicle. Students invariably viewed the problem as an insufficient amount of communication. Therefore, their solution was to increase communication by sending more requests for parts, rather than exploring the accuracy of communication about the number of parts and attempting to uncover the reason for inaccuracies in communication. They had treated symptoms rather than address the underlying causes of the problem, which resulted in “solutions” that provided no improvement to performance. During the first two semesters of the course, students eventually discovered the root cause of the problem as being the quality of communication versus quantity, but this path was slow and was not conducive to the class time allotted for the exercise. Given this issue, the professor realized that integrating the topic of RCPS had the potential to improve the reflection papers by providing students with a better internal feedback mechanism for their experiential learning cycles. If the students had conducted a 5 Whys on the communication issue, they could have identified the root cause much sooner. The application of the 5 Whys process for this issue is summarized in Figure 2.

Introduction of the 5 Whys

The third time the course was offered, the 5 Whys became a required part of the individual reflection papers. The 5 Whys was chosen because it created a

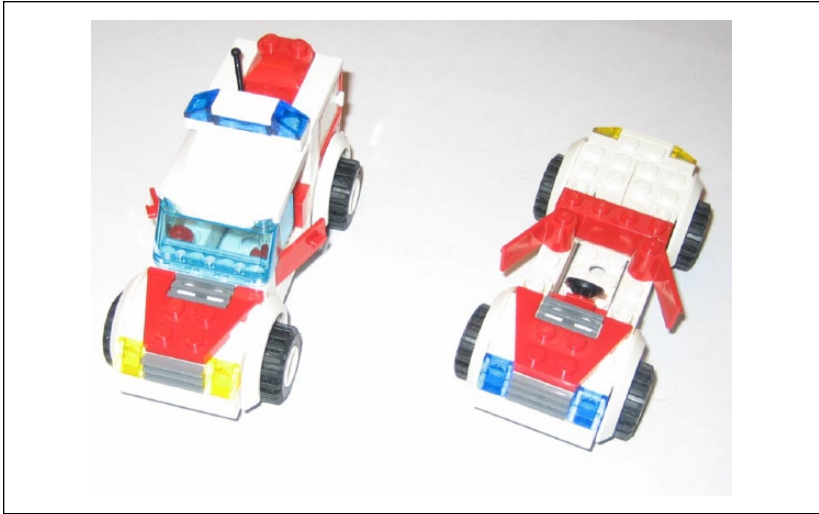


Figure 3. Initial vehicle (left) and variation vehicle (right).

structured process for metareflection through an *ex ante* thought experiment before a student's next active experimentation. This process provided the opportunity for students to assess the quality of their observations and conceptualizations. If they were not able to identify a potential root cause issue, they knew that they needed to reassess their experience and observations to determine whether their thought process was faulty or they had extracted the incorrect concepts. A great deal of time was dedicated to the 5 Whys, both in class—about 2 hours of class time wherein students had the opportunity to practice using the tool—and in providing detailed feedback to students on their reflection papers. Students typically had a steep learning curve and usually needed to complete 10 separate 5 Whys processes before they became proficient in identifying root causes.

The improvements from RCPS yielded many benefits, but the improvements began to plateau as the team applied the initial concepts of lean. In order to keep the learning progressing and challenging the students with new problems, modifications to the vehicle assembled at the beginning of the semester were expanded to 14 variations to force the students to create a mass-customization system that would produce the variations of vehicles in any quantity. These variations might be as small as changing the headlight colors, or as large as removing 40% of the vehicle. See Figure 3 for an example of variations to the vehicle. The goal of making the variations was to

introduce a stress on the assembly system that highlighted its inadequacies, thereby forcing students to reassess their understanding of lean and reconsider what they needed to address. In addition, the problems and their solutions were purposely more subtle than those during the initial iterations of the exercise with the aim of requiring more in-depth reflection to identify the root cause(s).

Team Reflection Papers

The addition of the 5 Whys helped students improve their ability to discern symptoms from root causes; however, team members often disagreed about what to change during the next learning cycle. The professor addressed this issue by adding a requirement for a team reflection paper in the fourth semester the course was offered. The team reflection paper was a synthesis of the individual papers, which forced the team to reach consensus about the issues, improvements, and proposed action plans for the next active experimentation phase. Discussing each student's assessment of the problem in an effort to reach consensus compelled students to examine the underlying assumptions they personally held about the problem. This team reflection process helped students develop new perceptions about the problem itself and conceptualize new ways to approach it (Cartwright, 2002; Korth, 2000). By uncovering and changing the tacit assumptions they held, students were now engaging in double-loop learning, which allowed them to find new problems to solve (Argyris & Schön, 1974; Korth, 2000). Learning was thereby enhanced for the current experience and at the same time the students were developing valuable skills they could use for future learning experiences and actual workplace problems they would encounter (Argyris & Schön, 1974).

The team reflection paper also served as team-based feedback on the individual team member's observations and suggestions for improvement. This is significant in that learning increased when students received feedback from their peers (Whetten, 2007). Additionally, arriving at a consensus not only affected the experiential learning of each student individually through a reanalysis of their observations and conceptualizations, it also acted as a filtering mechanism so that the entire team could experience greater success by working toward a common goal with a single improvement plan (Hansen, 2006). A further benefit of the team paper was the additional discussion of the problems among team members, which helped students who were not assimilating the concepts and learning lean as quickly as other students were.

Evidence of Success

The vehicle assembly exercise, with the modifications as described above, helped address the learning objectives for the lean operations course. Student comments on end-of-semester course evaluations offer evidence that the modified experiential activity increased their learning (Schmidt-Wilk, 2010). However, if students had been asked for comments at the beginning and middle of the semester, the value they saw in the exercise would not have been as great. This is because the process of learning to use RCPS challenges the way that students are accustomed to thinking about problems. After successfully using RCPS, students come to realize that merely proposing solutions is no longer adequate; rather they understand they must evaluate possible solutions to determine if they will actually lead to improvement.

The following comments were submitted by a sample of 40 MBA students in the last four offerings of the lean operations course, during which the RCPS and team reflection modifications to the experiential learning process were in place. The comments are characteristic of the responses students provided for the course.

The first learning objective of the course was to be able to differentiate symptoms from root causes, which is supported by this student's comment:

The main benefit I received from the whole process was that it gave me a different outlook on approaching a problem. I no longer go for the obvious solutions that will give me quick fixes, I try to dig deeper in order to see why a problem happened. The 5 Whys is great because it forces you to move past the obvious.

This is evidence that the RCPS step enhanced learning.

The following comments from various students indicate that the collective reflection modification helped them achieve the second learning objective, which was to be able to synthesize individual viewpoints:

The team reflection paper helped me to tie together the observation during the exercise (mistakes, lack of response, timing problems, and lack of alignment) with the 5 Whys root cause analysis. When we did the group reflection papers, everybody started to include their observations and recommendations to improve the next exercise from individual and group (team) perspectives.

The reflection papers helped our thought process. It gave us an indication of what we knew and what we didn't know in terms of the individual and as the team. During the course of our group reflections, we discovered that some team

members were better suited for different tasks, which led to reassignment of tasks, which led to less waste and then process improvement.

The team reflection papers set a collaborative tone, streamlined our team communication, and resulted in better flow in terms of team interaction and process improvement.

The third learning objective required students to identify and resolve issues in a production process to improve production throughput, first time quality, and inventory management. This objective is related to the first two in that it is an indicator of how well the students had improved their vehicle assembly process. Improvements were measured by improved throughput (making more vehicles), first time quality, and inventory management. The number of cars built was a good indicator of how well the students were able to identify and address root cause issues and improve their assembly process. During the first offering of the course, the average number of vehicles assembled across the teams during the final iteration of the exercise was 6 cars. This number increased to 6.5 for the second offering and has averaged 7 or above for subsequent offerings.

It is evident from the students' comments that they were able to develop the ability to differentiate symptoms from root causes during the course and that the team reflection paper created a collaborative environment that led to improved outcomes. Most important, the RCPS and collective reflection modifications to the experiential exercise are synergistic. The combination of these tools creates a level of learning that exceeds what each student alone could accomplish. In the next section, we discuss the application of these tools to other courses outside the operations management discipline.

Applying RCPS and Team Reflection in Other Courses

Student difficulties with differentiating symptoms from root causes and the inability to generate accurate feedback between learning cycles is not limited to the topic of lean operations. Other courses also present learning opportunities that require students to examine their underlying assumptions by engaging in double-loop learning to achieve intended learning outcomes. This section presents the case of a leadership course where an RCPS step and a collective reflection step were added to an experiential learning activity with successful results. The potential application of the modified experiential learning process to an OD course and an ethics course are also discussed.

Leadership Course

Students in a core MBA leadership course are required to demonstrate interpersonal acumen in a business environment. This course focuses on developing effective behavioral and communication skills necessary for effective interactions as students work with others to achieve organizational goals in the workplace. In order to facilitate the attainment of this learning objective, the students were asked to develop viable behavior change plans for a reflective practitioner exercise (Argyris & Schön, 1974). The attainment of this learning goal was measured by the accuracy and applicability of the behavioral changes students chose to make at the conclusion of the exercise, in accordance with the published grading rubric for the assignment. The exercise consisted of analyzing an interpersonal interaction at work (conversation, meeting, or telephone call) that did not have a positive outcome. In the exercise students recorded what was said, as well as their thoughts and feelings during the problematic interaction, using the left-hand, right-hand column technique (Argyris & Schön, 1974; Cummings & Worley, 2009). Students applied the Awareness Wheel (Miller, Nunnally, & Wackman, 1994) to help them reflect on how their thoughts and feelings converged and drove them to engage in the actions that proved ineffective. The students then created action plans to change their behavior in future similar interactions so they could experience outcomes that were more positive.

The professor noted that the students' planned behavior changes were generally not aligned with the effective behavioral and communication models presented in the course. In addition, the students often focused on treating symptoms instead of identifying the root cause of the problematic interactions. Therefore, during the fifth offering of the course, the professor added a RCPS step to the reflective practitioner exercise. After a brief introduction to the 5 Whys, students used the tool to analyze their ineffective interaction prior to proposing future behavioral changes. In evaluating the exercises against the grading rubric, the professor found that more of the students' planned behavior changes were targeted toward changing the actions that were at the root of the previously problematic interactions. An example of this is depicted in Figure 4. However, the new behaviors that students proposed were still rather narrow in scope and usually did not include more than a single behavior change that might result in more effective outcomes. This was not sufficient. It is important for leaders to develop a range of interpersonal behaviors because each unique interaction they encounter will require different responses and actions (Hargie, 1997). Therefore, during the sixth offering of the course, the professor implemented a second modification to the exercise by requiring teams of four to five students to collectively reflect on each student's reflective practitioner case.

Initial Problem Statement: Tense interaction with co-worker I volunteered to help with a report in the absence of the employee who usually prepares the report	
Why?	He criticized the work I did on the report
Why?	He did not appreciate my help
Why?	He is very controlling about how the report is prepared
Why?	He is concerned about its accuracy because he does not usually prepare the report himself
Why?	He doesn't want to appear incompetent to his bosses
ACTION:	Realize that his behavior is caused by his own feelings and not directed at the quality of my work – keep a more open mind about what he needs from me for the report

Figure 4. Example of 5 Whys exercise for a leadership course.

This modification resulted in the students proposing planned behavior changes that were more representative applications of the effective behavior theories and interpersonal skills developed in the course. These theories and skills are summarized in Figure 5.

The benefits of implementing the two modifications can be seen in the following example, which describes how a typical student would progress through the three iterations of the exercise. For the first iteration of the exercise, the student would write about a situation that became tense when he volunteered to help a colleague prepare an important management report in the absence of the employee who usually prepared the report. The colleague criticized the student's contributions to the report, resulting in an angry exchange of words. After applying the Awareness Wheel model to the interaction in question, the student's planned behavior changes might include not volunteering to help someone unless he knew what was involved ahead of time, and/or going into the situation with lower expectations so he would be psychologically prepared for an unfavorable outcome. While these changes might eliminate the immediate problem, they would not guarantee that the student would not encounter similar tense discussions when offering to help colleagues in the future. After the second iteration of the exercise, which included the 5 Whys tool, as shown in Figure 4, the student would discover that the tense discussion resulted from his colleague's anxiety over the accuracy of the report and how it could reflect poorly on him if not prepared correctly. After gaining this insight, the student could behave differently in similar interactions in the future by realizing that tense interactions can be caused by the anxiety of others rather than from disrespect or lack of appreciation for his own efforts. He could plan to keep an open mind when entering

Issue: Tense interaction with co-worker who I volunteered to help with a report in the absence of the employee who usually prepares the report			
Teammate	Observation / Feedback	Suggestion	Relevant Theory / Model
1	You seemed overly concerned about not being appreciated	Re-examine underlying assumptions and intentions about volunteering to help with the report	Reflexive Practice (Argyris & Schön, 1974)
2	It appeared that you were defensive during the interaction	Be more aware of and effectively manage your anger over feeling attacked	The Defensiveness Inventory (Byrum-Robinson & Henning, 1997) Reducing Communication Barriers (Bolton, 1986)
3	The argument ensued as a result of an ineffective conflict resolution approach you employed	Use either an accommodating or collaborative conflict resolution approach	Five Conflict Handling Orientations (Callanan & Perri, 2006)

Figure 5. Alternative interpersonal behaviors generated as a result of collective reflection.

into helping situations with others, which would be less likely to result in a tense discussion.

Finally, after the third iteration of the exercise, which included the collective reflection step, the student would have several options from which to choose his future behaviors. These options are summarized in Figure 5. The alternative behavioral approaches suggested by the student's teammates would allow him to plan different behaviors that would be most appropriate for the specific circumstances of various future interactions. For example, the exercise raises the student's awareness of the need to reexamine underlying assumptions about motives for helping. Other effective strategies that result from this process include making an intentional effort not to be defensive during the interaction and employing a more effective conflict management strategy once the interaction becomes tense.

Evidence that greater learning has occurred can be seen not only in the closer alignment of the proposed new behaviors to proven behavioral theories and effective interpersonal skills but also in the grades on the assignment. After the first iteration of the exercise, the average grade was 86% (on a scale of 100%). The average grade on the second iteration of the exercise increased to 90% with the inclusion of the 5 Whys tool, and after the final iteration that incorporated the collective reflection step, the average grade rose to 93%.

At the conclusion of the exercise in the two most recent course offerings, the professor led a discussion about the value of the reflective practitioner exercise. While several students mentioned that the additional time and effort required for the collective reflection step of the assignment was somewhat stressful, the majority felt the time and effort was beneficial. They acknowledged that the exercise equipped them with practical knowledge they could immediately apply in the workplace. One student noted, "I now know how I would handle the situation in the future. Sometimes I'll think of what has happened in the past, but I have never focused on how I would do things differently." Another student said, "The most important thing I learned was from the feedback. Your behavior and actions in the particular situation seem to be perfect to you, but you think about it differently when you see it from others' perspectives."

As an indirect measure of learning, the professor distributed a survey at the end of the most recent offering of the leadership course. Students indicated on a 5-point Likert-type scale how well the learning activities assigned in the course supported their attainment of the five overall learning objectives. In a sample of 53 students from three class sections, the average rating for attainment of the specific objective targeted in this exercise (demonstrate interpersonal acumen in a business setting) was 4.57, which was the highest rated objective. The lowest rated objective was 4.43 and the average rating for all of the objectives was 4.49. Because this was the first time such a survey was conducted, there is no historical data with which to compare the results from the students' perspective; however, it can be viewed as an indicator of successful achievement of the learning objective. Additionally, one student indicated in the comments section of the survey that the reflective practitioner assignment significantly enhanced her learning. She noted, "It was an assignment where I got the opportunity to apply my learnings from this course in a very unique way. It was a very productive assignment."

Organization Development Course

Another potential application of the modified experiential learning exercise would be in an OD course. Students frequently struggle to determine the actual cause of organization ineffectiveness during the diagnostic phase of the OD process (Cummings & Worley, 2009). This is due, in part, to the fact that OD issues typically manifest themselves in various ways that mask the actual causes. For this reason, OD practice often involves the use of diagnostic models to help practitioners distinguish presenting problems from actual problems in organizations (Cummings & Worley, 2009). Using a case study based on a real organizational problem as the experiential learning activity,

the professor could include the application of an OD diagnostic model as the RCPS modification to isolate the root cause of the problem. This could be augmented with a team reflection activity to help students generate alternative organizational interventions to solve the problem (Cummings & Worley, 2009). As discussed earlier, the benefit of our recommended modifications to the experiential learning cycle lies in the use of RCPS *in conjunction with* collective reflection. As with the lean operations course, rather than using only one modification to the process, adding the collective reflection step could further enhance the students' learning.

Ethics Course

An issue that students often encounter in ethics education is the inability to separate the actions of an individual, such as a salesperson, from the reward structure in which they are operating (Bell, Gilley, & Medaille, 2013). A frequent view of students is that if a salesperson is acting unethically, a remedy would simply be to provide them with more training. However, unethical actions are more likely the result of the salesperson's response to the environment created by their reward structure. Requiring the students to conduct a 5 Whys on this issue would enable them to identify the reward structure as the true cause of the unethical behavior and realize that additional training would therefore have no long-term impact on the situation. Including a collective reflection step would allow students to generate various possible revisions to the reward structure to deter future unethical behavior.

Closing Thoughts

As demonstrated by our examples, incorporating the unique combination of RCPS and collective reflection into the experiential learning process can result in greater attainment of course-learning objectives. Table 2 below summarizes these modifications and the associated benefits they can produce in a variety of management courses. Table 2 captures actual modifications and outcomes from the lean operations and leadership courses, and the potential application and outcomes for use in an OD and an ethics course.

The time and effort of including RCPS and collective reflection steps in the experiential learning process can be significant; however, we believe that the benefits of more accurate reflections and more meaningful conceptualizations that lead to greater learning outweigh these costs. Prior to making these modifications in the lean operations and leadership courses, we found that students' individual reflections captured only the symptoms of the problems they had to solve as a part of in-class experiential learning activities.

Table 2. Applying Root Cause Problem Solving (RCPS) and Collective Reflection to Management Courses.

Course/learning objective(s)	RCPS activities directed at LO	Collective reflection activities directed at LO	Observed/potential outcomes
Lean Operations (LO)—Differentiate root causes from symptoms; arrive at consensus problem solution; and resolve production process issues to improve throughput, first time quality, and inventory management	5 Whys	Team reflection paper	Identification of root causes more quickly and development of better improvements through consensus building
Leadership—Demonstrate interpersonal acumen in a business environment	Included a 5 Whys analysis to determine root cause of ineffective interaction	Incorporated a team reflection discussion to generate different perspectives on the issue	More accurate identification of root causes Wider array of alternative behavioral changes Improved grades Greater achievement of learning goal
Organization development—Select and design interventions to effect desired organizational changes	Use an organization development diagnostic model to identify actual versus presenting problem	Conduct a team discussion to evaluate efficacy of potential interventions	Greater likelihood of identifying the true source of the problem Selection of intervention with highest potential of effecting positive change
Ethics—Identify and address ethical environment in a business	5 Whys analysis to identify root cause of ethical issue	Development of new incentive system to avoid ethical issue	Better understanding that individual actions are often a result of the incentive system in which they operate

Consequently, the next active experimentation phases were not yielding the expected performance outcomes. In the lean operations course, this meant that students had to reassess their past reflections and conceptualizations to determine where the error was made. While this can be an important part of learning, adding the RCPS allowed students to spend the valuable time during class on improving their current learning cycle instead of fixing the problems of the past. With the addition of the collective reflection step in the leadership course, students were able to develop a broader range of new behaviors that were also more likely to be effective in future interpersonal interactions.

The collective reflection step has general applicability to other areas of business education as well. By compelling students to aggregate their individual reflections into a consensus reflection for the team, each student has the opportunity to reflect again on their individual experiences. In the process, any gaps between the students' reflections and conceptualizations and those of their teammates will need to be resolved in order to complete the activity. While this step does not guarantee the correct result, as the entire team may have a faulty mental framework, the resolution of the differences can yield a better outcome. At a minimum, it forces students to reevaluate their underlying assumptions as Argyris and Schön (1974) suggest. As a result, some students may find further validation of their assessment of the problem signaling they are on the right track, while others may have to reformulate their conceptualization of the problem to seek alternate, more effective solutions.

These outcomes are ideal from our perspective because the ability of the students to determine root causes via RCPS and generate more effective future applications through collective reflection allows them to move beyond the simple acquisition of knowledge. The benefit is that students are more likely to apply and successfully use their new skills and abilities at work when they have been able to apply and practice these concepts more accurately in the classroom (Michlitsch & Sidle, 2002). This further enhances the value of the learning experience (Kleiman & Kass, 2007).

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