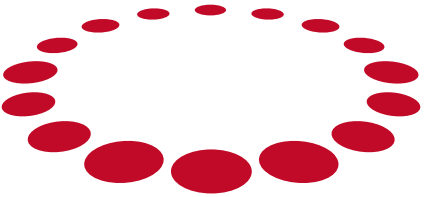

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Cooperative Learning in Action: Strategies that Work in the Classroom

Nancy A. Madden

Debates on education | 40

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Introduction

We were working to become teachers when we were at Reed College and were concerned at that time about the number of students who were just sort of written off, they were not successful and not really expected to be successful in school and we noticed that the same children could learn every score of their favourite baseball team and rattle off the ratings and the statistics and it wasn't that they weren't able to learn it was that they weren't engaged in school.

And we wanted to bring the excitement of the sports team and the support of the sports team to these students so that they could be successful in this very important part of their lives in learning as well as with their peers in sports. So we began to play with cooperative learning structures at that time and we knew we had to bring team celebrations into the classroom.

So that was one of the key elements that we brought in first so we asked kids to work together in teams and we got them interested in working in teams by saying if you all do a good job of learning then your team will be successful.

So in the typical classroom what was happening was that the teacher would pose a question. The students who knew the answer would raise their hand. The other students who didn't know the answer would hide and very few students were actively engaged and those students who knew the answer weren't interested in the students that didn't, they weren't asked to be interested. And those students who didn't know the answer knew that they really didn't have a chance so they might as well, you know, just stay quiet and not really be engaged.

So in bringing teams into the classroom we were changing that entirely so that those kids that did know something had a responsibility to engage

their teammates and make sure they did learn. And those who had a chance to engage and explain and talk suddenly found out that they really did know a lot because they could share it with their teammates.

We began to play with this idea then went on to teach for a while and then to do research at Johns Hopkins. We went all the way from one side of the United States to the other and the United States is big, it's not like Europe, which is tiny. So we came to Johns Hopkins and did lot of research because we found that while cooperative learning is very quickly able to break down a lot of barriers in the classroom and create very positive social interactions in the classroom and create engagement. It doesn't always result in increased learning and we wanted all of the social benefits of cooperative learning, but we also wanted to increase the actual learning of all students in the classroom. Again, our concern, our initial concern, was that some students were not able to reach their potential, they were not learning what they could do, even though we knew they could.

So we not only wanted the positive social results, we wanted increased learning for students. So as we did the research we found out that there were a couple of critical elements to ensuring that learning occurred. One was that all students had to demonstrate their learning individually, we call it individual accountability. That learning could be demonstrated through a typical assessment where teacher would give an assignment and would score that assignment and then the teams' results on those assignments would be added together and the celebration done for teams that did a good job.

It could be on a piece of writing that students would write. It could be on a set of oral responses that students would give. So there is a wide range of ways to assess the individual learning of students. But it was critical that the individual learning be assessed. Many folks who support cooperative learning work sometimes by just providing a product that the group does together. When our children were in school many times their teachers would put them in groups where the product of the group was perhaps a report, or perhaps a diorama or a product. But often times in our kids experience one child in the group completed that product rather than all children contributing and learning.

So we don't consider that the kind of cooperative learning that will work or it's not a matter of not considering that we've done the research that demonstrates that that kind of group work does not result in increased learning for students because it's not necessary for all students to demonstrate their learning.

So that was one of the elements that we knew, we determined through the research that was necessary for students to learn more in a cooperative learning structure. We also determined in our research that students needed to have team feedback. We sometimes call that a team reward but it's not really necessary that that teams be rewarded, but it's necessary that teams get feedback on the success of their work. It's not enough that kids simply do work together. It's fun. It's better than just inactively sitting and listening to a teacher. But if there isn't feedback, there isn't the motivation to make sure that every member of the team is actually engaged and is working.

Cooperative learning

So picture a classroom where...let's say it's a math classroom where ten year old kids are working on learning how to do problems with fractions. So students are learning something that's a little complex and you know something that's challenging to them. It's hard for another student to say you didn't get that right, you need to work on that harder, but if they are in a team where their team's success depends on the fact that every child in that group actually learns the material because they're going to have to demonstrate that learning individually then that gives kids permission to say, no you have to work harder on that, you can't just let that go, you can't just accept that you can't learn that, you actually have to learn that, you have to master that.

So that it gives kids permission to really demand from each other more effort and more work and they get greater satisfaction for doing it. But if there isn't that team feedback, frequently, there isn't that motivation to ensure that everybody is doing their best and working hard. So I've gone well beyond how did we get started here. One of the things that we note and you know I'll ask you how many of you are teacher in the audience? Many of you are teachers. Most of you are teachers.

In your experience in your schools is there cooperative learning used, is that something that's common in your in your schools? Raise your hand if you see that commonly in your schools. Often in the United States and perhaps not here and I will hopefully hear more about that as you ask your questions. Often in the U.S. we see what is called what we would call group work but not what Bob and I would call true cooperative learning. Because if the interdependence, if true positive interdependence is not there then again the group doesn't have the motivation to ensure that all members of the team are working, so we make a distinction

between group work and cooperative learning with the distinction being that positive interdependence that students must all succeed in a group in order for the group to succeed and that's the hallmark of true cooperative learning.

So you know I've talked about the motivation that goes into true cooperative learning. When we celebrate team success we often celebrate it with very simple things like an announcement of the success of the team to the class. We've developed ways of ensuring that not just one team can be successful because that limits the amount of celebration that can occur. But, for instance if any team that is successful, any team that achieves a score of ninety percent on an assessment or an essay or an activity is judged to be successful, then all teams that can achieve that level can be successful. And if the team achieves an eighty maybe they're a great team as opposed to a super team. Very simple ways of sort of describing to a team their level of success.

These have been very powerful in our work with schools. I'm thinking of a school, of a middle school right now and in the U.S. middle school would be children who are twelve, thirteen years old. We had a project going on again in math in the school and in one classroom what the most exciting thing that they could get if they succeeded as a team was to sit on these little yoga balls. So they had a set of yoga balls in the classroom and that was the success. Teachers find all kinds of ways of describing to kids what their successes are. Another class had a stuffed animal and you know teams that did a great job got to have that stuffed animal sitting on their tables for the week. You know it's more the communication of success and the acknowledgement that the result of their work has been significant learning that is the critical feedback for teams, so that's what turns the dynamic from students worrying about their own success to having them be concerned and work hard for the success of their team.

So one of the critical pieces, one of the critical things that occurs in effective cooperative learning is that students are giving each other explanations about their thinking and are not only hearing the explanations that other students are giving, but giving explanations, articulating their ideas and having to find the gaps in their understanding, and the gaps in

their articulation and really rehearsing what it is that they are working on learning.

This process of both speaking and listening engages the synthesis that students have to do in order to process and own the learning that they're working on it's the part that makes it go from passive to active. Now I was thinking of doing a little simulation to make you all engaged, but I understand we have folks streaming out there and I'm thinking that maybe we'll skip this, but imagine in your mind that I asked you to do this. I was going to require you to actually chat with three people next to you and share with each other your reason for coming today and then synthesize among the four of you what it was about your reasons that was common.

So the reason I selected that task is I want you actually to not just report but to think and to come to a joint understanding and then I was going to require you to all be prepared to report for your team. So one of the techniques that we've learned, that we've developed as a part of our work in cooperative learning, is called Random Reporter and I was going to make you all have the opportunity to be chosen as the random reporter. That means that I was going to ask you to number off one through four and then randomly ask one of you to be the reporter for your team.

That is to say I wasn't going to ask anyone to raise their hand. I wasn't going to let you know, let you choose for yourselves who was going to be the reporter. I was going to choose one of you randomly to be responsible for reporting for your team. And that's the dynamic that we want to have going in the team. We want the team to be ensuring that each member of the team is ready to report on their learning, has actually learned it. And again that takes it from a situation where I know that I learned it and I'm done, my responsibility in learning is done. Well, my responsibility in learning wouldn't be done until all members of my team understood the learning and was prepared to share their learning for the benefit of the team.

So again we call that little trick Random Reporter and it works incredibly well. If we have time I'll share with you another part of that trick, which is developing a rubric to ensure that the quality of answers

that kids give are very high and that's the next level of the trick that we have with the with Random Reporter.

In our form of cooperative learning we use four person teams, because four is a nice number. It's not too small and not too large and that's about the level of sophistication we have with choosing the size of the group. Since class size is not always divisible by four, we will have teams of five if there are extra students, and teams of five also work well. That allows students to work as pairs, to work as two pairs or to have discussions that are of rich and engaging, but still giving children a chance to be fully engaged and to talk.

We have in our structure the situation where children aren't always coming to school ready to cooperate. That's something they often have to be taught how to do and yet we don't want to spend all of our time teaching cooperation, we've got a lot of stuff we need kids to learn and to know. So we've developed some very simple, a simple mantra. The poster on the wall that is in every classroom that talks about what are the key skills involved in being a good member of a team, in working well as a member of a cooperative team. We teach kids active listening which means we teach them how to give eye contact, how to sit facing a speaker, how to acknowledge that they're listening with nods or yesses or restating what their partner has said or what their teammate has said.

It's interesting how difficult it is to teach active listening, but it's something that is important for kids to be successful. We teach kids how to explain their ideas, what that means and the telling why it's not just you never give an answer, you have to explain that answer and elaborate it. Each of them has the job to ensure that everyone participates, that they need to encourage their teammates and that they need to complete their work they need to stay on task and not wander off talking about their favorite sports team.

So we talked about some of the products that students might use as the basis for celebration and Random Reporter. Let me tell you one other great trick, by the way, to ensure that students are engaged even when the explanations are going on. Do you do you all know the term *think, pair, share*? Is that something familiar? This is just a way to quickly engage children to talk and again my goal is to never have a teacher ask

a question and have children raise their hands and this is hard to stamp out, let me tell you, it's very hard. But we try by teaching teachers that if they ask a question they provide children with time to think and then they ask them to pair which is to speak to a partner and articulate their thinking, to speak it out loud and in a sentence and then to share and then that's when a partnership would share the thinking that they have been talking about.

So these tools can engage teachers who are just learning how to engage children in cooperative activities to become more engaged and more active. So we use techniques like this to get teachers going.

I wanted to share with you some comments from kids and I'll read this one to you because it's in English. It says, 'I love how are we are doing maths. I used to be rubbish at maths. Now I'm really good and I'm more confident of what I'm doing. So I like it. I love how we do our work with team mastery and Random Reporter.' So they're actually talking about the techniques that they've been doing and the attitude is different.

And this is from another student who says, 'this team thing has been good because we've been explaining it and I like that we do active listening.'

These from the teachers are more readable. 'The program has raised my expectations of what the children can do and it's also raised the students' own expectations of themselves.' And another teacher said 'My class is much more engaged in math lessons and the children are enjoying talking about math.'

So again the attitudes change, the feeling is different and it can be a very, very quick transition. So let me qualify that a little bit. In this particular study that we actually did in England and you can tell that because the teachers and students all say maths instead of math. This was a study where we invited schools to participate and usually when we invite schools to participate we ask them to take a vote about whether they'd like to change the way they teach and we tell them about what the process would be. In the case of studies, it rarely happens so neatly because you have to randomize for studies. So teachers were never quite sure what they were getting into. But these teachers were given a training session and given materials that were built to do cooperative learning. So

that there were team practice activities and were provided with coaching and within a couple of months were doing an effective implementation of cooperative learning.

So my point is that teachers can be successful at very large changes in the way they teach in a fairly short period of time if they are given effective supports for changing.

We learned how to work with teachers by listening to what teachers had to say to us. When we started out, when we had done our first research in cooperative learning and we're going back to the 1980s now, we're very old, when we started working with teachers, we had these this great knowledge from the research that we'd done and we wanted to share it and we didn't want to just do research and publish it in in nice journals and have nice academic lives. We really did it to make a difference and so we started having workshops for teachers and we invited teachers to come to Baltimore, which is where Johns Hopkins is, which is why I keep talking about Baltimore, and they came for wonderful three day workshops and had great fun and were all excited and went back to teach in their classrooms.

And when we checked with them a few months later they would say well, we really wanted to do it. It was a great idea we really, really believe in it, but we just couldn't figure it out, it was too hard. So we said well what would help you? What would help you do it? And they said well, you know, we have to make all these team practice materials and so we said, okay, we'll make the team practice materials and we'll just give them to you. So we began to make the materials that they asked for, to make team practice easier and assessments to do the individual assessment of student learning.That's what teachers asked us to do and we did that.

So then we gave workshops and we provided materials and still when we asked teachers, how are you doing with this cooperative learning thing, which they'd been very excited about at the workshops, they said, well we tried but the other teachers in the school, they said that it was too noisy, so we gave up. Or they said, you know most of my kids really liked it, but I had one kid that really couldn't get along with his team. So we gave up and so we figured out that there was something else that was needed besides a great idea and passion. There was a lot of skill that

was needed as well. So we began providing coaching for teachers and that coaching would entail going to their school and watching them teach and giving them feedback or talking with them and helping them. Having them present their problems or engaging teachers in cooperative groups in their schools and enabling them to have opportunities to problem solve with each other with the support of experienced coaches.

And those things made a lot of difference. We began to see teachers who could sustain a good implementation of cooperative learning as their standard way of approaching instruction and that was very exciting and we began to move from that into school-wide support of cooperative learning, because if one teacher in a school is working with such a different way of teaching, there's peer pressure to give it up and to do things in a more standard way.

And we found that to really sustain a change in an instructional process it was much more effective to have the school-wide collaboration in support of that change and that innovation. So that was something that became very important to sustain the changes that cooperative learning required.

So I wanted to tell you a little bit at this point about the work that we got into as our work became more mature. As we did this research and as we got, you know, published some of the articles and things like that, we had the folks from the school district in Baltimore come to us and say, you know, you're all in your ivory tower at Johns Hopkins, you know so much. We have students who are failing all the time. At that time, which was you know still back in the 80s, fifty percent of Baltimore City's students did not succeed in graduating from high school. Half the students in the city didn't graduate and they dropped out, they just gave up because they saw no chance of actually being successful in school.

So they, the school district, came to us and said, you know, we want to work with you to create success for kids. They said if you had everything you needed and could ensure that students were successful, what would you do? So we talked with them for several months and we said, well you would need to first change the culture in the classroom and change the instructional process to a cooperative process. That would be part one and then you would have to ensure that students who

were beginning to fall behind had extra time so that they could take advantage of what was going on in the classroom. So we set up tutoring structures to ensure that students were successful.

We chose reading as the core learning as we were starting with elementary schools. We decided that reading was the critical thing. If students can't read then they're not going to be successful in school. So getting kids to be successful at learning to read was the goal, was the concrete goal that we took on.

We knew that for kids to be successful they would need to be in school every day. In Baltimore that wasn't something that was common in elementary school. At that time the attendance rate for first graders, you know that's when it's the highest, was eighty percent. Eighty percent of first graders were getting to school every day, that's not enough. So we put in plans to ensure that students were in school and that they were in school on time. And that when they got to school they weren't hungry and that they had had adequate sleep, so we had to engage their parents in making sure that they were supporting their children and sometimes that was solving the social problems that the parents had and other times it was simply making sure that the parents weren't afraid of the school and could partner with the school and sometimes it was teaching parents how to just celebrate with their children what they had learned in the evening.

So we developed a fairly complex program that we called, Success for All, and we started in a school in Baltimore. This turned out not to be just an academic discussion, but something the school district wanted to do, so in 1987 we began with one school and at the same time we had a second school that was very similar, so we had two very similar schools. And we used these tools that we had talked about in this first school and in one year we had students who had gained a year in four months worth of learning and this was in a school that was failing. So with the additional resources, with all the structures we were able to make substantial gains in a short time.

We continued this project and expanded to new schools over the next five years and we took a look at these kids who had been using this program for five years and we found that the assignments of students to

special education identification were reduced by more than half and the number of students required to repeat a grade, which is what you do if you to utterly fail, was cut by two thirds and we found that on the assessments that the schools typically gave to measure their own progress, that the schools made, I don't know, do effect sizes as make sense to you? Three quarters of a standard deviation of difference. It was a big effect. It was significant. It was educationally meaningful. These children were a full year ahead of the children who were in the comparable school by this time.

That year was enough to make the difference between staying in school and dropping out of school. It gave children the sense that they could be successful and the students who had been in our pilot school stayed in school and we measured by eighth grade the dropout rate, in Baltimore students were beginning to drop out at the eighth grade, but our students had not dropped out.

So there is incredible power in doing what we can. Using the research for children. If our schools aren't using the research that we have and is available then we're not giving our children what they deserve.

Questions

How can we train teachers in cooperative learning?

Teachers don't want to change their practice there's just not much you can do to require them to do it, so it often happens that in the schools that we work in with Success for All we take a vote and we ask the staff to have a secret ballot and to vote whether to change with a take on Success for All or not and we don't say one hundred percent though, we say eighty percent and we find that some teachers aren't ready to take it on, but if their whole school decides that they're going to do this together that becomes an agreement that they make and they will do that. So having that agreement is a good start and in schools where that isn't possible sometimes it does work to have a teacher who is eager to be the first to take the plunge and to start the ball rolling as long as it's part of a discussion to talk about what are the changes in practice, which when we work with teachers we start with an introductory workshop. It's usually one day. We don't usually do more than that because you have to try it, get your feet wet and we do provide fairly structured materials when we start that give teachers an easy way to get started. We say you can teach this lesson for ten minutes. Engage kids in partner practice, peer practice, team practice and this is where they're going to be aiming, you know they're going to be aiming for this, they're practicing this, everybody knows what it is that they're aiming for and how to be successful. And then they'll practice for a few days and at the end of that time have an assessment of some kind and find out where they're successful.

Some teams will be successful, some will be more successful than others and that's the beginning of the conversation because there's

feedback and when that cycle begins, it is the beginning of a continuous improvement process. Not of a mastered cooperative learning process, so if kids are engaged in that discussion as much as teachers are engaged and if teachers have a team of support, of other teachers to have that conversation going then they keep trying it and they learn how to do it better and better.

So if teachers are just in a cooperative process with no goals and no feedback then you will never feel that you've mastered cooperative learning because you're just chatting and it's fun but you're not necessarily getting to the learning. You're not evaluating. You're not goal setting. You're not finding out whether you are effective as a cooperative group or not and there are ways to be effective or less effective as a cooperative group. So again we will do a workshop and then we'll keep track of the success and have, you know, have the meetings and observations to find out how it's going and keep working at it.

So that brings me to who can come in my classroom and who can't. We assume in a cooperative learning situation that anybody can come into anybody's classroom. That it's a shared process and that everybody's learning and so we've worked in school districts where there are union rules against that and we'll work around it if necessary, but it's much more productive if people can share and can see and ask questions. And if it's a cooperative process then it's not evaluative, it's for the purpose of learning. So we've had success in doing that and of course coaches have to come into the classroom or else they can't be of much assistance. So that's one of the expectations that we have when you are engaging in the process.

So in the early years, because corporate learning can be used across the age span, there do have to be sort of differences in the structures, so in the early years again it's often partner activities that make up a lot of the activity, partner reading for kids when they're beginning reading activities at the age of six, are very, very powerful. *Think, Pair, Share* is something that we use a lot in the early years and doing a lot of teaching about how to be supportive of your peers. Again we teach active listening from the earliest ages that we work with kids and so kids learn how to partner. It becomes part of the curriculum. So I don't know how else to be specific about that. Mostly we get down to the nuts and bolts.

How can we motivate teachers in this practice?

People think they're doing cooperative learning, but they're really not doing that much of it and how do you actually increase and how do you ask people to utilize more effective kinds of cooperative learning?

So one of the levers that you have to use is why do people want to change? Why do they want to do something different? If they're completely happy with what they're doing their again not going to put the effort in to make a change, because change is hard. So sometimes they have to be assisted in finding a reason to change and that's where good school leadership or inspiration from peers can go a long way. Or self-reflection, even, an invitation to reflect and say, you know, how engaged are your children? How many of your children are achieving the levels of success that you'd like to see them achieve? You know are you stuck or are you really seeing the success that you want to see?

And often when teachers reflect they will find that, well a certain percentage of their kids are engaged and achieving, but they've got a group of kids who are not and that can become the lever for, well let's see if we can get all students engaged and, you know, let's look at some of these strategies that the research says make a difference and we like to use evidence as one of the tools and say well you know there's research that says that if you do this and this and this then you can get even better achievement and do you aspire to that for your students? And again that's where leadership can come in to increase teachers' expectations for themselves and for their students.

Sharing classrooms is a good idea so long as the models that you're sharing are illustrating the techniques that you want to illustrate and we are pretty picky ourselves about what the elements of effective cooperative learning are, because again we don't just want to increase the social to research to achieve the social benefits of cooperative learning we want to achieve increased learning, we want students to be more successful in achievement.

And that means that kids have to have this positive interdependence. They have to demand learning from one another. They have to demand hard work from each other. So we do want to see the feedback loops and

we do want to see the individual accountability in our cooperative learning classrooms. So we will bring those issues up and if we're having a teacher model we want those aspects of it to be included in the model so we would not just want a teacher who had good group work going on, but a teacher who had a real positive interdependence going on.

There is a problem when cooperative learning is built just around roles, because, again, what are the roles there are really the leader and the reporter are they? So we often do see structure other roles in some of our activities in a discussion of a piece of writing, in a discussion of a text, we might have someone who poses a question, someone who articulates an answer, someone who agrees or disagrees with that answer and someone who summarizes what the discussion was, so that we have more than one role to help kids begin to understand how to engage each other but then we, what we really want to teach kids is to celebrate constructive criticism and disagreement and we will have our teachers give kids feedback and say, you know, I'm not hearing enough disagreement here, you're not challenging each other to get to a high level of discussion and a high level of response.

When we do Random Reporter in the context of talking about pieces of literature in particular we want kids to prepare each other for a high level discussion. We want them to be a high quality reporter for their group, so they can't just, you know, have a question and give an answer. They have to be able to articulate the reasons for that answer and the references from the text that support the answers that they're giving.

So this is the rubric that I was talking about. You know, giving an accurate answer to a question about a text might be an eighty point answer. Being able to say that answer in a complete thought might be a ninety point answer, but you can't really get the full points for being a reporter for your teammates unless you can cite the evidence from the text that supports the answer.

So that's one way of teaching teachers how to keep high expectations for students and I will tell you that teaching teachers to do that in the U.S., I don't know about Catalonia, but in the U.S. it's very hard to get teachers to hold kids to a very high standard. They want to be nice. They want to say, that's a good answer, you know, and then they'll have

another student maybe elaborate that answer, but that says to the student I don't really expect complete work from you and the response should be well, that's a start, but next time ask your team to prepare you better with the full, you know, with some citations from the text regarding your response.

If it's fed back directly to the student and to the team, it's not just the students, you are not criticizing the student, you're asking the team to do a better job. It gives power to the team that can raise expectations, but it's very hard for teachers, because they feel that they're criticizing a child. It has to be directed back to the team.

Is it possible to balance cooperative work and good results in terms of the curriculum?

Sometimes it's the kids themselves, but it's often the parents feel that if they're being asked to work in a co-operative group that because they're the smartest kid in the class they must be, you know, not fully challenged because they're helping kids do work that their child already knows. Well the research on this is fairly clear. We've done many studies and we've looked at the kids that start in the bottom quarter of the class and those that are in the top quarter of the class and those in the middle and we've looked at the results for those groups separately and we find that the students in the top quarter of the class achieve at a higher level than the top quarter of the class in the comparison group, because we're always using a comparison group.

So that's our data. The fact is you can document greater learning even for the high achieving students in the group, so cooperative learning does not put kids at a disadvantage. If you think about it as teachers you know that when you teach something you learn much more about your own understanding of it than you knew before. So there is value in even asking high achieving kids to process their thinking, to take the perspective of another, to break it down in a way that makes sense to other children and that that benefits their own understanding and their own learning and that's what the data are saying.

We do in our groups and I'm not sure if I made this point, we do have the teacher create the groups in our form of cooperative learning. We don't ask students to self select their cooperative groups and we assign the groups to be heterogeneous, as heterogeneous as possible within the classrooms, so that they're mixtures of boys and girls and one high kid, two middle kids and one lower achieving kid in the group. And they're cross ethnicities and they're as heterogeneous as you can get within the classroom. And we do that for a reason, because we want the group, first off we want the teams to have an equal opportunity to succeed as teams, we want them to all be successful.

And so we try to create level teams and we try to create the bridges across those barriers in the classroom. So we do get those questions of what do you do with a higher achiever because you're not sending the high achievers often to a group of their own to do advanced work. You're asking them to participate in the in the work of the entire group to succeed.

What role does technology play in cooperative learning?

Technology is a fantastic thing and schools will someday learn how to use technology. I'm not sure they know how to use technology now, at least there's not a whole lot of evidence that technology benefits the achievement of kids at this point.

I think learning to use technology is a fantastic goal, it's something that we all do in our professional lives and kids need to learn, but technology is not is not a necessary element, a necessary tool in cooperative learning, that's an instructional process. You can use cooperative learning to learn how to do technology, certainly, having kids help each other toward those goals, certainly wonderful. Technology is I think often used as part of project-based cooperative learning and is a great tool for finding information. So I think technology in a cooperative classroom is a tool as it would be in any classroom.

A practical example of cooperative learning

A writing assignment, just to be different, math, I think you can all conceptualize in math. If you have a task to learn in math, perhaps it's a problem solving task kids need to take a complex problem about, oh, rate and distance is always fun. If you go by car to Girona versus taking the train and the car goes at this rate and the train... so math is great, so many opportunities for kids to think and discuss, so what we would do in math is have a challenge placed before the kids. The teacher, you know, will have presented it and the kids will start by talking through the kind of problem as a group and coming up with a group answer. And then will try it on their own each individual child will try a version of the task, another problem and practice and ask their teammates for assistance as they practice and, you know, continue in that vein, either having what we call team huddle which is the whole group talking together or team mastery which is the individual's mastering it on their own and then checking with each other. Both of those techniques would be used until the groups have mastered the challenge and there is a time for an assessment.

So that's sort of the basic structure, we call it the cycle of instruction. You know it's brief instruction by the teacher. It's team study. It's assessment and then celebration. So those are the four parts of the cycle and they're not rigidly adhered to, they go back and forth as needed by the lesson.

So take a writing lesson, a cooperative writing task. So perhaps the task is to write a persuasive argument in response to a text that the group has been reading. So to start the teacher might provide the rubric against which the product will be judged so that kids know that a persuasive argument needs to have a premise, it needs to have the arguments laid out with some detail and it needs a summary. Those kinds of things might be the elements of a persuasive argument that the teacher wants to lay out with as much detail as they want. Kids would be asked to brainstorm with their teams, to come up with some planning ideas. What was their topic? What position are they going to take on what argument and what details might they add to it and how are they going to get started?

Students would then individually go and draft, write their draft and then come back together and have a revision conference with the team

where each team member may read their essay and get feedback against the rubric from their teammates. They would then go and complete revisions, perhaps have another conference and then at some point come up with a final product.

There are lots of interesting ways to have writing products scored by other students rather than always by the teacher. I don't know if you find this, but often in high schools that have one hundred forty kids in their class if you assign an essay that's a solid week of scoring essays you can't read them as fast as the kids can write them and you want them to write them a lot. So there is some great peer scoring tools out there. There's one and here's a great use of technology. There are some crowd scoring tools that are getting developed, where say three students would rate an essay on a rubric that you've all talked about and agree on and if the three scores are discrepant then the teacher would score it and if the three scores aren't discrepant than that score would stand. And what happens then is teachers will assign much more writing because they don't then have to grade it all individually.

So those are two examples of different kinds of activities that might occur.

Is the teacher's role less important in cooperative learning?

I think that, you know, if they're sharing the teaching job with the students that somehow that diminishes them, but I think that there is, the role of the teacher is critical in ensuring that the learning is directed at the goals that are important in the class or in the task. So I don't think that the role of the teacher changes, I think that the process that the teacher uses to get to their outcomes changes and that they buy students in in a different way and interact they're no longer the sole distributor of knowledge, but I don't think that that makes them any less critical because, try to imagine a classroom with no teacher. It won't gel at all. It won't have a goal. It won't have a process. People just filter into a room and then filter out again. The goal is not there. So teachers are still critical to the cycle, but the teacher creates a much more engaging and interactive cycle than in the

typical stand and deliver lecture format. So I don't see it as taking anything away from the teacher. I think it's adding richness to what they do

And I agree absolutely that in order to change, teachers need to understand the rationale. They need to have a reason for change and need for change and to know why they're doing it and again that takes leadership. It takes someone guiding the teacher and the school to, I mean, teachers sometimes think they operate in a vacuum, but in in fact they operate as a part of a system that is there to benefit our students and our children and to give them the tools that they need to be effective citizens and effective adults.

So their job isn't just to, you know, get through the day. Their job is to create real learning for kids and when we can effectively engage teachers in reflection around the bigger issues they'll get to that understanding as well.

I don't have much to say about architectural barriers, I think, again with respect to cooperative learning. You can do it in whatever kind of architecture you've got and it, you know, that can be worked around.

Is it possible to assess students individually with the results of cooperative learning?

How is the individual assessment done? In order to create, you know, the documentation of individual learning and again there is a variety of ways depending on where you are in the cycle. The easiest way is a written product that each child produces, that each child or student or university adult produces in order to demonstrate their learning. That's the simplest way to do it, but again in some of our reading instructional groups we will choose a student randomly using Random Reporter, have a student report on the discussion of their group, record the quality of that response and then over the course of a week we'll have a sample of a response from each child, from each student and we'll collect those and use those as the individual evidence. There are an infinite number of ways to collect that individual demonstration of knowledge that then goes to create the team product and the team celebration.

About the author

Nancy A. Madden holds a PhD in Clinical Psychology from American University in Washington D.C. She is currently professor at the Johns Hopkins School of Education's Center for Research and Reform in Education and the University of York's Institute for Effective Education.

As president and CEO of the Success for All Foundation, she develops, researches and disseminates educational programmes to ensure that all students, irrespective of their background, achieve at the highest possible level. In the last 25 years, many US schools have used the programmes developed by the *S*uccess for All Foundation to improve educational success with cooperative learning teaching teams and comprehensive school reform programmes.

Dr Madden graduated from Reed College in 1973 with a B.A. in Psychology and a minor in Education. From 1980 to 1998, she was a researcher at the Johns Hopkins University's Center for Research on the Education of Students Placed at Risk.

As an expert in literacy and educational instruction, she has written a large number of articles and books on cooperative learning, integration and education of disadvantaged students, including *Effective Programs for Students at Risk* (Allyn & Bacon, 1989) and *Two Million Children: Success for All* (Corwin, 2009). Her current research interests include practices to increase social-emotional learning and the use of interactive whiteboard technology and electronic response devices to increase student success.

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