



Restructuring higher education class format to better prepare future teachers to offer hands-on science learning to their students

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Many traditional university-level science classes consist of multiple hours of lecture each week accompanied by a two-hour, hands-on laboratory session in which participants use high-tech equipment to explore the world around them. However, this model does not align with the typical elementary classroom schedule, and thus, it does not adequately prepare future teachers to be successful at providing hands-on experiences for their students. A typical elementary teacher cannot dedicate a two-hour block each week for their students to perform science experiments, and public schools often cannot afford high-end science equipment. Thus, there is a disconnect between how universities are preparing future science teachers and the reality of the day-to-day elementary classroom.

This disconnect can be addressed by restructuring the college science classroom to more closely mirror the elementary classroom, not in content but in time format. At Dickinson State University, science courses for future teachers have been adjusted to meet one hour a day for five days a week rather than three lectures a week plus a two-hour lab. This provides the same amount of time to teach content, but the lab times have been broken into two shorter lab days. These one-hour lab sessions allow future teachers to experience more hands-on labs which can be completed in a shorter amount of time, and they provide those teachers a wealth of classroom activities which can easily be converted to the elementary classroom.

Beyond a shift in time scheduling, Dickinson State University has also re-organized the equipment used in these labs. Rather than offering labs using equipment that will rarely be found in a public school classroom, the labs have been adjusted to make best use of simplified equipment that is reproducible by future teachers in their own classrooms. This allows for direct transferability of skills between the university classroom and the elementary classroom.

While every change in teaching format can pose its own challenges, these alterations are already producing positive results. The education majors completing these classes tend to be more excited about teaching science in their own classrooms, and they are more comfortable with the hands-on activities that are available to them. The new format is also providing a richer opportunity for the college instructors to model correct scientific thinking and experimental design skills that are specifically applicable to future elementary classrooms.