WIP: Get Them to Tell You What Works: Exit Surveys for Formative Feedback

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WIP: *"Tell Us What Works"*: Exit Surveys for Formative Feedback

This Work-In-Progress paper describes current work to leverage exit survey results for formative feedback in a project-based, first-year engineering course. The following sections contain our purpose, methods, and preliminary results to demonstrate how we used Exit Surveys to provide student feedback as a type of formative assessment for ongoing and future course improvement.

Introduction

Many students are eager to suggest what will make their learning experiences worthwhile and to have their voices heard. Faculty would like to learn more about students' needs and respond to them using their students' perspectives. Soliciting suggestions about students' learning experiences, and responding to them quickly, presents opportunities for instructors and students to provide mutual formative feedback as input to course planning, both in real time and for future course improvement. Specific course improvements include real-time changes to curriculum planning, learning activities, and classroom management, while the semester is ongoing. However, this can be challenging to accomplish, particularly with large class sizes.

We were thus motivated to implement a meaningful formative feedback process in classes with approximately 70 students each by designing and administering short Exit Surveys with concise, intentional questions related to student learning experiences and strategies. This allowed us to solicit student feedback, in multiple iterations, and adjust course policies, curriculum, and learning activities for immediate improvement as the semester progressed.

Facilitating a formative feedback process has been documented to increase student motivation and engagement and help students to be successful [1]. Exit surveys are an easily accessible opportunity for students to reflect upon their learning process and share these reflections with their instructor through formative feedback, as well as practice metacognition, particularly when students are prompted to reflect on their own processes and strategies for learning [2], [3], [4].

Our primary goal is to amplify student voices as we facilitate learning in our courses, by encouraging our students to *tell us what works.* If things are not working well, we want to hear their suggestions for things that we can improve to ensure that they have a worthwhile learning experience. We are guided by the following research questions:
- Central RQ: How do students describe their learning experiences in a project-based first-year course in response to a brief exit survey?
- Sub-RQ 1: How did students' descriptions of their experiences with the instructional processes and resources contribute to real-time and forward-looking course planning?
- Sub-RQ 2: How did students' descriptions of their learning experiences inform the integration of student motivation factors into learning strategies and activities?

We used the MUSIC Model of Academic Motivation [5] as the framework for analyzing students' responses for meaning. The MUSIC Model synthesizes theories on academic motivation into five components (***eMpowerment***, ***Usefulness***, ***Success***, ***Interest***, and ***Caring***) that instructors should consider in course design to support student motivation and engagement.

Methods

A series of Exit Surveys was administered to students in an introductory engineering foundations course, with example questions that included, but were not limited to, the following: *(1) What will help to ensure that you have a positive learning experience?* (2) *What are we doing that supports your learning?* or *(3) What could we do to improve your learning?*

Each instructor set their own schedule for administering the surveys, customized the survey questions to elicit specific feedback about the content of their own courses, and set their own preferences for the way responses were collected. One instructor used identified responses to facilitate follow-up actions and grading for participation, while another instructor designed their surveys to be anonymous and voluntary. We analyzed the responses by assigning labels or codes to either meaningful excerpts or full responses, and then categorized these labels as they related to components of the MUSIC Model. This allowed us to better understand student feedback in terms of the MUSIC Model's motivation components as prompts for course improvement [6].

Preliminary Results and Discussion

For one instructor, the most salient responses included perspectives on the quality of Communication between students and the instructional team followed. This label aligns under the element ***Success***, as good Communication strategies may foster student success in the course: "*The material covered and method of delivering information are perfect for this class. It gives a great representation (I think) of how an actual engineering job would function, in terms of presenting information and collaborating with teams.*"

Sometimes a question would elicit conflicting statements. For example, even though a student gave the following suggestion to improve their learning experience: "*I think the due dates for assignments could be much clearer, sometimes it is confusing to tell what needs to be submitted, and when,*" another student commented about the organization of assignments in the learning management system: "*Everything on Canvas is very organized and easy to navigate through.*" Conflicting statements emphasize that student experiences are unique but present a challenge when interpreting data. It indicates there may be a need to add another layer of analysis to make sense of qualitative data and use it productively, particularly if instructors are dealing with substantial amounts of data or would like to quickly analyze data so that it can immediately be used to make improvements to the course [7].

One instructor started the semester by giving a prompt to gauge what students expected from the instructional team, providing an early opportunity to design or modify activities and course plans to better meet students' needs [6]. Responses to this prompt indicated expectations for a learning environment and learning activities that promote ***Success, Interest,* and *Caring***: *(1) Be lively, present, and patient. Sometimes it is hard for me to understand more complex problems, especially when I'm falling behind a little, so just a support system (**Success**) (2) To have the same energy and enthusiasm as today's class (**Interest**)* and *(3) To make a safe environment where we're able to ask for help if needed (inside and outside of the classroom) (**Success** and **Caring**)*

The instructor then sought feedback from students in mid-semester using prompts meant to elicit what strategies were working well. Students expressed appreciation for ***Useful*** learning activities and strategies that they associated with engineering and being an engineer: *(1) Having us chat among*

other students. We get to share ideas and work together as a team. This is a big aspect of being an engineer. (2) Digging deeper into our selected problems, especially the concept map and helping one another improve them, can help improve my problem-solving and analysis skills."

Students also valued **Useful** experiences that they found unique to the course: *"Experience of hands-on projects. Not just studying text is a nice change that helps me retain information from experience."*

Data from this instructor indicated a successful implementation of evidence-based strategies for keeping students motivated and engaged [8]. Students seem to recognize and appreciate the value of these strategies, albeit deemed "non-traditional" or "out-of-the-box" at times, to their learning process, knowledge that will be helpful to the instructor in designing and planning learning activities both within the semester and for future iterations of the course [9].

Another instructor provided a prompt to gauge students' perspectives on topics that they found challenging. Responses included the following topics: *SolidWorks (it's extremely complicated)* and *Ethics because it's hard to know the right answer.* This instructor also asked students for their feedback on the learning strategies being implemented in the classroom: *What is helping me learn is seeing examples of what to do,* and *Hands-on activities and help from instructors going around and helping individually.* This feedback received from students provided important insights into what topics may need additional discussion; what strategies are helpful; and what strategies may need to be revisited to promote **Usefulness, Success, Interest,** and **Caring** [6].

Our preliminary analysis yielded helpful student feedback and informative insights. When viewed from the lens of the MUSIC Model of Academic Motivation, our results would allow instructors to assess, revisit, and design learning activities from student feedback. Upon further analysis, instructors will also have a chance to share their experiences and best practices and adopt prompts that will allow them to collect more insights from students or revisit how they structure existing prompts.

Opportunities for Future Work

We will continue this study with improved Exit Survey questions and larger data sets to further explore the nature of student feedback for ongoing and future course improvement in conjunction with the components of the MUSIC model of motivation. The ongoing use of our formative assessment process is intended to promote greater student motivation and engagement, which often results in increased learning and perceived course value to students.

In addition, we expect that survey content and frequency rate will influence and depth of students' responses, and plan to explore these factors as well. Are short daily or weekly surveys more helpful for course improvement than surveys covering a longer duration of the course? How long should these survey questions be to encourage meaningful responses? These and other questions will inform our continuation of this study.

References

[1] D. J. R. Evans, P. Zeun, and R. A. Stanier, "Motivating student learning using a formative assessment journey," *Journal of Anatomy*, vol. 224, no. 3, pp. 296–303, 2014, doi: 10.1111/joa.12117.

[2] J. B. Biggs, "The role of metacognition in enhancing learning," *Australian Journal of Education*, vol. 32, no. 2, pp. 127–138, 1988.

[3] K. D. Tanner, "Promoting student metacognition," *CBE - Life Sciences Education*, vol. 11, pp. 113–120, 2012.

[4] M. N. Ganz and B. C. Ganz, "Linking metacognition to classroom success," *The High School Journal*, vol. 73, no. 3, pp. 180–185, 1990.

[5] B. D. Jones, "Motivating Students to Engage in Learning: The MUSIC Model of Academic Motivation," *International Journal of Teaching and Learning in Higher Education*, vol. 21, no. 2, pp. 272–285, 2009.

[6] B. D. Jones, "User guide for assessing the components of the MUSIC Model of Motivation." 2016. Accessed: Mar. 01, 2017. [Online]. Available: http://www.theMUSICmodel.com

[7] J. A. Marsh and C. C. Farrell, "How leaders can support teachers with data-driven decision making: A framework for understanding capacity building," *Educational Management Administration & Leadership*, vol. 43, no. 2, pp. 269–289, 2015, doi: 10.1177/1741143214537229.

[8] W. J. McKeachie, "Good teaching makes a difference—And we know what it is," in *The scholarship of teaching and learning in higher education: An evidence-based perspective*, R. P. Perry and J. C. Smart, Eds., Springer, 2007, pp. 457–474. Accessed: Mar. 17, 2017. [Online]. Available: http://link.springer.com/content/pdf/10.1007/1-4020-5742-3_11.pdf

[9] L. R. Lattuca and J. S. Stark, *Shaping the college curriculum: academic plans in context*, 2nd ed. San Francisco, CA: Jossey-Bass, 2009.

Appendix: Examples of Exit Survey Questions

Questions about course content and delivery:

- What are your expectations for the teaching team this semester?
- What technical, professional, and/or interpersonal skills would you like to learn or improve upon in our course?
- How would you describe what an engineer does? (Use this one at the beginning and at the end of the course)
- What is your impression of our CAD program on a scale of 1 (I hate it) to 5 (I love it)
- What did we do this week that improved your learning?
- What questions do you have about the design project?
- What have we done during this course that you think was valuable to your learning?
- What else could we do to improve your learning?
- The next time that you prepare a presentation, what would you do differently?
- Please provide some specific feedback about our teaching assistants.

Questions about student welfare:

- What's new? OR What's exciting? OR What's bothering you?
- What do you like best about being at our university?
- What went right for you during this week, from anywhere?
- What else would you like to share with us, from anywhere?