

[TRANS²]

L. Michelle Baker, PhD

The Corporate Writing Pro

Interview with Rachel Murillo and

Heather Valdespino

Authors of Literacy and Writing in Science

LAWS – A Curriculum for Middle, HighSchool,

and Beyond

7 March 2015



Michelle: So Heather, before you got on, Rachel and I were just talking about how all of us got into our respective fields

Heather: Oh yeah. Well I mean, I'm actually a history teacher. So as far as my field, my background has been history education and also curriculum design.

So in college I actually was enrolled in anthropology with an archeology concentration. And when I became a teacher at Hill Middle School, Rachel and I realized that we had gone through the same program. So that was kind of funny.

So that was kind of our first connection together. And then I've just been really active in pursuing curriculum and instruction within history, really involved in writing projects and things like that. So Rachel would come into my classroom and see all the writing in history and said that this should also be going on in science and there should be a program similar, because there was a similar style.

So Rachel, did you say everything that I just said?

Rachel: No actually I didn't even get into how we got started on the LAWS thing. I was just telling her how I got into teaching way back in ancient times when they allowed emergency credentials.

By the way, Michelle, I do have to clarify. They basically quit handing those out. So then anyone working under emergency credentials that wanted to stay in education had to go and get permanent credentials. And at that point I made the decision that teaching was going to be my permanent career.

So yeah, no, we didn't even get into how we started the whole LAWS thing.

Michelle: Well, that's actually a good place to begin. And Heather, it makes a lot of sense with your history background, because history is a writing intensive discipline. But yeah, tell me how LAWS got started.

Rachel: So basically at our school we were a writing-focused school. And we had these, once a quarter we would have these things called all-school write. But they were really spearheaded by the English Language Arts (ELA) department and so in every class the kids would write, organized by grade level not by subject.

So even though I was teaching science, the prompt was an ELA prompt. And we were grading for the ELA conventions. So the students were very good at writing



5-paragraph essays, but when asked to write a science-based piece or a history piece, it was the 5-paragraph essay.

And so as Heather had mentioned, I saw that they had this writing program in history based on looking at actual documents and writing about them. And the history teachers were just raving about this writing program, this style of writing.

And I thought, why can't we do that in science? And so I started talking to Heather. As Heather said, I would go into her classroom, and seeing the kids doing it was fabulous, because up to that point, my science writing in class really revolved around lab reports, research papers, which no matter how much I coached the students, they were for the most part plagiarized off of Wikipedia. So I really wanted something different.

And then Heather, do you want to talk about the common core and how that really shaped what we did?

Heather: Oh yeah, so at the same time that this was going on, we had the shift to common core, and then also we were hearing about the shifts for the Next Generation Science Standard (NGSS). And a lot of the teachers had a lot of anxiety about the shift, especially within our district where everything was told to us. This is now how you're supposed to be teaching writing.

And the history teacher in me says, not every type of writing is the same. So shouldn't we be looking more into different content areas and seeing the expertise the kids need to have in order to be successful in those types of courses in college.

So I was part of a common core research team within our district for history to see how to structure questions and to give those questions to the ELA teachers. But what happened was ELA taking over again within our district and saying to the science and history teachers, no, we need to do it this way so that there's like voice, so that there's some kind of continuity.

And I was a really big proponent of saying, in college you have to write in different styles. And we talked to a lot of teachers, and we were hearing a lot from science teachers because they didn't have a lot of programs. So Rachel and I were trying to find a solution out there, a structured way of how to teach writing



in science classrooms, while also listening to what teachers were saying about the things they would want in their perfect curriculum.

And we were talking even to district leaders about “hey, it would be great to put something together.” And they were like, “oh, well the NGSS isn’t going to be implemented for a couple of years. We don’t have to worry about that. Teachers just shouldn’t worry about it.”

[laughter]

Which is not really practical. If you hear something is coming down the line in a couple of years, teachers automatically want to get prepared for it. That’s just the basic idea of educators.

So we were told, don’t worry about it. But we were still hearing a lot of teachers really need, so we just decided, let’s try, based on all of our research and all of the things that in a perfect science curriculum that Rachel would want in her classroom, or any of the other teachers had said that they would want, different elements, this is what we need.

So we tried to put all of that together and really create a perfect science writing curriculum that would not just help students get better, but also teach teachers how to teach writing in science along the way. That was our goal.

The biggest thing that teachers have to deal with is the time to create everything. And just to tell teachers, well, this is what you need to do, most teachers know, yeah, I need to do that. But the time to go into all the research and putting everything together and coming up with an actual set curriculum that the kids can use as practice to get better, that’s what takes a lot of time.

So we wanted to create something that would help teachers out in that way also. So that’s really kind of how we decided to even embark on this. It wasn’t as a business venture at first. It was more like, no one was even listening to us, so we wanted to take the initiative and find what was going to work in real classrooms, real settings.

Rachel: And the other issue was that for better or worse, the fact of the matter is that teachers in science got into teaching science because we want to cut up dead things and blow things up. We didn’t get into science to teach writing. And if we wanted to teach writing, we would have been an English teacher.



So where do your strengths lie? And now we're being asked to do more writing with the common core. Like I said, there were the little pieces of writing with the research papers and the lab reports. But now we're really asked to support the ELA teachers and a lot of science teachers feel very uncomfortable with that because we're not writers. We don't, we've never really been trained on how to teach writing.

And so it's a very, kind of scary area for a lot of people. And my mom was an English teacher. So I have a very good background with English. And I would say the hardest teacher I ever had was my high school English teacher. I had her my sophomore year and my senior year. And I never had, even in college, a class that was as tough as her.

She would make us write-write-write. And I always tell my students, I see one of those little composition books with the Spartan guy on the front, and I just want to throw up every time I see it, because we had those in her class. And every day she would make us pull those darn things out and write.

So I'm lucky. I had a very strong background. But that writing never came into play in my science-focused classes until I did my Master's Degree and I had to write a thesis. And I realized, I mean, it was like the light bulb for me finally went on that my students need these skills even if they're going into a science field.

The fact of a matter is in a science field is if you want to get a job or go anywhere, you need that Master's Degree or even the Doctorate. And in order to do that, you're going to need to be able to write. And Heather and I have done some research and have found that one thing people are talking about is you get these brilliant scientists who are writing up their research and the lay person can't understand what they're saying, because their style of writing isn't conducive to really getting their point across.

So that's kind of where, you had the one question about why is this an integral part of science? It's the whole communication piece. And that gets into the 21st c. writing, one of the four Cs is the communication piece.

Heather: I was just talking to a teacher yesterday who's using LAWS for the first time. And he was saying if he had something like that to teach him how to write within science, he probably would have done a lot better in his science courses.



In college, he would just look at the science journals and try to replicate that style. But he never really learned how writing in science was different. And so people would drop out.

He would see people just, I can't do it. I think in education if we really want to push students to go into, first of all to take more AP courses, and then pushing them into taking more science and engineering, we also have to give them the tools to succeed in those classes. So that's another important piece of it.

Michelle: Well you ladies have done a really nice job explaining the LAWS concept. I appreciate that. And this is why I so wanted to talk to you, because I just so appreciate your focus.

I work with the scientists that you're describing who never learned to write, they love to cut stuff up, they majored in biology and environmental science, and ecological services. And they thought that when they got a job they would be out in the field playing with critters.

And they spend their lives behind a computer trying to write. And they struggle with it, and yet if they want to save the species that they care so deeply about, they have to do a really good job as a writer. And it's a huge source of frustration for them.

So that's why I'm so excited that you guys are doing this work. As soon as I saw your website, I was like, I love this!

Can I just ask a clarifying question. You mentioned the Next Generation Science Standard. Can you explain that a little bit more?

Rachel: Yeah, it's basically when the common core came out, Bill Gates copyrighted the term. So the NGSS is common core, but they had to call it something different. So they call it the NGSS, which is cool, because it sounds like Star Trek.

Michelle: Makes the Trekkers happy, and I did say Trekkers, not Trekkies.

Heather: We really appreciate that you're taking notice that what we're doing is beneficial. We've been frustrated within our own district. Other districts have caught on to this trend. But within our own district, we are still battling this idea that you don't have to write in science that much.



[laughter]

I know. And that's our biggest challenge right now. Here we can convince other districts, and we've been going to different states and presenting, and every person we talk to, district heads, and even college science education professors are like, "oh wow, this is really great."

And within our own district it's been just a battle of frustration because we have, I don't know. Rachel, would be able to speak better. There's this idea of not putting too much pressure or stress on teachers. I think that's part of it. Not really having a deeper understanding so why it's so important to know how to write within scientific fields, I think. And so even within our own district we've had a challenge.

Rachel: I think you hit the nail on the head. We're trying to make teachers feel comfortable with this transition to NGSS, which is really focusing on inquiry-based lab models. And so I think they're trying to take one step at a time. So they're looking more at the inquiry-based lessons. And I think the writing focus will come in time.

It's just, they're trying to make folks feel as comfortable as they can with the shift, so it is just taking one step at a time. So are you going to teach the writing or are you going to teach the inquiry-based? And we decided to start with that focus.

Michelle: Well if you need any fuel for your fire –

Rachel: We'll always take fuel for the fire.

Michelle: The largest employer of scientists in the US is the federal government. And the second largest employer of scientists are the states taken collectively. And they're not research entities. These people are not making their money off of the publish or perish model. These are people who are making their money off of writing policy, communicating policy to the public, responding to policy. They spend their days writing lengthy technical and regulatory documents.

So you can pull a few stats right there and make your case I would think fairly strongly.



So talk to me a little bit about how you define literacy, because it clearly goes way beyond the ability to read and write.

Rachel: Well you're absolutely right. There are different levels. So you have a level where it's functional. Can you get around your everyday life? So I guess that would be the basis, but it's really being able to understand what you're reading. So not just being able to read it, but can you truly understand what you're reading and analyze it and synthesize it.

And then, for me literacy in writing is the ability to be able to communicate concisely and very apparently what your point is. Whether you're writing in science or any other subject matter, are you able to communicate your thoughts so that others can understand what it is that you're trying to say.

Heather: I would say definitely there's specific content literacies. So you have scientific literacy, kind of to piggyback on what Rachel was saying, you definitely need to be able to comprehend and understand the vernacular within your field and then also be able to synthesize that information and write in a style that's appropriate to that field.

So there's scientific literacy, there's historic literacy. And I think that gets taken almost on a back burner with a lot of things. People just say literacy as if it were all the same thing, and it really isn't.

Michelle: It's like that catch-all term "critical thinking."

[laughter]

I'm pretty fed up with that term in higher education, I have to tell you, but –

Rachel: We hear college and career ready all the time too.

[laughter]

Michelle: So I think we touched on this a lot already, but I want to hit on it just a little more specifically, the question of science and literacy. I want to come at it from a little bit of a different angle. You talked about the career aspect of how writing well is going to serve a person as they progress in their career. What I'm interested to hear is – this is the obvious question, and then the less obvious question is how –



do you think, and then how do you think that writing about science helps a student understand science better?

Heather: If you're going to convey your argument or your reasoning, you have to have a really deep understanding of what you're first researching. So if students are able to convey that within their writing, I mean, to me that's a really good marker to see if they've understood the content level at a deeper, more rigorous level.

We see that difference between just writing a summary paper, or writing an explanation of somebody else's research versus really thinking about that research, coming up with a different idea or angle, being able to use the evidence to support that reasoning, which starts more scientific inquiry and thought.

And I think if you're able to convey that in a written form, you're going to get to so many more people that way. And they're going to really see that you're more credible. And to start that early within the kids. It's not just good to say, "oh yeah, this is why I think that," and quote some random thing. But actually put it down on paper and not just hear whatever evidence it is, but actually hear the tone of a writer's intent.

And I think that's a really important quality that's missing even within many science journals. They're almost so dry that you almost don't even want to read it. And there has to be some kind of balance. How do we get all of the really good research and funnel it in an way where you're getting to an interesting paper also.

So that's really what we're trying to do with kids. And I think it's important to start it early. Because if you get to such a high degree and you've never really had to convey your thoughts in an way where people other than scientists can understand you, it's a really hard field to learn, kind of like going backwards.

The earlier we teach it, the easier the transition will be when we get into college, and then when they get into their careers.

Rachel: I think the other thing too is my students read things and they take it as fact. They're not analyzing. If it's in a book, it must be true. If it's on the internet, it must be true. So teaching them the writing process helps them to really start, they have to read first before they can write. And they're really analyzing. Is this the only point of view?



Is what this person saying the fact? Or is there any bias in it? So it helps them to start analyzing things that they're hearing and reading and really having them look at their own writing and say, "am I putting my own bias in here? Am I trying to convince somebody to look at my own point of view? Or am I just pointing out fact?"

So I think besides the whole career readiness aspect of it, it's helping them develop their analytic skills. And that can be transferred over into other content areas and just everyday life. If somebody's telling you one thing, you see it all the time in the news. Somebody's saying something is bad for you and somebody else is saying it's good for you. And so we have to develop that skill to really look at the things that we're seeing and make an informed decision.

Michelle: Good. That's what I wanted, for you to articulate that so that I can share those words with my readers. Thank you for doing so in a way that is succinct and unique. I think they're going to appreciate it. Thank you.

So teachers have great stories. Can you think of any examples? You mentioned a teacher earlier who was first starting to use the curriculum? Do you have any other examples you can think of from either teachers or students or school districts that are either benefitting from or were maybe resistant at first?

Heather: We have one actual district, West Side Unified. And the curriculum leader sent us a little message that said the science teachers were sharing the LAWS textbook to the ELA teachers. And the ELA teachers have said, "gosh, all the science teachers have all the fun stuff to do." And that was a switch up. That the science teachers have all the fun writing problems.

That was kind of a big deal for us.

We've had a lot of teachers that are using it that have had to pay for it on their own. I think that's the struggle for right now for them. Many teachers want it, but the district is waiting on giving them that access, because they're looking for all the other publishing companies right now with the shift.

We hear all the time at conferences teachers lamenting on that fact. So that's really my biggest challenge to try to find ways that they can get the curriculum and use it in the classroom.



Rachel: I was just going to say for myself, because we originally developed it for me. So I've used it in my class. And the problems in the first book were really born out of questions that my students had in class. So for instance I have to cover astronomy in my curriculum. So my kids are constantly asking me about aliens. So that's how the study problem came about.

We have a nuclear power plant down the coast between LA and San Diego that was shut down due to a leak, and my students didn't even realize that it was there. So when we were doing our nuclear energy unit, that's where that came about. So it supplements what's in the textbook and gets them to go beyond what's in the book.

And I had mentioned before about my research project where no matter how times we talked about plagiarism, and even in their ELA classes they're getting lessons on what plagiarism is and don't do it, they still will walk in with complete pages just printed off the internet.

So using the curriculum as they are analyzing the articles and the documents, they're really getting to know the information that is in each one. So when I get the final writing piece, there's no plagiarism going on, because they know it by the time they're done. And I think that's the problem with their research. They just don't know to get started. They don't even know where to look for credible resources.

And it helped me to see where the gaps were in my own teaching. Like I didn't focus enough on the research, getting the documents. Usually we set a limit saying, you need 5 sources. You need a bibliography. You need a title page. And we teach them how to cite. But they think if they put quotes at the beginning and quotes at the end that, well I cited it.

Heather: The mechanics.

Rachel: They find ways around, you said to put quotes around anything I cite. I did what you said. Oh, okay, I didn't even think about that. It showed me gaps in my own teaching. And we recently had another teacher who mentioned that he was seeing a lot of his own bias from his teaching showing up in their final writings.

So he realized, "oh my gosh! I am biasing my students, and I didn't even realize it." So that really made him stop and think about the way he was teaching. We



have to try to keep our own opinions and biases out of it and let come to their own conclusions.

Heather: And he said he never realized he had been doing that until the kids actually did a LAWS program and wrote a paper where he wasn't just focusing on the mechanics. And this part is from Wikipedia, and what the heck is this? And when he wasn't getting distracted on that point, he was actually able to read good papers and realize that his own bias was coming out.

And he's going to now restructure his class. That was a really eye-opening thing for him, and it was definitely a success for us as well.

Michelle: That's huge! That's big! Wow!

So you've touched on a couple of different needs in public school systems. You've touched on the common core. You've touched on the lack of funding, that teachers are having to purchase their own curriculum.

What do you see – and I know this is an unfair question – but what do you see as the greatest educational need?

Heather: Well, if I can go first, I think building up professional capital is really important. Listening to teachers. I think a lot of times we got bogged down, at least this is my experience, that leaders in education will be like "uh-uh, uh-uh, uh-uh," but they have their own agenda.

So I think it's really important to build up teacher expertise. I mean, Rachel and I are teachers. We didn't go into this thinking, "we're going to become businesswomen, and we're going to become advocates for science writing." We were just really trying to solve our own needs, because nobody was listening how to solve them within leadership positions. So we just stepped up and said, "we're going to do it."

And honestly, that's what a lot of teachers do. But they don't get recognition for that, or they're told to not say it to everybody. Or they stay in their silos in those classrooms. I think it's really important to start drawing on teacher expertise in building on that instead of saying, "oh well, there are all these teachers that are so horrible," I think we should do the opposite.



And that's my biggest thing within education reform, really listen to teacher expertise.

Rachel: Actually, I was coming at it from a different angle. My answer would be engage parents, because parents drive everything. If the parent complains, it will get fixed. And I think parents who are engaged in their kids' education, and not just involved. Being involved and being engaged are two different things.

So if they're really engaged and they know what's going on, and they know what their children need, they will communicate that to school districts, to policy makers, and that really is going to be where the support begins, if we can engage parents.

Michelle: Good. So I follow a lot of the Fish and Wildlife Service Refuges on Facebook. And they have made me aware that March is Women's History Month. I didn't realize that.

Rachel: I didn't either.

Heather: I did. I'm the history teacher!

[laughter]

Michelle: So every day they're posting a picture of a woman biologist. And they've got a woman from Fish and Wildlife Service in the field. She's either at a refuge, or she's wrestling an alligator, holding a turtle, rescuing a sandhill crane, and really stressing what these women are doing in the field of ecological and environmental services.

And you two, I'm so impressed as I've said before, with the way that you're leading the charge in education and science writing. So I'm wondering who have been role models for you in your disciplines?

Rachel: That's funny because my role model is Sandra Day O'Connor. It's not somebody within my own discipline. She is somebody who my mom went to the college in the '50s. And she said it was basically women either went to college to be a teacher or to be a secretary.

And here is somebody who went and got a law degree and when women weren't – when she did that, she kind of bucked the system and said, "I'm not



going to be a teacher or a secretary.” So I really admire the fact that – and I know there are others.

But to me, the women way back when that decided to do something else really inspired me. So she’s my role model. Sad to say, I’ll be honest with you, growing up, I really didn’t hear about women in science. There’s Sally Ride. But I have to say as far as science is concerned, I really didn’t have a female role model in science.

Michelle: Heather?

Heather: I guess, I mean my background was in anthropology and archeology. I was always really impressed with Margaret Mead if you want to let go with gender.

I don’t know. When I was thinking about that question, I didn’t think just in the field of history. I guess I was just thinking of my female role models. And honestly, my 9th grade anthropology teacher, Ms. Butler, was really my biggest role model and made me want to pursue anthropology in general. And I still say that she was my biggest role model, at least for me.

I really liked Eleanor Roosevelt and just women who didn’t take the status quo. And like Rachel, I’m very much like that. I like to ask why and push the limit a little bit for people’s arguments.

I think, honestly, I’m also a mother. And I think mothers are big role models also. They’re kind of the reason to keep the kids going in many situations. But honestly, other teachers are my current role models. Teachers that really are doing some amazing things under really harsh conditions and really tough situations. And what they put into all of that, that’s just amazing to me.

So I always liked, honestly my biggest role model isn’t really a female in the historical context. I’ve always love Siddhartha, the Buddha in all, just thinking about the balance in life and that there’s always some kind of positive that comes out of things. I think I have a strange conglomerate of role models.

Michelle: I like it!

You know, in asking that question Rachel I went back to the answer that you gave earlier when you were talking about that one English teacher that you had



in both your sophomore and your senior year. And if I could just give both of you some words of encouragement.

In one of the classes that I teach, I ask my students about their previous writing education. And without fail, they all describe this bland, useless college education that taught them nothing. It taught them how to write for the university and has been useless to them ever since then.

But when I dig in and I really probe with that question, they also, almost without exception, describe a junior high or high school teacher that taught them, drilled them, write-write-write, and that gave them lots of feedback and just devoted themselves to helping them be a better writer.

And that was where they got their writing background. So I mean, you guys are the front line. And people carry what you do with them for the rest of their lives.

Heather: We hope so!

Michelle: They do. They really do. I can tell you from where I'm sitting and the stories I hear day in and day out.

So on that positive note, and I do want to end the interview on a really positive note, I know that we hear a lot about the difficulties that American public education is facing. I would really like to hear from you what you see as the opportunities, the areas for optimism. What are we doing that really has the potential to be fabulous?

Rachel: What, you don't want to go first on this one?

[laughter]

Heather: Well, I think teaching has always been a hard job. I'm going to say in my history background a little bit too. But teaching has been a hard job since its inception, I mean public school education. This isn't something new.

And I think a lot of times people want to rebrand the challenges. The challenges are going to be there.

I think one thing that is such a great thing is people are continually trying to solve those problems and challenges. As long as there's interest in making things



better, there's always hope. And I really think that's the key positive takeaway. How do we make education better? We try to make education better.

We keep trying. We keep changing with the times. We keep listening to kids and what they need. And listening to teachers also. That's my takeaway.

Rachel: And to add onto that, the optimism and even with the hardness and the budget crisis and whatnot, you still have these really great people out there who are still being innovative. And the negatives are always reported. It makes great news.

But there are so many positives out there. And we all see it in our students. And the proof is the students that come back to visit us and say, "you made a difference."

So I think we get so bogged down in the media with, we're behind all these other countries. And like Heather said, we're constantly striving to make it better, and looking at how to make it better. So Heather, you're going to have to help me out with this. But there's a researcher out there in education called John Hadde, and he said, there's so many positives out there that the educational system isn't as dire in our country as everybody thinks it is.

Heather: Basically on his research of about 800 meta-analyses, he said as long as you go into education with good intent, you're not going to damage a child. And that's basically on research of tons of studies over decades.

So that made teachers, "oh, okay." We might not be the most expert, but if we're going in there with the right state of mind, that's all kids need. And at least having that, that's kind of a cool thing.

And really I think the more research and the more honest research rather than just lobbied, funded programs, I think that's going to be really important too. We have to start reading that research as scientists also, as an informed public.

Michelle: Well good. Thank you. This has been awesome! I've learned a lot. I appreciate the chance to spend some time with some wicked smart ladies. Thank you for that.

Heather: Well thank you for listening to us. It's a nice change.

[laughter]



It's nice to know somebody is taking up the torch. And it's great to hear at the university level also.

Michelle: Your work is appreciated. I know it doesn't always feel that way.

[laughter]

I look forward to staying in touch.

Heather: Whenever we can help out, just let us know.

Michelle: And the same here. Thanks ladies, I appreciate it.

Rachel: Thank you Michelle.

Heather: Thanks.

Michelle: Have a great weekend!

[bye]

[end of transcript]