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LET'S SCRUM: HOW SCRUM METHODOLOGY ENCOURAGES STUDENTS TO VIEW THEMSELVES AS COLLABORATORS

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Much published research emphasizes the value of collaborative learning between students in the classroom, citing benefits including increased levels of achievement, productivity, intellectual insight, motivation, and persistence (Johnson and Johnson, 1999; Morgan and Murray, 1991; Pfaff and Huddleston, 2003), as well as increased intellectual risk taking (Lundeburg and Moch, 1995) and improved interpersonal negotiation skills (Ede and Lundsford, 1992; Burnett, White, and Duin, 1997). In her collection of collaborative learning strategies for instructors, Elizabeth Barkley and her co-authors (2005), drawing on Kenneth Bruffee (1999), argue collaborative learning encourages students to build knowledge, develop stronger interpersonal skills, and listen and think critically for understanding.

Based on this research and the number of group projects we have completed during our college careers (and those assigned, in Dr. Pope-Ruark's case), you might assume that collaborative learning is highly effective and appreciated by students or that students begin to see themselves as effective collaborators as they work through these projects. But successful student collaboration has its challenges. For example, we four co-authors designed and conducted a short survey of students who completed one or both of two project-based, collaboration-intensive classes Dr. Pope-Ruark (or RPR, as students call her) taught during the 2009-2010 academic year. When asked their views on collaborative group work before taking RPR's classes, 11 of 15 respondents reported not enjoying previous group work because the experience was often disorganized, most of the work was completed usually by one person, or students did not trust each other with their grades. Even students who labeled themselves collaborative thinkers admitted to either taking most of the work on themselves or to re-doing their group members' work before the project was due. Most seemed not to participate fully because they viewed their group members as obstacles rather than partners in the collaborative experience. One student summed up group work experiences this way: "It usually felt like individual work where a bunch of other people would harass each other while I was trying to do things."

Our experiences and survey suggests that students entering RPR's classes had not, as might be expected, developed identities as collaborators despite completing many collaborative projects during their careers. How might instructors design experiences that not only help students learn about the process of effective collaboration but also help them build identities as engaged collaborators despite the individualistic, competitive environment inherit in a grade-based academic system?

In this article, we explore an adapted version of Scrum project management methodology[i], a framework of group meetings and process questions used to organize collaborative teamwork and borrowed from the software development world, that both created an atmosphere of collaboration for students in semester-long project-based courses and enabled students to develop and articulate their roles as collaborators. To do so, RPR will first introduce Scrum

methodology as a valuable collaboration framework for student projects and describe her strategies for adapting Scrum in her upper-level Publishing electives. We then explore how students built identities as collaborators by sharing the three student co-authors' experiences: Kasey discusses entering the discipline and collaborative atmosphere, Michelle learning to trust and relinquish control, and Sarah realizing her leadership potential. We conclude with suggestions for rethinking collaboration in the classroom based upon our experience with Scrum.

RPR's Turn: Adapting Scrum in the Collaborative Classroom

As an assistant professor teaching in a Professional Writing and Rhetoric (PWR) program and a former marketing agency writer, I believe creating experiences that engage students in active, realistic collaboration is crucial to helping them grow as effective communicators. As the research cited above argues, collaborative learning has many benefits for students, but while using short collaborative projects in the past, I have faced the reality (as we all do) that students are often resistant to collaboration with their peers for a variety of reasons, including lack of interest in the project, lack of trust in their peers, and lack of knowledge about what it means to really collaborate intellectually and productively with people. Terri A. Frederick (2008) posits that institutional structures undermine real student collaboration due to the established teacher-student authority hierarchy and antithetical definition of "the student as an individual trying to succeed alongside of, or in competition with, other students, but rarely in collaboration with them" (441). These dichotomies leave students facing an identity crisis: Am I an individual in competition for the highest grades or a collaborator who must trust my peers with those same grades?

This confusion argues for better instruction and a stronger emphasis on collaboration in the classroom, as Robert Reich called for in 1989 (cited in Beckman):

Learning to collaborate suggests a different kind of education... Instead of emphasizing the quiet performance of specialized tasks, a greater emphasis should be placed on interactive communications linked to group problem definitions and solutions... [S]tudents should learn how to share their understandings and build upon each other's insights... instead of emphasizing individual achievement and competition... (11)

In response to Reich, I created two upper-level electives in the PWR major at Elon University, a medium-sized comprehensive university in North Carolina that highly values both engaged learning and the mentoring role of faculty working with students. Learning objectives for both of these project-based, collaboration-intensive courses were drawn directly from the PWR programmatic goals:

- Students will learn, often through working hands-on with actual clients/partners, how to analyze, reflect on, assess, and effectively act within complex contexts and rhetorical situations.
- Students will study a wide variety of rhetorical techne (i.e., strategies) and, by working within and reflecting on actual rhetorical contexts, learn to adapt and develop rhetorical strategies and heuristics appropriate to specific situations.

These courses emphasized group performance but also helped students move beyond simple team divisions of work to encompass intentionality and purpose (Burnett, White, Duin, 1991) by actively teaching about group dynamics. In addition I strived to create a safe space for students to reflect, consent or dissent, and express both the positive and negative emotions associated with effective collaboration (Olguin, Delgado, Ricarte, 2000). The key to success in these project-based courses was Scrum.

About Scrum

I first learned about Scrum methodology from my husband, a computer programmer who works primarily with Web-based software. Scrum is an iterative design framework for complex software development projects that uses cross-functional teams, open collaboration, and well-managed chunks of time designed by the teams to achieve specific goals and actual deliverables toward the overall project (Scrum Alliance, n.d.). According to the original developers, Scrum is an empirical process that values transparency, inspection, adaptability as well as consistent reflection and flexibility in planning and execution (Schwaber & Sutherland, 2009). Additionally, the official Scrum Guide (2010) published by the professional group Scrum.org characterizes the methodology by these features:

- Release – a product goal to be achieved collaboratively over the course of several Sprints (see below). Because Scrum is used in Web software development, Releases are almost never full software packages but instead specific upgrades in functionality across the site. All team members working toward a Release participate in “Release Planning” to set the goals for the Release and the Release date.
- Sprint – a segment of time, usually between 2-4 weeks, during which teams work to achieve specified goals toward the eventual Release. Teams participate in regular “Sprint Planning” meetings when they determine which of the goals for the Release they will focus on during the Sprint as well as regular “Sprint Reviews” and “Retrospectives” at the end of the time period.
- Teams – cross-functional groups that work iteratively toward Sprint and Release goals. Teams are managed by two individuals – the Product Owner who ensures the team is meeting the business goals, and the ScrumMaster who maintains process goals.
- Daily Scrum – a short daily meeting during which each team member reports to the ScrumMaster and Team on the three Scrum questions: what have I accomplished since the last Daily Scrum, what do I plan to accomplish before the next Scrum, and what challenges might I face before the next Scrum?

Using Scrum as a framework for projects provides a valuable reflective and collaborative structure that can be used in any large-scale project from the workplace to the college classroom.

Scrum in the Classroom

As noted above, I designed two upper-level elective PWR courses, each consisting of full-semester client projects, to both meet the objectives of our curriculum and to actively engage students in collaboration:

- **Special Topics: Project and Publication Management** – students partnered with Elon’s Belk Library to create a series of short ‘how-to’ videos introducing interesting services and opportunities in the library. Students conducted research with the student body and faculty, compiled their findings, created and presented proposals to the librarians regarding the content and creative direction of the videos, and completed a series of nine how-to videos from storyboarding and scripting to editing and usability testing.
- **Publishing** – in this service learning course, students partnered with the Conservators’ Center, an exotic animal sanctuary 30 miles from campus, to create a coffee table book and series of children’s books. Students first completed small projects like Web site editing to get to know the Center, created and pitched book proposals to the Center’s director in competitive teams, and wrote, designed, and published the coffee table book and two children’s books.

Twenty-eight students enrolled in either course during the 2009-2010 academic year, with four students completing both courses. Enrollment was open to all students who had completed the first-year writing requirement, and students evenly represented the second-year, third-year, and senior classes. Project and Publication Management was populated entirely by PWR and Communication majors, while the service learning component of Publishing also attracted students from Environmental Studies, English, and Business.

Given that I was teaching these courses for the first time and Scrum was a methodology with which I was familiar, I decided to fully implement Scrum in these classes. At the beginning of each course, students were given a product goal equivalent to a Release in the language of Scrum – a how-to video series or sellable books – and were asked to accomplish these goals by organizing themselves and the work appropriately. I served as a guiding mentor, on-site Project Manager, and ScrumMaster, while the client/partners were integral to the learning experience, having frequent contact with the students and offering honest, substantive feedback on their work. The work was divided into at least three Sprints – preliminary work and research, client proposals, and production – within which students organized their work. A product was due at the end of each Sprint, students were given substantive feedback, and then we collaboratively planned the next Sprint.

Most importantly, virtually every class meeting began with a Daily Scrum. In a typical Scrum, students and I would sit in a circle while each student would report on the three Scrum progress questions listed above. Every student was required to respond and seemed to learn quickly that they did not want to be the one who had nothing original to contribute in front of the Team. Early in the semester, Daily Scrums also included discussions of reading materials which applied to our projects and specific questions related to project content. Later in the semester, several Scrums were held at the end of class rather than the beginning so that students could hold smaller team Scrums and move forward with their work prior to the Scrum. Once students became comfortable and accountable in Scrum, the discussion time could be used effectively to address team challenges, collaborative storming, and student motivation.

To learn more about students’ experience with Scrum in my classes, I conducted an Institutional Review Board-approved study and collected regularly scheduled coursework including weekly reflections and the final portfolio, as well as my instructor notes. During the summer of 2010,

after both courses were completed, I invited my three student co-authors^[ii] to collaborate on an article about their experience. In addition to their own notes, we collaboratively created an online survey exploring the Scrum experience and invited everyone who had taken one of the courses to participate. The survey had a 60% return rate. In the sections below, my student co-authors share their own experiences with Scrum in the classroom and discuss how Scrum helped them overcome barriers to collaboration, starting with Kasey.

Kasey's Turn: Learning to Take Part in the Collaborative Process

I will begin my commentary on Scrum by elaborating on the aforementioned system of handling group work from the perspective of a current college student. In my experience, most classes at a college level include at least one group project, and most of these projects are handled by students in a “divide-and-conquer” manner. The students are randomly organized into groups (at least, it seems random from our point of view), and the first few interactions are spent simultaneously struggling to understand the assignment, getting to know one another, and awkwardly discussing various methods of completing the project on time. A de-facto “leader” will usually emerge in an attempt to make order out of the chaos; I will admit to having played this role once or twice in my college career. Quickly and cleanly, I divide the work into chunks that could be completed by the team members individually, in their own time. That is generally the end of group interaction, as another person is usually delegated to coalesce the information into the medium (a PowerPoint presentation, essay, etc.) for which the assignment calls. That was what I knew of collaboration in my educational career until recently.

My experience is not isolated. My peers seem to agree that “dividing-and-conquering” the work is the widely accepted method of handling collaboration at a college level. When asked how s/he handled group-work, an anonymous survey respondent elaborated on a second method: “I consider myself a collaborative person, but I used to prefer doing most of the work by myself, as I didn't trust others with my grades.” Sixty percent of respondents to our online survey admitted to handling group-work in one of these two ways, and 73 percent reflected negatively on group-work prior to taking one of RPR's classes.

I admit to walking into the Spring semester Publishing class on the first day expecting the class to be one massive semester-long group project that would be handled in the same manner. Our final product-the coffee-table book for the Conservators' Center, in my group's case-would be evidence of our success. When we sat in the first Scrum circle and talked about our expectations for the course, I didn't know that RPR was measuring our success on a different scale: our development as collaborators. Participating in Scrum helped guide me to a better understanding of my peers and of group development and led me to become a more active participant in collaborative work and in the larger discipline of PWR.

The beginning stages of my growth as a collaborator and member of the disciplinary community could be accurately described as “shaking off the system.” Early in the course, Scrum was just a time when I felt we had to speak generically about how excited we were to be taking part in the project. My early reflections showed that I personally struggled with letting go of the typical methods of handling group projects: “To prepare for our visit to the Center, our group decided to divvy up the species of animals, two or three per person, and spend a day or two just looking

over [the existing Web profiles of the animals], taking notes on what aspects of their profiles worked and what didn't..." Clearly, I was still under the impression that this smaller piece of the larger book project could be approached the same way that I had approached every collaborative effort until that time.

Predictably, however, problems came to light quickly. How could we hold one another accountable for individual work? What if a person got sick, or just didn't do what he/she agreed to do? How could we establish the right tone in the content of the coffee table book if everyone was writing in the way that he or she thought best? What about peer editing? I slowly realized over the course of that first smaller task that a project of this magnitude called for a deeper level of collaboration which-at that point-was probably far over my head. There was going to be precious little that I or we could do individually to make our book a success; we needed to truly collaborate (whatever that meant), each participating in the decision-making process and joint execution of the publication.

After this realization near the beginning of our project, Scrum took on a new role for me. Not only was it a place where I could bring up various issues concerning the project itself, but it also became a setting that helped me actively learn about my peers in a way that the typical method of handling group-work prevented. Some of the discussions transcended the mere benefit of the project into an opportunity for personal growth. For example, in addition to discussing our project progress, RPR also had us discuss readings about service learning and writing for not-for-profit organizations which allowed each of us to really shape and articulate our views on service and the role of writing in service, which I hadn't really thought about before. We also used Scrum time in two other class meetings to share our best and worst collaboration experiences and to brainstorm ideas for how we could better approach collaboration in our projects for the Center. Each person seemed to feel safe to admit areas he or she wanted to improve and how he or she could use their strengths to help someone else learn.

Feeling safe to admit my shortcomings and my learning curve in Scrum was especially important for me, as a newcomer into the field of Professional Writing and Rhetoric. As a second-year student without even an introductory course under my belt, I often felt lost in the jargon of rhetoric and intimidated by my peers who had taken more classes and who were generally more conversant in the theory of the discipline. Since Scrum was very much a safe space, I was given the opportunity to listen to other students who knew more than I did, and perhaps even more valuable than this was the ability to ask my peers questions in the circle about the complicated rhetorical ideas that we were putting into practice. Scrum was a time when I could actively learn about the discipline and the theory behind the collaborative work we were doing; it was a setting where methodology was broken down and discussed in the understandable terms of the project, the better to be put in action when we divided into smaller teams.

An example of this would be a newfound attention to audience in my writing. About halfway through the composition of the coffee table book, a peer brought up in Scrum how we were actually dealing with two different audiences: the owners and volunteers at the Conservators' Center and the wider audience who would eventually pick up and read our product. The difficulty was in addressing both of these audiences and catering to them simultaneously-something I had been internally struggling with but unable to articulate. In that particular Scrum,

we discussed ways of adopting the Center's mission as our own, the better to serve both sets of readers. As I reflected in my final portfolio, "Every decision, from the tone of our book, to the stories we chose to use, to the style in which we wrote those stories had to call both of our audiences back into perspective." I didn't know it at the time, but this is a specific rhetorical strategy that is key to writing professionally for an organization.

I'll admit that it was a backwards way to approach knowledge, but nonetheless, the Publishing class itself provided my peers and me with the chance to develop and practice new rhetoric skills-peer editing, group writing, attention to audience-while Scrum enabled me to learn more about the theories behind real, effective collaboration and my new discipline. Openly discussing collaborative methods provided these opportunities for exchanges and interactive learning between students, but trust between the participants of these conversations was key to their effectiveness.

Michelle's Turn: Learning to Trust and Negotiate Control in Group Projects

As a student like Kasey whose first experience in the PWR discipline involved Scrum, I was new to the discipline and to the idea of effective collaboration when I entered RPR's Project and Publication Management class in the Fall. In previous classes where group work was assigned, my experience was similar to what Kasey describes; I would superficially comply by participating in the organization of separate pieces of work, making sure that everyone had certain responsibilities on paper. However, even before I received the pieces from my group members so I could compile them, I was writing as many of them as I could. I would read what my group members contributed, but more often than not, I would replace their pieces with my own out of concern for my grade. Only after experiencing Scrum did I realize what functional collaboration was like.

Because of Scrum, I no longer worried about my grades being damaged by group work when I entered RPR's Spring Publishing course because I knew that we were being evaluated on participation in Scrum, as well as our ability to interact with group members and demonstrate real investment in the projects. Since I was aware that the final project accounted for only about half of our grade, I found that my motivation to succeed was effectively channeled into functioning as part of a group that could be taken seriously. The projects provided enough of a challenge to keep me interested, unlike many group projects I had experienced in the past, and what challenged me the most were the dynamics of collaboration. Where I had distrusted group members in the past, I found that if I paid attention to what was being said and done in Scrum, I was better able to confer credibility upon peers, which allowed me to extend a measure of trust. In our joint experiences as students and collaborators, I found that Scrum became a valuable tool for building trust and credibility, dispelling the perceived need to protect grades with divide-and-conquer collaboration.

The Role of Scrum in Collaborative Trust and Credibility

In my experience and in talking with my peers, one reason students split group work tasks is to protect their grades. As a self-motivated student with high expectations of myself and my peers, I could relate to statements collected in our survey such as: "I consider myself a collaborative

person, but I used to prefer doing most of the work myself as I didn't trust others with my grades." As a component that can be ignored in group work, trust is one characteristic of collaboration that was strongly enabled by Scrum for the majority of students surveyed, including myself. When asked to agree or disagree with the statement "Scrum had no effect on my trust of my classmates during our project," 86.6% of students chose "disagree" or "disagree completely." Trust played a significant role in fostering successful collaboration through Scrum.

Trust allows for the formation of relationships and dependence on others, but it always involves risk. In the case of Scrum in RPR's classes, students risked both the judgment of their peers and the possibility that delegated work would not be accomplished satisfactorily when we trusted our collaborators. Part of establishing trust was establishing our own credibility with each other to abate risk. Credibility provided the basis of the trust I developed in my peers because, as individuals described their progress toward achieving the group goal during Scrum, their credibility as committed colleagues increased in my eyes. Responses to the following survey question show similar experiences from other students: "Do you think Scrum provided an opportunity for you to learn more about your classmates as fellow partners than you learned in other group projects? If so, how?" Students tended to judge a team member's "role," "interest in leadership positions," and "how much responsibility they were willing to take on" based on individual participation in Scrum. These responses demonstrate that Scrum enabled students to observe one another in a "professional" setting and draw conclusions about work quality based on their actions and reports to the group.

For example, I worked with several other students who emerged as an editing group during the coffee table book project in the Publishing class. When we described our work during Scrum one day, more group members began to submit their pieces to us for feedback on content and tone. Our editing group, which gained credibility by describing its initiative during Scrum and showing examples, was then entrusted with the responsibility of shaping existing pieces to achieve a consistent tone throughout the group's collaborative writing. Because nearly all progress was reported during Scrum, we became aware of which students had success with certain pieces of the project and responded accordingly by attributing credibility.

Negotiating Control with Scrum

Both the collaborative nature of the student projects and the way we interacted during Scrum had positive effects on the issue of control among group members, which is also an issue of trust and credibility. Because Scrum leveled the playing field in a way, it diminished the importance of the individual (and, therefore, the individual's grade) and emphasized the group. When asked to describe Scrum, one student stated that "It helps individuals understand what others are doing and how their actions contribute to the ultimate goal." Because everyone had something to share in Scrum circles, we learned that everyone had valuable skills, and I, at least, became more willing to negotiate project control.

One specific personal example involved being part of a small group of three students working together to create our own book proposal for the coffee table book to the client. I had experience with writing executive summaries through my experience in RPR's Fall course and felt relatively familiar with that particular type of document, while my two peers had never heard of one. I

described what I knew about executive summaries and, concerned that the other two students might not be comfortable writing their first one yet, I drafted an example for the book proposal rather than just doing the entire thing myself as I would have in the past. When I presented it to my team members in a small group Daily Scrum meeting outside of the classroom, they were able to identify several important pieces that were missing and were also instrumental in removing extraneous material and improving the approachability of the document. We were able to reach a comfortable negotiation of control that involved taking advantage of both document-specific experience and editing skill sets we all had to offer.

This experience was instrumental in showing me that the differences I was observing in my approach to collaborative work were also occurring in the students working alongside me. I began to realize that Scrum was having a strong and positive effect on everyone's perception of the collaborative process and that other students were truly motivated to succeed. Although I had not doubted the abilities and skills of my peers, I had assumed at the beginning of class that they would be reluctant to share my enthusiasm for maintaining a high grade point average (GPA). Even though Scrum showed me that grades were not the highest priority, I was still affected by this mindset until I was able to fully perceive others' credibility and build trust. Because of individual students' behavior in Scrum, I was able to build a workable level of trust with them, realizing that I could entertain high expectations without being disappointed.

In the student survey, one of the last questions asked students if Scrum had affected their view of collaboration and project control. An impressive 92.9 percent agreed that it positively impacted their views, demonstrating the strong role of Scrum in negotiation of control, and I fully agree with that view. Enabling students to break free of our practiced group roles helped us, and myself specifically, learn more about the nature of effective collaboration and about ourselves as individuals, group members, and in some cases, leaders.

Sarah's Turn: Developing Leadership Qualities in the Collaborative Setting

In my experience at Elon University, unlike Michelle's, I find most of the students engaged and ambitious; if they did not possess these qualities they would not attend a university that values engaged learning so highly. In this environment, I have spent the last three years trying to impress my teachers and contending with fellow students in order to receive good grades and appear attractive to future employers. Like many normal students, I would try to complete an assignment for the sake of completing it or getting the grade, but I never saw a task as a way to practice skills I will certainly need in the future – at least not until I took RPR's two collaboration-intensive publishing courses.

For me specifically, leadership was a crucial skill that I needed to develop but had often shied away from. Before RPR's two classes, I had never given myself the chance to practice effective leadership strategies, and I hadn't held many leadership roles in group work or extracurricular activities because I do not like confrontation or tension, which often accompanies leadership in groups. I would rather salvage a working relationship than advocate for my own products in most situations. In these classes though, Scrum provided me with the opportunity to establish an ethos for myself as a leader, to constructively deal with confrontation or tension within a group, and to learn how to motivate a team.

Scrum redefined roles in group work. Before Scrum, my experience of leadership in group work aligned with what Kasey and Michelle have described, in that I thought leadership meant delegation. In the Project and Publication Management class in the Fall though, I had my first experience with Scrum and this new format for group work. The first time we completed Scrum in the Spring Publishing course, I felt like I was going to be a valuable asset to this project since I had a better understanding of this new collaborative format from my experience in the Fall course.

The day we received the feedback from our client, the Conservators' Center, regarding our separate book proposals was a day that I was able to establish my ethos as an effective leader. In six small groups, we had each created a book proposal, three for the children's books and three for the coffee table books, and presented our proposals formally to our client. In Scrum that day, we were told that the client liked a few particular ideas from each children's book proposal and requested that we find a way to combine them into a cohesive book series. Before we could move forward with book production, we had to write those ideas out and present them to the client in another proposal so she could approve the new direction. In that Scrum, we talked about how we felt about the client's decision, and based on my experience handling client feedback from RPR's Fall project class, I moved immediately to the classroom whiteboard and started an outline of the tasks we needed to accomplish in order to help my group map out our production process. I asked questions of people from the different book proposal groups to encourage discussion and helped our group organize a plan. By taking this initiative and engaging my peers, I established credibility and essentially became the de facto ScrumMaster for our future discussions.

As I noted earlier, avoiding confrontation was one of the reasons I had avoided leadership positions in the past, but my developing ethos as a leader and role as ScrumMaster for my group helped me to confront the group when it was necessary, especially during one breakthrough Scrum midway through the project. The day before this particular Scrum, my entire group was supposed to have an evening meeting to work on our children's books, but only two people showed up including me. That peer and I worked on the project by ourselves for six hours when we couldn't contact the other group members. I knew exactly what I was going to say in Scrum following that exhibition of lack of commitment from my Team. RPR knew about our group meeting problem, and apparently the coffee table book group had been experiencing some storming too, because rather than our usual Scrum session, she asked us to hold official Scrum meetings with our project groups to express our concerns and problems, a sort of "pass the gavel" Scrum. RPR started the discussion in my area of the circle, so I was one of the first people to speak in our group. And for the first time in a group project I did not have a problem speaking out about an issue. One of the benefits of the Scrum circle is that you can see everyone, no one is hiding, so I took the opportunity to look at everyone in the face and tell them how disappointed I was, how far behind we were, and how hard we were going to have to work that day to catch up -and that we definitely could succeed if everyone recommitted to the project and remembered the great work we were doing for the Center.

I would not have had the courage as a leader to say those things to everyone if it were not for the Scrum discussions. As Kasey and Michelle have noted, Scrum provided a safe place to discuss the project and confront issues we might be having as a group. Our survey shows that others in

the class agreed with our perception. When asked if they were more comfortable dealing with “storming” issues or problems within the group during Scrum, 87 percent of respondent agreed that they thought Scrum helped to work out issues within the group effectively. I fully agree, because my growing confidence in myself as my group’s ScrumMaster and the safety I felt in the Scrum space allowed me to address my group honestly so that we could get our frustrations out productively and move forward.

Similarly, a few weeks later, I continued to encourage the entire group to stay committed to the project when stress and frustrations started to build up. RPR had noticed a trend in our written reflections, so in a regular Scrum, she asked us to just discuss what we thought we were gaining from the project. The first person to speak said she felt she was doing all of this work but that our client was reaping all the benefit. I immediately jumped in and listed multiple benefits we were gaining: multiple portfolio pieces including complete books, increased knowledge outside of previous skills, deeper understanding of concepts from our PWR major, experience with a community service project, and the satisfaction of donating our time and primary skills towards a good cause. Through further Scrum discussion, we realized the benefits outweighed the stress, giving us extra motivation to move forward. I then realized how motivating others was key to collaboration, and I had not experienced that before Scrum.

Scrum allowed me to be a “situational leader” – someone with situational authority, to use Katz’s (1998) term – someone who becomes the director for a short period of time based on relevant skills and credibility. In our survey, every single respondent agreed that Scrum helped them develop and actively practice their leadership skills. One student stated “Scrum forced people to step outside their usual roles they got used to in group work. Leaders had to learn to sit back, while the other passive members had to learn to take charge more.” My experience with Scrum and managing large projects from my first project class with RPR gave me the confidence to step forward into this leadership role when many of my peers were still intellectually overwhelmed by the size of the impending project. Effective leadership is an incredibly important skill to develop throughout college, and I am amazed I did not gain this experience until more than half way through my schooling. I am grateful that RPR gave us the opportunity in Scrum to practice these skills.

Our Turn: Scrum Helped Students Develop Identities as Collaborators and Actually Collaborate

We began this article by reviewing the contradiction between the literature’s advocacy for collaboration in the classroom and students’ honest responses to collaborative projects. Bridging the gap between these two perspectives is an important step toward helping students achieve the benefits of collaboration explored in the literature, and using Scrum methodology to help students address complex, problem-based collaborative projects has proved a successful bridge in our experience. Scrum enabled a richer collaborative experience in the project-based classroom and helped the student co-authors and our peers to better articulate their roles as collaborators, roles that are changing the ways we approach collaboration since the Scrum experience.

Benefits of Scrum

One of the primary benefits in RPR's classes for the student co-authors was that, in conjunction with the extended problem-based projects, Scrum enabled realistic collaboration practice that students saw as different from their past experiences and very valuable to their learning. The students who experienced Scrum learned to commit to collaboration, investing time and energy both in each other and in the project. Rather than dividing up tasks at the first meeting and never communicating with each other again, we learned that short-term delegation, multiple leadership roles, and smaller group Scrum meetings could facilitate real collaboration. We have benefited from learning how to collaborate in the true sense of the word: planning, communicating, and executing as a team. The group faced all parts of the group dynamics cycle: forming, storming, norming, and performing.[iii] Without the space of Scrum, we would not have been productive throughout all of the phases. Many students had experienced storming in previous group projects but had never moved on from that stage, making success almost impossible. With up to 20 students in the classes, we feel that we would not have experienced success without participating in the Scrum process throughout each semester.

Ninety-three percent of students surveyed agreed with our assessment that Scrum was an integral part of their learning experience in the Project and Publication Management and Publishing classes. For example, one student commented: "Scrum was valuable...because it enabled us to work more closely and effectively as a team. We felt more willing and able to ask questions of other team members ... and ... we learned each other's strengths." Another noted, "Scrum was very valuable. I learned a lot from my classmates during Scrum and was able to be more productive overall because I knew we were all on the same page." The student who felt Scrum was not valuable noted that Scrum could be "redundant" and a "waste of time" because group members often repeated what other members had already said. While this is a concern that faculty implementing Scrum should consider, the vast majority of students surveyed agreed that Scrum was a productive and important part of the class experience.

Scrum also seemed to enable students to actively create, reflect on, and articulate their roles as collaborators rather than reinforce individualistic student mentalities formed in previous group experiences. Each student seemed to understand that they were being evaluated not only on their products but also on their collaborative processes and articulation of those processes in Scrum. Because of this change in class mentality, students were able to focus on their own participation in the process with peers.

We have consistently reiterated that Scrum facilitates personal development. Many of us became leaders throughout the project because of Scrum and would have been unable to speak out, deal with confrontation, or inspire others without participating in it. Previously, there was no process of developing a role or an identity in group work; we simply implemented divide-and-conquer strategies to manage the work load. The reinforcement we received in the Scrum circle helped us develop as real collaborators and resulted in a successful project.

Thoughts on Implementing Scrum in the Collaborative Classroom

For RPR, one of the most beneficial pedagogical advantages to implementing Scrum in her collaborative classes was that it forced her to articulate for herself why exactly she was asking students to collaborate, what goals she had for their development as collaborators, and what her role was in this development. Because project-based learning is a messy and chaotic process that requires quick thinking, just-in-time teaching strategies, and an open eye to teaching moments, Scrum became a way to put some order to the chaos and actively talk to students about their collaborative process in situ. In RPR's view, the chaos is often the best teacher – for both her and her students. She fully admits to sometimes struggling with her role as Project Manager in Scrum, especially on days when she really just wanted to jump in and take over the projects to ensure that students met their goals – but on the days she came to class ready to take over the project, the students always surprised her with more progress and excitement than she had expected.

When considering implementing project-based learning and Scrum in the classroom, instructors should consider why exactly they are assigning group projects in the first place and how exactly they will be evaluating them. For Michelle, group projects before her Scrum experience were akin to torture:

Every time group work is assigned in a class, I prepare for the worst. I have preconceived notions about the way things will regress, how my group members will fail to attend our meetings, and how much time I will have to put in as the sole worker. After experiencing Scrum and collaborating with skillful and motivated students, I realized that the nature of a group project has a singularly strong influence on students' behavior.

As Michelle notes, consider ways to make collaboration absolutely necessary to success for students and value the collaborative process in the classroom by making each Scrum discussion meaningful. Making collaboration necessary requires students to break out of their usual divide-and-conquer mentality to engage the project and peers more actively. For students who enter collaborative projects with assumptions about their peers' performance and quality of contributions, low expectations can influence group behavior. By creating a complex, multi-layered project that is infeasible for one student, collaboration is required, and those who had concerns were more likely to talk about them in the group. Developing projects that truly require collaboration, which is not an easy task, creates both a challenge and an opportunity to significantly improve students' collaborative skills and allow them to grow as collaborators, while Scrum used with active written reflection can help to reinforce that learning.

Scrum works best for projects that mimic cross-functional team structures in the workplace. If the student group is small enough that they are already working together intimately toward a goal, Scrum can be redundant and take up time students would rather use to be productive, leading to limited buy-in from students in daily Scrums. RPR recommends considering Scrum to help frame projects in which smaller groups or individuals are working on pieces of a larger, much more complex project on which the rest of the larger group must be constantly updated to help eliminate the potential for this redundancy. Scrum can also be used to frame a class initially

and then phased in and out as needed depending on how effectively the students are collaborating throughout the process.

Our Final Turn

All but one survey respondent stated that Scrum could and in many cases should be used in any college course requiring collaboration, group projects, or problem solving. Students particularly noted that Scrum would be useful in collaborative projects in communication, business, engineering, and even English classes. Another survey respondent added that most discussion- or project-based courses taken in his/her career “might have benefited from Scrum, even if we’re not doing a group project. It’s just a fantastic way to discuss the problems everyone has with projects and is a sort of safe place to admit that you are confused or have problems with an aspect of the course or project.” In other words, professional communication and real collaboration are encouraged through the process of consistent Scrum meetings in the classroom.

Our research and collaboration over the summer to write this article reinforced for RPR the importance of not only creating collaborative interactive spaces for students to explore their skills but to also frame those spaces effectively. She had initially added Scrum into the project classes as a way to help students stay accountable for their project work, but the rewards have far outweighed that initial goal. Our survey data and discussions with co-authors have redoubled her faith in the value of collaborative work in the classroom, and she will continue to use Scrum to create successful frames for learning in my courses. But the student co-authors sum up the value of Scrum best:

Before being introduced to Scrum, we, the student co-authors, saw group assignments only in terms of the product they were required to produce and took the path of least resistance to that goal. Scrum has added a new dimension to group projects for us and has changed the way we see collaboration: careful attention to process and product rather than dissection and allocation of individual tasks. Now that this particular experience is over, it would be impossible for us to return to previous methods of managing group work without including true collaboration. Scrum not only served as a catalyst for completing our books and videos in those semester-long classes, but also for transforming the way we will treat future collaborative experiences. We now recognize the importance of having these opportunities for open discussion and interactive learning, and we feel that our new, more mature perspective will serve us well in our future collaborative experiences, in school, in the workplace, and in the community.

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[i] The name “Scrum” is a reference to the sport rugby and first appeared in a 1986 *Harvard Business Review* article by Hirotaka Takeuchi and Ikujiro Nonaka entitled “The New New Product Development Game,” which compared effective, flexible teamwork to the rugby move and was adapted by Scrum guru Ken Schwaber for software development.

[ii] The three student coauthors were chosen based on interest and proximity. Each coauthor had exhibited strong interest in the projects, were active leaders in Scrum sessions, and recognized personal growth in their post-experience reflections. Because writing was to take place in the summer, students were also chosen for the ability to meet as a collaborative group with me during that time when many students were away from our residential campus.

[iii] The forming, storming, norming, performing model was developed by Brain Tuckman in 1965 and first published in the article “Developmental Sequence in Small Groups” in *Psychological Bulletin*.