

Faculty Development Plan
Draft

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Teaching

In order to improve my teaching, I will focus my efforts on 3 actionable items during my first year: 1) obtain feedback from students, colleagues, and programs; 2) Reading at least one book on improving college teaching; and 3) implementing course design features and learning objectives discovered during trainings and educational research.

1. Obtain feedback from students, colleagues, and programs. This will be accomplished via course evaluations (mid-term and final), colleague observations of my class material and lectures, and meeting with the center for teaching and learning to review course materials and structure.
2. Reading at least one book on improving college teaching. This will be accomplished by reading *Make It Stick: The science of successful learning* by Brown, Roediger, and McDaniel. Once this book is completed, I will read *McKeachie's Teaching Tips: Strategies, Research, and Theory for College and University Teachers (14th ed.)* by Svinicki and McKeachie.
3. Implementing course design features and learning objectives discovered during trainings and educational research. This will be accomplished by pulling out principles and practices in the above-mentioned books as well as other trainings I have or am yet to attend. These trainings include BYU's Write to Learn workshop and the American Geophysical Union's HydroLearn Hackathon, both of which were attended in August of 2021. Examples of practices to introduce include in-class write-to-learn activities and writing specific learning objectives based on Bloom's taxonomy.

Scholarship

In order to enhance my scholarship, I will execute a research program focused on understanding complex soil geochemical processes across time (seconds to decades) and across space (angstroms to hectares). This research will focus on the interdisciplinary study of extreme environments including the arctic, deserts, and coasts. This research will include investigations under different experimental and environmental conditions (climate, Eh, pH, temperature, hydration state, microbial populations) to understand the biogeochemical cycling and fate and transport of chemicals and nutrients. My scholarship between now and the next review will

include obtaining external and university funding to implement this research program. Specific research projects and funding sources currently funded or proposed are as follow:

1. Utah Lake Water Quality Project: Calcite scavenging of phosphorus in Utah Lake. *Funded, Utah Department of Environmental Quality, \$123K, PI: [REDACTED]*
2. Geochemical Characterization of Legacy Chlorination Ponds at a Wastewater Treatment Plant. *Funded, Timpanogos Special Service District, \$19.8K, PI: [REDACTED]*
3. Transforming Water Education to Address the Global Water Crisis. *Funded, BYU IDR, \$119K, PI: Abbott.*
4. Improving Soil Classification Analogies (iSCAN). *Recommended for funding, US Army Engineer Research and Development Center, \$1.2M, PI: [REDACTED]*
5. Collaborative Research: Integrating genomic and phenotypic analyses to understand microbial life in Antarctic soils. *In-review, National Science Foundation, \$1.4M, PI: Fierer.*

Each of the above projects will result in publications in peer-reviewed journals as well as reports to the respective funding agencies. Critical to my scholarship success will be working with colleagues and students. Each of the colleagues listed below are either Co-PIs on active research or proposals or co-authors on manuscripts in draft. Key colleagues within the Dept. of Geological Sciences include [REDACTED] and [REDACTED]. Other collaborations within the department are also being explored. Outside of the department, but still at BYU, collaborators include [REDACTED] and [REDACTED] all within the College of Life Sciences. Outside collaborators include [REDACTED] (US Army ERDC), [REDACTED] (US Army ERDC), [REDACTED] (US Army ERDC), [REDACTED] (US Army ERDC), [REDACTED] (University of Delaware), [REDACTED] (University of Delaware), [REDACTED] (USDA), [REDACTED] (Utah State University), [REDACTED] (Brookhaven National Laboratory), and [REDACTED] (University of Wuppertal).

There are also currently unfunded collaborations for which I am actively working toward funding and/or proposal submission. These include the NSF DUST² Critical Zone, Rio Tinto Kennecott Mine Reclamation, and Geospatial investigation of heavy metal distribution near Kennecott.

Citizenship

My classroom will be a place where equity is provided for all students. I will model inclusive behavior that reflects the gospel of Jesus Christ. I will get to know each of my students personally and make efforts to include students of color and female students.

I will make efforts to get to know each of my colleagues in my department. I will schedule one-on-one lunches with each of them to learn from them and build rapport.

During my first few years I will try to avoid serving on too many committees. However, I will contribute to growing the new Environmental Geology and Earth Data Analytics majors.

Additionally, I will work with groups from across campus to raise campus-wide awareness of ways we can be better stewards of the earth. This includes working on the Campus Sustainability Leadership Roundtable.

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