

Kaleidoscope

Educator Voices and Perspectives

"Teachers are experts at building relationships, experts at remembering what it feels like to be a novice, wrestle with a concept, develop understanding, and explore ideas in a real and difficult way."

~ Lauren Kline, Knowles Teaching Fellow

KALEIDOSCOPE

EDUCATOR VOICES AND PERSPECTIVES

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Call For Submissions

The *Kaleidoscope* editorial staff accepts submissions on a rolling basis. We publish in a variety of formats, including print, podcast and video.

If you are interested in writing, or already have a piece in mind, contact kaleidoscope@knowlesteachers.org at any time for feedback, information, or guidance. Every submission, from idea to fully-developed piece, is assigned a peer advisor to help develop, build, and edit the piece before submission.

On our webpage, www.knowlesteachers.org/kaleidoscope-about, you can find other resources to help you develop your ideas, including

- a non-exhaustive list of the genres of stories we publish, including examples of pieces from *Kaleidoscope* and elsewhere;
- the rubric used for the final review of submissions; and
- past issues of *Kaleidoscope* to see what others have written.

We look forward to reading your work!

To receive a digital subscription of *Kaleidoscope*, visit www.knowlesteachers.org/subscribe.

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From the Editors' Desk:

Celebrating the Journey

As all teachers know, it's important to sit back and take stock of what's happening in your professional life. We've been doing similar surveying of *Kaleidoscope* and are excited to share with you the incredible growth we've undergone this academic year:

- The issue in your hands or on your screen contains 10 pieces of thoughtful storytelling from 14 contributors.
- This issue's [Raise Your Hand](#) feature alone has 18 contributors! Make sure you read their reflections about what teaching has taught them.
- We've started [Teacher Voice: The Podcast](#), in which producer and *Kaleidoscope* Associate Editor Brittany Franckowiak and her guests have explored stories from the journal in more detail.
- This fall, we concluded our second writing course with 10 participants and are excited to be starting our third annual course as you read this issue.
- Associate Editors have been working directly with Knowles Teaching Fellows at their Spring Cohort Meetings, thanks in part to a Seed Grant from Knowles.
- We've built a robust program of in-house peer advising for authors as they develop their stories and are training our first peer advisors from the Knowles community at large.
- Three members of the Editorial Staff facilitated events at the 2017 Knowles Summer Meeting, including two workshops and a wildly popular evening of story slam.
- Starting this fall, *Kaleidoscope* will be accepting submissions from authors beyond the current Knowles community.

We've also been reflecting, over the last few months, on the degree to which conversations about school culture and community are now part of our national discourse. In this issue, we're honored to publish one teacher's first-hand account of [how gun violence affected her and her classroom](#), our [second piece](#) about the impact

of violence on schools, students, and teachers in *Kaleidoscope's* short existence.

Inside this issue, you'll also find a powerful story on how one teacher's identity intersects with her additional needs, ideas for balancing introversion and extroversion in the classroom, and an essay on how both society and teachers often have difficulty discussing the long view. We're also highlighting a professional development opportunity in Yosemite, a project-based learning project that shakes up students' expectations, ideas for building and sharing meaningful curriculum, and a reflection on how early-career teachers learn to balance the struggles of the profession against its rewards.

Kaleidoscope has been publishing teachers' voices for over four years. In the last two years, the current editorial staff has developed amazing writing workshops, begun supporting and developing non-print storytelling platforms, and developed trust with authors as we work together to share their experiences. We're incredibly grateful for our editorial staff members, who have risen to each challenge we've faced, as well as to our program liaison Linda Abrams for her unwavering support. Most importantly, we're thankful that our authors are sharing their powerful, relevant stories.

If you're sitting on a story (and who isn't?), we'd love to work with you to share your experiences and thoughts with the world. Get started by sending us an email at kaleidoscope@knowlesteachers.org.



Kate Blaske
Editor-in-Chief



Kirstin Milks
Editor-in-Chief

Citation

Blaske, K. & Milks, K. (2018). From the editors' desk: Celebrating the journey. *Kaleidoscope: Educator Voices and Perspectives*, 4(2), 1–2.



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Raise Your Hand:

What's Teaching Taught You?

This issue, we asked teachers in the Knowles community to write about one thing teaching has taught them. Here are their responses.

Teaching has allowed me to take a hard look at my perfectionist tendencies because I cannot possibly be perfect for every student, every day. In a related way, teaching has highlighted to me the value of humility and honesty. I now strive to listen to students' complaints or issues with an open heart and mind instead of being defensive. This is still a challenge for me. I try to be transparent about ways I am working to improve and errors I make in pedagogy and content. When I admit missteps, I find students become more trusting and more willing to do the work that I ask of them.

Mary Chin, Senior Fellow

Teaching has taught me to learn about my strengths and weaknesses as a professional and as a person, and it's taught me that working collaboratively is much more productive and effective than working alone. It's forced me to face what I need to work on (such as avoiding confrontation) and celebrate what I'm great at (such as generating super creative ideas!). I've learned to listen to others for advice and feedback, and have seen greater outcomes from collaborating with my colleagues than I would have produced alone.

Kristin Mongelli, Senior Fellow

Teaching requires an extraordinary amount of emotional resiliency. In order to be an effective teacher, I need to show my students that I care and that I'm invested in them. As a result, I get more student buy-in to what I'm teaching, but I also have become a sounding board for students' personal struggles—suicidal thoughts, self-harm, bullying, perceived injustice, you name it. We have

protocol to follow to help these students, but recently I've been learning the importance of understanding how these student traumas can take an emotional and physical toll on me as a teacher, as well as how to cope.

Beverly Stuckwisch, Senior Fellow

Teaching has taught me that our system is not necessarily set up to value the whole person that each of our students is. Because of this, we have to be intentional in showing our students that we value who they are inside and outside of our classrooms. This communication may not always be verbal, often is very subtle, and requires consistent reflection. I have to continue to ask myself: What messages am I sending with my daily choices? Are they consistent with what I say I value? Not easy.

Allie Webb, 2014 Teaching Fellow

Teaching has taught me to ask for help, and that to do so is a strength, rather than a weakness.

Sarah Spector, 2016 Teaching Fellow

Teaching has made me realize that behind every student there is a story. No one makes the decision to miss class, stop trying, or sleep through a lesson without a reason. I am learning the importance of understanding students' stories before making judgments based on their actions in class. Before I can help students understand the beauty of the Pythagorean Theorem, they need to be safe and fed and feel cared for. While I can't always personally make sure these needs are met, understanding this

allows me to feel empathy for students who might feel difficult to work with. I know I am a better teacher when I acknowledge their needs and find a way to meet them.

Emma Vierheller, Senior Fellow

Emma's answer made me realize there is a story behind every teacher, too. The teachers that go on their phone during class instead of interacting with students have a reason for doing so. The teachers that seemingly try to sabotage collaborative efforts, like common labs and assessments, didn't start teaching with that goal in mind. In many teaching communities, it's a crime to bad-mouth students, but it seems perfectly acceptable to assume our colleagues are incompetent, malicious people. One of the biggest privileges of being a teacher and not an administrator is that I don't have to decide who gets tenure and who gets fired. Therefore, since I can't control who I work with, I get to control my approach to working with them. I choose to assume that all teachers have positive intentions, and I view it as my job to uncover and understand them.

Lyudmila Shemyakina, Senior Fellow

Teaching has taught me the importance of language. Every decision we make about how we communicate—structure, diction, tone—has an impact, positive or negative. Optimizing the positive potential of language requires constant analysis of our own language from an empathetic lens towards our audience. While at times it is a terrifying task, when done appropriately, teachers have enormous power for good.

Chris Lipski, 2013 Teaching Fellow

Teaching has taught me to ask. Are students not doing what you want? Ask. Are your colleagues struggling to collaborate effectively? Ask. Do you feel like your administrators are over- or under-managing your department? Ask. Are there opportunities you would like to take advantage of to grow? Ask. In need of fresh ideas? Ask. Do you just want a really long hug? Ask (an adult). Assumptions can not only be harmful, they also take away your power to make change. There's nothing harder to deal with than a lack of personal agency in a job that requires so much of your time, energy, spirit, heart and mind.

Sarah Berger, 2013 Teaching Fellow

Teaching has taught me that I don't truly understand what our society expects from education. I had a clearer view of what I thought the purpose of education was before I became a teacher. Now I see more of the nuances. I see the underlying principles behind our policies and standards as educators. I see how some students fail to fit that mold. I see how school structures, built to align with our vision as educators, can support or exclude students. I see that teachers are gatekeepers and coauthors of our students' progress



*Teaching has taught me
that students are incredibly
perceptive."*

in life, and what a hefty load to bear that can be, and what radiant hymns ring out when they surpass our expectations. As a scientist, I am uncomfortable with the amount of subjectivity I bring to my job everyday, but as a human being I am equally uncomfortable with the amount of objectivity my profession requires.

Katrina Jones, 2015 Teaching Fellow

Teaching has taught me to have more patience and understanding for my students. Many students have so many challenges to overcome at home that they need care and concern to succeed at school.

Kim Lintker, Senior Fellow

I've learned that there are some core psychological needs as a teacher-human that impact student learning. Two of these are control and consistency. If we think of these two needs along a continuum, they can be hindrances when expressed on either end of the spectrum. Extreme control can stifle student agency, but at the opposite end, chaos can ensue. While being consistent provides students with a set of clarity and predictability, it can lead to monotony. Balance is key.

Andrew Wild, Senior Fellow

People matter more than ideas. Ideas matter more than things.

Dan Voss, 2016 Teaching Fellow

Teaching has taught me that students are incredibly perceptive. Students come to your classroom every day, waiting for how you're going to interact with them. Are you going to treat them like they have to be there, or are you going to treat them like you want them to be there? A student can tell and feel what you are thinking—and respond accordingly. If you treat students like you want them to be there, then in both your minds they will want to be there. This makes for an enjoyable, positive and productive student-teacher relationship.

Anthony Tedaldi, 2016 Teaching Fellow

Teaching has taught me how much there is still for me to learn. I suspect there are few professions as humbling as teaching. Every time I feel like I truly have something figured out, my students, my classroom, or my school throws a wrench into the mix and makes it clear I am still at the beginning. Every little challenge met leads to bigger more interesting problems to solve. Luckily this fuels me, especially when I get to tackle challenges in a team while learning from my fellow teachers and my students.

Heather Buskirk, Senior Fellow

Teaching has taught me to stop being an adult all the time and to not take myself too seriously. "Yes, I'll eat that awful-looking blue donut you made for me! Yes, I'll wear those awkward school polo shirts every Friday. Yes, I'll dance to Fergalicious for your silly spirit day."

Ben Graves, Senior Fellow

Teaching has taught me to be patient. I won't always connect immediately with students, students will need directions repeated, and I will spend time in meetings. There is much to wait for, but waiting will pay off in the end.

Erin Oakley, 2015 Teaching Fellow

Teaching has taught me that there is far, far more going on in the lives of my students than I can see or anticipate when they walk into my classroom (or than I was remotely aware of when I was in high school). Sometimes things (friend drama, a social embarrassment, etc.) that from an outside adult perspective seem inconsequential are all-consuming to the teen in front of me—and no less real for their temporary nature. Other times students return from things that, again, from an outside adult perspective, seem soul-crushing (loss of a parent to suicide, accident, cancer, or murder; a sibling fighting leukemia; an abusive home life) with such remarkable resilience that it both humbles and amazes me. I have learned how hard it is to find the balance between being understanding that this background tapestry can make it challenging for some students to succeed or even focus in my classroom—and maintaining my standards, expectations, and consistency (or, looked at differently, that to remove my standards, expectations, and consistency is often not the kindness it might seem). I have also learned that I cannot ignore my own background tapestry; I cannot let teaching be so all-consuming that everything else starts to unravel, because this in turn will impact my teaching (in addition to my mental health). I haven't struck this balance, but I've acknowledged I need to work towards it. First step, right?

Katrina Cornell, 2014 Teaching Fellow

An ongoing feature in *Kaleidoscope*, Raise Your Hand, features short responses to a writing prompt. Do you have an idea for a storytelling prompt? Contact us at kaleidoscope@knowlesteachers.org.



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Citation

Chin, M., Mongelli, K., Stuckwisch, B., Webb, A., Spector, S., Vierheller, E., . . . Cornell, K. (2018). Raise your hand: What's teaching taught you? *Kaleidoscope: Educator Voices and Perspectives*, 4(2), 3–5.



Now on Teacher Voice

An Inquiry Into Good Teaching

In this episode of **Teacher Voice: The Podcast**, Knowles Fellows share their thinking around good teaching: What can good teaching look like? How can we recognize it in ourselves and others? How do we sustain ourselves as we strive to become good—and better—teachers?

In this episode, host Brittany Franckowiak (@FranckoWLHS), *Kaleidoscope* Associate Editor, speaks to three *Kaleidoscope* authors:

- Maria Chal, author of “[Being Okay with Imperfection](#)” (Spring/Summer 2017 issue);
- Heidi Park, author of “[What Makes Good Teaching?](#)” (Fall 2016/Winter 2017 issue), and
- Cacia Steensen, author of “[Finding Sustainability in Strengths](#)” (Fall 2016/Winter 2017 issue).

To hear more about the relationship between good teaching and teacher sustainability, listen to the podcast on our website.

Digital Media Citation

Franckowiak, B. (Producer). (2018, April). *Teacher voice: An inquiry into good teaching* [Audio podcast]. Retrieved from www.knowledgeteachers.org/kaleidoscope.

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We have to see our small successes instead of making our mistakes all that we can see.”

- Maria Chal

Listen to Teacher Voice: The Podcast at knowledgeteachers.org/kaleidoscope.

I Need a Minute: Teaching and Learning as Introverts in an Extroverted Culture

Cassie Bennett and Adam Quaal



Small shifts can improve the social experiences of teaching and learning for all.

We are teachers, and teaching is a social profession; we spend all day interacting with students and adults alike. As teachers, we are expected to write lessons that provide opportunities for students to engage in group work and to frequently collaborate with other teachers. These expectations unintentionally value the perspectives and skills of extroverts, and they create unique challenges for introverts.

When we met each other in our credential program, we quickly discovered we had similar working styles. We were hired at the same school in 2016; over the course of our first year, we both had difficulties putting a vocabulary to the pressures we felt in a collaborative environment. This past fall, we decided to explore these challenges by reading and discussing Susan Cain's *Quiet: The Power of Introverts in a World That Can't Stop Talking* (2012). Here, we describe the knowledge gained from our reading and reflect on the ways in which our introversion affects our roles as collaborators. We also discuss how our culture's extroverted outlook on collaboration permeates our daily routines as classroom teachers, and what we might do to address our own working style as well as those of our introverted students.

Introversion in collaborations

Consider that the simplest social interactions between two people requires performing an astonishing array of tasks: interpreting what the other person is saying;

“

As introverts, we prefer to share ideas only after we have had time to fully develop them, and we sometimes get so stuck in our own ideas that we have trouble synthesizing the ideas of others with our own.”

reading body language and facial expressions; smoothly taking turns talking and listening; responding to what the other person said; assessing whether you're being understood; determining whether you're well received, and, if not, figuring out how to improve or remove yourself from the situation. Think of what it takes to juggle all this at once! And that's just a one-to-one conversation. Now imagine the multitasking required in a group setting like a dinner party. (Cain, 2012, p. 237).

The challenges we experience in collaboration are twofold: as introverts, we prefer to share ideas only

after we have had time to fully develop them, and we sometimes get so stuck in our own ideas that we have trouble synthesizing the ideas of others with our own. Both of these challenges require extra processing time, which is often unavailable or underestimated during collaboration. This is compounded by our mental multitasking. We notice that during collaborative experiences, we try to develop our personal ideas while simultaneously processing the ideas of our colleagues so that we do not hinder the progress of our group as a whole. When this is not adequately addressed by the group, we feel that “going together” often means going too fast, and our ideas do not have time to take root.

One situation highlighting these challenges in our professional lives has been our experiences in a district-wide effort to develop new Next Generation Science Standard-centered curriculum for our science courses. In reflecting on these curriculum-writing events, I (Bennett) noticed that the facilitators focused on immediately letting groups get to work and did not allow participants time to independently consider their ideas. I felt pressure to “get something out there” to prevent my voice from being lost entirely in the group. As a result, only a fragmented portion of my ideas made it out, and I was left frustrated by the missed opportunity for think time to deeply consider my ideas so that I could clearly articulate them to the group.

However, introverted traits also come with some unexpected strengths for collaboration over the long term. We did not reach out to our colleagues much in our first year of teaching, but one graciously reached out to each of us. Over time, we came to feel comfortable telling them about our ideas and our classroom instruction, viewing them as mentors. I (Bennett) even invited my mentor to observe a lesson that included a game of Kahoot!, an online learning and trivia platform. He was unfamiliar with the platform and decided to implement it in his own classroom. A week later, he acknowledged my contribution to the entire school in a full staff meeting (to my quiet, introverted horror). This marked a turning point in my relationship with my department, after which other colleagues began showing interest in my ideas and instruction. As more of these subtle one-on-one interactions occurred for both of us, we began to feel more integrated into our department.

Due to our tendency towards self-reflection and mental multitasking, introverts prefer working in small groups of two or three individuals. In our own experience, this practice has led us to build strong relationships within our department by sharing well-picked resources or simply maintaining meaningful conversations on a day-to-day basis. Although this can seem exclusionary at times, it is an act of introverted self-care, as we require “down time” and focused interactions to avoid the exhaustion inherent in larger groups. However,



Introverted traits also come with some unexpected strengths for collaboration over the long term."

this does not mean that introversion and change are mutually exclusive. These smaller interactions have often grown—sustainably—to include members across our department. We have seen a gradual but measured change in our own department’s culture as colleagues have built confidence in us through these interactions, leading to greater cohesion in our department as a whole. Several colleagues who have been here for years have personally expressed to us that they have not seen this level of collaboration in years. It may not seem like much in the moment, but in a school context that has been fragmented by high administrative turnover in the past several years, it is a step in a right direction.

As our experiences show, our nation’s current educational culture places a high value on teacher collaboration. This tends to value the traits of extroverted teachers over introverted teachers, and is a reflection of what has occurred in the American “culture of personality” (Cain, 2012, pp. 19–33). To foster continued engagement from introverts in a collaborative setting, we suggest that facilitators provide adequate time for all participants to consider their ideas and perspectives. Introverts participating in a collaborative setting need to check in with ourselves frequently and monitor whether or not we are fully engaged in a task. We also need to seek out what Cain calls “restorative niches”—places where we can go to be alone and recharge (Cain, 2012, pp. 219–220). As introverts, we are especially prone to mental multitasking, and this can lead to our disengagement from group work. After reading *Quiet: The Power of Introverts in a World That Can’t Stop Talking*, we developed a set of critical questions (see below) for both facilitators and participants working in a collaborative setting.

Critical Questions for Facilitators and Participants

For facilitators:

- Am I allowing introverts enough time to independently think through their ideas throughout my session?
- How am I fostering small (2-3 people) group

interactions, rather than larger group interactions, so that the voices of the quieter participants are not drowned out?

- Am I providing spaces for people to be alone and recharge if needed?

For (introverted) participants:

- How can I reduce the cognitive load caused by my tendency to mentally multitask?
- How can I advocate for individual time to think and reflect in this particular context?
- What is my personal time limit for remaining fully engaged in group work?

Introversion in the classroom

At the end of each quarter, I (Quaal) like to give my students a brief engagement survey. The comments are often predictable, but one comment in particular struck me this past fall. After learning about several promising resources over the summer, I made some major shifts in my instructional style towards group work. However, one student in my Advanced Placement Physics course provided some gentle pushback in this anonymous survey: “I like group work, but sometimes I wish I was working with five of myself.”

As I fished through the survey responses and reflected on my new resources, I wondered about the assumptions I had made when choosing to implement these strategies. In our early careers as teachers, both of us have seen that many instructional strategies billed as effective place a high value on extroversion. We wonder if these strategies foster an engaging and cognitively demanding environment for our introverted students as well, given their potential to shut down in highly reactive situations. These students crave individual analysis and reflection, and we feel that rich tasks and effective lessons are often perceived as such because they equate student talk with student productivity. When this is the case, students who tend towards introversion may very well disengage from the task at hand. Moving forward, I (Quaal) altered several of my strategies to provide space for individual thinking and time for introverts to work alone. Some of my group structures remain, but I like to think I have moved towards a happy medium for both modes of interaction.

Many effective—even essential—activities in our classrooms revolve around group work and communication: laboratory investigations, whiteboarding, and group projects are just a few broad practices that appear in many science classrooms. We do not argue that educators should dispose of these strategies. Rather, we urge our colleagues to think about the ways they can ensure that individual time for analysis and reflection are built into each lesson. If introverted students do not have sufficient time to develop their thoughts, it is unlikely they will genuinely contribute to a group effort. Perhaps these students may still walk away from group work having

learned something, but these experiences over time will sour their opinion of the process. It is no coincidence that introverted teachers have such visceral reactions to collaboration, even when we are told these structures may produce superior outcomes.

In her chapter on collaboration and creativity, Susan Cain bemoans the rise of small group work in schools, citing the rise in classrooms and workplaces where seating has been rearranged in pods. I (Quaal) could not help but blush upon reading this critique, as I had just rearranged my own seating into groups of four desks. Many teachers Cain spoke with cited preparation for the business world when justifying their focus on small group work and promoting managerial roles (2012, pp. 77–78). These teachers are correct in their assumptions. Even a cursory search of skills valued by contemporary employers reveals a clear pattern that places a high value on extroverted traits, with a particular emphasis on teamwork and communication.

As educators, we aspire to train students—academically and socio-emotionally—to succeed in this economy. Part of that work will undoubtedly involve teaching students to collaborate, but in championing these environments exclusively, we lose sight of the powerful analytical tools that introverts quietly bring to the table. Workspaces and classrooms that are arranged solely for group work may stifle one of the cornerstones of deep understanding—which Cain refers to as “deliberate practice”. Deliberate practice is the solitary practice of a skill for uninterrupted periods of time, which the mental multitasking of group activities hinders. She cites a series of studies that focus on deliberate practice in various fields, from music to programming. These studies all reach similar conclusions: practicing in solitude consistently produces superior results (Cain, 2012, pp. 80–85). This conclusion was true for all people, not just introverts, and as teachers we would do well to recognize the importance of solo deliberate practice for all students to develop a deep understanding of our content areas.

After reading Cain’s book, I (Quaal) at first felt that refining my classroom for introverts would require me to backtrack to some archaic form of teaching. This is not the case. After all, the success of introverts in any field will require them to deliver effective presentations and relay information clearly to their colleagues. Introverts do not abhor all group work, and they may actually enjoy listening to the complex thinking of their peers. Both introverted and extroverted students have a great deal to learn from each other, but instructional strategies that inherently place a higher value on extroverted traits signal to our introverted students that their deep reflection and meticulous thinking are inferior to fast talking and quick decision making. Here are a few questions to start reflecting on existing classroom practices.

Classroom Practices

For our classroom environment:

- To what extent does my classroom culture equate talking with learning and understanding?
- How reactive is my classroom environment? Do introverted students have the personal space, personal time, and freedom from peer pressure to be creative in their thoughts?
- How are roles in my classroom distributed between extroverted doers and introverted listeners? Does every student feel comfortable in or appropriately challenged by their role?

For our classroom instruction:

- Do my instructional strategies give introverted students enough time to recharge their batteries and think independently between social interactions?
- How can I prevent my introverted students' good ideas from being drowned out during necessary group work or whole-class discussions?

Conclusion

We hope it is apparent in this article that both introverts and extroverts are needed in the collaborative process. Without extroverts, we might fall into an infinite loop of analysis and prototyping, never taking any action. No irony is lost on the fact that it took two introverts six months and three separate brainstorming documents to write this brief article on the subject. Without introverts, however, working groups might make important decisions based largely on instinct and wordiness, without critical reflection. We believe the latter has occurred disproportionately in our experience as collaborators, and we see this phenomenon among our students as well.

The introversion/extroversion divide is one that spans student demographics and teacher contexts. As we attempt to foster engagement in our classrooms and among our colleagues, it is important that we critically examine what exactly engagement feels like to both introverts and extroverts. This may be an unorthodox and uncomfortable process, especially in an organization that views collaboration as essential to progress. Implicitly exalting extroversion in our department meetings and classrooms runs counter to the important role that solitude, analysis, and reflection have played in our own fields of science and mathematics. If we expect all of our students to become the next generation of leaders, we must provide a space where they, both introverts and extroverts, can flourish.

References

Cain, S.H. (2012). *Quiet: The power of introverts in a world that can't stop talking*. New York, NY: Broadway Paperbacks.

Citation

Bennett, C., & Quaal, A. (2018). I need a minute: Teaching and learning as introverts in an extroverted culture. *Kaleidoscope: Educator Voices and Perspectives*, 4(2), 7–10.



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Summits and Valleys

Rebecca Guarino

Connecting my first backpacking experience to the summits and valleys of my beginning years of teaching.

I am a city girl, born and raised in the Bronx, New York. My exposure to nature consisted of tall buildings, concrete streets, and sitting under the one tree in our backyard. As I grew older, I spent summers in the woods in the Poconos breathing in newfound fresh air, and I began to understand what others meant by connecting with nature.

At the age of 24, I embarked on a trip I never once imagined: going backpacking. For non-city people this might not sound unusual, but for a Bronx girl it seemed very adventurous. I planned to go with three friends who had all been backpacking before and wanted to expose me to a new challenge. As they excitedly began planning to hike a section of the Appalachian Trail with well-known lookouts, I was hesitant about going. The thought of being in nature for that long and physically pushing my body to new limits was completely out of my comfort zone. I remember condensing all my gear and preparing my pack while my parents were telling me, "Hiking 30 miles in three days carrying all your water, food, clothes, tent, sleeping bag, everything on your back? Are you crazy?!" Although I talked a big game and told them I was prepared, I was nervous I wouldn't be able to take the trip. I allowed my competitive nature to push me and decided to at least try.

On our first day of hiking, I felt like a champion. The scenery was beautiful during those first miles; we saw

magnificent lakes and met unique people from all over the country along the way. The conversation with my friends made time seem like it was flying by. I was confident I would make it.

Similar to the beginning of my hike, I felt like a superhero during my first month of teaching. Everyone had warned me that teaching math was hard and that students would be disengaged. I was told that the state exams for public schools in New York were challenging and that geometry was particularly difficult. However, my lesson plans were written exactly as I had been trained, I arrived to school an hour early each day to set up my classroom, and it seemed as if my students appreciated me. I was confused as to why people said the beginning of teaching is so hard. I thought nothing could stop me.

On day two of the hike, we prepared to go 13 miles. About halfway through, the joys of yesterday felt like a dream. My legs were sore, my pack felt heavier, blisters began forming on my feet, and suddenly the views

“

I needed to look for the smaller, daily accomplishments.”

looked less enticing. My friends had no trouble hiking along, but I was feeling short of breath and moving at what I thought was a snail's pace. We encountered hikers trekking all the way from Georgia to Maine; they were on their 1,200th mile while I felt like I couldn't reach my 21st mile. I was exhausted, burnt out, and wanted to quit.

After the first few weeks of teaching, I became overwhelmed. Maybe everyone was right and teaching was a lot harder than I anticipated. Although I told my friends and family I could not see myself doing anything but teaching, it wasn't everything I said it was. I entered the classroom scared and nervous that my lessons wouldn't go well; to be honest, they often didn't. I lacked confidence to fully implement the tasks I desired. Every day felt like a struggle as I failed to be fully present for my students when I didn't get enough sleep because I was up late planning for the next day. My lessons were not beautifully orchestrated because my classroom management was lacking. I sat in team meetings and didn't feel outstanding and energetic like the other teachers around me. I felt burnt out and unable to achieve the daily goals I wanted for my students. Some days I failed, some I succeeded, but most days I left my classroom feeling drained and exhausted. I learned quickly that the thought of teaching, similar to the thought of hiking 30 miles, was much more thrilling than it actually felt. It was much harder than I ever anticipated. I had reached my first valley of teaching.

Gladly my story of backpacking didn't end with misery and exhaustion. My friends pushed me to keep going. On day two—after 10 hours of walking, two feet with blisters, and eight miles of hiking—we reached a beautiful summit that had a lookout on both sides of the trail. The air was fresh and the breeze was relieving as I had to catch my breath for the final push to the top. I had never seen anything so unbelievably beautiful in my entire life. I looked to a friend and said, "If people like me don't push themselves physically, they never get to see anything this beautiful." Suddenly the journey seemed worth it. I realized that sometimes the most difficult challenges in life have the most worthwhile outcomes.

Reflecting on my first backpacking trip has allowed me to recognize how it paralleled my teaching journey. I began to look for the everyday summits and valleys in my classroom. Yes, some days would feel like a 13-mile trek, but—rather than dwelling in the exhaustion of it all—I needed to look for the smaller, daily accomplishments. With a change in perspective, I started celebrating the mountaintops that my exhaustion seemed to cover up. I began to allow myself to see little summits, like when my students came to see me in the morning just to say hello or tell me they missed me when I was absent. I even took more joy in the bigger summits, like when I got to call a student who believed she wouldn't pass the state



Teaching is filled with endless numbers of beautiful, breathtaking summits if we allow ourselves to experience them."

exam and tell her she scored the highest in the grade. After shifting my mindset about my teaching journey, I've realized that teaching does not have one end goal or summit to conquer. There will never be a moment when I realize I became a great teacher; it is more about the journey along the way.

Teaching is filled with endless numbers of beautiful, breathtaking summits if we allow ourselves to experience them. My backpacking experience was not just about reaching the mountaintop—it was about the excursion it took to get there. As teachers, we will have low points where we don't fully feel successful and affirmed. Some days might feel like a 13-mile trek where we feel burnt out, worn down, and tired. However, if we learn from the challenges and find support to keep going, we will always get to see a new breathtaking view. Equally importantly, we need to take time along our journey to see the incredible mountain range created by not only the summits and but also valleys we have conquered.

Citation

Guarino, R. (2018). Summits and valleys. *Kaleidoscope: Educator Voices and Perspectives*, 4(2), 11–12.



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Sew What? Engineering Fashion in the Classroom

Kate Miller

Photo Credit: University of Wisconsin-River Falls Upward Bound program

What happens when you ask students to engineer clothing that responds to the world around them?

In this video, Senior Fellow Kate Miller describes a wearable electronics unit that she and other teachers implemented at Upward Bound, a summer camp aimed at preparing first-generation and low-income high school students from the Minneapolis/St. Paul area for college. Students engaged with the engineering design process as they drafted, sewed, optimized, and presented a unique garment. Students also learned to program lights to respond to sensory input, and attached these to the clothing itself. The project culminated in a fashion show, both in the light and the dark.

“This [summer] project was an example of real, authentic, get-your-hands-messy, make-mistakes, not-quite-sure-where-we’re-going-to-end-up sort of learning,” and it stuck with the teachers well into the school year.

Watch this video on our website to see the project’s progression and learn about the teachers’ thoughts and reflections, including:

- how students’ authentic learning is a reflection of the teachers’ authentic learning,
- a realization of preconceived gender bias around who can do engineering, and

- how this project has inspired similar ways of teaching and learning in more traditional classroom contexts.

Watch *Sew What? Engineering Fashion in the Classroom* at knowlesteachers.org/kaleidoscope.

Special thanks to the [University of Wisconsin-River Falls Upward Bound](#) program and the National Science Foundation-supported [IceCube Neutrino Observatory](#) and [PolarTREC](#) for their ongoing support of student learning.

Digital Media Citation

Miller, K. (2018, April). *Sew what? Engineering fashion in the classroom* [Video file]. Retrieved from www.knowlesteachers.org/kaleidoscope.

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Barriers and Blessings

Lindsey Quinlisk

I shared openly about my hearing loss with students but struggled privately with vision issues.

Geometry class, your warm-up today is a free-write for the following prompt:

“Write one to two paragraphs about a challenge you face or something you struggle with. It can be about anything: school, parents, siblings, peer pressure, etc.”

Thank you for taking the time to write about your struggle. I am collecting your responses as a way to get to know you better and see ways that I can support you. Now, let me share my story with you.

I was two years old when my parents started to recognize something was wrong. I was not talking like other children my age. One day, my dad and I were sitting on the back deck. I had my back turned to him and was immersed in my own world of Legos and blocks. My dad decided to conduct an impromptu test:

“Lindsey,” my dad whispered. I gave no response.

“Lindsey,” he said, using a normal talking voice. I still did not acknowledge him.

“Lindsey,” he called, raising his voice, but I still did not flinch.

“Lindsey!” he shouted. I then turned my head and looked at him.

That was the day my dad figured out there was something wrong with my hearing. It took months of doctor visits and tests until they identified the root issue and fitted me with hearing aids. At that point I began to talk and progress in my development.

You know what? I love my hearing aids. Turning my ears off is amazing! Need to study in the college dorms when people next door are blaring their music? No problem—turn my hearing aids off. Need to take a moment to calm down and block out the world? Simply turn off my ears. Need to tune my mom out when she is yelling at me for not cleaning up my mess? Yes, I can turn that off too! I bet you wish you could do that!

I had you write about something you struggle with because we all have personal challenges. That is part of our human experience. We need help with the things we struggle with. I have hearing loss and I will need your help with this. I need you to speak loudly in class. If I don't hear you, I may have others closer to me repeat what you said (so that means you all need to be paying attention, because I will put you on the spot). What questions do you have?

Over the past nine years of teaching math at three different large, public comprehensive high schools, this scenario became a staple first week of school activity for all my classes. It let my students know that I wouldn't always hear their answers and that they needed to speak up. It also gave me a peek into each of my students' lives. Jolene¹, who feels like the parent because she is responsible for her four younger siblings when they are not in school. Matt, who has testing anxiety and

gets nauseous before a big test, no matter the subject. Alexis, who has to ride the bus one hour to school each way and doesn't get to spend much time with her friends because she lives so far away. Then there were Tim and Jordan, students who also wore hearing aids, who came to me after class and said they appreciated me telling my story and described how theirs was similar or different. I treasured this look into my students' worlds beyond their math class. Yet it wasn't easy to get to a place of knowing myself enough to share my story with my students.

When I first started teaching, I felt anxious about how my hearing loss would affect my career. I worried that I wouldn't be able to hear my students' answers. I wondered: what if my students wouldn't feel safe because other students would say inappropriate things and get away with it because I didn't hear them? Then, if I really started to fret: what if I lose control of my classroom? What if I were to lose my job over something like this?

It was the first time in my life that my hearing impairment seemed like a barrier rather than a blessing. Turning off my ears was normal to me and felt like a personal benefit until I stepped into the flood of uncertainty and self-doubt that typically comes with being a first-year teacher. As the teacher I was now the adult in the room, not just responsible for myself but for every other person too. And, let's be honest, that requires hearing. I was terrified of this responsibility and whether my ears would let me carry it out.

The year that I was in my master's program and doing my student teaching aligned with my first year as a Knowles Teaching Fellow. One of the requirements of the Fellowship was to pick a goal to focus on for professional growth. Through the nudging and support of Knowles, as well as my university supervisor, I determined that my goal was to find strategies for dealing with my hearing limitations in the classroom. In this journey, I researched articles on nonverbal communication, experimented with strategies for informal assessments that don't rely on verbal answers, and visited another teacher who has hearing loss and observed her classroom. It was this visit that single-handedly calmed my anxieties. Ms. Witzemann did not give me any major insights or secret strategies; it was simply seeing her in action and how her students responded that gave me a sense of relief. She had been in the classroom for years and not lost her job or cited any failures as a professional because of her hearing loss. I had met numerous people who wore hearing aids but up to that point had not seen one working in a professional capacity. Even though I only spent a few hours with her,

¹ All student names are pseudonyms.



*Teaching was the first time
in my life that my hearing
impairment seemed like a
barrier rather than a blessing."*

Ms. Witzeman became a model for me of what it means to be a hearing-impaired teacher.

Shortly after my visit with Ms. Witzeman, I created the lesson plan that I described at the beginning of this article. This was my way of beginning the conversation with my students about my hearing loss in a way that felt safe for me as well as opening the door to conversations with students, both as a class and individually. After eight years in the classroom, I know that my hearing loss is not a barrier but continues to be a blessing.

It would be easy to stop here, to share the success of how I came to terms with my own hearing loss in my professional career and how I shared it with my students. To give you, reader, the happy ending. However, as is the case in real life, there is always more to the story.

I have another physical disability that I could not bring myself to talk about with my students. I am sure my students picked up on my odd behaviors: not seeing raised hands on the sides of the room, losing my spot while writing notes and taking a few awkward seconds too long to find it again, always missing random chunks of words and graphs while erasing the whiteboard. In fact, I had one student get so annoyed that she offered to be the designated board eraser for the class.

My visual world is narrowing on me and I was in denial about it. My hearing loss I see as a blessing, but I have yet to find the blessing in going blind. At 22, I was diagnosed with retinitis pigmentosa, a genetic eye disease which starts as night blindness, continues to gradual loss of peripheral vision, then to loss of central vision, and eventually, in many cases, total blindness. Right now my visual field is a third of the typical range of vision. My central vision is clear; I just see less than normal. Imagine holding toilet paper rolls to your eyes and walking through a normal day with tunnel vision. This is my reality (see Figure 1).

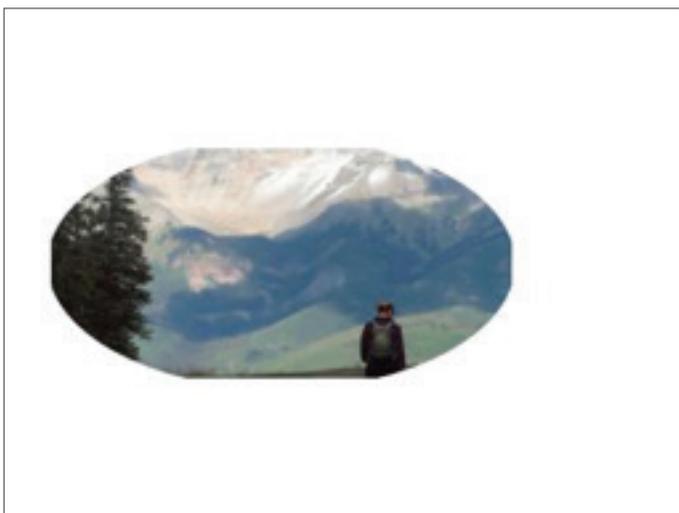
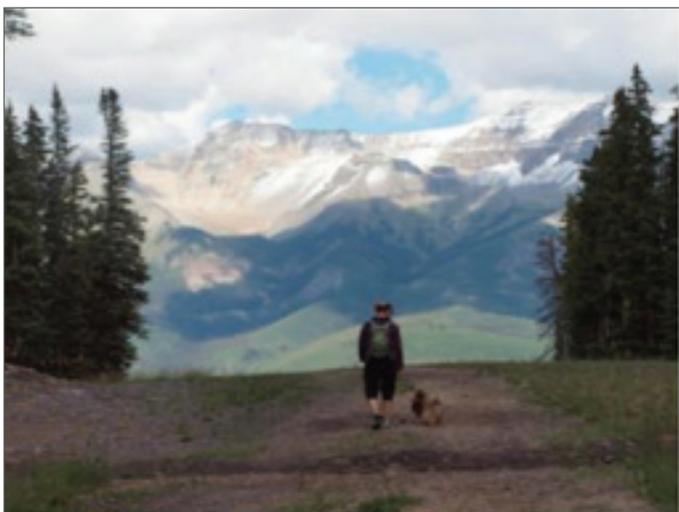


Figure 1. Visual fields, typical and with advanced retinitis pigmentosa.

How did this affect me in the classroom? Let's say I drop the whiteboard marker I am using while going over a geometry proof, and it rolls across the floor. Then I spend an inordinate amount of time looking for it. A student chimes, "It's right over there" and points to the marker. While the student is trying to be helpful, "here" and "there" are un-descriptive words, giving me no visual orientation of where specifically to look. Of course I am expected to see where the student is pointing. Yet, to look at the student who spoke up, find their arm and follow in the direction where their finger is pointing is a difficult task. It might actually be faster for me to get on my hands and knees and conduct a comprehensive visual sweep than transfer those vague verbal clues onto my limited visual map. I learned to keep a good grip on my markers and if I lost a cap, I would wait until students were working independently to begin my hunt for it. I couldn't stand wasting class time, much less putting on a public display of the ineffectiveness of my eyes.

When I first started teaching nine years ago, my diagnosis did not concern me as much, as I was not experiencing its limitations. Yet in the past few years, I have noticed the change in my vision. I talked to my friends and family about what was happening but could not talk about it at work. I was afraid that if I let my colleagues and administrators know about my changing vision, they would tell me I had to stop teaching. If I had to leave the classroom, I wanted to leave on my own terms, not because someone else told me to. And certainly not because of my eyes.

Around the same time, I started seeing a new eye doctor. After conducting a comprehensive examination, she sat down with me to discuss her findings, particularly about my limited field of vision. She expressed her concern about my ability to manage a room full of teenagers and whether they might take advantage of me. I responded by telling her that I wasn't worried about it, that I had a positive relationship with my students, and I was managing them just fine. In the moment, I shrugged off her concern as minor. However, I left that appointment feeling frustrated and angry. She hasn't even seen me in the classroom! How can she pass judgment on my classroom management skills? I am the professional educator, highly trained in the field, not her. Yet, I was scared because there was a jabbing needle of possibility in her concern. There may be a day when I should not be in the classroom; how would I know when that would be?

My hearing loss is stable. It is familiar and predictable, so I can adapt accordingly. I won't hear you whisper, and it will always be that way. Either use a normal voice or write it down. Because I know what to expect of my hearing limitations, I can coach my students. My visual field, on the other hand, is always a shifting line. How can I share this with my students when I myself don't even know what to expect? An acquaintance I met at a Foundation for Fighting Blindness event who has completely lost his vision to retinitis pigmentosa told me, "The hardest thing is not being blind, it is going blind because it is always changing and you don't know what is going to hit you next." That resonated with me both figuratively and literally. I was constantly running into student desks as I walked around the classroom and by the end of each week, my thighs were littered with bruises, the physical evidence from the ongoing battle between my vision and my profession.

I felt I could talk about my hearing loss with my students and still retain my sense of authority. But to talk about hearing loss and vision loss together seemed to be an invitation for student rebellion. For example, I had a hard enough time with getting buy-in from my algebra class, over half of which were taking the class for the second time and dreading every moment of it. There was simply no way I felt comfortable sharing this raw part of me

with them, especially as the class ring leaders and I were already on delicate footing. My pre-calculus class, on the other hand, was filled with model students who were eager to learn and emotionally aware of themselves and the people around them. I would have been willing to be transparent with them, but students talk and it would eventually get to my algebra students. I took the safe route of silence and secrecy.

As the adult figure in the classroom, being transparent with students can foster a greater sense of respect and build stronger connections. You are showing that you are human and that you have issues as well. I wonder where the line is for being transparent and being too vulnerable. I believe I have not fully taken ownership of what losing my vision means for me personally. By sharing it with 130 teenagers, I felt that I would lose myself in that transparency. But I also wanted to be real with them and I wrestled with this tension.

As teachers, we have a unique opportunity to be role models and influence young people in a way that directs the course they take. We nudge them, encourage them, coach them, invest in them and in the process, we can share so much of ourselves that our professional and personal lives get blurred. When do we know if the best way to support our students is to share with them the challenges we ourselves are facing? Or if it is better to keep that information private and be the strong shoulder on which our students can stand? I do not have a clear-cut answer for this dilemma but will continue my role as a teacher to explore ideas, ask questions, and see beyond the immediate challenge.

Citation

Quinlisk, L. (2018). Barriers and blessings. *Kaleidoscope: Educator Voices and Perspectives*, 4(2), 14–17.



When do we know if the best way to support our students is to share with them the challenges we ourselves are facing?"



Lindsey Quinlisk, a Knowles Senior Fellow, most recently taught math at Liberty High School in Colorado Springs, Colorado. She has taught in California, Tanzania, and Lithuania. Her love of connecting with people from different places

and cultures keeps her friends and family guessing as to where she is headed next. Reach Lindsey at lindsey.quinlisk@knowlesteachers.org.

Weather and Climate: A Story of Teacher Leadership

Ben Graves

Comparing real-life weather and climate with lunchtime conversations in the teacher's lounge.

Five years ago I was cautioned, as many new teachers are, not to eat lunch in the staff lounge. The argument was simple: the staff lounge is a place where teachers endlessly complain about students. "It just gets you so depressed," my stepfather, a 30+ year veteran public school teacher in California, warned.

So for five years I avoided that place like the plague. But this winter, I ventured into the lounge with my lunch tray. At first, it was to show gratitude towards my coworkers, who generously donated a mountain of diapers as a baby shower gift. Now, though, I'm spending more and more of my lunches eating with my colleagues.

I've noticed that the topic of conversation in the staff lounge seems to dwell on particularly disruptive students, lessons that flopped, or, more often than not, the weather. I live in a rural agricultural community in Colorado, many hours from metropolitan Denver or the posh resorts of Summit County. People in my community, teachers included, love talking about the weather. The allure of a casual weather conversation is that it transcends all boundaries of politics or religion. Whether it is the late frost that ruined the peach blossoms or the persistent rains that bogged down the plows, weather is where newcomers from the city and third generation cattle ranchers find common conversational ground.

A frequent misconception in my earth science classroom, my rural Colorado community, and society as a whole is the conflation of the terms "weather" and "climate." This confusion can lead students and the public towards unscientific conclusions about the existence and consequences of global climate change. Weather is an ever-changing melange of chaotic atmospheric conditions; the study of climate requires looking for patterns by examining decades—even centuries—of carefully averaged data.

This makes weather a much easier subject than climate to talk about and to take actions around. A meteorologist attempts to predict how you should dress for tomorrow and you curse them every time they are wrong, but you can easily pack an umbrella just in case. Climatologists, on the other hand, step back and look at historical data and build models that give a range of possibilities for the future. That single degree of temperature change over a decade might not feel like much, but it can disrupt delicate plant-pollinator relationships or cause a region's principal crop to suffer.

As a science teacher with a background in climatology, I find it ironic that as a nation we have become fixated on the Weather Channel but just can't give a hoot about the serious, underlying issue of a rapidly changing climate. My personal explanation is that the slow, creeping time scale at which climate change occurs is no match for the exciting immediacy of extreme weather events.

After all, climate scientists can't help you decide whether or not to delay your afternoon wedding ceremony. Their complicated climate models won't help you decide

to wear sandals tomorrow or whether you should break out the snow chains. However, increased global temperatures do lead to warmer oceans, and this has profound implications on weather events around the world. From intensifying hurricanes along the already beleaguered Gulf Coast (Knudson et al., 2010) to disrupting the jet stream and plunging the Eastern states into frigid wintertime weather (Palmer, 2014), human-caused climate change is already influencing our day-to-day lives in unfathomable ways. Yet, instead of talking about climate change, we stay glued to the weather, fretting over urgent happenings when it is the important underlying climate system that we really need to be talking about.

We can't really do anything to stop the weather. Rain will come when it may, and that early frost will kill all your tomatoes. But we actually have the power to do something about our changing climate. We can limit our personal carbon footprints and elect officials who will work with global leaders to wean our society off carbon-intensive fuels.

However, working to stop climate change is a slow process without tangible feedback. The subtle timescale and massive spatial scale at which climate change operates make it hard to tell if our actions are making a difference. So instead we keep checking our weather apps and hope for the best.

I find our culture's weather obsession and climate denialism a helpful analogy to help me make sense of the patterns of conversations I see in the staff lounge at lunch hour. We teachers love talking about our classroom and our students. But so often we focus on the day-to-day: the single lesson that flopped or that particular student who is acting out or hard to reach. I, too, find myself discussing classroom "weather" with my colleagues, despite the fact that most days we are relatively powerless to control it. In the teachers' lounge, the conversation often turns toward the atypical behavior of one particular student, rather than looking for patterns that transcend across class periods. Like the weather, those particular conditions will never exactly repeat. Instead of the "weather" in our classrooms, we need to be talking about the "climate" of our schools and our community. But how do we start to shift the conversation?

Growing inequality, decreased access to mental healthcare, and eroding family structures due to economic instability act like Earth's increasing load of greenhouse gases, putting stress on the "climate" of many rural and urban schools. Yet instead of talking about status, race, equity, and inclusion as a staff, we stress about the "weather." Maybe it is because these issues are far outside the boundaries of our control,



Growing inequality, decreased access to mental healthcare, and eroding family structures due to economic instability act like Earth's increasing load of greenhouse gases, putting stress on the 'climate' of many rural and urban schools."

or maybe surface-level conversations are less risky and easier to talk about between bites of a sandwich. I certainly think so. Either way, the break room simply doesn't feel like the place for such heavy issues.

So is there value to talking about the weather? Just like the freak May snowstorm that knocked down trees all over the county, stories about the weather are emotionally resonant and connect us to a shared, immediate experience. Climate models and historical statistics just don't compete with the feeling of your boots filling with rainwater. Similarly, classroom stories—even those shared in the lunchroom—give teachers clear examples instead of generalities and help us build empathy for each other's struggles. I once shrugged off this type of lunchroom discussion of classroom "weather" as unproductive venting, but I am starting to realize that it has a purpose. My colleague Heidi Park understands this sentiment, writing, "although your context is different from mine, your successes and your struggles are both things that I can relate to. And most likely, my successes and struggles are things that you can relate to" (2016). I find myself leaving the lunchroom with a new perspective of what it feels like in other classrooms at my school and an appreciation for, and connection to, the successes and struggles of my colleagues.

In the last decade, national surveys have shown a modest increase in society's acceptance of climate change as human-caused. Possibly the increase is due to scientists learning how to humanize the data they collect through telling compelling stories about specific communities and species that are impacted by climate

change. I am slowly learning that this might be the value of the staff lounge—a place where teachers can share personal and unabashed stories about the “weather” in their classroom.

Conversations over lunch have helped me connect with my colleagues and learn that we share the same positive intent for our students. The work we do every day supporting and caring for students can often be arduous, and knowing that others are struggling helps build rapport. I hope that, if and when we finally have a dedicated time and space to address the “climate” issues at our school, our lunchtime conversations will have helped us build the trust we need to be open and honest.



Conversations over lunch have helped me connect with my colleague and learn that we share the same positive intent for our students."

References

Knutson, T. R., McBride, J. L., Chan, J., Emanuel, K., Holland, G., Landsea, C., ... Sugi, M. (2010). Tropical cyclones and climate change. *Nature Geoscience*, 3, 157–163. doi:10.1038/ngeo779

Palmer, T. (2014). Record-breaking winters and global climate change. *Science*, 344 (6186), 803–804. doi: 10.1126/science.1255147

Park, H. (2016, November 27) “Is anyone listening?” Learning to Teach Science. Retrieved from <https://urbanscienceed.wordpress.com/2016/11/27/is-anyone-listening/>

Citation

Graves, B. (2018). Weather and climate: A story of teacher leadership. *Kaleidoscope: Educator Voices and Perspectives*, 4(2), 18–20.



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Professional Development: Yosemite Field Institute

Brianna Balke, Bernice O'Brien,
and Jesse Stonewood



Photo Credit: Erika Mitkus

A short course for science teachers at Yosemite National Park changed how three Fellows use outdoor education in their classrooms.

Introduction

"Hey, I think I found one! Come take a look, it's right here."

"Really?"

"Is it like the other one?"

It doesn't take long for the dozen or so people hiking up Pothole Dome to scramble up the slope and gather around the person who first called out. A handful get notebooks out and make quick sketches while others snap pictures. Then someone, hoping to get a closer look, lays belly-down on the warm granite slab. "Notice how the mark looks different than the other cracks and are all oriented the same direction," she says. Another person chimes in, "It sort of reminds me of arrow markings on a road." While a few more people have joined her down on the rock, exploring the rough edges of the crescent-moon shaped mark, someone turns to look back towards the meadow below. "It's pointing uphill; I wonder if that means the glacier was moving that way too."

If you were to make your way through the crowd to see what could be captivating this group of 20 in sun hats and backpacks, you would see a series of semicircular marks etched into the surface of a light



One of the authors getting up close and personal with the rock described in the text. Photo credit: Krystal Park.

grey rock speckled with white, pink, and black crystals (Cathedral Peak Granodiorite). It's a chatter mark, lasting evidence from 20,000 years ago when this peak was 2,000 feet below the Tuolumne Icefields glacier and boulders swept along by sub-glacial rivers left their characteristic impact pattern.

Who is this group of adults so excited by a single section of rock? They're science educators from around the country who have all come to the Yosemite Field

Institute to hone their observation skills, practice new sketching and field journaling techniques, snap photos of phenomena to bring back to the classroom, and learn about the natural history of the High Sierras. Here atop Pothole Dome in Yosemite National Park, surrounded by verdant meadow systems and picturesque granite peaks, they are getting quite excited about geology and science education.

Description of the Institute

The primary focus of the Yosemite Field Institutes is to give teachers practical, in-depth training on how to lead students through field-based explorations. This training unfolds over the course of several days through a series of outdoor activities designed to have participants engage with content, phenomena, and pedagogy as both teachers and learners. Typically, the Field Institutes center around a theme related to the Next Generation Science Standards (NGSS); this year's theme is "Concepts, Core Ideas and Practices." This theme is first explored shortly after participants arrive and then revisited many times throughout the Institute as teachers are urged to think about how to bring it back to their own classrooms.

Course name: Yosemite Field Institute

Quick info: This training gives teachers practical, in-depth training on how to lead students through field-based explorations. Over several days, participants engage outdoors with content, phenomena and pedagogy as both teachers and learners. The majority of workshop time is spent outdoors on daily excursions to different, breathtakingly scenic places throughout Yosemite National Park. Each excursion highlights a different dimension of field-based teaching such as developing local knowledge, understanding ecology, practicing field techniques, and learning useful outdoor teaching skills.

Who should consider this PD: High school earth science, biology, environmental science and geology teachers

Provider: California Institute for Biodiversity

Location: Yosemite National Park, California

Duration: Two separate four-day sessions

Cost: \$349–449 depending on time of registration

Learn more at:

www.calalive.org/professionaldevelopment

Nearly all of the workshop time is spent outdoors on daily excursions to different, breathtakingly scenic places throughout Yosemite National Park. Camping in the park allows for easy access to some of Yosemite's most famous vistas and provides the perfect opportunity to see providers model teaching without a traditional classroom. Each excursion highlights a different dimension of field-based teaching from developing local knowledge (e.g., the geology, natural history and cultural history of the Sierra Nevada) to understanding ecology (e.g., soil typing, water quality and macroinvertebrate collection) to practicing field techniques (e.g., birdwatching, plant identification, quadrat and transect sampling methods) to learning useful outdoor teaching skills (e.g., sketching, journaling and making observations). The workshop is led by practicing teachers, and scientists and local professors are often brought in to share their expertise. Participants are given ample opportunities to reflect and discuss how they could apply their lessons from the Field Institute to their particular school context. It should also be noted that participants get to spend plenty of time relaxing around a campfire and having great conversations with interesting, like-minded educational professionals.

Teacher learning and implementation (Jesse)

My experiences at the Field Institutes have been nothing short of incredible, and this year will be my fourth time returning to Yosemite as either a participant or facilitator. On a personal level, simply taking time to be outside, making observations and learning about the natural world, has been a good way to mentally reset during the summer. The rich professional learning is almost an added bonus to this vitally important time and experience away from the classroom.

One of the biggest takeaways for me has been a deeper understanding of the NGSS, which evolved through several different curricular activities as well as numerous conversations with other teachers. The field work in Yosemite, where participants are able to actively engage with natural phenomena and use data to develop the story of a place or object, was where I really started to see NGSS crosscutting concepts (concepts which are linked across different domains of science) come to life. Parallel lines of stomatal openings for gas exchange on the underside of a Ponderosa pine needle—*structure and function!* Distributions of plant and animal species based on the geology and hydrology of meadows—*patterns (and systems. . . and stability and change . . . and energy and matter . . . and cause and effect!)* This way of viewing the natural world has helped me to internalize the NGSS in a new way and my current units and lessons now incorporate many more earth science concepts and tangible, real-world phenomena.

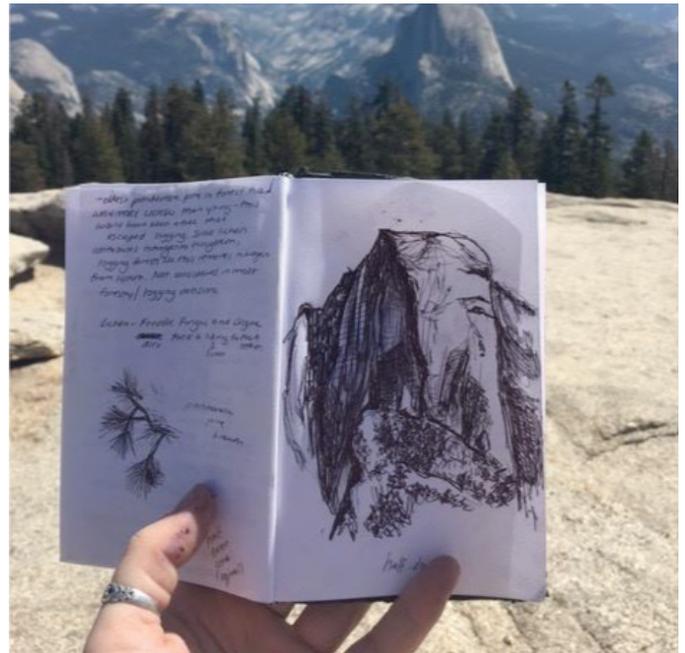
I have also become better able to lead field-based projects with my students, which can be intimidating as it involves leaving the cozy (and more controllable) confines of the indoor classroom. For the past three years, I have had my students get outside to track changes in their own schoolyard with a phenology (the study of change in nature over time) project based on observations of trees. This year, my students are making one to two monthly observations of assigned trees on our campus. These observations include either a short- or long-form data collection sheet, a scientific sketch, and a photo. All materials are archived by students, and the project culminates in two products: an illustrated circular calendar and a digital PowerPoint flip book. Both products are annotated with field notes and observations about the growth and development of their trees and as many related examples of NGSS crosscutting concepts as possible. The tree phenology project is not only a creative way for students to connect crosscutting concepts to the real-world phenomena they directly experience but it has been financially rewarding for my classroom as well. In the past three years, I have leveraged it to land several grants worth thousands for computers, field equipment (e.g., notebooks, rulers and magnifying glasses) and Vernier data collection devices.

Teacher learning and implementation (Brianna)

I remember our first task at the Yosemite Field Institute because it transformed the way I think about engaging students with the outdoors. We were sent out into the woods to find a spot where we could sit alone. The prompt was simple: "Write down what you notice and wonder." In 15 minutes, I filled my nature journal with observations and questions that never would have crossed my mind had I not been asked to sit alone in one place silently with my eyes and ears open. Could unleashing my students' powers of observation be this simple?



Give students a few moments to notice and wonder, and they will see the world through fresh eyes."



2017 participant Erika Mitkus, a 2016 Knowles Teaching Fellow, journaling at the peak of Sentinel Dome, looking out over Yosemite Valley and Half Dome. Photo credit: Erika Mitkus.

I tested it out the first week of school. Our urban environment isn't quite Yosemite, but several oaks, dogwoods, and maples spring up out of a narrow patch of grass and shrubs across the street. I gave each student a blank nature journal and sent them out with the same prompt that spawned pages of observations and questions in my own journal.

After 15 minutes, we came back together and shared our "noticings" and "wonderings." One student was shocked at how many different species were in the tiny plot of land. Another pointed out multiple birds' nests in the trees. A third noticed two distinct leaf shapes that seemed to grow out of the same tree and wondered how this could be. Many had detailed drawings of leaves, bark, and cones. When I pulled out the handheld microscopes we had used in the Sierra Institute, students crowded around eagerly awaiting their turn to get an up-close look at a caterpillar that we found on that plot of land.

I took away countless ideas from the Field Institute. I began a year-long citizen science phenology project in collaboration with Harvard Forest, started taking my chemistry students out to the Seekonk River to measure water quality, incorporated sketching into my environmental science class, engaged students in a variety of outdoor labs to measure biodiversity, and was inspired to take my students camping. But my biggest

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Learning and doing science with other educators in this environment provides a rare chance to grow professionally while at the same time rejuvenate personally.”

take-away was also perhaps the simplest: give students a few moments to notice and wonder, and they will see the world through fresh eyes. Let them be in nature, and their curiosity will flourish.

Teacher learning and implementation (Bernice)

If you were to ask me about what I learned at any given professional development training from three years ago, I might have a hard time giving you something beyond



A student's scientific illustration of a common kingfisher, her final product for Bernice's short course in field research techniques and scientific sketching.

the major takeaways. I would have the same problem if you asked about most of my science courses in college. However, the Field Institutes are different. I can tell you in detail about the life cycle of wildflowers across Yosemite's meadows, or the observation prompts, or the tree phenology project mentioned by Jesse and Brianna. All I would need to do is pull out my nature journal from the Yosemite Field Institutes and look through my sketches and field notes. The lessons of this professional development course have also stayed with me so clearly because I still use them almost daily in my teaching practice.

In Yosemite, I learned not only how to record observations of the natural world, but how to ground those in scientific sketching techniques. I do not think of myself as an artist, but learning simple techniques such as using component shapes and acronyms made me feel scientific sketching is an approachable, transferable, and useful instructional tool. I left excited to introduce scientific sketching to my biology class. Initially, many students had the same resistance I did, telling me "but I'm not good at drawing." However, after time and practice, students report that it has added depth and a sense of creativity to their science class. Now my students use scientific sketches daily: making notes about the "Organism of the Day," marking the changing seasons for their "My Tree" project, and recording data during labs. Some even employ the principles while taking notes.

Seeing the positive benefit and wanting to incorporate more of what I learned during the Yosemite Field Institute, I piloted a two-week "short course" last school year called Field Research Techniques & Scientific Sketching. Students commented that they enjoyed getting the chance to spend time outside conducting labs (i.e., water quality testing, biodiversity sampling and soil nutrient testing) and connecting with their school environment by journaling. My experiences at the Yosemite Field Institute not only changed how I interact with my surroundings, but gave me the tools to change my teaching practice and open my students' eyes to the world around them.

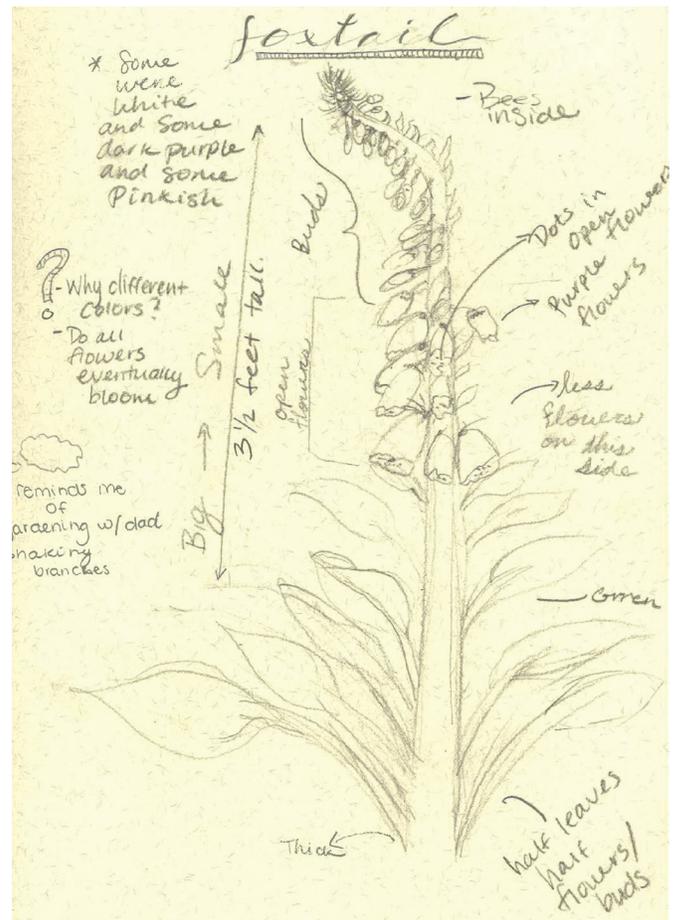
Conclusion

The Yosemite Field Institutes provide a tremendous opportunity to place the three dimensionality of the NGSS in a tangible, real-world context. We highly recommend this professional development for any teacher, pre-service to veteran, who wishes to ground their curriculum and pedagogy more strongly in earth science and natural phenomena. Participants will develop capacity as outdoor educators and come away with directly applicable skills, knowledge, and resources to take their students outside to learn and do science.

In turn, they will be able to give students opportunities to explore, ask questions, and make observations of the natural world around them, in the process developing skills which are directly transferable to more traditional indoor lab settings.

Participants who teach in urban or suburban settings with limited access to wide-open outdoor spaces should not be deterred. Many of the techniques practiced at the Field Institutes are directly scalable to urban environments, as even the smallest patch of nature can offer myriad ways to explore how natural systems work. Additionally, although the Institutes are ideally suited for earth science, biology, environmental science and geology teachers, past participants who teach math and other sciences have reported they, too, came away with valuable and creative ideas to integrate into their respective curricula. For example, chemistry teachers have applied their learning by designing a water quality unit that moves the learning outdoors and connects students to their local river.

Lastly, it bears repeating that the Field Institutes take place in Yosemite National Park. The awe-inspiring and geologically unique landscapes of Yosemite and the California High Sierra mountains have captivated people for centuries. Approximately five million people annually visit Yosemite Valley (which covers no more than seven square miles) to climb, hike and camp amongst the towering granite peaks, ancient groves and lush meadows of this glacier-carved wonderland. Learning and doing science with other educators in this environment provides a rare chance to grow professionally while at the same time rejuvenate personally. Both of these are necessary components of a sustainable teaching practice, and their relative importance should not be underestimated. We hope that you will join us around the campfire this summer, and for many to come, for this incredible experience.



Students used scientific sketching to make observations of a plant of their choice at their home sit-spot during the first week of Bernice's short course.

See more examples of student work at www.knowledgesteachers.org/kaleidoscope.

Citation

Balke, B., O'Brien, B., & Stonewood, J. (2018). Professional development: Yosemite Field Institutes. *Kaleidoscope: Educator Voices and Perspectives*, 4(2), 21–26.



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Being More Than the Violence Around Us

Jolie Glaser



A teacher at a school affected by a mass shooting reflects on how we respond to violence.

This is my experience as a person trying to make sense of drunk driving and mass shootings. This is my reflection as a teacher at a public school in Las Vegas, trying to get to know and value my students, to create a community where they are safe, and where we can all become more than the violence around us.



Thursday

September 28, 2017

My physics students¹ were drawing diagrams to show how increasing molecular mass increases density. Outside, paramedics and police officers were staging a crash scene of a head-on collision between a truck and a car. This was for a two-day program called "Every 15 Minutes," where a few students were chosen to act as a drunk driver and victims while the rest of our students sat in bleachers and watched as the police and paramedics responded. Most participating students were taken away in ambulances or helicopters. One student was zipped

¹Students' names, as well as identifying details, have been changed.

into a body bag, and her parents met the coroner at the crash scene. The next day, students attended the memorial for the student who "died" the first day.

I told my students right before the program, "My dad was an alcoholic. When I was in eighth grade, my dad tried to drive home drunk and collided with another car, killing two men and injuring a third. Right now I feel like puking or crying, or both. I don't think I can handle being there. If any of you need to talk, come find me."

While I waited for students to return, I grew nervous. I planned to share my family's story with each class period. I hoped I could share our story with honesty while also keeping my family's dignity. I hope I could do this without breaking down in front of my students.

Soon, my students came back in. Most looked somber.



High school can be tough and lonely. Please know that I care about you. And if you ever want to talk, I'd be happy to."

Some were crying and wanted hugs. We told each other we loved each other, which surprised me. I asked my students to hold up the number of fingers to show how they're doing. Five fingers is amazing, three is okay, one is terrible. A lot of their hands had one or two fingers. Some kids don't bother holding up any fingers. I call them gently by name: "Aimee, how are you doing?"; two fingers. "Bryan, how are you feeling?"; one finger. "Gabe, how are you?"; three fingers. We did this at the start of each period that day.

Then I told them that, before we started on physics, I wanted to share my own experience with them. I took a deep breath and began. "When I was in eighth grade, I answered the phone at home and it was the police. My dad had been in a car accident, and he'd broken his leg, but he was alive. My dad had gone to a bar and then tried to drive home, hit another car head-on, killed two men and caused a third to be paralyzed."

I paused to look at my students' faces. Then, I told them everything: what it was like to not have money at home and to be afraid we couldn't stay together as a family. I talked about my dad's trial, hearing from victims' families, and then watching him handcuffed and taken away. I talked about people in our community, who made sure we kids had rides to sports practice, food, funding for school trips, and people with whom we could talk. I was proud of my mom, for holding our family together. I was proud of my dad for using his time in prison to help other inmates get their GED credential, play piano at all the prison church services, and volunteer to support mentally ill prisoners. I choked up when I told them about how when my dad was released, our neighbors had decorated the 20 miles of highway with signs welcoming him home. I told them how lucky I am to have my dad and to be able to visit him, when the family members of the two men who died will never see their loved ones again.

"I told you all this for a few reasons. I know a lot of you have already tried alcohol and maybe even other substances. I want to ask you to be careful. Know how easily people can come to rely on them. Know how it can lead you to make choices that destroy others' lives. Don't be so proud that you can't ask for help. Be brave; confront your friends if it's hurting their lives. Also, be careful as you start to drive. It's easy to be distracted. You want to just look at that one text, change the song that's playing, look up directions. But it can always wait until you get there."

"Lastly, I wanted to share that with you because I don't know you that well. But you could all be dealing with something similar. We're all dealing with different things in our lives. High school can be tough and lonely. Please know that I care about you. And if you ever want to talk, I'd be happy to."

I paused. My students were all looking at me. Or they were looking at their hands. Or at each other. Or at anywhere but each other.

"Does anyone have any questions or anything they want to share?"

I waited.

Students shifted. Their eyes focused in front of themselves. Someone raised their hand.

Each class of students responded differently. In one period, my students said, "Thank you for sharing your story." They were ready to move on, so we observed a convection cell of water dyed red for hot and blue for cold, remarking on how the dyed water swirled around and around until it became purple.

In another class period, some students asked me questions: "Do you drink alcohol?" and "Why do you teach?" I answered honestly. Heather asked, "What did you tell people when they asked you where your dad was? Or what your dad does for work?"

I said, "That's tricky, right? It depends on the situation. Sometimes, you don't want to go into it with a stranger. So you tell them that your dad teaches, since it's partly true. Or you don't mention your dad, but then it's weird, it's like you're acting like he died." Heather nodded.

Then Camille raised her hand. I nodded. She said her mom was an alcoholic too. When Camille was 13, she and her sister had found their mom dead in her bedroom, with a bottle of scotch still in her hand. Her mom had drank herself to death. Wayne said he was in a car accident caused by a drunk driver and his brother died. David shared that his sister was so far gone with alcohol and drugs that he only saw her twice a year now and can't even relate to her anymore. He spent the rest of the period clenching and unclenching his jaw.

The pauses between stories grew shorter. Another student said, "Well, as long as we're all sharing," and then told us his story. One by one, students shared, and everyone listened. Some students asked how people could be so awful or stupid to think they could drive drunk. "You drink to go numb," April said. "You drink to make your whole body numb. How could you think you could drive when you're numb?" Camille responded, "When my mom was drinking herself to death, she wasn't thinking about how she was going to die. Or maybe she wanted to die. But she wasn't thinking about us."

The bell rang, and I said, "Thank you. Thank you for listening to me and for sharing your stories."

My students all moved out, except for Heather. She is the student who challenges me more than any other student. She came up and said, "When people ask about my mom, I say she must be a magician, because she disappeared when I was two. I make it a joke. I show people I can laugh about it." She looked at me. "I'm not looking for pity. I just want you to know."

I nodded and said, "It's one of those things where you aren't sure you'd wish this awful thing on anyone, but you're not sure if, given the opportunity, you'd take it back. Because at this point, it's shaped who you are. And you're proud of who you are."

"Yeah," she said.

I followed up with students after school and the next day, to thank them for sharing. David told me, "Yeah, well, after everyone else shared, I just felt like I could. I don't think I'm ever going to forget that period. I think that period will be the most memorable period of my whole school life."

I hadn't expected to hear story after story after story. I left school that day feeling overwhelmed by how many students' lives had been upturned by alcohol and drug abuse, yet I was grateful that students had created a space for each other where each student wanted to share. I remembered when I was a teenager, choosing who I would trust with my story and when—choosing over and over again when to come out with a part of my identity. I hoped that, moving forward, we could give each other empathy and we could see these stories as part, but not all, of who are are becoming.



Monday

October 2, 2017

I woke up to texts and emails about the mass shooting in Las Vegas. It didn't make sense. In my mind, mass shootings happen in schools, and yesterday was Sunday. I looked up the news and found the shooting had happened at the Route 91 Harvest Festival. This was only a few miles from my school. Some of my students had talked about going. I felt sick to my stomach.

By the time I got to school, I was crying. The first person I ran into was Melanie, my student from last year. Melanie looked at my wet face and asked "Ms. Glaser, do you need a hug?" I nodded.

My first period students started coming in. Every single one that came through the door, I was so glad to see them. Who was absent? Why were they absent?

Eddy was worried about Danno. "I keep texting him. He's not responding. Why isn't he responding?"

"I don't know, Eddy. I'll call his parents after class."

In every class we checked in, holding up our fingers. My students were all over the map. Some held up fists; terrible, and buried their faces in their arms. A couple students held up four fingers; it was a good day for them.

"Okay." I took a deep breath. "I'm really glad to see you today. I am so glad you came to school today and that I get to see you. We're all still learning about the shooting and we're all affected in different ways. However you are feeling, it's okay. I want you to do whatever you need to do today. If you want to see a counselor, let me know. If you need to make a phone call or leave class for a bit, let me know before you go. You can zone out, listen to music, draw pictures, or text friends. I won't take your phone." Some students laugh, since I'm notorious for taking phones if students aren't using them for classwork. "Some of you may just want a normal day. Some of you just want to write about how the density of saltwater affected your ice cubes. Sometimes, moving on is a way of showing that these events that are meant to terrorize us don't have power over our lives. So, we're going to have a normal class today, for those of you who want that. But if you need something different, do what works for you."

My students filled two cups with water and then stirred salt into one. I dropped the ice cubes in dyed blue water. We watched, as the dye in the freshwater cup swirled downwards and eddied in the bottom of the cup. In the saltwater cup, the dye slid upwards, along the edge of the ice cube, collecting at the surface. Many students started creating a final diagram to show how density, temperature, and convection cells explained the ice cubes' different melting times.

I came around to each desk. I squatted. I looked at Muhammad. "Muhammad, are your friends and family okay?"

"Two of my friends are dead. My family is okay." His colored pencil kept circling around and around, showing the movement of the dye.

"Do you want to talk about it?"

He shook his head.

"Do you want to stay here or go see your counselor?"

"I want to be here."

"I'm glad you're here," I squeezed his arm.

I checked in with each student. Most of my students told me they were mostly fine; none of their friends and family had been directly hurt or killed, at least not that they knew of yet.

We looked at the ice cubes. "Where does the dye go in each one?" "Why?" "Was this a convection cell?" "What would a convection cell look like if we saw it?"

Cara hunched up in her hoodie. She was trembling and drawing the saddest stick figures. Stick figures that were hunched over, crumpled up in balls, drowning in red clouds.

I knelt next to her desk. "Cara, what's going on?"

"My friend is missing. No one knows where she is."

"Was she at the Harvest 91 Festival?"

She gulped and nodded.

"Do you want to talk about it? Or go see a counselor?"

She shook her head. "I want to stay."

We watched the ice cube in the freshwater quickly disappearing.

"That one is the convection cell," Cara said.

"How do you know?" I asked.

"It's like what we saw on Friday. Where the red and blue dye mix up and turn purple."

I nodded. "How can you show that in your diagram?"

Cara started drawing cups of water and adding in arrows.

When the bell rang, I said, "Cara, let me know, okay? Let me know what you hear." She smiled weakly.

"Muhammad, if you need space, you can come hang out anytime during the day." Muhammad nodded.

My first period students moved out. My second period students moved in. I started class again. I sat on the lab table at the front of the room. I took a deep breath. "I'm really glad to see you today. I was worried about you . . ." We checked in on our fingers. More fists, but some kids were doing fine. I repeated this in every class.

After each period, I wrote down who had lost someone or who seemed especially troubled. I needed to remember whom out of my 108 students I should check in with tomorrow. It was too important to forget.

At the end of the school day, I looked at my sheet of absences. Then I started calling all the parents and guardians of students who had been absent.

Danno Masan's dad answered the phone. "He's okay. He's here. I just . . . I just . . ." Mr. Masan starting choking up. "You see, I was in New York, in 2001. And it was just too close to home. It was like 9/11. And I really needed him home." He was crying. "I really care about him. I just love him so much. And I needed him home."

I was crying too. "I'm glad he's home with you. I care about him too. I'm so glad he's home with you."

Mr. Masan started to apologize.

"It's okay," I said. "It's okay to want him home."

"He'll be at school tomorrow," he said.

Leaving messages was the hardest. What do I say when I don't know why they were absent? I tried not to imagine the worst.

When I called Jenna's mom, she must have needed someone with whom to talk. She and Jenna were at the Route 91 Festival. Jenna was okay. They were both alive. No bullets had hit them, but the bullets came from everywhere, and they were running, slipping over blood, trying to get over barriers, running into the hotel, being locked up for their own safety, getting home at 4 am, not sleeping. Other friends ran to the Bellagio and hid in the janitor's closet with some employees, but then there were reports that there were shots at the Bellagio. I pressed the phone harder and harder to my face as I listened. At the end, Jenna's mom took a deep breath, "She'll be in school tomorrow."

Clubs and tutoring were canceled after school.

I went home and cried. Then my husband and I went on a run in the dark, with only the moon lighting the trails. I stood on a ridge in the faint moonlight, looking out over the lights of Las Vegas. I imagined my students and all the other people, in their homes throughout the valley. I thought of the tourists who had been displaced to new hotel rooms, visitors staying in community centers since they didn't have a hotel room, people anxiously waiting overnight in hospital rooms and coroner's offices. I thought of the marathon in Boston, the Pulse nightclub in Orlando, and the hashtag #VegasStrong that was sure to arise from today. I wished that there were no more tragedies, no more #CityStrong hashtags.



The next day, and the following day

October 3–4, 2017

My absent students came back. I checked in with all my students who were worried about friends or family and my students who had lost friends or family. While we worked, students hashed out details of the shooting. I wanted them to have time to process, but I worried about the kids who sat in their groups stone-faced, who maybe didn't want to hear all the details again. It was hard to listen to my students normalize the mass shootings that filled the news. My student who had been there and escaped alive was especially busy drawing her diagram. I checked in briefly but didn't press. I didn't want to make her have to explain to one more person what she went through and how she was doing.

I had an online hangout with other teachers from across the country who are in my inquiry group. We were supposed to be talking about our research question and figuring out how to collect data. I broke down in tears. I had so many questions about the world, humanity, and teaching. Nothing made sense.

"How do we make it better?" my friends and family asked. I felt anger and despair. We don't make something like this better. It's terrible, and you can't just make it better. But at the same time, I wanted to have something to laugh about and a reason to live on. I wanted the same for my students. I stayed up late looking for goofy science cartoons to share with them.

Our student clubs began a donation drive to replenish supplies that community centers had used hosting people displaced by the shooting. Our school events became fundraisers to help victims pay for medical costs and for victims' families to pay for funeral bills.

Then two days had passed since the shooting, and it was Wednesday. My students practiced, discussed, and compared how to use models to explain energy transformation and transfer. My students described how their understanding of density had changed and decided what they wanted to focus on tomorrow.

When class was over, I realized I had forgotten to check in with my students who had lost people. I needed to check on them tomorrow. Or should I? How many days in a row should I follow up with them? What if they didn't want to be reminded?

After school, Charlotte came to my classroom crying. I asked her, "Did you lose someone in the shooting?" Charlotte said, "No, I'm crying because I had surgery on my shoulder because of volleyball and I missed a week of school, and my grades are horrible, and I'm overwhelmed. And now I feel selfish for crying about my grades, when

there are bigger issues." We laughed. I gave her a hug and said, "It's okay to worry and cry about your grades. That should be your biggest worry."



Our "Every Fifteen Minutes" program happened on Thursday and Friday. Then the shooting happened on Sunday night, and it felt like we couldn't escape the violence. The tears, hugs, and heartfelt conversations continued. It seemed as if every person was on the verge of melting down, and yet we were all trying to prove to each other that Las Vegas is a beautiful place and that this life is worth living. We wanted to be there for each other and make sense of it together, but we also wanted to have a life beyond the shooting.

In those few days, I got to know my students more deeply than I had in the previous weeks. But I didn't want to see my students only through the trauma they had survived. In the following weeks, my students returned to being goofier and more light-hearted. How my students had responded to trauma became only one part of their identities. After sharing so deeply with each other, it was easier for students to use class time to talk about how they were dealing with racial tensions, pressure to try alcohol and drugs, busy schedules, family strife, mental health, and other issues, as well as to celebrate getting their first job, getting a driver's license, and being courageous enough to ask their crush to a dance.

I try to keep this promise to myself: Every school day, I will do my best to love my students. I'll do my best to show that I care for them by letting them be silent when they need to be and listening to them when they want to share. I'll do my best to make our classroom a place where we want to be, on good days and on bad days. I'll do my best to teach them science. We'll ask questions and seek to answer them. We will leave most of our questions unanswered. In science and in life, we don't



I didn't want to see my students only through the trauma they had survived."

ever prove anything completely. There's always room for more wondering. I'll tell my students their process can be even more important than their answers. In the process, we will share with each other how beautiful, complex, painful, ridiculous, and worthwhile this world can be.

Citation

Glaser, J. (2018). Being more than the violence around us. *Kaleidoscope: Educator Voices and Perspectives*, 4(2), 27–32.



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Sparking Change: Equity Initiatives in a Liberal Arts Charter School

Ian Caldwell and Katie Carmer

Working with students and colleagues at a classical school to improve school-wide culture and address systematic inequalities.

Introduction

Change takes time, and initiating change can be risky. In our own classroom, when we seek to change classroom behavior and culture, we do not expect it to happen overnight. We find allies in students, notice positive actions, and consider underlying reasons for poor behavior. We have countless conversations and make progress in small steps. Addressing the hidden systemic inequities in our schools is similar. There is no one right way to improve classroom culture or systemic inequity, and it often happens that, in both cases, the hardest thing to do is start.

The following is our story of the first small steps toward equity that we supported in our school, Arete Preparatory Academy, a small liberal arts charter school in Arizona. The school, which emphasizes a classical Great Books curriculum, serves a middle-class suburban community.

Why I care and how I became involved: Katie's story

After my third year of teaching, I decided to pursue a master's degree in educational leadership. I had only worked at one school in my teaching career—for a

paltry three years at that—and I longed for a broader understanding of the American educational system and the challenges facing it. My studies opened my eyes to structural inequities in the education system, and the complex ways they relate to pervasive inequality in American society. Schools are tasked with so many duties and challenges, but among the most important is the urgent need to achieve equity in the classroom. After completing my master's degree, I returned to Arete because I saw a unique opportunity to start a conversation about equity.

I was excited, then, when the teacher in charge of clubs asked me to start a diversity club the summer before I returned to teach. It is important to note that the drive for the club was student-led. The previous year, a group of students voiced a need for a forum to discuss their own sexual and gender identities. Unfortunately, a club like Gay-Straight Alliance was not permitted; leaders at the charter network believed it would be too politicized and controversial. After meeting informally for a year, the students decided to find a way to exist as a club so that they could engage other members of the school community in their discussions. Socius Club, whose name is described below, emerged from this original group of students who were determined to create a space to discuss their identities.

Meanwhile, Ian had also been thinking about the need for an equity-based club; when we realized we were both interested in the enterprise, we decided to team up and lead it together. We met with the group of students that were interested in starting the club, and we came up with the following mission statement: "Socius is a safe place for all students who wish to strive toward understanding

all forms of diversity, and who are ready to appreciate and discuss the diverse perspectives and experiences of all people. Together, we will discuss equality, tolerance, and inclusion, and advocate for a greater understanding of these principles in the world around us.”

We thought that the focus on shared stories, rather than on a particular identity group, would signal that all were welcome to attend. The club’s existence was met with skepticism and even hostility by some members of the community; I found myself feeling a need to prove that the club was not exclusive, that our conversations were not secret, and that we were not pushing a political agenda. At the same time, I lamented the fact that the safe space the students had enjoyed the year before, when they were not yet a club, would disappear. I was glad that they were willing to open up this space to others, but the fact that they had to sacrifice their supportive environment felt problematic.

Why I care and how I became involved: Ian’s story

Early in my teaching career, I read *Still Failing at Fairness: How Gender Bias Cheats Girls and Boys in School and What We Can Do About It* by David and Myra Sadker and Karen R. Zittleman (2009). At the time I was reading about the subtle ways we fail at fairness, I was a long-term substitute teacher with my first full load of classes. As I read about the types of feedback we give girls versus boys (“nice handwriting” versus “creative idea”) or who gets the majority of our attention (the disruptive boys), I realized I implicitly and unknowingly supported inequity of instruction based on gender. This surprised me and hurt me, so I decided to try to gain some awareness.

Over the next two years, I taught the highest level math classes in a STEM-focused school in Colorado. Girls in these classes were a minority. In some classes, including honors courses of algebra 2 and pre-calculus as well as AP Calculus, I had only a single female student per section. The young ladies in these classes taught me much about teaching. Through them I learned that I care deeply about equity in education, especially in building awareness of all the subtle and hidden ways we make education unfair to groups of our students.

I moved to Arizona to teach at Arete, and after a year of teaching here, I was thinking about how I could engage colleagues and perhaps students in understanding the hidden inequities that exist in our school. When I found out about the interest in starting a diversity club, I immediately reached out to Katie to offer my assistance in any way I could.

Our school’s context and curriculum

Arete’s curriculum is based on the Great Books model.



One of the most important tools for achieving equity in the classroom is dialogue that promotes empathy between individuals from diverse backgrounds.”

The Great Books theory of education was popularized in the 1920s by Mortimer Adler at the University of Chicago. In an age when many educational leaders believed schools were meant to train future laborers, Adler and his colleagues pushed for a common curriculum to train freethinkers. In a Great Books—or classical—curriculum, students read a standard canon of books that includes philosophy and literature from throughout Western European and American history.¹

In addition to a specific set of content, the Great Books curriculum also includes a particular pedagogy: the Socratic seminar. Students discuss their learning with one another in regular seminars, with the teacher functioning as a facilitator rather than an expert. At Arete, we extend the Socratic format beyond the humanities. As much as possible, our math, science, language, and arts classes are also student-led and discussion-based.

In many ways, the Great Books curriculum is well-suited to equity initiatives. One of the most important tools for achieving equity in the classroom is dialogue that promotes empathy between individuals from diverse backgrounds. By sharing our experiences and identities, we increase our ability to understand one another. Understanding, in turn, allows us to break down the biases that form the backbone of structural inequality.

¹ The definition of a “Great Book” is a controversial topic that merits its own article. In the context of Adler’s curriculum and the reading list at Arete, it refers to a text that is at least 50 years old and has been deemed important by several generations of scholars.

The Great Books curriculum encourages students to engage in deep, challenging discussions about big ideas. Students read about virtue in Plato and Aristotle and speak eloquently about the importance of pursuing goodness for its own sake. They know how to have complex conversations and how to challenge each other's views in a respectful way. They understand that, unlike debate, there is no single winner in a discussion; together, all participants strive to seek a higher level of understanding. In these ways, the conditions necessary for discussions about equity already existed at Arete. However, there was no forum in place to have these discussions.

The curriculum mandated that our conversations remain rooted in the text. Students had been instructed from middle school not to include personal examples or anecdotes in their comments. Such details might make others in the group unable to relate to personal anecdotes, detracting from the ultimate goal of shared understanding.

This rule was well-intentioned; it encouraged the students to draw their evidence from a pool of shared knowledge—i.e., the books they all had read. In a way, it was meant to promote equity by ensuring all students had access to the same information and were equally prepared for discussions. However, it meant a missed opportunity for students to relate to the topics and each other in a personal way.

Our students shared that they wished to discuss current issues in the same ways they discussed philosophy, ethics, beauty, and other abstract topics in Humane Letters. Humane Letters is a two-hour seminar-style class in literature, history, and philosophy that every student takes for all four years of high school. The curriculum is strictly classical and, as such, does not include current events. Students told us that they wanted to unpack what they were learning through the news and through social media in the same ways they unpack the classics. The conditions necessary for a diversity club existed; the logical next step was speaking to interested students and having them spread the word to create momentum.

Starting Socius Club

To begin, we worked with students to decide on the name of the club. We knew the word “diversity” was a loaded word for many in our community, so we decided to call the club “Socius Club.” The Latin definition of “socius” is:

- sharing, joining in, partaking, united, associated, kindred, allied, fellow, common
- leagued, allied, confederate

We liked the name Socius because of its classical roots and its association with being an ally. We shared our excitement about the club with colleagues with whom we had strong relationships, and they were generally supportive and even expressed interest in attending.

We invited students we knew would be interested, posted fliers, made announcements, and started our weekly 45-minute Wednesday morning Socius meetings. In our initial meeting, we discussed norms and wrote the mission we share above. Following meetings consisted of reading a short article about an issue for 15 minutes, then discussion for the remainder.

Our first issue, the discussion of which we teachers led, was *Brown v. Board of Education of Topeka* (1954), and we included statistics about segregation in schools from Boston and Arizona. Soon after this first discussion, we received a charge to root our club discussions in classical material that aligned with our curriculum. Thus, we had to start each of our meetings with a classical reading about the topics our students wanted to discuss. Though this constraint was challenging, we found some excellent resources.

We kicked off a discussion on reparations for slavery with an article on reparations for Japanese internment camps. We drew on Mary Wollstonecraft to discuss gender inequity, Herodotus and Plato to discuss LGBTQ+ topics, and W. E. B. Du Bois to discuss racial identity and double consciousness (see the sources we used in our resource list). Students were generally engaged, but they expressed dislike for the need to read older works rather than directly tackle current issues.

Attendance through the fall averaged 15 students, mostly from 10th through 12th grades, and three to six teachers. When we invited teachers to attend personally, we found they were more likely to join us. Additional teachers expressed interest but struggled to attend the morning sessions due to other commitments. Our colleagues told us they enjoyed hearing about Socius conversations and the times we tried to address inequities in class. A few shared their own stories with us about how they addressed inequities in their classrooms.

In January of our first year, the attendance for Socius fell dramatically. Seniors were busy with senior theses; juniors and sophomores complained about the early morning meetings, heavy homework loads, and exhaustion from playing sports. After a couple of meetings in February were attended by only one or two students, we put Socius on hiatus. We met with students to discuss changes to the club for the next school year, deciding to shift the focus from diversity to human rights. Additionally, we wanted to give students more opportunity to research topics and make connections

between what they see in the world today with key events and literature from the past.

Impacts of Socius Club on the community

Even though we were careful to draw on the classical canon, we experienced parental pushback. Some parents expressed concerns that the club was politicized and pushed an agenda that did not align with the mission of the school. For example, the mother of a student who had not attended the club called to say that clubs like this were inappropriate because “women in America had it good compared to women in some other countries.” She said there were women with fewer rights, women who couldn’t show their face in public, women who couldn’t drive, women who couldn’t go to school. She said women in America had no right to complain. Katie, who received this phone call, struggled to hear her out and, rather than argue, explained to the mother the club’s mission: to learn about others’ experiences and cultures.

Though more subdued, Socius also received positive support from families. We had one parent, who has a background of teaching equity at the university level, come in to lead a session of Socius. Another reached out for possible support working with youth in an intensive care unit. The challenge for us was recognizing the quiet support when faced with others’ loud concerns.

A concern some teachers shared was that the club could be divisive for our students. They worried that discussions of contemporary issues would polarize students and cause them to form cliques based on their identities or beliefs. Such a divide would then introduce negative energy into the classroom. This did in fact happen in one section of Humane Letters and posed a challenge for Katie.

On a brighter note, one of our colleagues shared a story about a young man in her class who made an inappropriate comment about people speaking Spanish in America. Our colleague immediately told him his comment was inappropriate, choosing to address the issue in the moment. She told us that in the past she probably would have let the inappropriate comment slide because she was not comfortable addressing it. Now she felt encouraged by what we were doing in Socius Club.



Another positive outcome was when a colleague shared a concern about the lack of diversity on the senior thesis curriculum. He noted that nearly all of the authors—as well as the main characters—in the books our seniors read were male. This led to a discussion on opportunities to include more female voices in the curriculum and ultimately led us to switch out one of the books and replace it with a novel by a female author.

A book discussion and two visiting professors

The second year of the club’s existence coincided with two additional equity measures at our school. First, the administration chose the book Claude Steele’s *Whistling Vivaldi* (2011) as our professional development text for the year. Steele discusses stereotype threat and the ways that institutions, especially schools, can defeat it to achieve equity. Throughout the first semester, teachers met in small groups after our Wednesday faculty meetings to discuss the book. For many, it was the first time they had encountered this subject matter. Others had thought about it deeply and shared their personal experiences with stereotype and bias. Teacher reactions to these conversations ranged from hesitation to excitement and a hunger to apply strategies from the book immediately to make classrooms more equitable. Several groups had frank discussions about the implicit messages sent by our curriculum, our language, even the art on our walls. When the discussion series finished,

many teachers wanted to know how we could continue to practice and improve the strategies we discussed.

Second, in September our school hosted two professors who study equity in the math classroom. The professors observed classes, met with a focus group of students, and gave a presentation to the student body that broadly defined the meaning of equity. Afterwards, they presented their research to the faculty and shared some of the things they had noticed about Arete after spending the day with us.

Our faculty seemed excited by the research the professors

shared, especially their focus on “rigor, relevance, and relationships.” The room was abuzz as teachers discussed closing gaps between their students and creating innovative opportunities for success. The professors commended the efforts of our passionate, caring teachers and lauded our students’ love of learning.

However, when the professors held up the mirror and presented their findings from the focus group, the mood in the room shifted noticeably.

The focus group had consisted of students from varied grades pulled from classes to share their experiences. Students raved about their classes, shared how much they enjoyed every class, specifically because of their teachers' passions for the subjects and how much their teachers cared for them as individuals. The professors noted that all of the students who spoke were white; the students of color were silent. With 15 minutes remaining to speak with the students, the professors asked the white students to leave. Only then did the students of color speak. They shared that they did not feel included by our culture. They did not have adults on campus with whom they could relate. In class, they were less likely than their white peers to volunteer to share an idea or to try a problem.

Reactions to this information were varied. Many teachers were troubled and moved to action; they wanted to jump immediately to solutions. Others seemed skeptical of the link between the students' race and their experience. Comments were made along the lines of, "I treat every student as an individual when they walk through my door. I do not make assumptions about their previous experiences." It became clear that we did not share a common understanding of the problem—or even share the opinion that a problem existed. This particular conversation ended on a note of tension, but it was a healthy tension for us as a faculty. It was the first time we had ever spoken about race as a whole group.

The conversation that started that day in September has continued to pop up in the faculty office in small ways throughout the year. At the lunch table, teachers began to share stories of times they had experienced bias or profiling. In pedagogy conversations, it was not unusual to hear teachers unpacking the unconscious ways that they treated their male and female students differently. These were topics that would not have been discussed in this setting a year earlier.

Moving forward

As these conversations were beginning amongst the faculty, we shifted the focus of Socius from diversity to human rights. Our hope was that this lens would allow us to examine more contemporary equity issues and attract a broader array of students to our meetings. In one of our first meetings of the year, we discussed the history of hate speech in America and applied it to the recent white supremacist march in Charlottesville. After that, we asked students to research human rights issues that interested them and create a presentation to share with the group. Many students started researching topics that ranged

from depictions of women in the media to white privilege to bioethics.

However, many of these students did not finish their research or present their topics, and the attendance for Socius again fell dramatically in winter. As of this writing, we have a core group of three or four students who continue to show up consistently, with other students dropping in from time to time. Additionally, many of the club founders will graduate this spring, and it is unclear whether younger students will step forward to take on a leadership role. We will need to find new momentum and new student leadership. Despite this element of uncertainty, we are determined to continue to make Socius more visible and effective in our school community. Going forward, attendance and momentum are two issues we would like to focus on to make our club sustainable.

Throughout this process, we have discovered valuable action steps to increase equity within a school community. Using the momentum of students' requests to address identity-based issues they face in their daily life, we saw an opportunity to support our students and create positive change amongst our colleagues. We initiated small group discussion from the start of the club. We used the lessons learned from that experience to encourage deeper dialogue about racial inequality in our own school, recognizing how students of color were experiencing our educational tactics differently. This final element—the reflecting back of all we have learned upon ourselves—has proven the most fruitful. By identifying the distance we still have to go to achieve equity, we feel our teachers and students have been able to highlight small steps that they can implement in pursuit of this goal.

As we continue to strive for equity, we also hope to engage other schools in dialogue so that we can learn from the experiences of educators across the nation. We are each other's best resources and allies in the pursuit of positive change.



We are each other's best resources and allies in the pursuit of positive change."

Resources from classical curricula that address equity and human rights

Japanese internment camps:

National Park Service (1942). Determining the facts, document 1: "To all persons of Japanese ancestry." Retrieved from <https://www.nps.gov/nr/twhp/wwwlps/lessons/89manzanar/89facts2.htm>

Women's rights:

Wollstonecraft, M., & Ward, C. (1996). *A vindication of the rights of woman*. Mineola, NY: Dover Publications.

LGBTQ:

Herodotus. (2003). *The histories*. New York: Penguin Books.

Plato. (1989). *Symposium*. Indianapolis, IN: Hackett Publishing Company.

Racial identity:

Du Bois, W. E.B. (1994). *The souls of black folk*. Mineola, NY: Dover Publications.

References

Sadker, D., Sadker, M., & Zittleman, K. R. (2009). *Still failing at fairness: How gender bias cheats girls and boys in school and what we can do about it*. New York: Simon & Schuster.

Steele, C. M. (2011). *Whistling Vivaldi: How stereotypes affect us and what we can do*. New York: W. W. Norton & Company.

Citation

Caldwell, I., & Carmer, K. (2018) Sparking change: Equity initiatives in a liberal arts charter school. *Kaleidoscope: Educator Voices and Perspectives*, 4(2), 33–38.



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Finding Sustainability, Joy, and Connection in Teaching Through Mindfulness and Self-Compassion

Megan Grupe



Documenting my learning journey and what it's meant for my teaching practice.

The first years and expectations: A recipe for burnout

Throughout my first years of teaching, I found myself on a roller coaster of exhaustion, enthusiasm, self-doubt, and burnout. I went from finishing my teacher preparation program on a Friday to starting a full time high school biology position the next Monday, with 150 students in my classes by Wednesday. I remember going to a movie at 7:00 p.m. with my husband at the end of my first week of teaching, only to fall asleep 10 minutes in and sleeping through the entire thing.

This form of immediate exhaustion became a norm, but something I was good at working through. I attempted to get ahead by using my Sundays to map out the week to come and construct curriculum and reproducibles. Realistically, this got me only through the first couple days, and I would have to put in time in the evenings to plan for the week. On top of that I was grading, writing letters of recommendation, prepping for labs, and more. At the same time, I was getting to know my students, working on developing my own identity as a teacher in a new school, and participating in California's Beginning Teacher Support & Assessment Program (BTSA). That first year was about survival. I was working 60–90 hour work weeks and constantly felt like I needed to be doing more professional learning and bettering my classroom instruction.

I went from physical exhaustion and survival in my first year to head games during my second year, spiraling back and forth between burnout and booms of motivation around a new lesson/curriculum/technique/process only to come to the same conclusion over and over again: "this isn't working the way I want it to." As a result, I felt a strong need to balance personal self-care and the high expectations that I had for myself as a teacher. I also noticed in myself a need to understand how my teacher identity influenced these expectations and how to sustainability work with that. All of these experiences allowed me to seek out a mentor and start a journey into mindfulness and self-compassion practices that have greatly sustained me in my teaching practice.

“

I've been able to shift my own inner self-critic and feel more connected and joyful in my work as a result of practicing mindfulness and self-compassion."

I came into the teaching profession with a desire to ignite student curiosity. Having spent seven years doing outdoor education, my mantra for teaching was based off of a Rachel Carson quote: "If a child is to keep alive his inborn sense of wonder, he needs the companionship of at least one adult who can share it, rediscovering with him the joy, excitement and mystery of the world we live in" (1998, p. 55). My teacher preparation program, which left me prepared but also holding extremely high expectations about how to be a teacher, was another strong influence. During my program, I built a strong pedagogical foundation and learned to be continuously reflective on my teaching practice and student learning. I wanted all my students to be engaged in each lesson, feel safe and supported, challenged in my class, and show wonder and curiosity about science. I wanted lessons that were long, project-based, meaningful to students, integrated into local community/natural history, and impactful. These visions strongly shaped my teacher identity and, therefore, my motivations and expectations as a high school science teacher. I expected I could magically accomplish this in my first years of teaching.

My journey using mindfulness and self-compassion tools began as a way to support myself in continuing to feel joy from my profession. After five years, teaching is still incredibly challenging, so please keep in mind that my journey with mindfulness and self-compassion is not a panacea that makes teaching miraculously amazing and easy. It is also not the only path. However, I've been able to shift my own inner self-critic and feel more connected and joyful with my students and their learning as a result of using these tools.

I share my journey with you in the hopes that you will glean something helpful from it or feel a sense of calm and connection for yourself. And, to all my teacher readers, I hope this story provides a space of reflection about your own self-care and maybe even shifts you into a place of hope.

Shifting expectations and the inner self-critic using mindfulness

At the end of my first semester of teaching, I was at a district training and reached out to one of my mentor teachers from my student teaching with my

feelings of burnout. He recommended a Mindfulness Based Stress Reduction (MBSR) course at University of California, San Diego, based on the work and research of Jon Kabat-Zinn, professor emeritus at the University of Massachusetts Medical School (see the list of resources at the end of this article for more information). I went home that night and read about it. It sounded perfect!

During the eight-week course, I was introduced to many tools, including formal meditation, where I would sit or lie down and notice where I was holding tension by systematically scanning the parts of my body. I also listened to an audio track or sat in silence just noticing what was going through my mind and clearing it out for 15–30 minutes a day. Other tools in the class included informal mindfulness, such as bringing mindful attention when eating, driving, washing dishes, and other daily tasks. I journaled and documented my habits, such as how I responded to unpleasant or pleasant moments. The course was a large time commitment in the midst of my first year of teaching, but I felt committed to learning how to make teaching sustainable for myself and found ways to make time for the weekly sessions and daily meditations.

The type of mindfulness I was learning to practice comes from Jon Kabat-Zinn's definition: "awareness that arises through paying attention, on purpose, in the present moment, non-judgmentally" (Kabat-Zinn, 2013, p. 136). Mindfulness is a type of engaged commitment. For me, this manifested into an intentional practice of pausing and bringing non-judgemental awareness to specific moments in my life, especially with regards to my teaching expectations. For example, when I start to notice myself going down the road of "I'm not doing enough" or "I am not doing ___ well," I have learned to let the thoughts pass through or to simply change my language to "I am doing as much as I can right now" and "I am learning how to do ___ better." I try to take

on a mindset of not judging, striving, or solving, but shifting. This has come about through practice with formal mediation, yoga, and informal mindful attention throughout my daily tasks. I have also found that over time, I have had to make a recommitment to my personal vision for myself, not just my vision for myself



professionally. This has been especially important during moments of low motivation with career, life, or my commitment to mindfulness practice (which happens too).

Research shows that when we practice this type of intentional mindfulness, our brain actually changes. Ricard, Lutz, and Davidson (2014) summarized the findings of recent studies of the effects of this type of intentional mindfulness on our brains, noting increased grey matter/cortical thickness in the anterior cingulate cortex (behind the brain's frontal lobe), the prefrontal cortex, and hippocampus. These areas of the brain are associated with self-regulation, attention, cognitive flexibility, executive functioning, emotion regulation, problem solving, and learning/memory. Additional studies have shown that mindfulness practice can reduce the size of the amygdala, the area of our brain responsible for the "fight or flight" response and where fear and anxiousness originate. Mindfulness practice has also been connected to decreased activation of our Default Mode Networks, allowing us to develop neural pathway patterns where we don't fixate as readily on events over time.

The bottom line is that your brain is evolutionarily built to hold information, update awareness, and seek stimulation and is continually juggling these three parts of your attention. Rick Hanson, a neuroscientist, writes that each of us balances these three aspects of attention (i.e., holding, updating, and seeking) differently, depending on our temperaments, life experiences, and cultures (2009). A table in Hanson's book (2009, p. 181) shows how someone can be working in hyperdrive or at low levels across these three aspects of attention. When I am feeling burned out by teaching, I find that I am in hyperdrive and/or lowdrive, which puts me into behaviors associated with the "high" and/or "low" aspects of attention. The result for me is over-fixating on events, feeling sensory overload, being easily distracted, and sometimes feeling stuck, apathetic, and/or lethargic. I have noticed that since starting to practice mindfulness, I am able to rebuild my brain's patterns (i.e., neural pathways) to shift myself more easily into the moderate zone for all three types of attention, whereby I have better focus/concentration, higher mental flexibility, adaptability, and enthusiasm. I believe that this has made me become a more present teacher much of the time and limits the time my mind is in hyperdrive and/or low drive.

I learned much in the MBSR course, but the material was dense and felt stressful at times. I was still overwhelmed with teaching and expected to see results sooner. I was not immediately doing all the practices, and teaching did not magically become less overwhelming. Again, my expectations for my rate of

personal learning were high and created conflict for me.

However, little things shifted in me. I started to learn how to read the signs of my burnout, stress, and anxiety with teaching. I also felt a higher frequency of empowerment; I felt I was able to attain the tools to support myself through the complex challenges of teaching. Additionally, learning some of the science behind mindfulness was motivating for me because it meant that practicing mindfulness was having a direct impact on the way that my mind handled input and how I physiologically responded, even if I couldn't see it shifting all at once.

Because they addressed my feelings of burnout, these elements of the course were enough to hook me to continuing my mindfulness journey, and I incorporated them into my school day in small ways. For example, I started taking my lunch breaks more seriously and practicing mindful eating. This was different from before, where I would book myself with students at lunch or do some last minute running around the school and sometimes not even remember to eat.

In addition, I built in a five-minute self-check right before my students came into first period and sometimes at the end of the day. These moments helped me center and relax myself for a new day with students or decompress from a rough day in order to let some negativity drift away. I also found ways to infuse mindfulness into my lessons when teaching about the circulatory and nervous systems by having students participate in a breathing exercise, measure their heart rate before and after, and then compare this to other activities. During these lessons, I taught about some of the brain science around mindfulness. Looking back, these small steps were essential for me to start integrating mindfulness into my school routine, but I still wanted to do more.

In my second year of teaching, I felt like I had a good sense of the school community, and my mind was less consumed by questions like "What am I going to teach tomorrow?" or "Who can I ask for help on ...?" or "What is my school's process for ...?" As a result, I found more opportunities for connecting with students and colleagues. These sorts of connections allowed me to have more patience because they gave me a broader perspective on the growth of a teacher and students over time.

The only problem was I still found myself struggling with some of the same student learning challenges that I had experienced the year before. Wasn't I supposed to be a pro now and have it all figured out? I still had some students who were disengaged in lessons, occasionally disrespectful, failing my class, or whose trust I was

not able to gain. I found myself internalizing this, and my old negative self-talk and self-doubt about my competencies as a teacher started to creep in at higher frequency. This translated into me putting in more hours and not taking time to exercise, eat well, or practice the mindfulness that I had learned in my MBSR course. I began to spiral in a way similar to my first year. Even though I had the tools of mindfulness, I found the habits unmanageable. Mindfulness became another thing I had to do but didn't have time for.

Over my winter break, I referred back to a book that I had read over the summer called *Teach, Breathe, Learn: Mindfulness In and Out of The Classroom* by Meena Srinivasan. The book had inspired me to start thinking about how I might share my learning with my students, but at the time I thought, "I have to get this down for myself first before I share." I had also developed a desire to explore self-compassion for myself in concurrence with mindfulness.

Looking back at the book made me realize that both of these goals were about the intention of connecting with my students and with myself in a compassionate way. I also realized that, just like with teaching, I had to develop community around using mindfulness and self-compassion if I wanted to make them part of my daily life. This encouraged me to sign up for a Mindful Self-Compassion (MSC) course and a local conference, *Bridging the Hearts & Minds of Youth*. I also intended to share the work I was doing with my students and open up to them about these struggles.

During the eight-week MSC course, I was introduced to Kristin Neff and Christopher Germer's work on self-compassion (see resource list). They defined self-compassion for us as our ability to relate to our own suffering in a kind, caring manner. Neff specifically breaks this down into three parts: mindfulness, common humanity, and self-kindness. Her research argues that striving for higher self-esteem, a common strategy for self-help, is flawed because it requires someone to constantly be thinking about themselves as above average (which of course is impossible) in order to feel good. Striving to be above average can also close someone down to recognizing the importance of a community of people that bring different strengths and struggles to the table, fueling narcissism, bullying, prejudice, ego-defensive anger, and social comparison. Self-compassion, on the other hand, is linked to developing skills in altruism, empathy, intrinsic motivation, increased resilience and coping, and personal accountability (Neff, 2011).

The MSC course for me felt less formal than the first course and more about increasing the frequency

of incorporating mindfulness and self-compassion informally into my daily life and teaching practice. During this course, I did a combination of journaling activities, creating personal affirmations, and practicing skills of giving and receiving compassion to self and others. I also continued my practice of formal mindfulness exercises. These elements felt like the missing links and just what I needed to help shift my expectations of myself more, without just limiting myself to formal mindfulness.

One of the MSC sessions that hit home for me was about transforming relationships with self and others. We explored the impact of mirror neurons and the role of empathy fatigue (Winerman, 2005) to think about transforming relationships. Mirror neurons have been found in primates and some birds, and they respond to the actions of others, or "mirror" them. For example, when you yawn, someone else does. This "contagion" is a function of mirror neurons at work. Evolutionarily, these neurons are an adaptation that enhances cooperation and helps groups stay connected. A good example of this might be how you emotionally respond when you see a little kid fall off their bike or when you learn someone has lost a loved one (Winerman, 2004).

In teaching, responding this way can become a problem because we care about our students and their well-being. When you have a student that came to school without eating, how do you respond? When you have a student whose parent is in jail? What about a student who comes to you describing abuse received or witnessed? The list goes on and on.

The concept of empathy fatigue, coined by Mattieau Ricard (2013a; 2013b), takes into account the biological workings of mirror neurons that respond to external stimuli and recognizes that when one is in a position of caregiving (e.g., teacher, nurse, counselor, doctor, etc.), it is common to feel a sense of fatigue because of the suffering you are witnessing and therefore experiencing. In fact, when these events repeat over time, this empathic resonance can lead to distress, exhaustion, or burnout (Ricard, 2013a; 2013b). These ideas transformed my own thinking and set the stage for a movement towards more internalized self-compassion in my relationships with myself, students, and others.

The session described above, in addition to the entire MSC course, started me thinking more about ways that I could use self-compassion as a tool in moments of emotional distress to be present without taking on the emotional drain, especially if the biological response of my mirror neurons was naturally trained to do this. As a result, I found greater balance for myself between my school and personal life. I found myself using strategies

such as loving-kindness mantras at school and at home, as well as gratitude journaling at home. This allowed me to be kinder to myself and step away from internalizing events that happened with students. It also allowed me to begin to notice the high frequency of great things that happen at school among the frustrating events. Most importantly, these practices allowed me to gain perspective that helped me to realize I wasn't always the cause or center of the frustrating events.

During or after a tough or fast-paced class, I would take one or two minutes to scan my body with compassionate phrases noticing where I was holding tension and let it go. I would also take self-compassion breaks, often including a two-minute series of positive affirmations to myself, recognition of a tough event, and breathwork. On most days, I would also make time at school to get out and take a walk or stroll away from people. If you want to learn more about this, I strongly recommend reading *Self-Compassion: The Proven Power of Being Kind To Yourself* by Kristin Neff. Each of these strategies were small, but they added up to big shifts in my approach to my students and my place in the classroom.

Using mindfulness and self-compassion to connect with students

In my first two years of teaching, I used my learnings of mindfulness and self-compassion to care for myself and to create a larger sense of personal sustainability around teaching. I had noticed a shift in my mind and recognized strong connections between mindfulness and self-compassion and a developing growth mindset in myself. I started to think about how teaching the skills I'd learned to my students might support me in connecting with my students—and support my students in connecting with themselves and their learning in turn. I made it a goal in my third year of teaching to start doing mindfulness and self-compassion practices with my students.

My third year of teaching brought another new class and added responsibilities, as well as some minor health issues and major life changes on the horizon. I had intended to do mindfulness and self-compassion with all my classes in the same way, but this was not realistic.

Therefore, I focused on doing it with two of my classes, while also starting an after school club that met for two hours weekly over the course of the year. This way, I would be able to practice using it as a classroom tool, but also go deeper into the practice through the club with students who were motivated to take mindfulness and self-compassion practices further. In order to prep myself, I did a series of trainings.

First, I completed an online Mindful Schools Curriculum Training (see resource list). From this training, I learned how to facilitate 18 quick mindfulness and self-compassion lessons in my science classes. I started with the intention of doing one lesson per week, but realistically it happened once every two weeks or once a month, with some repetition of a lesson or other practices based on student needs. The immediate response from most of my classes was, "Why are we doing this in a science class?" and some students were uncomfortable the first time. It took most of my students about two sessions to buy in to the ideas, but there were still one to three students in each class that I am not sure ever fully accepted them.

As I built a routine of practicing mindfulness and self-compassion with my students, the atmosphere of my classroom changed tremendously to become an environment where the emotional well-being of both my students and myself was valued. For example,

after one month of doing the lessons and practices in my science classes, I started to have students request that we take time as a class to do some mindfulness or self-compassion. I also had students that would self-regulate and request to go to another part of the room or step outside to do one of the practices. Additionally, I noticed that my classroom became a safe place for discussing social and emotional needs, both for students and myself. In the past, I felt like there wasn't room for this, even for myself. As a result of these shifts in my classroom culture, I felt more connected to students.

It wasn't always rosy, and there were times I felt like I didn't have time to stop and do this mindfulness and self-compassion stuff—I had to retrain my thinking to "if I invest in this mindfulness, self-compassion stuff there will be better space for the learning that is going to happen today." I also had to realign my expectation



of wanting these practices to be an everyday or weekly thing, at least for my first run at it, and focus on an attainable frequency.

One of the coolest things that came out of taking the time to share these practices in my classroom were shifts around group work and the types of language students used about their own learning process. Of course, this wasn't the case for all my students, but there were many students that started to take on leadership roles when working in groups and used mindful or compassionate phrases to pull group members into a group learning process or during personal reflections. Some students also took more risks to give and receive feedback from their peers using non-judgemental language. This was incredible to see my efforts surface in areas that I had not predicted and solidified my commitment to keep incorporating and teaching these practices to my students.

Meanwhile, my mindfulness/self-compassion/yoga club was meeting once weekly for two hours at a time. We focused on mindfulness/self-compassion skills the first semester and then emphasized yoga during the second semester. We were a small group, between two and 10 people, depending on the week. Sometimes, teachers or spouses of teachers would come. I had written a grant to get towels and yoga mats so that the experience could be more formal. For this club, I used a fusion of lessons from Patricia C. Broderick's *Learning to Breathe: A Mindfulness Curriculum for Adolescents to Cultivate Emotion Regulation, Attention, and Performance* (see resource list) with other resources I'd accumulated. I had also completed a yoga teacher training course to help with facilitating yoga in my club and incorporating more mindful movement into my classroom curriculum and used ideas from that experience.

Some profound learning came out of these meetings for myself and my students. I realized that many of my students didn't have skills to self-reflect, making this a very uncomfortable and new process for them. Additionally, the practices we did together revealed that my students were carrying with them a depth of stress, anxiety, worry, and tiredness that was illuminating for me. Because of this, I felt invigorated to keep teaching them mindfulness and self-compassion tools to help them bring awareness and support for themselves in the midst of these strong emotions. This process resulted in a deeper connection with my students because I began to feel like I was connecting to them in a way that I couldn't in my biology classroom and was able to see them as whole people. For me, the club experiences outside the classroom brought great insight and compassion for my students inside the classroom, and I brought higher attunement to supporting students' social and emotional



I began to notice the high frequency of great things that happen at school among the frustrating events."

needs in both spaces. With this recognition, I also noticed a greater self-compassion for myself and my teaching practice.

Moving Forward

I would like to leave you with a quote from Brené Brown (2010, p. 1) that embodies where I find myself in my teaching practice after all this learning:

*Wholehearted living is about engaging in our lives from a place of worthiness. It means cultivating the courage, compassion, and connection to wake up in the morning and think, *No matter what gets done and how much is left undone, I am enough.* It's going to bed at night thinking, *Yes, I am imperfect and vulnerable and sometimes afraid, but that doesn't change the truth that I am also brave and worthy of love and belonging.**

I am now halfway through my fifth year of teaching. Looking back on my journey, I realize that learning about mindfulness and self-compassion practices is one of the major reasons that I am still a teacher today. These practices helped me to shift my own expectations and to change the voice of my inner self-critic, allowing me to step into the type of teacher I wanted to be with joy and patience in my own learning.

I also realize that my expectations can help drive me towards a goal, but were acting as hindrances to engaging in teaching in a way that was sustainable and meaningful to me. Taking the time to learn skills in mindfulness and self-compassion allowed me to be kind with myself around these expectations.

Mindfulness and self-compassion practices also helped

me transform my classroom into an emotionally safe place for myself and my students, and increase my overall feelings of connectedness with the work we do. Sharing these practices with my students influenced their behavior when they engaged in group work in my classroom, motivating me to keep teaching these practices to my students so they could build higher autonomy and capacity in learning with others.

I now feel like a stronger, more resilient, more playful and loving teacher who prioritizes relationships with my students before academics. Teaching is still a challenging and exhausting endeavor, but it is one that I feel good at and that I am meant to do.



Learning about mindfulness and self-compassion practices is one of the major reasons that I am still a teacher today."

Resources for teachers exploring mindfulness and self-compassion

Mindfulness-Based Stress Reduction (MBSR) course

at University of California, San Diego

health.ucsd.edu/specialties/mindfulness/programs/mbsr/Pages/default.aspx

Mindful Self-Compassion course through the Center for Mindful Self-Compassion

centerformsc.org

The space between self-esteem and self compassion:

Kristin Neff speaks at TEDxCentennialParkWomen

www.youtube.com/watch?v=lvTZBUSplr4

Bridging the hearts and minds of youth: A yearly conference of educators, healthcare providers, psychotherapists, researchers and administrators of programs providing care and education to youth

bridgingconference.org

Mindful Schools: Curriculum training for educators

www.mindfulschools.org/training/mindful-educator-essentials

Learning to Breathe: A mindfulness curriculum for adolescents

learning2breathe.org/about/introduction

References

Brown, B. (2010). *The gifts of imperfection: Let go of who you think you're supposed to be and embrace who you are*. Center City, MN: Hazelden Publishing.

Carson, R., Pratt, C., Kelsch, N., & Lear, L. (1998). *The sense of wonder* (2nd ed.). New York, NY: HarperCollins Publishers.

Hanson, R. (2009). *Buddha's brain: The practical neuroscience of happiness, love, and wisdom*. Oakland, CA: New Harbinger Publication, Inc.

Kabat-Zinn, J. (2013). *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain, and illness* (2nd ed.). New York: Bantam Books Trade Paperbacks.

Neff, K. (2011). *Self-compassion: The proven power of being kind to yourself*. New York: HarperCollins.

Ricard, M. (2013a, October 3). Empathy fatigue – 1 [Web blog post]. Retrieved from <http://www.matthieuricard.org/en/blog/posts/empathy-fatigue-1>

Ricard, M. (2013b, October 9). Empathy fatigue – 2. [Web

blog post]. Retrieved from <http://www.matthieuricard.org/en/blog/posts/empathy-fatigue-2>

Ricard, M., Lutz, A., & Davidson, R. J. (2014, November). Mind of the meditator: Contemplative practices that extend back thousands of years show a multitude of benefits for both body & mind. *Scientific American*, 311(5), 38–45. doi: 10.1038/scientificamerican1114-38

Srinivasan, M. (2014). *Teach, breathe, learn: Mindfulness in and out of the classroom*. Berkeley, CA: Parallax Press.

Winerman, L. (2005, October). *The Mind's Mirror*. *American Psychological Association*. 36(9). Retrieved from <http://www.apa.org/monitor/oct05/mirror.aspx>

Citation

Grupe, M. (2018). Finding sustainability, joy, and connection in teaching through mindfulness and self-compassion. *Kaleidoscope: Educator Voices and Perspectives*, 4(2), 39–46.



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Moving Beyond Dropbox: Designing Powerfully Sharable Curriculum Materials

Monica Sircar

How curriculum materials we share can be designed to more powerfully support the work and growth of other teachers.

We teachers are notorious hoarders of potential curriculum materials, and with good reason. Teaching is hard, particularly the first time—whether the first time in the classroom, teaching a course, or trying a new instructional approach. We are eager to ease others' burden by sharing our hard-earned successes through our classroom artifacts and to learn from others via theirs. Consulting others' curricula is a strategy to increase efficiency in our planning and to accelerate our own growth as practitioners. But is a folder of shared classroom handouts enough to fulfill this promise?

At an alumni panel during my teacher preparation program, a graduate offered the following advice: *Ask every teacher you know for their course materials. Take anything that others share. You never know when something—a handout, an activity, an assessment—will come in handy.*

My first year teaching high school, I planned to rely on this advice. I had been hired to teach Advanced Placement Environmental Science, a course outside my expertise, and I would need to build my own content knowledge as I went along. I was grateful when a fellow teacher offered her course Dropbox folder—thank goodness I wouldn't have to reinvent the wheel! I expected this would reduce the time I spent designing materials, and then I could spend more time learning and

preparing to teach this new content.

However, preparing lessons continued to consume most of my time. The Dropbox wasn't enough. Between this folder and Google searches, I seemed to spend more time sifting through others' documents than preparing for deliberate instruction. Even though I had a full year of another teacher's handouts, I realized that I was missing critical information.

Often, what we plan to do with classroom materials is stored in our minds, not in the materials themselves. For each resource, I had to reverse-engineer “hidden teacher knowledge” implicit in the design: purpose, rationale, assumed instructional moves, background content knowledge, anticipated student struggles, and connection to the broader learning sequence. I craved insight into my colleague's choices and use of these materials in order to make them work in my classroom. Sometimes I could pick her brain over the phone about her units, and these conversations were enlightening. However, when this wasn't possible, my reverse-engineering seemed to take more time than it saved. After a few weeks, I stopped using her Dropbox as a starting point. However shaky I felt with the content, designing materials from scratch just seemed easier.

Shared curricula can provide useful foundations for course development, as well as tools to support teacher inquiry and growth. Unfortunately, curriculum materials are not often designed with these tasks in mind. This leads to missed opportunities to fully leverage strong materials as tools for both student and teacher learning. What could it look like for curriculum materials to be designed to more powerfully capitalize on these opportunities?

In my second year, teachers of the same course began meeting to plan and share instructional materials. The struggles of my first year motivated me to develop stronger curriculum supports to offer new members of my course team. I drew from my rocky start to build teacher resources that accompanied the course curriculum, such as teacher-facing “project overviews,” guidance for lab prep, and framing themes that spanned the year. These were designed to help others quickly orient to each learning sequence, reveal choices made during development, and embed insights and adaptations gleaned from our classrooms. Our weekly meetings also provided a forum to uncover “hidden teacher knowledge” in our materials and share how we were adapting the curriculum for our own classrooms. The goal was not to prescribe one way of teaching but to unpack the existing curriculum as a strong starting point for planning. Compared to my first year teaching the course, these supports seemed to leave us feeling better oriented—new teachers to the course especially.

Recently, I moved into a full-time curriculum developer role, where I curate project-based learning materials utilized by teachers within and outside my organization. These materials include curricula developed by other teachers in their classrooms, as well as novel materials for new courses. Many of the teachers working with our materials design their own curricula, but they look to our curated materials for strong models of an instructional method they are working to incorporate. In my role, I draw on my experience as a teacher leader to make the curriculum easier to make sense of, use, adapt, and learn from. As with the resources I shared on my course team, the goal isn't to direct other teachers in how the materials must be used, but to provide insight into design choices and instructional experiences underlying the curricula. Ultimately, I want our curricula to help teachers make decisions as they interpret and adapt the materials—or design new projects of their own.

There is deep power in teachers sharing the rationales and instructional insights behind the curriculum materials they use in their classrooms. However, when real-time conversation is not available, some of that power can be embedded into the materials themselves. I think of my role as capturing insights about a curriculum like those that teachers share with one another on collaborative course teams, and then making these available to a broader community. In this way, shared curriculum materials can serve as an asynchronous dialogue between educators as they interact with these classroom artifacts.

It is rewarding when teachers report that materials I curate have been valuable to their course design and instruction, as well as when teachers suggest adaptations, improvements, and insights to inform further



Opinionated curricula recognize that teachers exert power as designers whenever they select, implement, and adapt materials—and offer rationales about design choices in order to enable that work."

refinements. As my role as an educator evolves, I keep returning to the following questions: *How is developing sharable curriculum materials different than designing materials solely for one's own classroom? Beyond reflecting strong pedagogy, how can shared curriculum materials be designed to powerfully support teachers who draw from them?*

Although central to my work as a curriculum developer, these questions are also relevant to other teacher leaders. Teacher leaders occupy a variety of formal and informal roles—course team member, department head, mentor teacher, instructional coach, professional development facilitator, peer thinking partner—which can involve supporting others by sharing curriculum. Sometimes, simply sharing our “raw” classroom materials is enough (or all we have time for). However, there are opportunities to grow as teacher leaders in how we curate our own curricula for others. As we move beyond a handoff of digital files, we can more powerfully leverage curricula as tools for supporting other teachers.

As I have grown as a curriculum designer, three principles have come to guide my thinking about designing powerfully sharable curriculum materials.

Powerfully sharable curriculum materials are coherent

How can curriculum materials more powerfully support teachers in planning instruction? Often, sharing curriculum materials is reduced to passing on a student-facing document for an activity, resource, or assessment of a given topic. However, these objects don't exist in a curricular vacuum—we design and select materials to fit

within a broader learning sequence. Without revealing the intended coherence, we miss an opportunity to support deliberate instruction.

Rather than leave peers to reverse-engineer organization and sequencing decisions, powerfully sharable curriculum materials foreground choices about coherence. Making these assumptions and relationships, which form the architecture of the learning sequence, transparent can help others leverage these connections in their own classroom. It can also enable teachers to quickly determine whether the curriculum materials match their classroom contexts and to make productive adjustments as needed.

Questions to ask when designing sharable curricula:

- At the end of a learning sequence, what should students understand and be able to do? How does each component of the learning sequence support this central focus?
- How is the overall learning sequence organized? How might instructional moves or framing reinforce this organization?
- How are choices about the architecture of the learning sequence made transparent?

This might look like:

- A concise chart visualizing the main activities within the overall learning sequence, noting key choices about sequencing
- A brief description of the summative assessment and a table that quickly reflects how each component in the learning sequence builds towards that endpoint
- A bullet-pointed list at the top of an activity document that highlights the purpose and key outcomes for that activity as part of the overall learning sequence

Powerfully sharable curriculum materials are opinionated

How can curriculum materials more powerfully support teachers in adapting them? For every lab, video clip, or reading I've embedded into a learning sequence, there are several alternate versions I've considered. Why not just share the whole folder of possibilities? I've noticed an initial tendency (in others' work and my own) to provide a smörgåsbord of options with the intention of preserving teacher agency. Although the intention is valid, this approach can be counterproductive.

Any well-designed learning sequence is *opinionated*: the designer necessarily takes a position on the focus of the curriculum, and the activities, sequencing, and instructional moves are selected in alignment to these. In

other words, the curriculum is *designed for* specific aims. No lesson, unit, or project can be good for every use—and curricula that try to position themselves as such mistake weak coherence for adaptability. Unnecessary choices dilute focus and fail to provide a clear vision for how the materials might be used productively, which ultimately makes adaptation more difficult.

Curriculum materials can better support teachers in making adjustments, not by *avoiding* designer decisions, but by being explicit about them by presenting a strong model of how the curriculum *could* look as the foundation for others' adjustments. This does not mean offering alternatives is always bad, but that we should only do so with clear purpose.

Opinionated curriculum materials do not displace a teacher's agency in establishing the priorities for instruction within their classroom. Rather, opinionated curricula recognize that teachers exert power as designers whenever they select, implement, and adapt materials—and offer rationales about design choices in order to enable that work. These rationales should speak to teachers as fellow designers, offering justifications for the original design as resources to inform deliberate adjustments.

In contrast, curriculum materials that lack rationales and provide empty choices are harder to implement, adapt, or use as a model for new design. When I get curriculum questions like “*Which activities are necessary and which are optional? Why would I pick one of these options over the other? Why were these materials designed this way?*” I can tell there's room for the materials to be more explicitly opinionated.

Questions to ask when designing sharable curricula:

- What priorities drive the design of these materials? Where might another teacher want to know more about the design thought process in order to understand or adapt these materials?
- If teachers are presented with necessary choices within the materials, does each choice serve a clear purpose? Are all options well developed and focused towards the aims of the curriculum?

This might look like:

- A concise list of the main pedagogical aims of the curriculum
- A note highlighting any necessary choices within the learning sequence and a brief rationale contrasting each option
- A short description of modifications you or others have made to the curriculum that still allow the main aims to be achieved

Powerfully sharable curriculum materials are educative

How can curriculum materials more powerfully support teacher growth? A powerfully sharable curriculum is educative—that is, the materials are designed to promote teacher learning as well as student learning (Davis & Krajcik, 2005). We teachers often look to examples of curricula in support of our own growth as practitioners: to build our content and pedagogical content knowledge to new areas, to experiment with a new instructional model, or to visualize how specific teaching strategies manifest in lessons.

Educative curricula recognize teachers as learners and the materials of daily practice as tools for teacher growth. Embedded supports within curricula can include teacher-facing content knowledge underlying the lesson, strategies for revealing and responding to student misconceptions relevant to the topic, or suggestions of strategic instructional moves that support chosen activities. Powerfully sharable curricula are designed to do more than fill gaps in the learning sequence of a course: they enable teacher inquiry into a broader area of knowledge, skill, or pedagogy. In doing so, they aid a teacher's transformation of practice.

Questions to ask when designing sharable curricula:

- What do these materials assume a teacher knows and is able to do skillfully in the classroom? What supports enable teachers to visualize use of these materials in a classroom?
- What supports within these materials equip teachers to further build expertise?
- Do these materials assume fluency with specific pedagogical models or strategies? If so, how might the materials be designed to support teachers in building these fluencies?

This might look like:

- A text box with key background knowledge about a phenomenon explored in an activity, with anticipated student thinking about the phenomenon
- A brief rationale for instructional strategies assumed by the materials, such as debate or Socratic discussion
- Tools and ideas from practice that support experimentation with an instructional model, like classroom feedback structures within project-based learning
- Select examples of student work that illustrate different levels of performance

Revisiting the Dropbox

You might be wondering: when is there time for all of this? The truth is, there's not—at least not for everything—and



When we foreground coherence, surface design decisions, and incorporate educative elements into our curricula, we make them more powerful vehicles for supporting each other's work."

surely not within every piece of curriculum (even for a full time curriculum developer). In contrast, sharing a digital folder is often manageable, and there is value in perusing the collected resources of a trusted colleague.

However, we must recognize that "raw" curriculum materials miss much of the teacher knowledge we bring to bear when we select, refine, and use them in our classrooms. This teacher knowledge is valuable, and we add power to our shared curriculum materials when we surface this knowledge, even (and perhaps especially) in small amounts.

Different teacher knowledge will be valuable to different audiences. A beginning teacher might appreciate guidance and rationale for key teacher moves, while an experienced teacher new to the course may be more interested in background content and anticipated student thinking. Meanwhile, teachers exploring the underlying instructional model might want insight on how the curriculum enacts a specific pedagogical vision. The ideal amount of additional resources should overwhelm neither the sharer nor the audience, so I recommend starting small. By considering the most strategic areas to curate teacher knowledge within curriculum materials, we can begin to refine them as tools that support each other's practices.

All teachers are the curriculum designers of their own classrooms, whether through creation, adaptation, or interpretation of curriculum materials. This work is a necessary (and rewarding) part of the role of a teacher. Shared curriculum materials cannot diminish this responsibility, but they can enhance it. When we foreground coherence, surface design decisions, and

incorporate educative elements into our curricula, we make them more powerful vehicles for supporting each other's work. With these principles in mind, the materials we share can better support the work and learning of other teachers—by design.

References

Davis, E., & Krajcik, J. (2005, April). Designing Educative Curriculum Materials to Promote Teacher Learning. *Educational Researcher*, 34(3). Retrieved from http://www.project2061.org/research/ccms/site.archive/documents/Promote_Teacher_Learning.pdf

Citation

Sircar, M. (2018). Moving beyond Dropbox: Designing powerfully sharable curriculum materials. *Kaleidoscope: Educator Voices and Perspectives*, 4(2), 47–51.



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