This interview with Caesar Malave, Associate Professor of Engineering at Texas A&M University, took place on the campus of Arizona State University on April 5, 2001.

Susan Ledlow: . . . How long have you used cooperative learning and . . . why did you get started?

Ceasar Malave: . . . I started using cooperative learning . . . the spring of '93 . . . because we were writing the proposal for the Foundation Coalition and Lynn Bellamy, who was a professor here at ASU, came to visit us. And he gave us a short workshop on how to use active learning in one of the engineering courses. . . . I thought the idea of using student teams and trying to listen to the students while they're working was an exciting concept. So the next time, [we] started using the active, cooperative learning in the classroom.

Ledlow: Could you compare your experience using cooperative learning versus more traditional strategies such as lecture? . . . How have your students responded to it, or what are the differences in your students from when you were lecturing and now?

Malave: . . . At Texas A&M we have large classes, and one of the things I always noticed in the classroom was that students were not really engaged. And here I was delivering this great lecture, and I would look, and the students would . . .just not [be] in the classroom, at least by looking at their faces. . . . Now I see the students engaged in the classroom, and from the point of view of the faculty, I have seen a difference in what . . . I consider a successful class. I used to believe that a successful class was when you finished all the material you wanted to cover that day. . . . Now a successful class, to me, is if I have a feeling that the students understood what I presented to them.

Ledlow: Do you think students are getting better grades, or learning more things, or learning different things? How has their learning been impacted?

Malave: . . . The assessment that I've done in the class has not been a formal assessment. What I've noticed is that I can do more design problems in the class than before. . . . One day I compared my grades to one of our best teachers who was teaching the same class that semester. And I noticed we had more or less the same average in the classroom, but I had less numbers of students getting D's and F's in my class. And when I went to the literature, I found out that that's what you see—you see that more students move up and perhaps the average grade in the classroom stays the same [in the cooperative learning classroom]. And our experience in the Foundation Coalition was exactly the same.

Ledlow: How did you learn to do cooperative learning after that initial presentation by Lynn Bellamy? Did you get more formal training? Did you read? Did you have discussions with colleagues? How did you do it?

Malave: . . . I took the [short] seminar given by Lynn Bellamy. . . . Karl Smith came to our university, and he also gave us a one-day seminar. And then I attended a three-day seminar with Karl Smith at Rose-Hulman—it was part of the Foundation Coalition. And I remember also that I came here to ASU in the summer, and I took a seminar not only in active and collaborative learning—it was more on teaming—and the seminar was delivered in an active way. So that, to me . . . was something really important, because I was able to see how somebody was using active learning [to] teach . . . me a concept. And in that case, it was the concept of teaming. And after that, it has just been talking to colleagues. You know on the Coalition project we went through five years that we were doing [cooperative learning] in the classroom, and we had weekly meetings, and we were able to exchange different techniques that we were using in the classroom.

Ledlow: I want to follow up on what you said. You kind of mentioned active and cooperative learning. For you, what's the distinction there?

Malave: Well, this is something we do in the workshop. As engineers, you know, sometimes we mix these terms. And you probably will see it in the workshop. Active learning is when we try to get the students to also . . . engage in the classroom. So they discuss, they argue, they present to each other. And then, what we call collaborative learning, that's when we have the positive interdependence and individual accountability. And one of the themes that we have in our workshop is this idea of individual accountability, you know, holding the students accountable for their individual work and also for their teamwork. So, that's where we make the distinction. And in the workshop we call it active collaborative learning, or ACL is how we refer to what we've done at Texas A&M.

Ledlow: What skills did you need to develop to be effective using active or cooperative learning in your classroom? I mean, you need certain skills to be a good lecturer, but what sort of skills did you need to develop to be a good cooperative learning teacher?

Malave: You know, I can answer that by telling you that the faculty that I've seen struggle in implementing the active learning are those that . . . don't feel a comfort level in the classroom. They still like the traditional methods, because they separate them from the students. And I believe that one of the skills that you have to develop is that you . . . have to be comfortable around the students. You have to develop the skill of being able to take a question from the student that perhaps you might not be able to answer at that point. Because that's one of the things I have observed happen in an active, collaborative classroom: . . . the students are working, and a question might come out that you didn't plan for. . . . Another skill is the idea that—I don't know how to put this one—but, you know, we all think that we know our subject well. I have discovered, personally, when I was doing the [lecture] classroom, that there were things that I didn't know; but I was never challenged in the classroom. So I have been forced to know my subject even better than before in the active classroom.

Ledlow: Let's move into setting the climate for cooperation. Do you explain to your students why you're using cooperative learning?

Malave: Yes, I do. We . . . started this in the Coalition. We have a two hour introduction to teaming. And within that training, we also tell the students about the fact that the environment in the classroom is going to change. And I even show them data that demonstrate that the learning will be better in the classroom. So they know . . . that I'm going to switch from the traditional lecture that they're used to, to a more active classroom.

Ledlow: What methods or criteria do you use to set up teams in your classroom?

Malave: We started in the Coalition looking at entrance characteristics of the students. Remember that we start out with the freshman year, so we had information on the students. You know: GPA, school ranking, and so on. We use any information we have on the students. I personally give them a questionnaire, and I ask them about previous courses that they've taken. I ask them how they rank themselves on different competencies that I require in my class, for example, the use of the computer, or the use of mathematical modeling that is . . . a requirement in my class. And I use that information to create teams that are more heterogeneous. I try to put a student who considers him or herself very strong with a student who perhaps considers him or herself a little bit weak in that area. And the only [other] criteria that we use are gender and ethnicity. We try for the female student not to be the only one on the team. And we try for the underrepresented student, either Hispanic or African-American, not to be the only one on the team. Sometimes we cannot do that; we don't have enough students. But that's another thing we learned from the literature and from the experience in the Coalition.

Ledlow: Have you incorporated teambuilding activities into your classroom?

Malave: Yes, as part of the training, the first week of the semester and also throughout the semester, we try to take some of the in-class exercises and try to make them also teambuilding exercises. But mostly they happen at the training, the first week of the semester.

Ledlow: Can you give some examples, either of the teambuilding you do at the beginning or some of the academic tasks that you turn into teambuilding exercises?

Malave: . . . At the beginning . . . we use the desert survival exercise . . . to show the student[s] how working together as a team, they can get a better answer. But we also use some of this [with] building. . . . In LEGO building the students have to build the tallest tower—and you give them some constraints—and they have to do it first without any teaming skills. Then . . . you go through some of the teambuilding techniques, assigning roles and so on, and then they have to do it again. And hopefully they will see a difference when they use some of the teaming techniques. In the classroom, what I do is I try to get exercises that are open ended, and they require discussion. That's one of the things I've seen lacking in our students is the ability to engage themselves in an argument. You know, it's something that sometimes they resist. So, if I have something that might have an ethical component, I try to use that as a team builder, because there is no right or wrong, and it requires the students to argue and discuss. And then after the exercise, I try to go through the process. I ask them how they went through the process, how they came out with a final answer, and how they felt when they were going through the process.

Ledlow: Do you also explicitly, as part of your teambuilding, teach communication skills like active listening, or constructive criticism, or checking for consensus?

Malave: We talk to them about that in the first week of their training. But . . . I don't go into any formal training about how you develop your listening skills. I refer them to books. . . . For example, The Seven Habits of Highly Effective People [by Stephen R. Covey] has a whole chapter [on listening skills]. I [also] use some of the ideas out of the Team Handbook on how to provide constructive feedback when you are in a situation. So we do a little bit [of communication skills training] as part of the training that we give the students at the beginning of the semester, but we don't get into any of the details on these topics.

Ledlow: What skills do you feel are important to develop in your students to prepare them to go out and work in a team of engineers? . . .

Malave: I think that one of the things that I try to do in the classroom as part of the teaming skill, is this idea of feedback—the idea of giving and receiving constructive feedback. And I keep telling them how easy it is to insult somebody—you can always tell somebody, "I don't like this, I don't like that." But I keep telling them that one of the things industry is looking for is people who can deal with difficult situations in a team. And many times that requires confronting somebody and also requires that somebody might tell you things you are not doing well in a team. So I tell them that if they can develop the skills to give and accept constructive feedback, then that will be something very valuable when they go out and work as engineers.

Ledlow: Ok, we're moving into talking about planning cooperative learning lessons. . . . When and under what circumstances do you choose to use cooperative learning rather than some other teaching strategy?

Malave: . . . I still do some lecturing, which is something I do in my workshop. People believe that you are not going to do any more lecturing in the classroom [when you are using cooperative learning]. And in a way, unfortunately, I jump to lecturing when I'm behind, which is something we try to tell people in the workshops not to do. I always tell people that lecturing is a very efficient way of teaching. You can cover a lot of material in a short amount of time. But the active collaborative learning, I try to use it when I see there is a situation that will require the students to discuss the final answer. I look for those situations in my class, I look for ways. For example, there might be four different ways to solve a problem, and I assign one of those ways to each member of the team. And I ask them to figure out which one is the best way to solve the problem. The first question that I get is, "What do you mean by best?" So, on purpose, I create these situations in which, well, you have to define what is "best," and that's part of working together as a team. You know, best might mean this procedure gives me the most accurate answer, or best might mean this procedure gives me the answer the fastest. So they have to decide that. And I like those situations in which there is no clear answer, and the definition of a successful result is also up to the team.

Ledlow: How is preparing for cooperative learning different from preparing for a lecture?

Malave: . . . Most people think that getting ready for a cooperative class takes longer, and to me, it took [less time]. Now I must tell you that I am not a faculty member that has a class lesson plan, and I'm going to do this in the classroom and spend an enormous amount of time preparing class notes. So, for me, switching from the traditional method to the cooperative method was really easy. It was really easy, because I would look at what the students can do in the classroom when I am covering this subject so I can do a few bullets just to guide me in the classroom. And then all I have to prepare is what I am going to ask the students to do. Now, initially, it did take a lot of time. When I was trying to [decide], "Am I going to do a Jigsaw? Am I going to do a Think-Pair-Share?" it took a lot of time for me to get ready for the class. But today it doesn't take that much [time].

Ledlow: Well, that's the perfect segue into the next question about whether or not you use pre-designed strategies like Jigsaw, Think-Pair-Share, Academic Controversy.

Malave: . . . I used them at the beginning. And I follow Karl Smith's book. . . . He has all the examples, and I try to give my class topics and put them into one of those scenarios. But mainly, P.K. [Imbrie] and I developed one: that is the one I use in the classroom. . . . We ask the students to do something individually first, and we believe that that is something that will help, you know, the [student who] prefers to think by him or herself first. Then we ask the students to combine in some way the answers, and that is when I add the controversy. If you see our workshop, you will see that when they combine the individual work, we ask them to rank the best. We ask them to come out with individual answers: which one was the best and why. So we add the controversy in there. And then we ask the teams to come out with a team solution in which they have to combine, in some kind of way, the individual ones. And then we ask somebody in the team to present the team solution. So we have come out with a way to present material in the classroom that we think has positive interdependence and also individual accountability. . . . .

Ledlow: . . . You said that it's really important as you plan these activities to incorporate positive interdependence and individual accountability. Can you talk more specifically about some of the ways you do that? For example, do you assign homework, do you give quizzes, do you assign roles, do you have written products or instructions? What are some of the ways you build in [positive interdependence and individual accountability]?

Malave: . . . We assign roles. The teams . . . have specific roles they have to play while they're working the exercises. So that's one way we do the positive interdependence. We also have classrooms that have computers, and all the classrooms—well, most of them—have two computers. And we have teams of four (that's the way we usually teach our classes at Texas A&M), so they have to share the computers. So it brings the idea of resource interdependence that Johnson and Johnson and Karl Smith talk about. We also do something in which we assign each member of the team, perhaps, a subtask of the final task that has to be accomplished. That is a little bit difficult—to find tasks that can be broken down that they can do some work independently, but, at the same time, they cannot do the whole task by themselves. So that combines the positive interdependence and individual accountability. [For] individual accountability we have something we call check for understanding in the classroom: we call students to present their results from the teamwork. We also have quizzes based on the homework. . . . Professor Nicholson from Oklahoma . . . came and visited us and had this idea of an R-A-T. You know, we call it a "rat". . . . The students . . . don't like the name of the quiz, nor the quiz. But it's the idea that you assign homework—usually it's reading homework so that students will be prepared for the exercises in the classroom. That's why it's called the Readiness Assessment Test—the RAT. And when [students] come to class, we can start the class with a quiz. And the quiz is an individual quiz, so they have to read the material; and I want to find out if they have read the material and they can come prepared to class. Now you can do combinations of this RAT, and it can have a teaming component. . . . You can give them a team quiz and then give them an individual quiz. And you can have a way to combine the individual component of the quiz with the team component of the quiz. And that's something that we have done in the freshman year, and that's something I still do in the classroom. I still have team exams and I have individual exams, and I combine [them] in such a way that the final grade is a factor of individual work and also teamwork in the classroom.

Ledlow: A common question from new people who are just starting is, "What are you doing while your students are working in groups?"

Malave: . . . I'll tell you—and this is a good story—the first time that I did it, I went out and drank coffee while the students were working in teams. I read the newspaper, and I said, "This is a great way of teaching, you know, I don't have to do much." Well, that was precisely the first semester that I tried active learning. I was team teaching with another professor, and we drank coffee and we read the newspaper. That is a mistake. What we do now, as the students are working in teams, is that [we] are just walking throughout the classroom. I keep telling people that when I finish a two-hour active, cooperative class, I am really tired, especially in a classroom with 100 students. And you have steps in the auditorium, you are just running around, you are listening to the students, and you are answering questions in the classroom. But mostly . . . I am listening to the students as they try to solve a problem.

Ledlow: As they are doing that problem solving, do you ever participate? Do you ever intervene if they are off track?

Malave: I have a tendency to intervene. . . . You have a tendency, like, you know, “Give me the pen, and I’ll do this for you.” So I do that less now. I listen. I intervene only if I see that the team cannot solve the problem. I learned this from P.K. [Imbrie] mostly. He was very good when the students would come and say, “We don’t understand this.” And he would say, “Have you asked your team members?” “No, we’ll go back.” And the problem is that students feel really uncomfortable in this situation, because they want you to give them the answers. So I only intervene when I see that the team is just in a hole. They cannot solve the answer, and they are frustrated to the point that the learning now is going to be affected. That is the point [at which] I try to intervene.

Ledlow: . . . After they have been working together, what do you do to pull it all together?

Malave: They have to present. And because we have classes with ten, fifteen, twenty-five teams, not all the students can present. So I explain to them that I am going to call some of the teams’ work, but I don’t have time for all the teams to present. We also discovered in our work that the students, once they do the work, they want you to call them. They want to present their work. So I call a few teams at random, and then I ask in the classroom, “Is there any other team that would like to add something to the discussion?” So, they do present. And sometimes I collect the work. Sometimes I let them know in advance that I will be collecting the work; and sometimes I don’t tell them, and I collect the work. But I try to let them know in advance. Most of the time I will collect the work and it will be counted as an in-class exercise, which is a percentage of [their] grade.

Ledlow: Do you have any special tips for managing teams in the classroom effectively? Do you do anything like team folders or classroom management software, like Blackboard CourseInfo?

Malave: Yeah, the team folders we do. We started doing team folders when we had twenty-five teams of four in the freshman Coalition pilot, and we were trying to collect homework or give exams. So, teams do have a folder. And I believe Lynn Bellamy, also in one of the training Coalition [courses], used team folders. So when I grade homework, when I want to give a handout, I enter the classroom and I put the folders on my desk. And there is a student that is responsible for walking to the front of the classroom, picking up the folder, and then bringing the material back to the teams. [For] classroom management, we also have TAs in these classes, so we work together with our TAs in the classroom. We don’t use electronic classroom management, even though the students do have the laptops in the classroom. We have the folders; when the students present, we ask the students to present to the class (students have the tendency to present to the faculty member). We have a process called an issue bin [that we use in the classroom]. When we have a question from a student, we discovered if you engage a student one-to-one in the active classroom, you lose the class. So we try to answer the question, but we also ask the student, “Would you write that question?" We have sticky notes in the classroom, and they will place them in a location. And when students are working in teams, I can go read the question, and then I can try to answer the question for the whole class. . . .

Ledlow: Let's move into talking about assessing, grading and reflecting. And let's start with . . . grading. What's the percentage of group versus individual grades in your classrooms?

Malave: . . . I have tried all percentages. I have gone from fifty percent teaming to ten percent teaming. I thought that the fifty percent was too much in my classes. And even, . . . getting the feedback from the students, they thought that it was too much. And if you look at making fifty percent of the grade teaming, the problem that I had was that you could have a student fail the individual part and still pass the class. Now it all depends. When you're teaching a senior design class, you could have a class that is one hundred percent teaming. So I have used twenty percent . . . usually. . . . Twenty to twenty-five percent is teaming. If I have a project in the class, the percentage will be a little bit higher. But in the Foundation Coalition and throughout my experience, we realize that twenty to twenty-five percent is enough that it will make the students be serious about the team and is not that much that [the percentage] will make the free rider, or the student perhaps who wants to rely on the other students doing the work, pass the class without passing the individual component of the class.

Ledlow: Do you grade all of the in-class problem sets that you are giving the teams?

Malave: Yes. Well . . . I have a TA in my class, and my TA grades all that.

Ledlow: And when you have students turn in these problem sets, how do you assess individual accountability?

Malave: Sometimes I ask them to turn in the individual work, and sometimes I ask them to turn in just one answer per team.

Ledlow: Now how do you get feedback on whether or not an activity you've designed and implemented is successful? How much do you get from students, versus colleagues, versus some other process?

Malave: . . . The main thing that we use is plus/delta, which is another technique we learned here in the seminar with Lynn Bellamy. At the end of every class, I ask my students to give me a "plus" of things that they enjoyed, that they thought were useful to them, and a "delta," something they would like to change. It's interesting because plus/delta is another way to teach the student a little bit about professional behavior, because it's a delta—it's not a negative. They still have to tell me how they would change it to make it better. And that's where they tell you, "The activity was too long. We couldn't finish." or "It was too simple, you know, we were there waiting for you to work with other teams while we were here with nothing else to do." . . . I read that at home, and I try to provide them with what actions I am taking, based on the feedback they are giving me.

Ledlow: Do you ever have colleagues come in and observe your class and give you feedback?

Malave: [We all do] now, as part of promotion, tenure, and post-tenure processes that we have now in the university. But it's difficult in the sense that you need to find somebody that is aware also of what you need to do in the classroom. And the problem, at least that we have, is that most of the people who get assigned to review you are senior faculty. And we have not done the good job that we have done with the younger faculty in trying to get them into the active and collaborative learning. . . . So during the Coalition years, we had colleagues come. For example, P.K. [Imbrie] would come to my class and tell me these are the kinds of things you can do to improve. But right now, I must tell you that no, I don't have [teaching observations] on a regular basis in my classroom. Only if my department heads say that I have to. . . .

Ledlow: How often do you expect students to work together outside of your classroom?

Malave: . . . I like out-of-class projects. And that's because I like to do a lot of design in my class. We have an unwritten rule: we expect our students to work between two and three hours for every hour that they spend in the classroom. I expect my students to get together about two hours outside the classroom. But I also tell them that team [members] can do a lot of work by themselves. You don't have to get together to get the work done. So that's another message that I tell them in the class: effective team [members] do a lot of work by themselves, and then they get together to make decisions and to put together the work they have done individually.

Ledlow: Out-of-class projects, in my experience, are the hardest things to do well because of the issue of individual accountability. It's not like your classroom where you are sitting there monitoring, and you can see and give immediate feedback about those things. How do you structure or design your out-of-class projects so you don't get that "one student did all the work" complaint?

Malave: . . . Number one, I think that the training that I give the students at the beginning of the semester helps. I tell them about what it is to work on a project. I talk to them about the free rider. I talk to them about the overachiever, which has given me more trouble than the free rider. We talk to them about the Code of Cooperation and how they have to develop that and work together as a team. But we also have peer evaluation. I must tell you, I am not a fan of peer evaluation, because sometimes they do become popularity contests. But it's one way that . . . you have to assess your own work and the work of your peers. And I wish there was another way that I could do that, because all the years that I have done this, some of the biggest complaints have been from a student being evaluated by another student and going down a letter grade in the class.

Ledlow: So do your peer evaluations translate directly into grades?

Malave: Yes, we [use] . . . a modified system like [Richard] Felder's. . . . You can give each other a 'satisfactory,' or a 'good,' or an 'excellent'; and then you translate that to a set of points that becomes a multiplier to the grade in the project. And that's what we do.

Ledlow: How do you handle team conflicts? If you've got a team working on a design project and a student walks into your office and says, "My team's horrible. Move me, help me, do something," how do you respond to those complaints?

Malave: . . . We developed a process that we call team facilitation. . . . [The Foundation Coalition has] a couple of rules: number one, I never take a complaint from an individual student. The whole team has to be in my office, unless it's an issue. For example, if it's a sexual harassment issue, obviously, then I want to have to handle [the problem] one-to-one. But if it's an issue that so-and-so is not doing enough work, they have to be in my office—I mean the whole team has to be in my office. And I tell them that at the beginning of the semester. First question that we ask them—and we developed a process throughout the Coalition—is "Let me see your Code of Cooperation." Ninety percent of the time we get an answer that says, "We don't have one." And we tell them that in the training: . . . most of the teams that we have observed that struggle in the classroom . . . never develop a set of ground rules. And then we go through a process in which we ask them, "What have you done individually in order to move forward on each one of the items that you mentioned in the Code of Cooperation?" We discovered that just taking the teams through the conversation on, "Where's your Code of Cooperation, and what have you done related to each one of these items in the Code of Cooperation?" You solve most of the problems just taking the teams through that conversation.

Ledlow: How large are the classes that you teach?

Malave: They go from 100 students to forty-five to fifty students.

Ledlow: And are you doing different sorts of active, cooperative strategies depending upon your class size?

Malave: Yes. I think that when the class size is smaller, you can do more of the complex structures. For example, in Jigsaw (my friend P.K. [Imbrie] will disagree with me on this one), I have a hard time doing a Jigsaw with 100 students. I have an easier time doing a Jigsaw with thirty students. Sometimes I do go as low as thirty students. But I can do it with thirty, thirty-five, fifty students. I can have a lot more in-class presentation when the class size is smaller, and I find myself doing a little bit more lecturing, more than I should, in large classes.

Ledlow: Could you follow up and give me examples of some of the things you use Jigsaw for? You've mentioned it a few times. What kind of content might you use, or what kind of problem might you use for a Jigsaw?

Malave: In my course, a typical problem for Jigsaw is when I am trying to teach a student an algorithm, and there might be four different algorithms. . . . I either have it in the textbook, or I have brought it into class, and then—it's really neat, you know—each student has to become an expert on each one of these solution procedures. And they go to the expert teams, so they become an expert. And they come back and they tell the team about their solution procedures. And once they become an expert after the Jigsaw, it's an excellent introduction to do a real neat problem. . . . They get the problem, and now they have to decide which method to use.

Ledlow: As you've gotten more skilled doing cooperative and active learning, what has changed? Are you still doing the same sorts of things, or have you added things or deleted things? How have you developed as a teacher?

Malave: You know . . . I don't know if I have changed that much. I feel more comfortable. The class preparation is a lot lower than it used to be, but I don't know if I am [doing] new things. I think that I am getting better doing the ones I used to do at the beginning. . . . I might go to an industrial engineering conference, and I might hear the professor saying, "You know, when I'm teaching this, I do this." So I'm bringing things to my classroom, but [course development] is more content related than related to the pedagogy of active and collaborative learning.

Ledlow: If another engineering faculty member came to you and said they were considering using active, cooperative learning, . . . what advice would you give them?

Malave: . . . The advice that we give people now is to start slow. In the Coalition, we changed everything, because we had a grant, and we had to do . . . the active learning, the active collaborative learning, the teaming, the use of technology, all at once. And one of the things that we lost was the assessment—we could never assess, (the students were getting better why?) because we were doing five different things at the same time. And it's overwhelming. And at the beginning of the Coalition, when we were trying to get new faculty, we were trying to tell them, "You've got to do what we did." And I think that was a mistake. They need to start slow. They need to get a part of the course that they think they can do the active collaborative learning, and just do that part. And then, every semester perhaps, add a new one. Because you are [also] going to get . . . the concern that, "I cannot cover the same amount of material." And faculty members have to feel comfortable about that aspect.

Ledlow: Could you share some of your best experiences using active, cooperative learning? Did you have any of those "Aha!" moments—"I feel so good, this is the right way to be teaching"?

Malave: . . . I have one that I tell a lot of people. There is a very difficult concept in my class, and I always thought it was an easy concept. . . . As an industrial engineer, one of the topics that we deal with is when you are trying to produce something with a set of machines. So you are trying to assign activities to machines. It's a typical industrial engineering problem. And there is a very complicated heuristic in the class that I teach, and I always thought that it was easy, and I always had problems with students understanding. So initially, your typical faculty thinking is, "These students are getting worse. When I was a student, I understood this very clear[ly]." And something that happened while using active learning was I saw a student explaining to another student the procedure. And the student had this drawing, and these circles, and these balls, and "This is what you have to do." And when I saw that, I thought it was great. You know, I've been teaching this class for ten years, and it took . . . students explaining to each other something, and using these diagrams, and doing it at their level, for me to understand that perhaps this was a complex subject, and I needed to change the way I explain it in the classroom. And that's how I explain it today, and I learned it from students.

And that's something that they tell you when you go to an active, cooperative learning workshop, that you learn it all from the students. But I never had that experience until I had it with this specific topic. So I discovered there something that everybody tells you, and it's that something that is second nature to you, it might not be for the students. And perhaps the way you are explaining is not the way that they learn. I wasn't using any diagrams, I wasn't using any arrows and balls and squares; I was just explaining it in words and with equations. So, I think that that was a great experience for me.

Ledlow: Is there anything I haven't asked you that you wanted to touch upon?

Malave: Well, I have something that I tell people in the workshop. It's that we have been really concerned about teaching evaluations. At least in many universities they have become a lot more important than they used to be. My personal experience is that my teaching evaluations went down when I used active learning—the first time. . . . When I was using it the first time in my class, they went down. And we realized that at Texas A&M, and what we did was we changed the teaching evaluations, because they were asking the students questions that were not related to what [we] were doing in the classroom.

For example, "Is this professor organized?" Well, the students think the first time that you are disorganized, because, to them, their reference of an organized class is a lecture. So having all these teams talking to each other . . . to them they get the feeling you are not being organized in the classroom.

[Another question was], "Was the grading fair?" Well, the students believe that maybe the team aspect is influencing my grade—is that fair or not? So . . . at Texas A&M . . . we changed the questions that we asked the students, and we got rid of that problem. So I tell faculty members that if they have experienced [low student evaluations] in the university, or if they have heard of faculty members experiencing that in the university, perhaps it probably means that the instrument is wrong. . . .

Ledlow: What are some of the questions you have now that are different?

Malave: Oh, we ask precise questions: “Is your faculty member using teams in the classroom?” Because we thought—and when I say “we,” this was started by our Dean—we thought that was something important in the classroom. “Does the faculty member engage you in an active way in the classroom?” So now the questions are related to things we believe the faculty members should be doing in the classroom. For example, textbooks—the students do like for you to follow the textbook—so there were questions like, “Is this textbook good?” Well, you go into the active format, and you discover there are a lot of things you can do that they are not in the textbook. So now you are not using the textbook the way you used to. Well, now the students are a little bit upset that they spent $100 for the book that you don’t use anymore. Or you don’t use it in the way they are used to. I find myself jumping from chapter 1 to chapter 3 in many textbooks, based on what I have learned from the students. So now . . . that question is not there anymore. . . . So we tried to put questions in a way that when faculty members now see the questions, they go, “Oh, so maybe these are things I should be doing in the classroom.” So we tried to measure something that we would like to see from the faculty member.

Ledlow: Thank you.