Utilizing Dental Student Feedback to Enhance Service-Learning

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Student feedback is a valuable tool for educators and academic institutions. However, the utilization of feedback varies by course, program, and institution. For the evaluation of experiential learning, which takes students out of the familiar classroom setting and into the community, student feedback can be particularly meaningful. This paper describes how collecting detailed and specific feedback from students in mid-course evaluations, resulted in opportunities to enhance their experience of the service-learning program. The paper also proposes a model that can be followed by educators in other disciplines.

Review of Literature

Program Evaluation

In higher education student feedback is most commonly collected through standardized, formal, end-of-course evaluations that is often used for faculty promotion and tenure decisions (Centra, 1993). A frequent criticism of end-of-course evaluations is that they can be influenced by students' final course grades (Svanum & Aigner, 2011). It has also been suggested that timing and mode of dissemination can influence students' responses (Burton, Civitano, & Steiner-Grossman, 2012). These issues, along with low response rates, have implications for the validity of evaluation data (Jaquett, VanMaaren, & Williams, 2017). Therefore, student feedback obtained through end-of-course evaluations may not directly reflect course or teacher effectiveness and consequently, may

Abstract

This paper describes the use of mid-course feedback to modify the structure and enhance student experience for a service-learning (SL) program. Dental students completed mid-course surveys during four academic years, ranking their perceptions of level of preparedness for, and value of, the SL program components as well as suggestions for program improvement. Results were analysed for differences by academic year. Qualitative analysis was conducted for open-ended questions. Students' rankings varied by SL activity but were primarily positive for all academic years. Statistically significant increases in student value for specific program activities were observed in later years in response to course changes. Over time, student recommendations changed from an early focus on logistics to an emphasis on program content and value. Actively seeking timely and specific feedback from students enabled course faculty to make changes that lead to improvement in students' experience and a greater appreciation of the purpose of SL.

not provide information needed to make substantive changes to course curricula (Combs, Gibson, Hays, Saly, & Wendt, 2008). Evidence indicates that faculty-developed and course-specific midterm evaluations may provide greater insight for making effective real-time instructional changes (Harris & Stevens, 2013). It has also been suggested that mid-course evaluations may favorably impact students' perceptions of the course, instructor, and teaching process (Keurzer, 1993), and are less influenced by academic performance (Svanum & Aigner, 2011).

Service-learning

Service-learning (SL) is an experiential educational methodology that integrates community service with specific course instruction and guided student reflection. An important characteristic of SL is continued evaluation and improvement (Yoder, 2006), with goals of enhancing students' learning experiences, instilling civic responsibility, and addressing community needs (Hood 2009). Students' educational experience is enriched by allowing them to apply theoretical knowledge gained in the classroom to real world settings, thereby reinforcing didactic concepts. SL also has the potential to increase professionalism and improve communication and critical thinking skills which are important educational competencies for the health professions (Hood, 2009; Aston-Brown, Branson, Gadbury-Amyot, & Bray, 2009). Health professional students' civic engagement can be fostered by SL through improving cultural competency and providing a better understanding of social determinants of health and health disparities (Hood, 2009; Bryant-Moore, Bachelder, Rainey, Hayman, Bessette, & Williams, 2018), and preparing students to "take an active role in promoting population-based disease prevention and health promotion activities" (Henshaw, 2006). In addition to the benefits to students and the educational institution, SL strengthens communities by establishing partnerships with agencies or organizations that can help address the communities' unmet needs (Yoder 2006).

Background

Over the past several decades, both clinical and non-clinical SL experiences have been gaining in popularity in medical, dental, and allied health training programs (Henshaw, 2006; Yoder, 2006; Hood, 2009). At Boston University Henry M. Goldman School of Dental Medicine (GSDM), the experiential learning curriculum includes a SL program for first year dental students, which began in the fall of 2008. It is incorporated into a year-long, 7-credit introduction to general dentistry course (GD1). Dental students develop and present oral health education to classrooms of elementary school children attending the Boston Public Schools (BPS), a longstanding partner of GSDM. In addition to providing time for community-based rotations, the course provides the platform for faculty to provide foundational knowledge for the SL experience through lectures, workshops, and discussion.

The didactic coursework related to SL includes prevention, social determinants of health, health disparities, risk factors for oral disease, and oral health promotion/disease prevention, with a focus on how these concepts relate to BPS school children. During a workshop, students are introduced to a lesson plan template and the structure of SL and are assigned the elementary school

grade level they will teach. Faculty describe specific SL program changes that have occurred based on student feedback from the previous year. Then in pairs, students create an age-appropriate lesson plan and develop educational aids and activities to use during their teaching session. Faculty provide written feedback for the students to revise their lesson plans. This is followed by a 15-minute meeting where students receive additional feedback from faculty on drafts of their educational aids, planned classroom activities, and revised lesson plans. Students then present their finalized lesson plans to a small group of peers and faculty during a rehearsal session that is video-recorded. Using the Blackboard management system (Huff, Kernier & Schollaardt, n.d.), the faculty and peer evaluations and video recordings are shared with the students. Students review their feedback and videos and complete a self-assessment in preparation for their culminating experience, presenting oral health lessons in the Boston Public Schools.

Evaluation of the SL program was initially limited because the original assessment consisted of a single question embedded in the formal year-end course evaluation. This evaluation was designed by the GD1 course directors and administered by the GSDM Office of Academic Affairs. Students completed this course evaluation at the conclusion of the spring semester, approximately 6 to 8 months after their SL experience. The single question asked students to rate how confident they felt in developing and delivering an age appropriate lesson plan as: very much, somewhat, very little, not at all, and unsure. While the responses to this question were consistently positive, the question was general, focused only upon student confidence, and did not encourage student feedback specific to the SL component of the GD1 course. Thus, SL faculty received little data for making SL program improvements.

Methods

Survey Instrument

To better measure students' perceptions of, and experience in, SL, an expanded evaluation system was created which addressed each component of the SL program as well as its overall goals. This new SL evaluation tool was piloted in 2014 for a sample of students and was fully implemented in 2015. In the new system, program evaluation surveys were sent electronically to students immediately following their classroom presentations at BPS via an anonymous link. While students were allowed to skip individual questions, submission of the evaluation surveys was required within 48 hours

Surveys completed during four academic years from 2015-2018 were included in the analysis. Responses could not be linked to individual students. However, they were identified by academic year to assess change over time and because evaluation questions were altered slightly each year to reflect program development.

Quantitative Questions and Analysis

The students were asked to rank, on a 10-point scale, their perceived level of preparedness as they entered the elementary classroom (0=not at all prepared to 10=optimally prepared). They were also asked to rank how valuable (0=not valuable to 10=extremely valuable) they found various aspects of the SL preparation process including creating a lesson plan, rehearsing

lesson delivery, and faculty feedback. Students were then asked to rank their agreement with three statements using a five point scale (1= strongly agree to 5= strongly disagree). These statements included: 1. I enjoyed my experience in the classroom, 2. I am certain the students in my classroom learned, and 3. I have a solid understanding of what service-learning is.

Differences in means in student rankings were examined using omnibus ANOVA with Bonferroni corrected pairwise comparisons for each activity by academic year using SPSS version 25. Data from the earliest survey year, 2015, was used as the baseline for comparison to other years. In cases where a question was added to the survey later than 2015, comparison was made to the earliest year in which that question was included.

Qualitative Question and Analysis

The final evaluation item asked students to respond to the question "What feedback would you give the program as we strive to continue to make changes for future years?" An open-ended question was included to convey to students that the faculty valued their feedback and to provide them with an unrestricted opportunity to share any thoughts they had about the SL program. For the analysis of this question, four content experts from SL faculty individually reviewed each comment and developed a list of recurring themes. These themes were then compared, and the categorization of themes was agreed upon. To ensure consistency before final coding, each coder piloted the codebook using 20 random responses. For final coding, one content expert served as master coder for all items. The remaining content experts each coded one-third of the open-ended responses. The coding results were evaluated by comparing the master coder's response to those competed by the three additional coders individually, producing three Cohen's Kappa's per code. The three Cohen's Kappa results were averaged to determine the mean between the coders. The mean Cohen's Kappa determined the overall agreement of the coders. Interpretation of Kappa scores less than zero was considered poor agreement, those from 0.0-0.2 were slight agreement, 0.21-0.40 fair agreement, 0.41-0.60 moderate agreement, 0.61-0.80 substantial agreement, and 0.081-1.0 almost perfect agreement (Landis & Koch, 1977).

This SL program evaluation plan was reviewed by the institutional review board of the Boston University and determined to be exempt from human subjects' research approval.

Results

Quantitative Results

Program evaluation surveys were completed by 468 first-year dental students. The overall mean of the students' ranking for perceived level of preparedness (n=365) upon entering the classroom was 8.53 (SD 1.14). Pairwise comparisons indicated statistically significant differences in the means for this question by year (Table 1). When compared to 2015 (8.07), the means of student rankings were significantly higher in 2017 (8.95) and 2018 (8.72).

Table 1. Student Rankings for Perceived Level of Preparedness, 2015-2018 (0=not at all prepared to 10=optimally prepared).

Year (n)	2015 (n=118)	2016 (n=105)	2017 (n=87)	2018 (n=83)	2015-2018 (n=365)
Mean (SD)	8.07 (1.58)	8.54 (1.14)	**8.9 (1.43)***	**8.72 (1.28)***	8.53 (1.41)

*statistically significant when compared to 2015

Mean student rankings for perceived value of SL activities are shown in Table 2. Among program components included during all four years, students consistently reported high (mean >8) perceived value for lesson plan development, faculty feedback on lesson plans, and a 15-minute meeting with faculty.

There were no significant differences in means of student responses for value of any of the SL components between 2015 and 2016. Two components were ranked as only moderately valuable during that time, a home video rehearsal requirement, and faculty feedback on that video.

Statistically significant differences in means were noted for two components during 2017 and 2018 when compared to earlier years; students' perceived value of faculty feedback on their lesson plan (2017 only) and use of standardized nutrition and prevention learning objectives.

Table 2. Mean Student Rankings for Perceived Value of SL Activities, 2015-2018
(0=not valuable to 10=extremely valuable).

	2015	2016	2017	2018
Lesson plan development	8.60 (n=118)	8.80 (n=116)	9.19 (n=117)	8.53 (n=114)
Standardized nutrition & prevention learning objectives		8.04 (n=115)	**8.76**** (n=118)	**8.67**** (n=113)
Faculty feedback on lesson plan	8.22 (n=106)	8.42 (n=116)	**9.03*** (n=117)	8.76 (n=114)
At-home rehearsal & video	5.39 (n=102)	5.63 (n=115)		
Faculty feedback on home video	5.49 (n=104)			
Group rehearsal & video			9.16 (n=117)	8.68 (n=114)
15-min. meeting with faculty	8.93 (n=111)	8.90 (n=115)	9.23 (n=117)	8.96 (n=114)
E-mail communication with faculty	7.92 (n=109)	8.07 (n=114)	8.65 (n=116)	8.55 (n=114)

*statistically significantly different compared to 2015
**statistically significantly different compared to 2016

The means and standard deviations were calculated for students' level of agreement with each of three evaluation statements by year (Table 3). Means were consistently positive, ranging from 1.31- 1.64 (1= strongly agree) for all questions and years, however, there were no statistically significant means for agreement with the evaluation statements across years.

Table 3. Student Agreement with Evaluation Statements, 2015-2018 (1=strongly agree, 2=agree, 3=neither agree nor disagree, 4=disagree, 5=strongly disagree).

	2015 (n=121) Mean (SD)	2016 (n=116) Mean (SD)	2017 (n=117) Mean (SD)	2018 (n=114) Mean (SD)	2015-2018 Mean (SD)
I enjoyed my experience in the classroom.	1.38 (0.64)	1.39 (0.27)	1.38 (0.68)	1.35 (0.78)	1.37 (0.67)
I am certain students in my classroom learned.	1.57 (0.64)	1.61 (0.56)	1.57 (0.81)	1.57 (0.66)	1.58 (0.67)
I have a solid understanding of what SL is.	1.38 (0.58)	1.36 (0.52)	1.35 (0.58)	1.31 (0.59)	1.35 (0.57)

Qualitative Data

Nearly three quarters of the students (335/468) responded to the question asking for suggestions for program improvement. The average inter-rater reliability score (Cohen's Kappa) for the creation of the response codebook was 0.81, which is on the border of substantial agreement (0.61-0.80) and almost perfect agreement (0.81-1.0) as defined by Landis & Koch (1977).

Analysis of survey responses resulted in the creation of 12 major codes, some of which were further subdivided for a total of 35 codes and sub-codes. These were ranked by relevance to program goals and potential for program improvements (Figure 1). Many students commented about the value of the SL program, while others provided comments about working with faculty and about their experiences with the preparation required for presenting their classroom lessons. These were categorized as the more relevant and useful comments because they highlighted areas of success and areas for potential improvement. Comments regarding workload, scheduling, and working with partners were ranked lower because they were less amenable to program changes. The least useful comments were those that were non-specific, either positive or negative, because they provided no means for making improvements. An example of this type of comment was "SL was a great event."

Figure 1. Codebook: Suggestions for program improvement.

| Suggestions for Program Improvement – Resulting Codes |
|---|
| 1. Finds service-learning (SL) to be valuable |
| 2. Requests for additional SL opportunities |
| 3. Faculty related comments |
| a. Calibration between faculty |
| b. Communication with faculty |
| c. Grading |
| d. Working with teaching assistants |
| 4. Preparation related comments |
| a. Lesson plan objectives & template |
| b. Script of lesson |
| c. At-home rehearsal (video) |
| d. Faculty feedback lesson plan & teaching |
| e. Requests for sample lesson plans |
| f. Request for additional practice/preparation |
| g. Elementary student behavior management |
| h. Request videos of effective presentations |
| i. Teaching aids & supplies |
| 5. Rehearsal related comments |
| a. Ability to watch and learn from peers |
| b. Ability to re-watch your own rehearsal video |
| c. General positive comments about rehearsal |
| 6. Logistics related comments |
| a. Info about school/classrooms/teachers |
| b. Transportation |
| c. Day of unexpected issues |
| 7. Scheduling related comments |
| a. Close to exams |
| b. Timing between SL components |
| c. Length of presentations |
| d. Timing within curriculum |
| e. Time of day of elementary school presentation |
| 8. Stress and workload related comments |
| a. Last minute changes in age group assigned |
| b. General stress/work burden of activity |
| c. Grading of SL assignment |
| 9. Classroom presentation related comments |
| a. Pre- and post- lesson questions |
| b. Request to teach older kids |
| c. General enjoyment, fun |
| 10. Working with peers |
| 11. Non-specific positive comments |
| 12. Non-specific negative comments |

Qualitative analysis revealed that, over time, there was a noticeable shift in student responses. Thorough analysis revealed the following three major themes: 1. A change over time from comments related to the logistical operation

of the program to more meaningful comments about program content, 2. Increased recognition of the usefulness of the rehearsal and video recordings, and 3. An increase in meaningful feedback aligned with program goals.

Discussion

During the four years that the student survey has been implemented students have consistently indicated that they felt prepared to teach an oral health lesson when they entered elementary school classrooms. They also consistently agreed that they enjoyed the experience, had an understanding of what SL is, and were confident the children learned. However, the questions asking students to rank the value of specific components of SL and their suggestions for program improvement resulted in important programmatic changes (see Figure 2). For example, based on feedback in 2015, students were provided with a list of standardized learning objectives to choose from when creating their lesson plans. This addition allowed students to focus planning educational aids and in-class activities. The system for video recording of rehearsals was also changed as a result of student feedback. Initially students rehearsed on their own and submitted a video to faculty for comment. Student value rankings and comments revealed that they did not find this activity to be helpful. Following a change to small group rehearsals with immediate faculty and peer feedback, as well as a self-assessment, students indicated that the rehearsal was very valuable to their preparation. The major themes extracted from student comments following program changes demonstrate the success of those modifications.
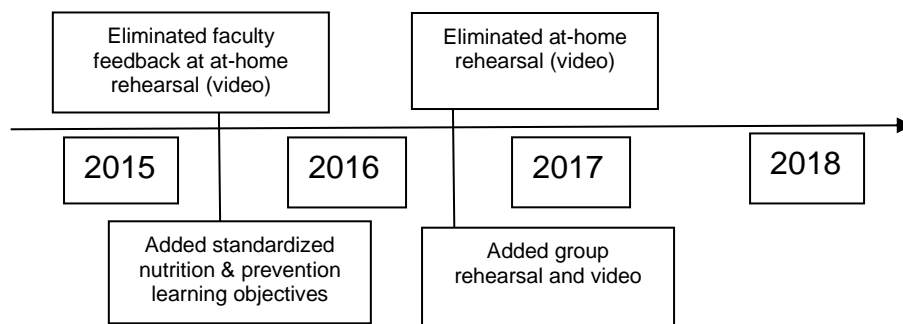
Figure 2. Timeline of Service-learning Program Changes as a Result of Mid-course Evaluation.

Theme #1 - A change over time from comments related to the logistical operation of the program to more substantial comments about program content

Since SL takes place it the community, it is, by definition, complex to organize and carry out (Bringle & Hacher, 1996; Muwana & Gaffney, 2011). During the 2015 and 2016 academic years, student comments were frequently focused on logistical operation of the SL program. For example, students commented on difficulties they encountered when traveling to and from elementary schools. Several stated that they felt disrupted by unexpected events during some of the school visits, such as a fire drill, or the class arriving

late for their scheduled lesson. Students also noted that times and dates of SL were inconvenient to their class schedule. Some changes could be made in response to student concerns about these administrative details. For example, public schools located closer to the dental school and thus requiring less travel time were prioritized for SL. Many issues could not be modified because they involved the operation of public elementary schools. Faculty were able to reduce the negative impact of these concerns upon students' experience by coaching them and managing their expectations regarding the unexpected challenges they might encounter while at schools, and describing the role of each party in the SL collaboration (school administration, nurses, teachers, as well as school-based programs staff).

As a result, responses shifted during 2017 and 2018 away from logistics to more substantive issues, such as the desire for additional information about classroom set-up (Will children be seated at their desks or on a rug?, Will they have access to a white board?), and information about the children (Will they be bilingual?, Will any have special needs?). Students also indicated that they would like to design more complex lessons and practice additional classroom management techniques. Examples of the type of comments made more recently are; (I would like to) "be able to spend more time in the classroom, especially to answer questions (2017)," and (faculty should) "give (dental) students more training on how to deal with elementary school students (2018)"

Experiential learning faculty can utilize students' feedback to become aware of concerns regarding program logistics that may otherwise remain unknown. Sometimes changes can be made to reduce the distraction created by students' perceived logistical burden. When modifications are not possible, managing student expectations can reduce the negative impact of perceived problems. When logistical complaints are addressed, student feedback becomes more thoughtful and more relevant to program content.
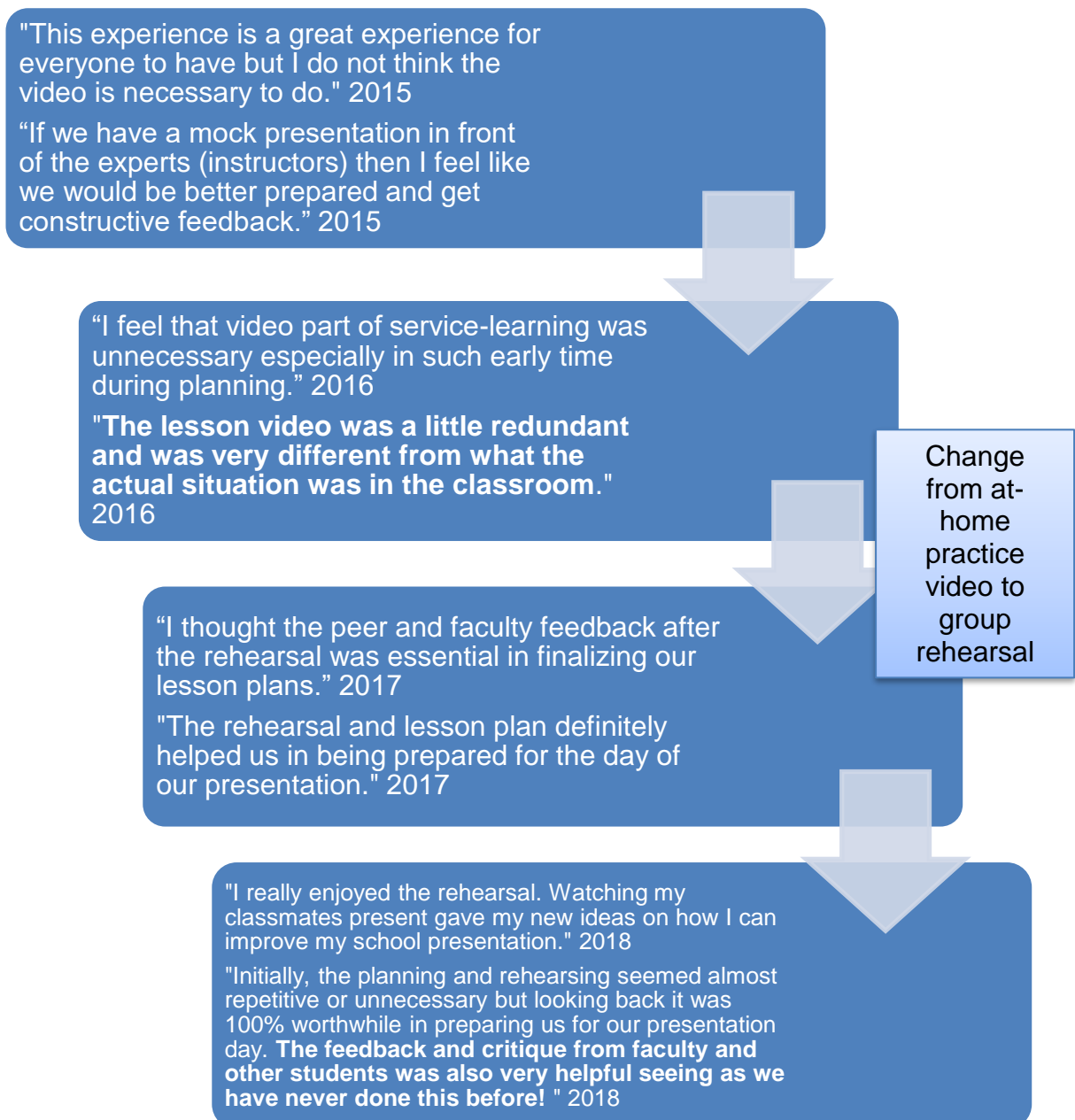
Theme #2 -Increased recognition of the usefulness of rehearsal and video recordings

The use of video recordings is common when preparing students for oral presentations (Hamilton, 2011). Students were initially required to practice presenting their lesson at home while recording a video that was submitted directly to faculty for comment. It was also suggested, but not required, that students watch and learn from their videos. In 2015 and 2016, numerous students requested that the video submission requirement be eliminated, while others noted that the "video was a little redundant and very different than the actual situation in the classroom." Student feedback also included suggestions for solutions, specifically opportunities to rehearse with peers, resulting in programmatic change. The at-home practice requirement was replaced with a small group rehearsal session that was also video recorded. The change required students to practice later in the lesson development process and in front of peers. Following rehearsal, students gave and received immediate oral and written feedback. They were then required to watch their recording and submit a self-evaluation.

Student comments following this change showed greater appreciation for their rehearsal efforts, their videos, and the feedback received. "The feedback and critique from faculty and other students was also very helpful seeing as we

have never done this before!" and, "It was nerve wrecking to watch myself speak on a recording, but I felt it was the best way for me to improve my lesson." A thematic representation of the changes seen in student feedback on this topic is represented in the flow chart (Figure 3) below.

The change in the nature of student comments in this case can be explained by literature supporting peer-to-peer feedback as an educational methodology. In some cases, student peer review has been shown to be more impactful than teacher-provided feedback, and can have the additional benefit of proving students with a greater sense of accountability (Topping, 2009). Ritchie (2016) reports that when self-assessment is added to peer and faculty feedback, the result is an even greater improvement in presentation skills. The opportunity to give and receive peer feedback has also been shown to enhance the quality of students' reflections (Wilkins, Shin & Ainsworth, 2009), which in turn enhances students' ability to construct meaning and value from their SL experiences (Sturgill & Motley, 2014). Therefore, SL faculty can enhance student engagement and performance outcomes by incorporating, wherever possible, multiple levels of feedback into students' SL preparations.

"This experience is a great experience for everyone to have but I do not think the video is necessary to do." 2015

"If we have a mock presentation in front of the experts (instructors) then I feel like we would be better prepared and get constructive feedback." 2015

"I feel that video part of service-learning was unnecessary especially in such early time during planning." 2016

The lesson video was a little redundant and was very different from what the actual situation was in the classroom. 2016

Change from at-home practice video to group rehearsal

"I thought the peer and faculty feedback after the rehearsal was essential in finalizing our lesson plans." 2017

"The rehearsal and lesson plan definitely helped us in being prepared for the day of our presentation." 2017

"I really enjoyed the rehearsal. Watching my classmates present gave my new ideas on how I can improve my school presentation." 2018

"Initially, the planning and rehearsing seemed almost repetitive or unnecessary but looking back it was 100% worthwhile in preparing us for our presentation day. **The feedback and critique from faculty and other students was also very helpful seeing as we have never done this before!** " 2018

Figure 3. Change in Student Comments are the Result of a Programmatic Change (at-home practice and video to group rehearsal & video)

Student feedback that solicits ideas for improvement can be extremely valuable, especially when an activity or assignment is not having the desired impact on learning. Students can provide informed and creative suggestions for improvement based upon their experiences. By being open to student input, by viewing students as collaborators, and therefore modifying student behavior and thinking, faculty can improve the experiential program structure (Fluckiger, Vigil, Pasco,& Danielson, 2010), ensuring student satisfaction and improved learning (Celio, 2011).

Theme #3 -Increase in meaningful feedback aligned with program goals

   Positive comments were provided by students throughout all four years of program evaluation. However, during the later years, positive student comments were more insightful and revealed an understanding of the SL goals of enhanced learning, civic responsibility, and community service. For example, comments shifted from superficial "Continue the program" and "It was great" in 2015 and 2016 to more meaningful "It … allowed you to explore how to communicate with different populations…" and "… it's a two way street of teaching and learning, we learned a lot as we taught" in the later years. Other examples of goal-oriented comments specific included "I think that oral health promotion is such an important part of dentistry" and "… we are more than just professionals you see in a clinical setting. It is really important for us to work on our interpersonal skills and to immerse ourselves in the diverse culture of the community that surrounds us."

   This situation is similar to that found with the first theme, where somewhat trivial comments were exchanged for more pointed suggestions for improvement. SL faculty should recognize that changes that lead to greater enjoyment and engagement for students can, more importantly, also result in greater understanding and appreciation for SL program goals. When distractions and complaints are reduced through thoughtful and responsive modifications, real value emerges.

Conclusion

   Before implementing a timely student evaluation of SL that focused on identifying areas for program improvement, course evaluation results, while positive, were limited to the fact that students felt confident planning and delivering classroom education. By actively encouraging student feedback immediately following the SL experience, course faculty were able to identify and continue effective SL components and ascertain those areas that could be improved. The changes made in response to students' feedback led to enhancements in their experience, greater recognition of the purpose of SL, and increased attainment of SL goals. The analysis of both quantitative and qualitative student mid-term survey results revealed that even a successful and popular program can be improved when students provide specific feedback. SL faculty can use this model of student input to ensure that students feel like the experience is collaborative, are not distracted by minor administrative logistics, and internalize SLs' important aims.

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