HOW HAS WORKING IN GRADE 8/9 CLASSROOMS PROMPTED YOU TO THINK ABOUT YOUR OWN K-12 SCIENCE COURSES AND EXPERIENCE? IDENTIFY THREE DIMENSIONS THAT OFFER A CONTRAST OR A PARALLEL. HIGHLIGHT AT LEAST THREE SPECIFIC EXAMPLES. FIND AT LEAST 2 EXAMPLES OF RELEVANT PAPERS TO SUPPORT YOUR PAPER.

In comparing my own K-12 science student experiences with the classes I now teach, I find contrast as well as parallel. I currently teach in a public school in Santa Barbara, whereas years ago I attended K-12 Catholic schools in San Fernando Valley. Although one might assume that private schools are more affluent and well equipped than public schools, the schools I attended were crowded parochial schools with relatively low tuition and financial resources. These schools were largely subsidized by the Catholic Church, so that poorer families could still provide their children with daily Catholic education. It often seemed to me that religious instruction was of higher priority than other educational subjects. In fact, while I was in attendance, my high school was in danger of losing accreditation and of being shut down, but for the political intervention of the Catholic Church.

I’m fortunate to now teach in a school that doesn’t suffer from the same lack of lab equipment and computer resources, as these disadvantages are documented barriers to effective teaching in elementary science and mathematics.¹ Thanks to the diligence of SBHS physics teachers in securing grants for these items, SBHS students can benefit from more hands-on, minds-on activities than I experienced in grades K-12. Teachers can better design
enactive, rather than iconic or textual, presentations. This instructional strategy has long been attributed with engaging student interest and increasing both understanding and memory retention. Recently, enactive teaching has been shown empirically to yield higher student test scores than iconic teaching.²

Another contrast is that my SBHS Conceptual Physics students seem much less motivated than my own parochial K-12 science classes, as I remember them. Perhaps this is because the more motivated SBHS ninth graders are enrolled in Physics rather than Conceptual Physics, whereas in my own K-12 student experience I was enrolled in the more challenging classes, which would have comprised the more motivated students. Whatever the reason, my SBHS students display and profess more lack of interest in science than I remember in my own K-12 science classes. Not only do many students say that they find science boring, difficult, and irrelevant to their futures, but they demonstrate these attitudes with absences, tardiness, and non-cooperation during class. Of course, this doesn’t describe all my students. However, this describes students who then act as role models for students around them. This issue can be a significant barrier to effective teaching in elementary science and mathematics.¹

But the barrier of poor student motivation can be mitigated by peer tutoring, as I’ve seen both in K-12 classes I teach and in K-12 classes I’ve taken. It doesn’t surprise me that peer tutoring is documented as an effective instructional method, benefiting both tutees and tutors.³ In my own experience as a student, I remember feeling inadequate and terribly sad that I couldn’t understand the then novel procedure of long division. I was too embarrassed to ask my teacher for help, but after she grouped the class into pairs, my partner helped me understand the process and I was completely elated! At SBHS, we consistently rearrange the class seating assignments, in order to pair stronger students with weaker classmates. With at
least two pairs of students, I've noticed improved class participation and self-confidence. What a joy it was to see such animated conversations and smiles!

In summary, teaching in K-12 classes has prompted me to think of my own experiences as a K-12 science student. Both memories and instructional training help me to identify barriers to effective teaching, as well as methods to mitigate such barriers.

REFERENCES

