Plan for a SoTL Project and Reflective Response

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| **Research Question**What are you curious about? What would you like to know about strategies that might hinder and/or help students to learn, in your course?Do you want to know if an activity, assignment, or teaching strategy “works?”Do you have a question about how to help your students learn a particular skill?**I would like to explore the following:** What is the best method of teaching unit conversions to Pre-Health Sciences students in my math courses. I teach in two Pre-Health programs, one where students apply to future programs that are 1 or 2 years in length, and the other where students then apply to programs that are 3 or 4 years in length. I am curious to see if there is a difference in the learning strategies used between the ½ and ¾ students.I am interested in learning whether students prefer to use physical objects and compare their size, weight, volume, in class or on their own, or if they don’t want the visual representation and solely want to learn just by looking at the unit conversion equations. |
| **Identify challenge/outcome related to learning that is related to your question.**Describe the learning in a way that suggests how you might *measure* it using either qualitative or quantitative methods.I will compare the grades of students I notice actively participating in studying the physical objects, to those that either refuse to participate, or did not come to class to get the hands-on experience. It will be interesting to see whether students can use their critical thinking skills to tell me how much a toddler would weigh in kg vs lbs and how much volume we can hold in our lungs in L vs mL, etc. |
| **Describe the instructional activity, assignment, or teaching strategy that will promote student learning on the outcome you identified.**SoTL projects might investigate the impact of a *modification* to an existing strategy or assignment. Describe how the new approach differs from the old approach and why this modification might change student learning on this outcome.My old approach is to use my PowerPoint slides to demonstrate how to use the unit conversion formulas. I also show them pictures of objects and describe different units of measure. I also talk about my children and their weights vs my weight in different units of measure. However, I think that for some students, they really need a visual or kinesthetic approach to learning where they need to see/hold/touch items and see what their units of measure are and compare those. For this activity, I will be bringing in every day grocery store items that are measured in different units – mL, L, oz, lbs, etc. with varying items of varying capacities/weights/sizes during this lecture. |
| **Describe the evidence that would persuade an external audience that the new or modified teaching strategy improves student learning on the targeted learning outcome.**Describe the evidence you would need to collect to answer questions about the impact or value of this teaching strategy. How would you convince others that this approach is better than other approaches? What comparisons should you make? Examine students; skill before and after the assignment? Compare students who complete the learning activity to another group of students – what comparisons would be meaningful?I would compare the results of evaluations of students that complete the activity to students that did not participate to students that did not attend at all. If I found that students that completed the activity were better at understanding if a final answer made sense based on the unit of measure compared to the other two groups, that would be enough to indicate that this new teaching strategy is useful (practical significance). I could perform a one-tailed student T test and see what P-value I end up with to determine whether the results are also statistically significant, or if they could have happened by chance.  |
| **How and where would you publish, present, or disseminate this work?**I would present this data to my colleagues and supervisor to demonstrate whether this teaching method was significant. If it is found to be significant, I would keep it in both Pre-Health programs in the level 1 math course. |

Adapted from: C. J. Stanny, E. M. El-Sheikh, & H-M. Chung (2009) ***Getting Started with a SoTL Project***

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**Ethical Considerations for this Project:**

* All students must be made aware that I will be comparing their outcomes to students that do not participate in the project.
* Students can withdraw at any time without penalty.
* Individual student grades will remain anonymous when I’m presenting the data; just the overall means will be visible.
* Individual student names and any other personal information will be kept confidential.

**Dissemination Strategy:**

Share the findings with the students from my math courses. Then, if the results are significant, I would present the findings to my colleagues and supervisor. I would also share these findings with the mathematics faculty group and perhaps even the professional development and teaching and learning departments at my school. If the teaching and learning department was interested in performing more studies with me, I would then be interested in completing more experiments and publishing those findings in journals (with their help).

**Reflective Response**

My question is whether a hands-on learning approach will improve critical thinking skills related to unit conversions in level 1 Pre-Health Sciences students. I will look at articles talking about hands-on learning approaches and how that can increase critical thinking skills. I will specifically see how they set up their materials and methods sections. I will purchase a multitude of items from the grocery store and label them with the numbers and associated units. I will set the materials out in stations – volume, weight, height, etc. and have the students come up to each station and physically touch or look at the objects to understand the differences in units. I will then relate this back to health sciences with weights and volumes of patients and medications. I will compare the critical thinking skills that students who participated in the activities have compared to students that did not participate in the activity either by choice or by lack of attendance on that day. I will perform statistical analysis using scores from assessments within each group and compare them to see if there is any practical as well as statistical significance between the experimental and control groups. I think this will allow the students to go from confused to that AHA moment.

BEFORE:



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