Plan for a SoTL Project

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Research Question
What are you curious about?

I am interested to explore this research question:

- How might we improve student team performance by making mandatory use of software tools in a Systems Analysis and Design (**SAD**) course and by requiring each student to submit individual lab results?

What would you like to know about strategies that might hinder and/or help students to learn, in your course?

- I want to explore on the use of experiential learning in the use of software tools to enhance student team performance.
    - In this context, we apply the experiential learning strategy and move from passive learning (i.e., watching the instructor's demo) to more active learning (i.e., follow the instructor step-by-step)
    - In the Systems Analysis and Design course, students are required to work in teams.
    - The goal is to encourage each team member to have the same baseline skills in drawing Unified Modeling Language (UML) models/diagrams. These models will be accessible to all the team members.
    - Motivation: An Agile team is a cross-functional and self-organizing team. In the past years, some students get frustrated when some of their team members did not complete their "assigned" task in a timely manner. By encouraging each student to be multi-skilled, any team member can now review and edit the UML diagrams created by another team member.
    - With this new individual lab requirement, the team are now equipped to complete their team assignment even when a team member has to deal with an emergency.
- I want to know more about my students (audience) and to answer the question:
    - Do my students prefer instructor-led or self-directed approach when completing their individual labs?
    - To answer this question, I pursued the following teaching strategies.
        - **Instructor Demo**: The students will watch the instructor demonstrate the use of a software tool, followed by a class discussion.
        - **Instructor-led Lab**: The students will follow the tutorial steps synchronously. If a student is stuck, they can ask help immediately.
        - **Self-directed Lab**: The students will follow instructions in a set of slides. They attempt to draw the diagram on their own. If they are stuck, they can play a pre-recorded video that shows the steps from start to finish.

- Over the years of teaching, I find ways to improve my teaching and improve the learning of my students.
    - I expected that moving from **Instructor Demo** to **Instructor-led Lab** that requires the students to do hands-on lab, will eventually enhance student learning.
    - I spent some time to prepare lab slides and prepare pre-recorded videos. This provided an opportunity to implement a **Self-directed Lab** approach in the middle of the school term.

Do you want to know if an activity, assignment, or teaching strategy "works?"

- I am preparing this "Plan for a SoTL Project" at a time when I have implemented the **Instructor-led Lab** strategy for at least 7 weeks in my **SAD** course. Based on initial course feedback, I noticed an improvement in teams completing their team assignments. Team members are now able to help their own teammates, even when there are emergencies right before their assignment due date.
- are no longer complaining about getting "stuck" when team members are not always available.

Do you have a question about how to help your students learn a particular skill?

- There are no specific questions identified based on the research question identified above.

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.

- Despite the requirement of a "team charter" or "team contract" at the start of the course, there are still challenges such as some students who did not participate in the individual lab sessions and team members not being able to make timely contributions to the team.
    - The current solution is to ask the team to conduct a "working agreement" session and let the team agree on timeliness of contribution and the potential consequences of non-compliance.

- Another challenge is when students may not participate in the individual labs.
    - To make the individual labs meaningful and effective, they matches the unit outcomes of the course (e.g., draw a UML Activity Diagram).
    - To give an incentive for students to do their individual lab, each individual lab completion is worth 1% of the overall course mark.

- One way to record and measure the potential outcome of **Instructor-led** vs **Self-directed** approach to completing individual labs is to let the students participate in both approaches and then, conduct a qualitative survey afterwards.

Describe the instructional activity, assignment, or teaching strategy that will promote student earning 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.

Prior to Fall 2021 school term, the SAD course did not require individual labs to be completed.

- I used to evaluate assignments at the team level and all members of the team will receive the same team assignment mark.
- The team assignment has a case study that requires the use of software tools to draw UML diagrams as part of the systems requirement/project deliverable.
- In previous terms, some teams were not able to submit on time because one of the team members have an emergency and no other team member can finalize certain parts of their team solution.

Starting in the Fall 2021 school term, I introduced the new **Instructor-led Lab** approach, where each student will be required to complete the individual labs.

- The new teaching strategy seems effective in helping students enhance their learning with their hands-on participation.
- In the first half of the term, all teams have submitted their team assignment solutions in a timely manner.
- In this new approach, I observed that attendance have been relatively higher than in previous terms, despite having a "remote" course delivery in the Fall 2021 term.

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?

When comparing the **Instructor Demo** approach from the **Instructor-led Lab** approach, we can see the evidence in the impact of implementing an individual lab strategy by observing the attendance during lab sessions, the participation rate of individual lab completion (almost 100%), and the timeliness and overall quality of team assignment submissions.

- Attendance - more students are attending the lab sessions in the Fall 2021 term
- More students are engaged in the labs and class activities. I observed that students raised more questions related to the use of **Visual Paradigm** (software tool).
- I noticed that the confidence level in drawing UML diagrams has increased in the Fall 2021 term. There seems to be fewer UML diagram errors found in the team assignment solutions.

- The survey results in **Fall 2021** shows **Visual Paradigm** as the most valuable lesson they learned, surpassing the **Agile / Scrum** topic as the most valuable lesson learned in **Fall 2019**. Please refer to **Appendix A** for a quick comparison between Fall 2021 and Fall 2019 results of Question 1.

To compare the **Instructor-led Lab** approach from the **Self-directed Lab** approach, I propose to conduct an experiment within my Section 1 class of the SAD course. I was encouraged to conduct a mini-experiment when I joined the Saturday Extender (Scholar module) session on Nov. 13, 2021.

- Instead of using the Instructor-led Lab approach for the entire UML Communication lab session, I divided it into two parts: Part 1 is Instruction-led and Part 2 is Self-directed.
- At the end of the UML Communication labs (Part 1 and Part 2), conduct a survey with no more than three (3) questions to encourage student participation with a goal of two (2) minutes average survey response time.
- The questions of the survey using MS Forms (*which I learned from the Experimenter module!*) were as follows:
    1. Did you finish Part 1 (Add a Customer use case)? Describe at least one characteristic of "instructor-led" approach? (e.g., easy to follow)
    2. Did you finish Part 2 (Add an Account use case)? Describe at least one characteristic of "self-directed" approach? (e.g., allow self-exploration)
    3. After completing Part 1 (instructor-led) and Part 2 (self-directed) of the UML Communication Diagram lab, which method do you prefer?
- The results of the survey gave me a better understanding of my students (audience) and their learning preferences
    - Many students (50%) still prefers the Instructor-led Lab, while 39% has no preference. This helps me to decide to continue a combination of both Instructor-led Lab and Self-directed Lab, as appropriate.
    - This mini-experiment demonstrate that I can introduce incremental changes to my teaching strategies and I need to get systematic feedback, in order to enhance student learning. These are all part of the scope of SoTL.
    - The results of the sample survey are available in Appendix B.

How and where would you publish, present, or disseminate this work?

- I shared the survey results to my SAD students. They are the stakeholders, it will demonstrate my commitment to excellence in teaching and learning strategies, and that I care about my students.
- I can share the results to other faculty mmbers, especially those who are teaching in the SAD course or teaching in the same program and in the same college.
- Information Systems Education Journal (ISEDJ)
    - E.g., Bruce Saulnier of Quinnipiac University, CT 06518, USA published a paper entitled “The Flipped Classroom in Systems Analysis& Design” [ISSN: 1545-679X: July, 2015]

Ethical Considerations

This SoTL Research Plan (mini-experiment) does not have any ethical implications associated with surveying students. The survey does not collect any personal information of the students (anonymous) and student participation is voluntary.

Final Reflection:

With many Ontario colleges and universities having to deal with budget constraints, it is not easy to propose large-scale SoTL research. As a professor, I will continue to make smaller SoTL research plans and implement them in my own classroom. I believe that if I can consistently make small improvements, it can lead to higher levels of satisfaction from my students.

Learning the SoTL module reinforced my understanding of what I have informally been doing as a professor. The SoTL Research template is useful and it provide a guidance to plan and implement a teaching strategy. In the future, I can further explore by adding more lab exercises to allow students to explore more case studies on their own. This will provide students with opportunities to learn and grow further (e.g., basic, intermediate, advanced).

Photo by Marvin Meyer on Unsplash

Adapted from: C. J. Stanny, E. M. El-Sheikh, & H-M. Chung (2009) ***Getting Started with a SoTL Project***
Center for University Teaching, Learning, and Assessment http://uwf.edu/cutla/

Appendix A: Comparison of Fall 2019 and Fall 2021 SAD course feedback

(1) In the **Fall 2021** term survey conducted using **Microsoft Forms**, **Visual Paradigm (software tool)** is now **the most valuable lesson learned (60%)**, which surpassed **Agile / Scrum (30%).**

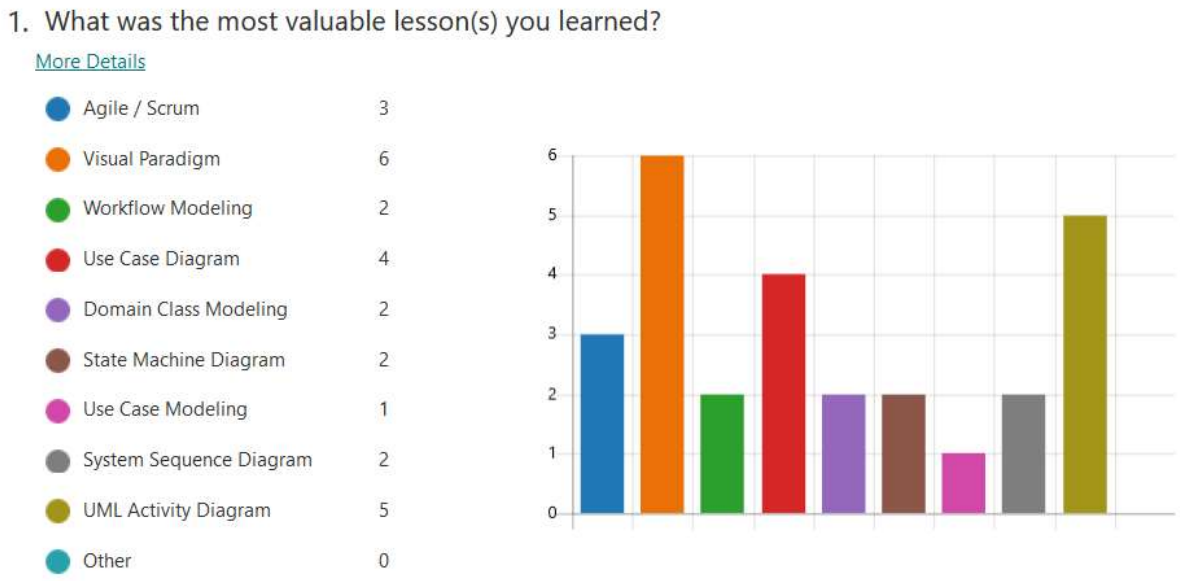


***Figure 1**: Survey result of Question 1 for **Fall 2021** SAD course*

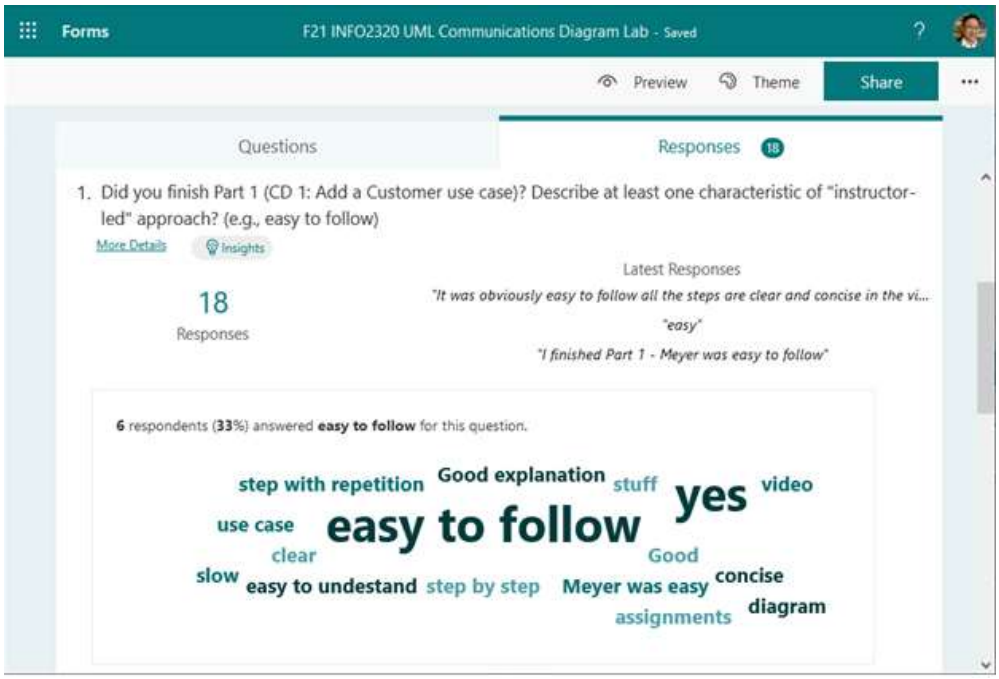
(2) In the **Fall 2019** term survey conducted using **Survey Monkey**, **Agile / Scrum (70%)** was the most valuable lesson learned.

***Figure 2**: Survey result of Question 1 for **Fall 2019** SAD course*

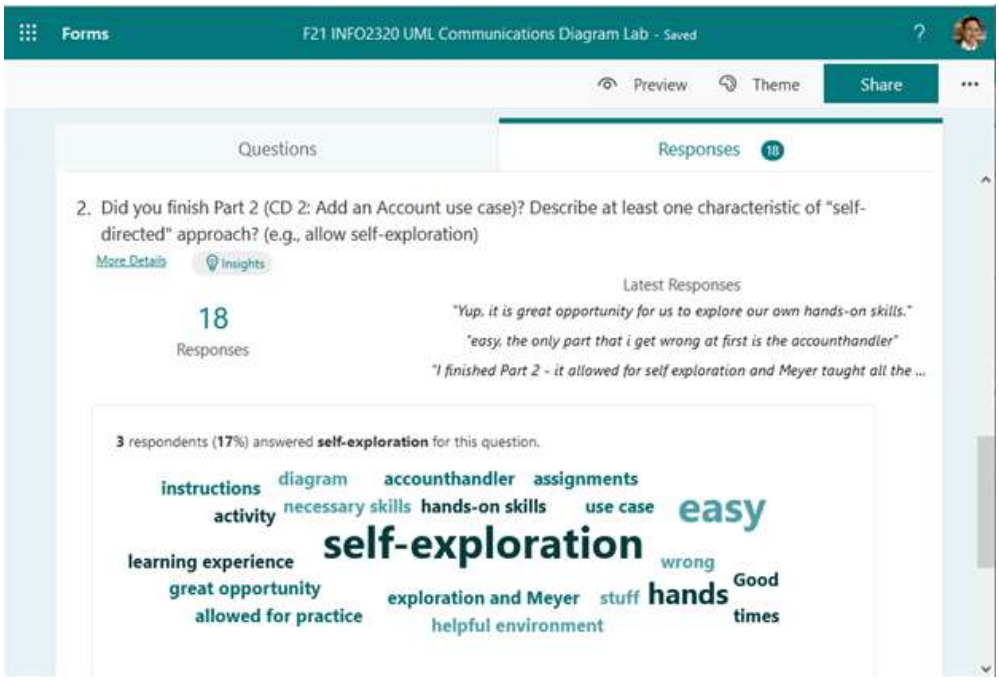
Appendix B: Fall 2021 UML Communications Diagram Lab feedback

- Responses: **18**
- Average time to complete: **01:46**

Q1 Result: No student said NO; Easy to follow



Q2 Result: No student said NO; Self-exploration



Q3 Result: Total of 89% of students either prefer Instructor-led (50%) or has No preference (39%)