

This interview with Jim Richardson, Associate Professor of Civil and Environmental Engineering at the University of Alabama, took place on the campus of Clemson University on March 19, 2001.

Susan Ledlow: Jim, how long have you been using cooperative learning?

Jim Richardson: I taught a class for the Foundation Coalition in the fall of 1996, and we used cooperative learning then; so that would be five years.

Ledlow: What made you say, “I’m going to use cooperative learning in my teaching?”

Richardson: Well, it was kind of part of the package. I was interested in just trying new things in teaching, and I became active in the Foundation Coalition. We taught this freshman class, and that included cooperative learning.

Ledlow: How would you compare your experience as a teacher using cooperative learning versus [using] more traditional learning strategies such as lecture?

Richardson: Well, there are real highs and real lows. When I lecture, the reaction is almost always the same from the students. There’re a few sitting up front, taking notes, and nodding their heads, and so forth, and a lot in the back that I don’t think are really there, even though they are smart enough to nod their heads and play along. And when the lecture is over, I get a couple [of] questions, and we all walk out. Cooperative learning, though, can go really well or it can go bad, because you’re basically giving control over to the students, and it takes practice in learning how to control that.

Ledlow: How have your students responded to cooperative learning?

Richardson: When I teach freshmen, they respond positively, and I think it is because they are coming to the university, they are ready to try new things, and they pick it up and go with it. But when I use it with my juniors and seniors, they’ve already had two years of college behind them. They have an expectation: teacher’s supposed to write on the board, we write it down, and then we put the problems back on the test. When I turn it over to them, they get the sense that I’m not doing my job. They want to see a worked example on the board, and when I kind of throw it back in their lap and say, “Well, what do you think? Work together with your partner,” that’s not what they want. They want to see an example that they can then mimic on an exam. And so it’s harder with the older students.

Ledlow: How did you learn to do cooperative learning? You mentioned you learned through the Foundation Coalition, but did you have formal training, discussions with colleagues, readings?

Richardson: We had workshops. Karl Smith came and gave us an excellent half-day workshop on cooperative learning. We’ve had other speakers, such as Rich Felder, early on. I’d go to educational conferences, and sit in on workshops and papers and so

forth, and then we would talk. Our freshmen curriculum is team-taught, and so we meet weekly with other teachers. I would team-teach a section with another engineering professor. We had two classes. We each met in two different classrooms, but each class was identical, so we would plan out the week's activities ahead of time. That took a lot of coordination, and then we would always talk about what went well and didn't go well. That was probably the most valuable source of feedback on learning how to use cooperative learning.

Ledlow: What skills did you need to develop as a teacher to be effective using cooperative learning that you didn't necessarily need when you were just lecturing?

Richardson: I learned I really had to script what I wanted to have happen in the class. That's like a lesson plan—what K-12 teachers call a lesson plan. In lecturing, I just have to have my notes. I put them on the board, or overheads, or whatever, and away we go. But when I turned control over to the students, I learned I really have to have a clear idea of what I want them to do and how long I want them to be doing it. [Also, I need to know] what I want them to turn in at the end of that time period and then how that relates to the next step. I really had to have a script if I wanted it to go really well. That took a lot more time than I expected.

Ledlow: Do you explain to your students what cooperative learning is and why you're using it?

Richardson: You know, I used to, but I stopped doing it. I wasn't really sure if the students were getting anything out of that. . . . I do give just a very brief, two- to three-minute talk about why class is going to be different than what they are used to, what I hope to accomplish. And then I shut up, because it would quickly turn into kind of a sermon. But then, as the semester goes on . . . I remind them, "This is why we're doing this. This is why we're doing that." That seems to be a little more effective. I guess it is good to clue the students in as to why they're doing different activities, but too much is lost on them, I think. . . . They want content, and so the quicker I can stop talking about the method and get into the content, the better for them.

Ledlow: How do you set up teams in your classroom?

Richardson: That's a whole topic unto itself. When we were first starting, we'd heard from somebody that it's not good to have a teammate isolated, like a woman or a minority. In an engineering class, because most engineering classes are white male, we would carefully try to always pair up a woman or a minority with another student like that. Then the students started to rebel against that. They would say, "You know, this is your deal. You're making a great big deal out of this. We just want to be put together with other classmates." And so what we do now is, [for] the very first team—when they arrive on campus and we give them their first team assignment—we do try not to isolate students on that one. But after that, I just use a random number generator and just let it go. In fact, I even demonstrate it to the students. I have it on a little spreadsheet, and I have the teams made up. And I press a button, and every time I press it, the teams

scramble; and I keep pressing the button until they say, “Stop.” Of course, I’m going way too fast for them to actually try to pick the team they want. But they do see that it is random.

Although, I tried something different a couple of times. I thought it worked pretty good. I put all the people that were introverts together and all the people that were extroverts [together]. We gave them the Meyers-Briggs Personality Inventory, as kind of a way of showing them that people are different. When you work together on a team you need to stop and listen, because the fact that you don’t like what they are saying might not be so much content-based as [related to] the fact [that] you have a different communication style. Anyway, we gave them the Meyers-Briggs Personality Inventory, and I used that to put teams together. And so we had four introverts on a team, and then other teams would be all extroverts. It was pretty interesting. When I first gave the assignment, and I said, “OK, go to it”, the introverts would just sit there. They would look at each other, not much conversation at all. Meanwhile, the extrovert table would just be going crazy. They would be yelling and screaming at each other. But then, as the semester went on, as the weeks went on, the introverts would [seem] to work together pretty well, and their report was really better. They gave exactly what I asked for, much more thoroughly documented, and the extroverts’ report was kind of hit or miss. But, to give credit where it is due, the extroverts’ presentation was much better, much more lively and outgoing.

And then, for the next set of teams, I just mixed them up randomly again. And that seemed to work pretty good. People that sometimes get pushed into the background because they’re not quite as assertive—I think they learned how to be assertive on that first half of the semester, and then, when they were put on a team of mixed personalities, they could hold their own.

Ledlow: How long do your teams stay together?

Richardson: I usually have about three sets of teams during a semester, so about five weeks.

Ledlow: Do you incorporate any sort of teambuilding activities into your class?

Richardson: We do in the freshman class where we don’t have as much content to try to get across. . . . One thing we always do is have them pick their own team names, and that gets a lot of laughing, and there’s some bonding going on there. We have some other exercises too with the freshmen that we usually do early on, but we don’t do it with every set of teams. . . . Although we do . . . teach them how to have an effective team

Ledlow: Do you explicitly teach communication skills or point out communication skills like active listening, constructive criticism, or checking for consensus?

Richardson: I do. I give them a lecture and I have a Website that talks about active listening and how to deal with conflict. I don’t dwell real heavily on it. One thing I’ve

discovered [is] that if I go in and try to lecture like an expert—like I do on structural analysis, which is my specialty—on teams, I feel kind of funny and the students look at me kind of funny. It finally dawned on me that I'm not an expert on teams. I'm an expert in civil engineering—not on teams. There are other people out there who are experts on teams. So I've toned it down quite a bit, and I give them tips and examples of what I would do. And then I encourage them to volunteer examples of when they have been on a team and there has been conflict or a problem that they've have tried to resolve, and [I] try to get their input. A lot of times they are as qualified, maybe even more than me. I think students, on average, have personalities that are better adapted to working on teams than a typical university professor.

Ledlow: Everyone I've interviewed has talked about students needing to learn to work together because they're going to do that in industry. What kind of skills do you think that your students are learning that they didn't learn when you were just lecturing?

Richardson: In the generic sense, the ability to work with others; but, in order to do that, they need to understand that there are different personalities out there. And they may have a conflict with somebody solely based on difference of personality. They need to know how to check their first reaction to that and then listen to see what the person is saying. Something else that is pretty practical, that has to do with teams and the industry, is how to run a meeting. A lot of teamwork occurs during meetings. We give them a fair amount of guidance and have them . . . evaluate their meetings from time to time and their effectiveness as a team. We give them quite a lot of concrete suggestions, specific information that leads to more effective meetings. Right down to the first one being, "Maybe we don't need to meet." I think lots of times people call meetings, and you don't even need one.

Ledlow: Why would you choose to use cooperative learning for a particular activity, rather than use some other teaching strategy like lecture?

Richardson: The easy answer is it energizes the students. You can use a very short—say five-minute—cooperative learning exercise, and it will re-energize the students and get them back awake. Then you go back to lecture. That's what I usually recommend to people who want to try it but are kind of nervous about it or [have] never done it before. Because you do fall on your face sometimes when you try to do this, especially if you try to bite off more than you can chew. So a short, five-minute cooperative learning exercise wakes the class back up, gets them awake, and you can go back to lecture.

But I really got into cooperative learning because I realized that the students weren't learning on a very deep level. I would ask them questions based on material they had in previous semesters—I thought very simple, basic, elementary questions—and, one, they didn't know the answer for the most part, and, two, even if they did know the answer, they had absolutely no confidence to explain their answer. They weren't used to articulating the concepts; they were used to filling in formulas on exams to get their grades. I got really frustrated and felt like, "I am wasting my time. If they can't go out in

industry and articulate even the most basic concepts that they have learned here, then why am I doing all this other stuff?” So what I do is I cover much less content, and I have much more cooperative learning, much more class exercises, where the students are interacting with each other.

But one thing I learned very quickly is that if you don't have a deliverable at the end of the time period—if you just say, “I want you to discuss this or brainstorm this topic or work on this problem”—then they quickly learn they can talk about football or whatever until class is over and then walk out. And so when I say, “You've got ten minutes, and at the end of that ten minutes I'm going to pick a team at random to come up and present their results,” or, “I'll call on a team member at random to explain what you talked about,” or, “You've got to put your calculations on this sheet.” . . . what I've found is that the deliverable is not really so important. It is the fact that . . . I asked them to give me something. And that comes in handy with the next exercise I have, because then they'll take it seriously, and they just won't talk about the weather or whatever.

Ledlow: Having a deliverable is one way to make a cooperative learning activity successful. What are some of your other tips for carefully designing a lesson so that it's a good use of the students' time and they are meeting that objective that you want them to meet?

Richardson: Sometimes I try Jigsaw, in which everybody has a job to do and the team's dependent on each of those people. That is kind of hard to set up, but that does get into that interdependence, where the team is dependent on every person in that team to deliver some type of product and to be able to explain it. Or I'll give a quiz, and I'll say, “If everyone on your team gets above a certain level, then I'll give you a bonus point.” So they have some incentive when they are working together. . . .

Ledlow: Could you give me an example of a concept you have used Jigsaw to teach?

Richardson: I'll give them a project, and the project will be divided into different parts. Each team member then has to go and gather data or build a computer model or work up a design. In order for the project to be successful, all three of these parts have to fit together. Or sometimes . . . I've divided up a topic into subtopics. Then I get all the people that are in Subtopic A to get together and develop the answers to a quiz I might give them, or a list of study questions. They have to go back to their home teams, and they have to explain all those study questions to their teammates. Then I go ahead and give the class a new quiz that is similar, but [with] different questions.

Ledlow: Have you used other pre-designed cooperative learning strategies?

Richardson: . . . I use Think-Pair-Share all the time. That's my bread and butter, and I think my colleagues would agree that is a very good one. In fact we are using that one in a workshop today. It's very easy to implement; it's productive.

Ledlow: Have you ever tried using roles?

Richardson: I use roles in the freshman class.

Ledlow: What roles do you use?

Richardson: Well, number one role is “team facilitator,” I call it “team leader.” . . . Then we need a “recorder” and a “gatekeeper”—this is somebody who keeps people from talking too much or draws out people who are fading to the background. You can have a “timer,” someone who keeps track of the time to make sure that you are on schedule.

Ledlow: What’s your job while your students are working together in teams in your classroom?

Richardson: To walk around—try not to be obtrusive. [I’ll] maybe sit down at a desk, and sometimes I look the other way so students won’t look at me and then start responding to me. I want them to realize that they’re the focus, and I’m just kind of listening. Basically I just monitor the class, and when it looks like they’re starting to get off-topic or they’re getting stuck on a problem or whatever, then I can change the exercise. I can stand up and say, “Can I have your attention please? Let’s think about doing this, or let’s move on to the next step” or whatever. I can sit down and actually be a little more directive and help one team or another, but my style is to sit back and do as little of that as possible and really just listen. That’s very valuable, and in a regular lecture mode we don’t get a chance to listen. Being able to watch my students, and listen to them, and to hear them talk about concepts—really get a feel for where their level of understanding is and what types of problems they’re grappling with—it helps me in that semester, and it really helps me in future semesters. It’s a valuable feedback mechanism.

Ledlow: After the teams have been working together, how do you debrief—pull it together or call on people? What do you do to make sure everyone is on the same page?

Richardson: That’s a good question. That’s a weakness really. I’m still striving, looking for better ways to do that. I can call on students at random and have them stand up and explain or come and work part of the problem on the board. . . . Lots of times I hand out transparencies, and the team has to produce a transparency. I don’t usually have time to call on all of them, and so, at random, I will call on a couple of teams to come up, put their transparency on the projector, and I explain what they’ve discussed. An idea I heard about that was developed at ASU in the physics department that I’m pretty excited about uses whiteboards or flip charts. The idea there is you get the group in a circle all facing each other. The teacher is outside the circle, and they are talking to each other—very dynamic. The problem with overheads is you kind of have this parade going up there, with one student talking at a time. But when you have the class facing each other and the teacher outside the circle, not really in the picture, you have this very dynamic interchange that can really go anywhere. I think students have a feeling like they can contribute at any time, not just . . . to wait their turn for their

one little minute to give their summary using an overhead. But that's an area that I think needs more work, at least in my expertise.

Ledlow: What are some tips for ensuring individual accountability? You've mentioned calling on one student randomly, but what are some other ways that you make sure that one student is not doing all the work or dominating the process?

Richardson: Really the best thing that I've used is calling at random—students know that it can be anyone in the class. I don't pull numbers out of a hat and keep the numbers out. If a random number generator did it by chance, they could be called back to back even.

Something [else] that came to mind . . . you can have a couple of students stand up and talk about what their team discussed. But then you can stop and turn to someone else and say, "Can you please summarize in thirty seconds what that person just said?" Lots of times if a student is not called, then they'll breathe a sigh of relief and then shut down for a little while. But if they see that you may actually call on them to summarize what somebody else said. . . .

Ledlow: How do you assess student performance? What kind of ratio of individual to group grades are you using in your teaching?

Jim Richardson: That's a really good question, too. I've experimented with both ends of the spectrum. You have to have some individual accountability, I believe. Students today are really tied into grades. It would be nice if they weren't, but they are. That's just a fact that we're dealing with, so I always have some individual component, a quiz or a presentation.

One thing I do that works pretty good, and maybe it gets back to your last question too, [is] I have a four-person team work five weeks on a design project, a pretty big design project. I'll bring them all in, and each team will give a presentation. But I split the team in two, so I have two students come into the room and the other two . . . [wait] outside. And I say, "You two are going to give the presentation"; they know this ahead of time. And I flip a coin at the beginning; I say, "Whoever gets heads is going to give the first half of the presentation and the other student will give the second half." That way they really have to be prepared to give the whole presentation. Now the downside to that is they probably can't give as good of a presentation as if they really knew what they were going to be talking about. But the good side is, if they are one of the people that likes to . . . just kind of coast and ride others' coattails, then they're in big trouble, because they may well have to talk about part of the project that they might know nothing about. And what that does is it sacrifices presentation quality for a lot better participation on the projects. It does seem a pretty effective way to make sure that everybody stays involved. . . . There are still some students who will try to finesse it. It's amazing. Within about thirty seconds, you can tell if they know what they're talking about. It doesn't take very long. You don't have to have a big twenty-minute long presentation. I really only need to listen to them about two or three minutes. . . .

Ledlow: How do you balance the grades in these out-of-class projects? Is it one score for the whole team, or are there individual components as well?

Richardson: I've experimented with different ways. Probably the easiest is just to give one score for the whole report, divided among four people, and then the presentation is an individual score.

Ledlow: How do you get feedback on whether or not a lesson or a project you've designed and implemented is successful?

Richardson: I sure don't get it from colleagues. I haven't taught in the freshman program for a couple of years now, so I'm really [referring to] the mainstream civil engineering classes. It's a regular lecture class, although I did change it. We added a three-hour lab to it, so I have lots of time to do all these types of interactive exercises. I probably should do more of the surveys or ask students to write down, "What is one thing that went well about this class and one thing that should be changed?" or "Write one thing that you definitely learned from this class and something that you still have questions about." Those are techniques that I've used sometimes, but I've drifted away for whatever reason.

I have to say this—in most universities you don't get rewarded for spending extra time in trying new techniques or in trying to get the students to learn better. There's some inertia . . . after awhile in not getting rewarded. . . . I guess it's like regression toward the mean. . . . You start to fall back and do things the way everybody else does just because it takes a lot of time. And colleagues, for the most part, don't really care—they think you're crazy to be spending that much time in the class. And administration is really not interested—they say they are, but they're not interested in what's going on in my class. . . . That's the long way of saying [that] I think for cooperative learning to really be effective and to really do it right, then my boss has to come and visit my classroom a couple of times a semester, and his evaluation has to find a way into the merit process and the promotion process. Sorry, but I had to say it.

Ledlow: It's true in many departments at our university, too.

Richardson: I mean we're spending all this money and time talking about this stuff, but none of the young faculty at my department would touch this with a ten-foot pole. It's professional suicide. It's really . . . we do it like a hobby, and that's not the way it should be.

Ledlow: How often do you expect students to be working on cooperative activities outside of class versus inside of class?

Richardson: . . . Well, the projects have a lot of [time] outside, and then in class . . . I'd say probably about fifty percent of my class time is cooperative learning.

Ledlow: When you're doing out-of-class design projects with them, obviously it's not as easy as when they're in class to monitor who's participating and who isn't. If the student comes to you and reports that another student didn't participate or there's conflict in the team, how do you react?

Richardson: I talk to them and see if there is not some way they can go back to the team and fix the problem—either quiet down a dominant member, or energize the slacker, or whatever it is. The best suggestion I've heard for this I have to attribute to my colleague Russ Pimmel in electrical engineering. He gives semester-long design projects. The whole grade is really based on this project, so if you get placed with some slackers, it has a big impact. Now what he does is he has the teams give regular status reports, maybe once every three weeks. They have to write a little section on how their team is performing and even comment on the other team members. So he tells them, "If you have a problem with a team member, you have to come to me right away; and if you do that, then I'll take care of it." And he'll sit and talk with them individually, or all as a team, and usually he can work out some type of resolution. Sometimes he actually has to remove a person from a team, but he tells them if the students don't come to him early on . . . [if they] wait until the end of the semester and then complain, then it's too late to do anything, and they get the grade that their team gets. So I think the early intervention, with the instructor actually stepping in and talking to the teams, is the best idea that I've heard to deal with people who don't participate.

Ledlow: How large are the classes that you teach?

Richardson: Average of about twenty students.

Ledlow: Have you taught larger classes than that in the past?

Richardson: Yes. The freshman classes are forty to sixty students.

Ledlow: Does class size affect your choice about what kinds of cooperative activities to do?

Richardson: Not too much. [In] the smaller class, I get a lot more contact with the students—I can spend more time [with individual teams]. In the larger class I am much more of a manager, keeping track of what time we're at now and how . . . you get papers handed out to the students and collected back. Although, we have student helpers in the larger classes. I still do the same types of exercises with sixty, as I do with twenty, as I do with ten. I just have more time to spend with the individual students when I just have ten.

Ledlow: Are you still doing the same types of cooperative learning activities as you did when you started, or has your approach to cooperative learning evolved over the years?

Richardson: It has changed. I'm definitely much more conscious of giving the students a definite deliverable. If the students don't have a deliverable, they're not going to take

it seriously. They're very goal-oriented, grade-oriented . . . it's too bad. I used to try to get on their level, or try to bring them to my level, and say, "Hey, this is a better way to learn. Let's talk about this among ourselves." And most of them would say, "He's crazy. We've got thirty minutes now to talk about whatever." So I'm very conscious of having a deliverable. I'm conscious of [the] length of time that I let them work together. Too short: they never really get the juices going. Too long: they start to diverge and get off task. . . . When I'm walking around listening, it is very easy to tell when they haven't had enough time, or they've had too much and it's time to move on to the next.

Ledlow: If another faculty member came to you and said that they were really thinking about using cooperative learning, what advice would you give them?

Richardson: Start small. Don't do what I did—and a lot of people do—which is try to wade in and completely change your class with great big, over-arching cooperative learning exercises. Start with something like a Think-Pair-Share, and just do a little bit of it during the semester. . . . You know, the thing about cooperative learning is you just can't tell someone how to do it. It's very much dependent on the personality of the teacher and on the personality of the class. It's more of an art than a science, and so teachers need to find out where they fit into the spectrum of different types of cooperative learning—what works for them and what doesn't. There is a fair amount of expertise to be gained, and if you start too big . . . I've seen a lot of people do this—they start big and really get turned off to it. So my advice is always start real small. I'll actually ask them, "Well, okay, what are you talking about tomorrow?" and I'll try to give them a specific suggestion for how they can use a ten-minute cooperative learning exercise in their fifty-minute lecture.

When you turn control over to your students, which is what you're doing in a cooperative learning setting, you need to be prepared for the students taking control. . . . Now the students are talking to each other. Before, when you did something that they didn't like, there might be some individual grumbles but no organized resistance. Now they have a voice—they're used to talking to each other, they know each other, they compare notes, and many times we've had organized resistance rise up. And that can be okay, if you're ready to deal with it. You have to keep the communication channels open. You have to keep listening and giving them the chance to talk.

Ledlow: When you think about teaching using cooperative learning, what's one of your "wow-that-was-great" moments?

Richardson: I had a couple of highlights last semester. One of them was that I had the students design a sports arena roof. . . . That's where the real interesting structures occur: in real long spans like the Georgia Dome or something like this. But it was very open-ended. They had been working cooperatively all semester long. I was a little nervous as to what I was going to get, and we had our presentations, and I was sitting back there, and I was just on a high. It was so much imagination and creativity. Some of it was a little hokey, but so much energy they had put into that. It really was rewarding. And you know, the thing was the students didn't really think they did that

good of a job. But I've been teaching the class for twelve years, and I was amazed at the creativity and energy that I got out of that last project. It never would have happened with a traditional class.