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Depth of Field / Depth of Understanding: Finding The Emotional Connection

When we educators fail to appreciate the importance of students ' emotions, we fail to appreciate a critical force in students ' learning. One could argue, in fact, that we fail to appreciate the very reason that students learn at all.

Immordino-Yang, M. H. and Damasio, A. (2007), p. 9

In the summer of 2008 Packer Collegiate Institute in Brooklyn hosted a workshop with neuroscientist Dr. Mary Helen Immordino-Yang to learn about and work with her recent compelling research on the fundamental connection between emotion and cognition. Through our engagement with her ideas and work over the three days it became clearer and clearer that without understanding and addressing the emotional life of the student in our day to day work, we are necessarily limiting what and how students learn. Knowing exactly how to go about that, on the other hand, remains an open question. This article explores my efforts to put into practice during the following year some of what I learned.

As part of the workshop we were asked to come with a teaching problem or dilemma that we could examine in the light of her research. In fact Dr. Immordino-Yang specifically invited us to join her as co-researchers, in a sense, to test out some of what she was discovering in her work. She emphasized that the research in isolation was of limited value unless it confirmed what good teachers already know and do intuitively. The value of research, of course, is that it can render with more clarity and precision some of what underlies good intuitive teaching. The melding of the two will eventually provide a more explicit rationale for good practices and ultimately more finely crafted tools for creating effective learning.

For my dilemma I decided on the subject of *depth of field* from my work as a photography teacher, a topic that I considered small, manageable, and relatively concrete in comparison to some other issues that troubled me. Basically *depth of field* refers to the area of a photograph from the foreground to the background that is in focus. Simple enough, it would appear; although the process for achieving a desired depth of field begins to get a little more complex. In my fifteen years of teaching high school photography I had never been satisfied with how I was teaching the concept because even the brightest students did not truly understand that it applied to every photograph they took; nor did they use it in personal or interesting ways. I brought the topic to the table fairly innocently and unaware of the can or more pointedly - the Pandora's box - I was opening for myself.

The problem for me lay in the nature of the topic itself. It was basically technical information and as such, a necessary evil in a sense, something that I *had* to teach. I approached teaching photography as an artist and only begrudgingly as a technician. I basically held my breath for the year in hopes that equipment would

operate without breakdowns and that students would not bring in their fathers' fanciest cameras with the expectation that I would know the function of every button and dial. Likewise teaching depth of field was something I balked at and even left out of the curriculum a few years to give myself a rest. Yet the bottom line was that any first year photography student should know this how-to chunk of information in order to have more control over their picture-taking.

One of my approaches to teaching depth of field had been to set the information to an interactive song that required them to repeat the definition over and over. Basically I felt that if I could entertain them as they learned, the dose of necessary information would go down more smoothly.

In a call and response fashion they had repeated:

It's the area in focus from front to back

It's the area in focus from front to back

Front to back front to back

It's the area in focus from front to back.

I found over the years that the song was indeed entertaining, but there was little retention even after they had repeated the definition numerous times. When I asked them for the definition, they would typically fumble with re-framing the words of the song. Few if any would ever repeat the actual lyrics, which is originally what I had in mind, thinking that repetition equaled understanding. It was probably to their credit that they were at least trying to put the definition into their own words instead of parroting back mine.

I persisted with this entertaining method of presentation for years. Sooner or later, I thought, a bunch of smart students would just get it and confirm the usefulness of my innovative methods (which in hindsight were just a whimsical remnant of a traditional form of rote learning) You could also say that my persistence with an unproductive teaching method was something worth examining. Better late than never. So I brought this topic to the table of the brain research workshop thinking that it would be a manageable one to resolve. I just needed to be more creative in my approach.

From the start of her talks Immordino-Yang emphasized that the emotional brain was wired into the whole system of learning and could not be divorced from cognitive functions. This was not a matter of choice but one of biology. The only matter of choice was whether we, as adults, would choose to understand and to honor the way our students' brains truly functioned. So what emotional component was there to the subject of depth of field? How could I engage them with this dry topic?

First, I grappled with the notion of emotion in neuroscientific terms. Immordino-Yang explained that it was not necessarily what we thought of – a variety of feelings – but more the physiological manifestations that are measurable and that

accompany feelings like change in pulse, palms sweating, warmth in the body. I am still grappling with understanding this, but it gets clearer the more I work with it.

Given these physical aspects related to emotion, it occurred to me to have them physicalize the concept of depth of field, that this might engage their emotional selves. If they could feel and sense the concept through their bodies they would have a more visceral connection to the information and perhaps more understanding and ownership.

So I devised this playful physical enactment of depth of field:

First I would teach them the “technical” part about how the camera created shallow or large depth of field. Basically depth of field is a function of the camera’s aperture, the variable opening that allows light to enter and strike the film. When reduced to its smallest size, the aperture creates images with a large depth of field and when widened to its largest opening, it creates images with shallow depth of field. (The *why* of this I had carefully avoided after my initial years of facing blank looks when delivering an unconvincing and not too well informed rationale. Just trust me. It happens this way. You don’t have to understand how an internal combustion engine works in order to drive well.)

So first I planned to teach them to embody becoming a large aperture with arms in a big “O” or a small aperture with thumb and forefinger in a small “o”. Then some of the students would line up in a row facing a student “photographer” at the head of the line. The photographer’s role in this enactment was first to physically indicate large or small aperture. Students in the row would correspondingly be focused or unfocused. For example, to physically enact *shallow* depth of field everyone in the row would appear spacey and unfocused except for the one person whose name would be called. That person would then stand with rapt attention looking at the photographer who would “snap” a picture. And similarly with a small aperture and large depth of field, everyone in the row would focus completely on the photographer, all eyes engaged. No one would be unfocused or staring off (my ideal class!) Half of the class would watch, so they could see the effects of a large or small aperture in the row of their classmates. Even as I write it down I can see that it was a little complicated - a few too many steps? But it was fun and I knew that I was on to something. I couldn’t wait to try this out the following year.

As we delved more into the cognitive aspects of learning in the summer workshop, it became apparent that there was still more to the problem. Embedded within the concept were some conceptual stumbling blocks. For example the term “field” did not name with accuracy what they needed to learn. What “field” exactly? A baseball field, a cornfield? There needed to be some definitions or clarifying of terms, a building of smaller conceptual steps that would lead them to a more complex idea. This understanding derived from the theory of cognition we were learning that complex ideas were built from the assimilation of smaller, more basic ones. So why hadn’t I thought of that? *Field* seemed clear enough to *me*. The solution, though, seemed self-evident. If I substituted “area of focus” for “field” then things would

make more sense. I was quite sure they understood the word “focus”, at least in concept if not in practice! So we would name this, first of all, the “depth of the area of focus”, a mouthful but more to the point.

Then it occurred to me to: rather than actively *teach* the concept, let them first be absorbed in the experience of looking at photographs that embodied the concept of shallow and large depth of field and allow the lesson to unfold from there. In retrospect and given the way that much of my teaching had evolved in the last few years – to hand more of the responsibility for learning over to them – this seemed liked the most obvious direction of all.

Why hadn't I come up with it sooner? The block in my thinking had a great deal to do with the problem itself. This was a piece of technical “have-to-teach-it” information that I personally did not relate to in any sort of emotional way. I felt no visceral connection to it on my part. It was just something that any photography student should know and that any good photography teacher into his second decade of teaching the subject should know how to teach! Now, at least, I had a plan and new energy for approaching the subject.

So the time arrived in the curriculum the following year to once again introduce depth of field. I had my new methods, looking at examples that embodied the concepts, the physicalization of the aperture and area of focus, the clarification of terms. I decided that I would not abandon the song but instead of starting with it, I would end with it after they had begun to grasp the concept in other ways, more like dessert than the main course.

I was very excited to try out my new ideas especially the spacing-out / stand at attention lineup. I started out as I had planned by showing them a carefully selected group of pictures and asked them to identify what was common about a series of pictures that had shallow depth of field. That part was fairly easy for them and seemed to be relatively interesting. There was an element of solving a puzzle, which was in itself intriguing; and just the act of looking at pictures in a slightly different way caught their interest. All I was asking them to do at that point was to identify the common aspect of shallow “area of focus” without having to officially name the experience. And they *were* interested in how to take such pictures, leading us directly to the rest of the lesson.

I first explained the function of the aperture in relation to deep and shallow focus. And of course the highly adept technical student asked *why*. At which point I said, truthfully, I can't give you a good explanation that won't confuse you even more. But if you figure out a way to explain it to the class, please let me know. (With age comes some wisdom and with wisdom some humility.) Most, of course, were happy not to have to go that technical route.

I then taught them the physical gestures for demonstrating large and small apertures. And now for the part that would nail it for them, the lineup. I had half of

them stand in a line with one as a photographer at the front facing them. The other half of the class stood and watched. I was on edge with excitement because they were truly going to get it this time. The only thing that I had overlooked – and what proved to be a strong emotional trigger embedded in my lesson - was that teenagers hate to be embarrassed; and this exercise was primarily one thing for them – a huge source of embarrassment. “This isn’t helping,” one student said. Her impertinent words only fired me up to pursue it with even more embarrassment-stirring energy. I had been thinking about this lesson for many months now. It was part of my own research and students were not about to ruin it! I bludgeoned my way through the lesson demanding participation and understanding, neither of which was forthcoming. Finally we got to the song – with a little trepidation on my part. At least they seemed to enjoy it, though again with little evidence of learning afterwards.

I cooled off over the next day and regained some of my humility. To honor the research aspect of my venture, I gave them a feedback sheet to fill out about the lesson. The feedback confirmed that the physical enactment part of the lesson had indeed not been very useful and in fact mostly embarrassing.

And as in most things, failure often opens the way to more fruitful thinking and action. It was after this fiasco that the real lessons started to emerge for me. I had missed the point *again*. I was still trying to teach just a concept, albeit in some interesting innovative ways. But I still had not really approached the topic myself in ways that were emotionally engaging.

At this point I began to step back and take another look at the images I had shown them and to ask myself, what *is* interesting about these images? Not just, how were they made? And that is when I began to connect. In fact shallow depth of field, in particular, creates images that engage a viewer in a very different way than ones with sharp focus throughout. I began to understand that the selective focus of the lens begins to approximate more closely our own ability to select out details to focus on, though our mental capacity to give our undivided attention to a detail is far more subtle than a camera’s. Often when I ask a student why they took a certain shot they will point to a small detail in the photograph and say: this is what interested me. With the camera set on a small aperture and the resulting large depth of field, that detail would be completely lost in a sea of details. But the photographer in his or her mind had selected it out as important. By using shallow depth of field the student could isolate a detail in a somewhat similar way that we do with our minds, and the viewer could immediately identify what the photographer had chosen to focus on.

Even more than this, I realized that in the images I had chosen, the photographers were often using the unfocused areas of the picture to add a level of suggestion, an air of mystery, or to tell a story. In other words this dumb technical tool could be a creative one that could enrich the process of picture taking, one that could open up options for adding new psychological and emotional depth to pictures. My whole attitude toward the subject shifted with this new understanding.

When I gave them an assignment specifically to use a large aperture and shallow depth of field, this time my intention behind it was completely different. I wasn't interested in their simply understanding the technical use of the camera. That piece was now subsumed within the larger context: "what makes this interesting and how can you use it in personal ways." The results of their efforts were uniformly more engaging.

Even more telling about their understanding and appreciation for this new "tool" were their subsequent self-directed efforts. They started using it by choice. When one student photographed a single dandelion in sharp focus against the blurred grass in front and behind, I knew exactly what he was seeing and wanted me to see. When another student focused on one edge of a long bench throwing the rest out of focus, I knew that she was intrigued with the resulting mystery of a thing seen only partially. Depth of field was no longer just a technical piece of information but a path toward seeing creatively and towards making new meaning out of their photographs.

I have learned many things from this experience – some are about myself and my habits of thinking, and the others about the usefulness of engaging with research. As for my self-understanding, the block with this subject was really mine, not theirs. Curiously photography is about seeing but in this case I was blinded by my own stuck habit of thinking in a certain way. I can't teach effectively when I have no emotional connection to the material any more than they can learn without it. If there is an area of my teaching that is not working for one reason or another, I need to remember that it is not because they lack intelligence. Maybe, just maybe, I am not approaching the subject in a way that is most appropriate for their stage of development. I need to stop and look at it carefully using some of the new understanding that I have about the brain, about the importance of the emotional connection and about cognitive development. The solution is not simply finding an innovative way to present the material nor to entertain them, but something more fundamental. This is a lesson that reaches into to all areas of my teaching.

Finally, and underscoring the whole point of this article, is the benefit of engaging with the research. The answers or solutions I came up with were not articulated by the research. What it provided was a different lens through which to examine my teaching practice and another way of considering the dilemma. It offered me direction, clearer understanding of what was going wrong and ultimately confirmed something that I intuitively understood from the start. And I now have more precise language of my own to describe and define the problem and to address similar issues in the future.

References

Immordino-Yang, M. H. and Damasio, A. (2007) We Feel Therefore We Learn: The Relevance of Affective and Social Neuroscience to Education. *Mind, Brain, and Education Journal*,

