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Abstract

Peer-led workshops in General Chemistry at the University of Texas Permian Basin (UTPB) were affected by COVID-19 restrictions during the 2020-2021 academic year. Most Peer-Led Team Learning (PLTL) workshops were conducted in person, but with the difference that protocols of distancing had to be observed, and a few were conducted online, so adjustments were necessary to prepare Peer Leaders to conduct their workshops in both types of settings. The facets of the modified PLTL program were supported by the online preparation for facilitation and chemistry content

The results of an examination of critical incidents are shared here. This qualitative examination of Peer Leaders' experiences was undertaken because of its exploration of formative events. Through the responses to questions about their experiences, Peer Leaders acknowledged the reality of dealing with Covid-19 restrictions as well as their preparation via a weekly online seminar. This paper, co-authored with Peer Leaders, examines the process of online training and facilitating workshops during the Fall 2020 and Spring 2021 semesters at UTPB.

Keywords: Peer Leaders, Critical Incidents, Online Training, Content Training, Leadership Training, COVID-19

Introduction

The University of Texas Permian Basin (UTPB), founded in 1969, is located in Odessa, Texas, under which is one of the largest oilfields in the United States. Twenty-two percent (22%) of the Odessa population (54% Hispanic and 38% White) has a bachelor's or higher degree (U.S. Census Bureau, 2020). UTPB's 5,834 students are from Texas (94%) and it is classified as a Hispanic Serving Institution with 49% of the student population. Other representations are as follows: White: 35%, Black/African American: 7%, Asian: 3%, Unknown: 1%, and Other: 5% (Quick Facts about UT Permian Basin, 2021).

Students had been performing poorly in General Chemistry since at least 2011, when 62% of the enrolled students received a grade of D, failed (F), or withdrew (W) (“DFW rate”). Worse, in that same year, students who had successfully passed Pre-Calculus had a DFW rate of 65% in General Chemistry, while those who had passed College Algebra had a DFW rate of 54% in General Chemistry. Students who had passed Calculus I and II had DFW rates of 34% and 32% respectively in General Chemistry. Even students who had passed Calculus II were struggling in General Chemistry.

In Spring 2019 a Peer-Led Team Learning (PLTL) program was started at UTPB in General Chemistry I in one section (Montes), who recruited three of her students as Peer Leaders. With the aid of the Student Success Center (Learning Center), the first Peer Leaders were prepared for their role through the existing Supplemental Instruction (SI) program. This arrangement allowed for the administrative details to be handled by the Student Success Center.

In preparation for the fall 2019 semester, a formal recruitment and interview process was undertaken in the summer of 2019 by the Director of the Student Success Center and Montes, and compensation for the Peer Leaders came from the Student Success Center's funding. A weekly meeting, facilitated by a rotation of Peer Leaders, presented the chemistry material for that workshop, and techniques for activities were suggested. Some 150 students in General Chemistry I participated in ten workshops, led by six Peer Leaders in fall 2019.

As elsewhere, in March 2020, the advent of the COVID-19 pandemic forced a transition to online workshops. The extra week of Spring break allowed Peer Leaders to send information to students and to become familiar with the college-selected platforms, Microsoft Teams and Canvas. The semester was chaotic due to the switch to online classes and workshops. The Peer Leaders used their ingenuity and suggested activities for the remainder of the semester. In the summer of 2020, Montes decided that there was a need to foster a

more robust PLTL program to increase retention. As a result, Dreyfuss and Fraiman were asked to provide online preparation in facilitation and content strategies for workshops.

In the Fall 2020 semester, due to the continuing COVID-19 pandemic General Chemistry workshop sessions were scheduled both in person with social distancing, and online. Workshops were a mandatory component of the General Chemistry I course, and eleven hybrid workshops were organized where half of the students were in person and half were online. The Peer Leaders separated their students into two groups, one group in person and one online and these groupings were consistent throughout the semester. The groups would alternate between being in person or online, switching each week. The preparation sessions were provided online by a learning specialist (Dreyfuss) and a chemist (Fraiman), which incorporated facilitation techniques, learning theory, and chemistry content. This paper, co-authored with UTPB Peer Leaders, examines the process of online training and facilitating workshops during the Fall 2020 and Spring 2021 semesters.

Methodology: Critical incidents

Studies using critical incident methods have examined such disparate topics as work behaviors, satisfaction in service encounters, restructuring academic curriculum, familiarity with information literacy, and teaching. Critical incidents are defined as “critical events, incidents, or factors that help promote or detract from the effective performance of some activities or the experience of a specific situation or event” (Butterfield et al., 2005, p. 482). Critical incidents can be examined through a variety of occurrences – specific events, incidents, processes, or issues (Gremler, 2004). The method is “culturally neutral” as the matter of what is most relevant to study participants regarding the phenomenon can only come from them and their experience. The questioner/researcher cannot determine what is important to the respondent (Gremler, 2004). Critical incidents allow for reflection on practice: participants in an activity or context provide insights into the practice through their experiences (Brookfield, 1995).

Exploring critical incidents depends on reflection and retrospective recall. A concern regarding “accuracy” is mitigated by respondents’ own interpretation and reinterpretation of events. While Flanagan (1954) requires questioning incidents based on recent memory, timeframes are flexible, suggested by a six-month to one year period (Bott & Tourish, 2016). A study of students’ attitudes toward peer-led workshops used Brookfield’s (1995) five questions to probe critical incidents at the end of two academic semesters (Dreyfuss & Liou-Mark, 2014). This study’s use of critical incidents encompasses reflections occurring over a matter of several weeks and incorporate Brookfield’s questions as well as other prompts.

While Butterfield et al. (2005) prescribe data collection through interviews (in person or in groups) or by telephone (p. 483), Gremler (2004) notes that respondents may not be comfortable or have the time to share their stories, either in interviews or writing. The exigencies of the online environment for the facilitation seminar provided the bridge to another way of responding. The “study participants” – the eight Peer Leaders (authors here) used the Canvas platform to respond to questions probing critical incidents (see Appendix A), thus responding by writing. All are undergraduate students, majoring in science and engineering fields; six are female, two are male.

The responses to each question were entered on Excel spreadsheets, and authors looked for similar and divergent themes. What follows are the reflections on the experiences of peer leading at UTPB over the 2020-2021 academic year.

Why Become a Peer Leader?

The Peer Leaders had various reasons for taking on the position. Some had been a student in a workshop and wanted to see it from the perspective of the Peer Leader: “I experienced firsthand the benefits and relationships I gained from participating in the workshops. I want to help others like my peer leader helped me.” Another stated, “I’ve always liked to ‘see things from the other side.’ I think it’s important to see both sides so that empathy for both sides can be formed.” Others had served as tutors and wanted to experience being a Peer Leader. Some wanted to share their love for chemistry and aid students in learning what can be a difficult course: “I wanted to also help other people learn that these difficult concepts are attainable to every single person.” Individual reasons also included practicing English-speaking skills, wanting to reinforce their understanding of general chemistry, and enjoying seeing students’ reaction when they finally understood what was happening.

Facilitation Preparation

In Fall 2020, the online preparation of Peer Leaders was based on a course (Dreyfuss, 2012) developed to prepare Peer Leaders to learn facilitation and leadership skills and learning theories for practice in workshops. Dreyfuss (in New York) and Fraiman (in Chicago) facilitated the online sessions together using Microsoft Teams or Zoom. Having two facilitators helped the sessions as one person presented, the other monitored time, chat comments and visual expressions of participants, and one could take over from the other in case of technology disruptions. A key aid in facilitating the weekly sessions by Dreyfuss and Fraiman, and shared with Montes, was the use of a “grid” that laid out the timing, topic, instructions and supporting material for each week (McWilliams, et al., 2019, p. 11). Prior

models of online PLTL workshops were examined, e.g., cyberPLTL (Mauser, et al., 2011; Alberte, et al., 2013). Various online facilitation methods were explored, such as Liberating Structures (2020) and handouts and lecture on learning theories were translated to presentations via PowerPoint; activities in groups used “breakout rooms.”

As noted above, an individual Peer Leader would present the chemistry material for that week to the other Peer Leaders, focused on using games to get to the answers. Mid-semester a modification was the implementation of content-based coaching by Fraiman to supplement the chemistry preparation, which focused on the problem-solving process. This change was reflected in the comment: “Ana's help when preparing the module was also really helpful.” Peer Leaders also mentioned using YouTube to help them understand a concept. One Peer Leaders noted that, “Preparing materials to follow along is important for my online format, which is where I combine all the resources together.”

Overall, Peer Leaders noted that the online training format was useful, but they all missed meeting in person. Peer Leaders commented, “I enjoy more face-to-face experiences, but I think [it] is working so far,” and, “I think the web seminar format works as everybody is not able all to be in the same room due to Covid restrictions and being in different states.” Interestingly, one Peer Leaders contrasted their role as a student and as a Peer Leader: “As a student I prefer the face-to-face format. However, as a Peer Leader I prefer the online format. I see why face-to-face is preferred, and it’s highly centered around the basis of better engagement when face-to-face. I do believe that despite being a bit more difficult to become engaged online, it is up to the learner to make the online environment one in which they can benefit from in their course.”

Evolution of the Seminar

For the Spring 2021 semester, the online training format was redesigned to become a stronger integration of the chemistry content and facilitation strategies based on feedback from Peer Leaders. In addition, two chemistry professors participated and received feedback from Peer Leaders on the prior week’s workshop. Peer Leaders also provided reflections to prompts, writing in Chat.

A sample conversation with a question and two responses:

Question: What facilitation techniques will you use this week? How can you use the information of learning styles to support students who are falling behind?

#1. Answer: I think I’ll use round robin [technique]. It will kind of force the weaker students to join in the discussion instead of them taking a bystander role in workshop.

#2. Answer: Sorry, everyone, I am having a lot of troubles today I was able to listen for a little while, however. I will use jigsaw this week and give hints. I know that giving hints will be especially good for weaker students!

Reflections on workshop sessions

Difficulties for online workshops included mentions of:

- overcoming technical problems and facilitating group-based activities through the Teams application;
- interaction between student and peer leader is weakened or lessened;
- online workshops waste more time due to the use of breakout rooms;
- students are less motivated and not willing to participate, and students become less interested in general.

Peer Leaders commented: “The biggest difference I have noticed from my online workshop to my in-person workshop is the online students lack motivation to participate and turn in assignments.” And “Definitely my biggest difficulty is keeping students interested and engaged. I am constantly having to change my lesson plans to keep them entertained, and sometimes I can tell when they are losing interest which is understandable.” Yet one Peer Leader found a bright side: “I am online and have not had issues with students going into quarantine like my peers.”

The Peer Leaders also felt the impact as they, as students themselves, involved not only in academic studies but in extracurricular activities, were conscious of falling behind: “It is difficult for me to transition from workshop to my next class, which has caused some very unsatisfactory grades,” “Compared to last year, my scheduling is a bit worse. Because of covid restrictions, I lose a lot of time in little things.” And, “Not ideal. Difficult to manage with my own classes and volleyball practice and games.”

Peer leaders found that their expectations of peer leading in the Spring 2021 semester, even in person, were quite different from the reality they experienced. In-person workshops were affected as much as workshops held online. As one Peer Leader explained, “The expectations that I had did not go as planned is that Covid restrictions made the semester harder because there is less interaction as students have to be 6 feet apart and [that] diminishes the ability to work in groups and limits us to the activities we can use.” The in-person workshops were quite different from previous semesters; a Peer Leader thought that “The students would be more willing to help each other. I also expected they would be a lot louder.

I expected students to be more participative and peer-oriented, but in reality, they prefer working by themselves, which is why I often have to choose them directly to participate and work together.”

The process of peer leading was found to be engaging in ways that affected the Peer Leaders’ understanding of their role. Beyond the satisfaction of watching students understand chemistry concepts, expressed, for example with this statement, “. . .that I could observe each student's approach to learning a concept or solving a certain problem, which gives me an insight that is very useful,” Peer Leaders became aware of “the process of learning and handling the many different learning styles our students possess.” As another Peer Leader noted, “Seeing how every student is different really opened my eyes.” This led to considering that “I must mold myself to their needs.”

Challenges were constant, especially “making sure each student is learning at their own pace and being able to facilitate them in each activity (avoid students not participating or being left out).” On a deeper level, one Peer Leader noted an obligation to “Make my students learn the material by thinking critically.” Keeping in mind the role of facilitator, and not becoming “a teacher” was a self-aware comment: “Another thing that is hard to not do is lecture when workshop comes to a standstill. Some things I need to improve on is not teaching when everyone is lost.” The diversity of ways of thinking was a dominant comment, expressed by “acclimating to learning styles that differ from mine, and also remaining patient when students are not accountable for themselves.” Finally, time management was a concern in facilitating the workshop effectively.

Yet “success” as a Peer Leader was notable in the pride expressed in: “When I can see the light turn on in a student. . . I personally feel that my students are learning and reaffirming that workshops really do work.” “It’s only been a semester, [watching] students’ confidence build – from timid, frustrated, to answering questions, raising hands, becoming more confident.” Some of the Peer Leaders also mentioned that a bond is created between them and the students. “My biggest success is the positive relationships I have built with my students.” Some of them have also become friends: “So, at this point it would be like helping friends to study chemistry.”

Becoming More Self-Aware

Self-awareness through the practice of the role of Peer Leader was reflected in several ways. One commented: “When I was a workshop student it seemed as if the Peer Leader have it all together when in reality, I now know that we have our own struggles and lives to deal with as well.” Another reflected: “Being a Peer Leader has taught me to be a better student by

learning the difficulties of being on the other side of the table, in a way. It has taught me patience and understanding when facing students. Also, I've become more responsible with time management and preparations for grading and workshop meetings.”

Being “on the other side of the table” was echoed in other comments:

Peer leading has put me in the skin of the professor and now I understand more things. So, if one of my students does something that I don't like, I try to avoid doing that myself.

Absolutely, I sympathize with my professors because it is a difficult job. I understand how much effort goes into designing a workshop module or lesson plan. I respect and applaud my professors for all their efforts.

Peer leading has made me much more considerate of my professors' and lecturers' time, now knowing how much time and effort goes behind just one single lesson. It has also made me become more prepared before classes, because I get frustrated with students who are unprepared, and I do not want to do the same thing.

One unexpected outcome was voiced by a Peer Leader who lived off-campus:

I've been more active on campus, compared to when I wasn't a Peer Leader. Since I've been more active, I feel more inclined to use on-campus facilities as well and have felt more included in on-campus life. As a Peer Leader, I try to make workshop feel as inviting as possible so students can see me as a resource if they need it.

An additional benefit was noted by one PL that “Peer leading has made me a better student because it allows me to review old material that can be applied to my upper-level Chemistry courses.”

And there were dissents:

No, Chemistry has nothing to do with my other classes, so I feel like I'm getting smarter in a subject that really doesn't matter much.

I feel like this actually made me a worse student because, I have a class less than 10 minutes after workshop that I cannot prepare for like I should. Also, the time I spend grading sometimes needs to be spent on lab reports and studying.

One Peer Leader summarized the duality of the roles of peer-student and colleague-instructor:

Being a peer leader shows the behind-the-scenes action that all professors go through. As a student, you only really care for your own experiences and outcomes. Being a peer leader puts you in the shoes of the professor. Now, we sympathize for them as we see it isn't an easy position. Because we recognize this, we are better students in the sense that we know what professors do and don't like. We can recognize our own behavior and prevent from doing the things we didn't like to our own professors outside of peer leading.

We are also becoming better students by knowing the information we talk about deeper. We have to be prepared for questions we might get asked. By leading other students and their success we are able to teach ourselves by helping others. However, being a Peer Leader takes a lot of time away from your personal studies and into the studies of another student at your university. It can possibly cause one to slip from their classes because they are too focused on education and success of another student.

Both positive and negative reflections were voiced by the Peer Leaders regarding their experiences in the past year (Academic Year 2020-2021). In general, Peer Leaders noted that leading was more difficult than it had seemed as a student because students do not see the necessary preparation to conduct a successful workshop. Comments included:

I was surprised by how much more stressful peer leading is than I initially thought.

I was most surprised at how difficult and time consuming it is to peer lead! I truly underestimated what was required of a peer leader and definitely have been challenged throughout the semester.

The biggest surprise that came to me about the peer leading program is how much work goes into making the modules.

Overall the biggest surprise to peer leading was how time consuming it was this semester compared to past semesters.

Confidence, knowledge, and skill are needed. These are bolstered by Peer Leaders preparing together: “This year, I really like that there is a lot of communication between all Peer Leaders.” And there are always surprises: “What has surprised me about being a peer leader is that every semester is different and never the same. Workshops vary from semester due to the students, sometimes the majority are strong in Chemistry and sometimes not, so having to change personally as a peer leader for each workshop.”

Discussion

A major element in the incorporation of PLTL workshops in General Chemistry had been the dismal DFW rates. Surprisingly, even during the Covid-19 pandemic and all its attendant issues, the DFW rates continued to decrease. In General Chemistry I, the DFW in spring 2019 was 9.2% and in spring 2020 was 2.1%, in comparison to the spring of 2018 when the DFW rate had been 29.8%, before PLTL workshops were introduced.

The Peer Leaders shared their reflections in answer to questions posed as “critical incidents” (Appendix A), the memories of their experiences that stood out. They reported difficulties in the transition during the first semester of Covid-19 (Spring 2020). To compound the difficulties, Peer Leaders were contending with simultaneous online and in-person workshops where the students were maintaining social distancing. Also affecting students and Peer Leaders were the elements of change of routine, technical issues including lack of connections as well as fatigue from online interactions. Engaging students in workshop activities was therefore much harder.

However, Peer Leaders also reported becoming aware of learning styles and the process of learning, leading to a beginning understanding of metacognition, critical thinking, and an appreciation of their leadership role. In contrast, their awareness not to “teach” when students stopped participating was a conscious endeavor to maintain their separate role. Mastering this new role came with a certain pride in knowing that students were learning in the workshops.

These challenging experiences provided confidence as nascent leaders and in their own lives as students. Peer Leaders became better problem-solvers and developed better study habits as noted by Wilson & Varma-Nelson (2016). They became “reflective practitioners” (Schön, 1983), pausing periodically to think about the work they have done and how it might

be improved in the future. They are therefore more aware of their approach to learning than other students.

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Appendix A

Critical Incident Questions for Peer Leaders

Developed by AE Dreyfuss, Ed.D.

1. Why did you want to become a Peer Leader?
2. What was the process of recruitment and application?
3. What, so far, do you think of the [seminar] [online training] format?
4. What resources have been useful for you? [e.g., Canvas, files, readings, coaching, Teams, Zoom, etc.]
5. What support have you received from the “Prep” sessions?
6. What [seminar] topics have resonated for you?
7. What has been engaging for you about the process of peer leading?
8. How effective has the scheduling been for your peer leading sessions? (What problems have you had, if any?) [Online; in-person]
9. What has been affirming about the weekly [seminar] [training/Prep] meetings?

10. What has been puzzling or confusing about the weekly [seminar] [training/Prep] meetings?
11. What kind of additional support would you have liked to have this semester?
12. What do you consider your biggest challenge(s) as a Peer Leader?
13. What has been your biggest success so far as a Peer Leader?
14. What has surprised you so far regarding peer leading or the program?
15. What would you like to improve about your performance as a Peer Leader?
16. What's the biggest difficulty in peer leading online as opposed to in-person?
17. What were some expectations you had of peer leading (either in person or online) as opposed to the reality you've experienced?
18. Has being a Peer Leader and this process made you a better student? How?