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Teaching Philosophy: A Biology Instructor Perspective

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Background Context

As an educator, my teaching philosophy is informed by both my academic training and hands-on instructional experiences. I earned my Bachelor of Science in Animal Science at a public university in California, and I am currently in my second year of a master's program in Biological Sciences at the same institution. Throughout my undergraduate and graduate studies, I have worked extensively with diverse student populations, which has shaped my commitment to inclusive and student-centered learning. I have served as a reading tutor and academic peer mentor where I support students from underrepresented backgrounds through individualized instruction focused on strengthening vocabulary, comprehension, and study skills. I now serve as the lead tutor, further expanding my role in mentoring and academic support. In addition, I work as a Graduate Teaching Associate for a Foundations of Biology laboratory course, where I teach fundamental biology concepts through hands-on, guided-inquiry activities. As I work toward my goal of becoming a tenure-track biology professor at a community college, these combined experiences at my institution have strengthened my belief in the power of meaningful, inquiry-driven instruction and desire to create learning environments where students feel supported, respected, and empowered to succeed.

Values and Beliefs

I believe that learning is inherently social and develops through interaction, dialogue, and shared experiences. My experiences as a student and educator have shown me understanding is strengthened when students collaborate, communicate their thinking, and engage with diverse perspectives. These social interactions create opportunities for students to make sense of ideas together and to learn through participation. Within these learning environments, I aspire to create conditions where students feel encouraged to participate and develop confidence to take intellectual risks, even when they are uncertain or still developing their understanding.

I also believe that meaningful learning occurs when students actively engage in *inquiry* and reflect on new ideas in relation to what they already know. Inquiry-based learning is central to my teaching because it allows students to ask questions, explore concepts, and deepen their understanding through investigation rather than passively receiving information. Supporting inquiry learning requires intentional guidance from the instructor, including structured support, clear expectations, and ongoing opportunities for reflection. These beliefs guide the kind of educator I strive to be: one who facilitates learning through *social interaction, inquiry, and guided participation* so that students can build confidence in themselves as capable learners and continue to grow beyond the classroom.

Learning Theory

Sociocultural theory most closely aligns with my teaching values because it emphasizes learning as a socially mediated process shaped by interaction, language, and shared experiences.

Grounded in Vygotsky's (1978) work, sociocultural theory views knowledge as developing alongside social participation and the use of cultural tools, rather than in isolation. Vygotsky explains that higher mental functions such as reasoning, problem-solving, and reflective thinking, develop as learners engage in social interactions that involve language and shared meaning-making. These functions are not simply acquired individually. Instead, they are shaped through dialogue, collaboration, and guided activity with others.

Vygotsky (1978) further illustrates how instructional support and social engagement enable learners to move beyond what they can achieve independently, emphasizing the importance of scaffolding and guided participation within a learner's zone of proximal development. The zone of proximal development represents the gap in which learners extend their understanding through guidance, collaboration, and meaningful support as they work toward independence. This perspective aligns with my belief that learning develops through inquiry and active engagement with others, rather than through passive reception of information.

This perspective also supports instructional approaches that emphasize instructor-guided, collaborative learning experiences. Within these structured learning environments, inquiry-based learning applies sociocultural principles by inviting students to actively engage with questions, explore ideas, and deepen understanding through investigation and discussion. Inquiry-based approaches position learning as a communal process shaped by interaction and sustained engagement with complex ideas (Levy et al., 2013). Grounding my teaching in sociocultural theory allows me to design learning experiences that include guided participation and inquiry to help students understand biology and build confidence to take intellectual risks.

Methods

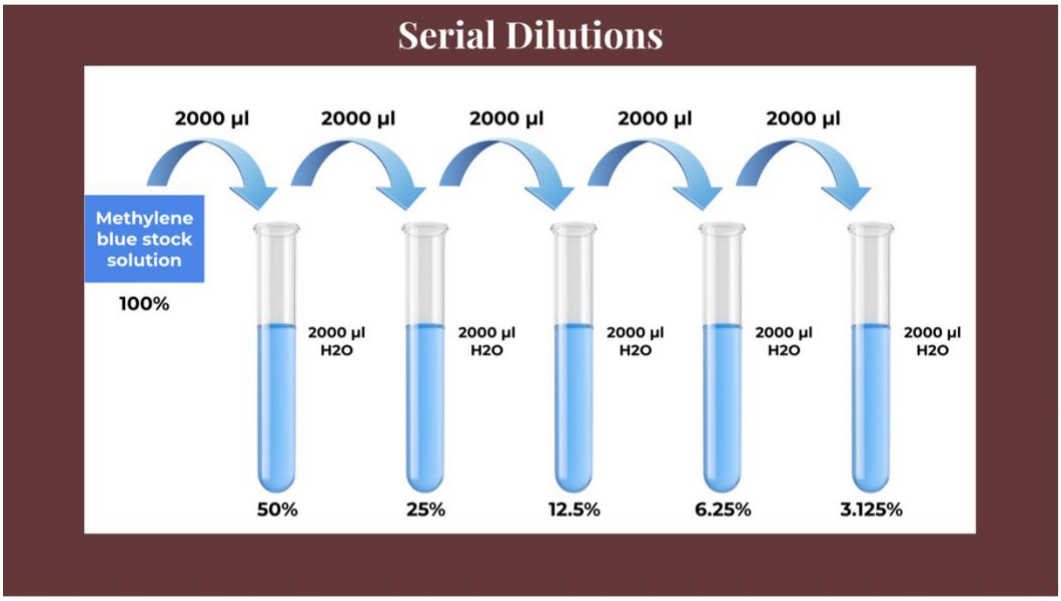
My instructional methods are grounded in a sociocultural approach to teaching, with scaffolding serving as the overarching framework for guided support. From this perspective, scaffolding involves both intentional planning and moment-to-moment guidance that support learning through interaction, language, and shared activity (Vygotsky, 1978; Walqui, 2006). This framework allows students to engage with challenging ideas while receiving the support they need to participate, communicate their thinking, and build confidence over time. Within this scaffolded environment, other instructional methods function as connected supports.

To provide accessible entry points into new concepts, I begin with multisensory learning experiences that engage students visually, auditorily, kinesthetically, and tactually. Multisensory approaches have garnered attention and support for enhancing learning through multiple forms of engagement (Shams & Seitz, 2008); whereas, learning styles have received criticism for lacking strong empirical support (Pashler et al., 2008). One example is a laboratory activity focused on serial dilutions using water dyed blue. I first model how to use a tool called a micropipette (auditory and visual), explaining each step while demonstrating proper technique. Students then practice using the equipment themselves (kinesthetic and tactile), physically transferring liquid between test tubes. As they work, they observe the color of the water becoming lighter (visual), which helps them connect their actions to the concept of dilution. Early in the activity, students often express uncertainty and rely heavily on guidance. As they repeat the process and receive feedback from peers and the instructor, they begin to work more independently, handle the equipment with greater precision, and explain their reasoning with more confidence.

To further support understanding, I use a visual diagram that represents the step-by-step process of dilution (see Figure 1). I refer to the diagram throughout the activity to help students

connect what they are doing physically with the underlying concept. Over time, students shift from following steps to explaining patterns, predicting outcomes, and supporting their ideas through discussion. This combination of demonstration, hands-on practice, and visual support reflects an experiential approach in which students develop understanding through multiple forms of engagement (Moses & Cobb, 2001).

Figure 1. *Dilution Process*



Within these shared experiences, I use the Socratic method as a form of guided questioning to support students' thinking through dialogue. I ask questions that prompt students to explain their reasoning, reflect on results, and clarify their ideas. As students engage in these discussions, their responses move from brief or uncertain answers to more detailed explanations supported by evidence. This process reflects learning through language and interaction, where students develop understanding by communicating their thinking (Vygotsky, 1978).

Building from scaffolded experiences and guided dialogue, inquiry-based learning allows students to extend their understanding through investigation and collaboration. In particular, the Biological Sciences Curriculum Study (BSCS) Engage, Explore, Explain, Elaborate, Evaluate (5E) instructional model provides a framework for guiding students through this process of exploration, explanation, and reflection (Bybee et al., 2006). As students work together, they begin to take more initiative in problem-solving, ask their own questions, and support one another's learning. My role shifts from directing to guiding as students demonstrate increased participation and confidence. Inquiry in this context emphasizes learning as a shared process shaped by interaction and guided participation (Levy et al., 2013).

Conclusion

Throughout this statement, I have articulated my teaching philosophy grounded in the belief that meaningful learning develops through social interaction, inquiry, and guided participation. For me, meaningful learning occurs when students actively engage with ideas

through dialogue, shared experiences, and structured support that helps them make sense of new concepts. Grounded in sociocultural principles, my approach views learning as a socially mediated process shaped by interaction, language, and intentional instructional guidance. The values, theory, and methods discussed across this statement reflect my belief that students develop understanding most effectively when they are supported to actively participate in class, communicate their thinking, and gradually take on more responsibility for their learning.

In practice, this philosophy shapes my role as an educator who serves as a facilitator and instructional guide rather than a transmitter of information. Teaching, in this sense, involves designing learning experiences that support problem-solving, reasoning, and sense-making through guided support and interaction with others. By intentionally sequencing scaffolding, multimodal experiences, Socratic dialogue, and inquiry-based learning, I aim to help students move from concrete experiences toward deeper conceptual understanding. Across my teaching, I prioritize guided participation and accessibility so that students feel supported as they develop confidence to engage, communicate their ideas, and take intellectual risks within a collaborative learning environment.

Reflection

Reflecting on the process of developing this teaching philosophy, I recognize how it has made my instructional decisions more intentional. Prior to articulating this philosophy, I was not always aware of the ways my lesson planning and classroom practices either supported or limited student participation. Engaging in this reflective process prompted me to examine how I structured activities, introduced concepts, and guided students through learning tasks. As a result, I became more mindful of how scaffolding, questioning, and visual supports could be used purposefully rather than implicitly. I now view this teaching philosophy as a living document that will continue to evolve alongside my practice. I look forward to growing as an educator who remains committed to supporting learning through interaction, inquiry, and guided participation.

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