

Research Articles

An Inquiry Into the Pedagogy of the Sensory Perception Tasting Component of Wine Courses in the Time of COVID-19

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In March 2020, universities switched to online learning in response to the COVID-19 pandemic. The use of technology, asynchronous scheduling, and the semi-anonymous nature of online courses created challenges for engaging students and the teacher-student relationship. The problem was especially relevant for curricula with multisensory components like wine tasting. In Summer 2020, the BevEd SIG became a virtual faculty learning community of both experienced and novice beverage instructors. The group discussed their experiences and addressed the pedagogy, logistics, and potential problems of maintaining the sensory perception (seeing, smelling, and tasting) component as an integral part of wine courses regardless of the class format. The experiential learning of sensory perception as the skill of tasting and evaluating wine is also essential in the industry, including wineries, distributorships, wine sales, serving, bartending, and training. The evaluation of the challenges of teaching the sensory perception tasting component of wine courses during COVID-19 and the solutions developed by the BevEd SIG to address them can be considered best practices for wine course instruction and experiential training for staff and customer sales and events.

INTRODUCTION

Teacher pedagogy and assessments for the beverage courses at universities, taught by members of the Beverage Education Special Interest Group (BevEd SIG), which included 120 professors in the summer of 2020, all included a sensory perception tasting component. Teaching the sensory perception of wines was integral to the courses for learning the subject matter and supporting positive teacher-student relationships. Experiencing the essential sensory components of wine (seeing, tasting, and smelling) while being led by a knowledgeable teacher was believed to be a vital takeaway for both teachers and students. Traditional pedagogy, which relied on the face-to-face mode of delivery, was challenged and required reimagining in Spring 2020. Wine courses were required to move online due to the restrictions on public gatherings in response to the COVID-19 pandemic (Kamenetz, 2020). In response to the increased emotional load for faculty, institutional rules influx, and infrastructure stretched to a breaking point in an attempt to transition all university courses online, the term “Panic-gogy” was coined (Morris as quoted in Kamenetz, 2020). Panic-gogy was a descriptive word where panic and pedagogy intersect. In the midst of the pandemic, members of the BevEd SIG shared panic-gogy stories and experiences. The members identified that the sensory perception tasting of wine pedagogy was their most difficult challenge and anxiety-inducing component of the newly mandated online delivery mode.

To the best of the authors’ knowledge, as of December 2020, the BevEd SIG is the only professional group that took a proactive approach in response to an unprecedented need to quickly address and adjust the curriculum with regard to the tasting component of wine courses. In addressing the issues identified, the group joined efforts to answer an initial question: *Is it possible (and if yes, how?) to teach the sensory perception component of wine courses online and/or in a face-to-face/hybrid mode?* Three goals emerged:

1. to identify challenges facing the teachers specific to executing the sensory perception tasting portion of wine courses online;
2. to develop a set of immediate solutions that could be implemented by instructors teaching wine courses during the Fall 2020 semester with the new modalities; and,
3. to conduct an evaluation of the proposed solutions at the end of the Fall 2020 semester in order to identify best practices.

The best practices would serve as a support tool for teachers at this time of crisis, requiring transitioning to the online modality.

LEARNING COMMUNITIES AS A VALUABLE RESOURCE

In higher education, learning communities are groups of students that participate in a cluster of courses and sup-

port activities. Previous research has linked participation in learning communities to improved satisfaction and critical thinking skills, as multiple studies suggest that students in learning communities tend to collaborate better, exude more academic effort, and achieve full academic integration (Ewell & McCormick, 2020; National Survey of Student Engagement, 2019; Zhao & Kuh, 2004). Learning communities are not restricted to early learners in college; they can help address more complex learning in scientific and professional problems (American Association for the Advancement of Science, 2011; Henderson et al., 2011). The learning community and its highly collaborative format have a lasting impact on students and fosters the development of critical thinking skills (Haak et al., 2011).

Early investigations found that learning communities reduce tension, provide social outlets, and facilitate positive interactions between students and faculty (Goodsell et al., 1994; Klein, 2000). Faculty involved in a learning community often help to support common subject areas, collaborate on themes, and link or team-teach courses. However, some investigators found disadvantages, including administrative planning, content coverage, time commitment, and personal barriers (Minkler, 2000). Despite the challenge of creating and maintaining learning communities, there is continued support from students and faculty for the quality and depth of knowledge gained through such supportive environments (Gaudet et al., 2010; Walker et al., 2008). The improvement to collaborative learning is not restricted to the classroom. Virtual learning communities have demonstrated similar results to a classroom learning community. New challenges emerge based upon the technology employed. Learning communities and virtual learning communities are most effective when faculty are highly involved (Nikiforos et al., 2020).

The popular mode of asynchronous scheduling and the semi-anonymous nature of online courses created challenges for engaging students (Burch et al., 2016). The problem was especially relevant for curricula with multisensory components like wine tasting. A study to be published in April 2021 used augmented reality to teach consumers tasting in a virtual wine tasting room with great success (Wen & Leung, 2021). Augmented reality as a modality is not online teaching, but is a technology separate and distinct from the traditional face-to-face pedagogical framework.

The literature on the topic was scarce due to the unique and rapid nature of the COVID-19 pandemic beginning in March 2020. While the literature discusses sensory perception and wine tasting as key components to teaching and learning, the literature is void of articles or cases focused on online or distance delivery. What separates this study from prior studies is its focus on teaching beverage courses at the university level. In contrast, previously published studies are mostly concerned with marketing and other business considerations.

BevEd SIG AS A FACULTY LEARNING COMMUNITY

The BevEd SIG looked at the value of implementing the learning communities model in a collaborative faculty group to address complex problems and issues, similar to

that of student learning communities. This form of learning community, specifically a faculty learning community, was purposed to advance the practice of teaching pedagogy. The BevEd SIG also focused on aspects of the profession and field of study representative of the group (Horvath et al., 2019). Faculty learning communities are situated away from the realities of college administration and focused on the reality of teaching under the pressing issues facing the profession (Dooner et al., 2007). Previous evidence has demonstrated that students and courses both benefit when faculty learned from one another how to address the practice of teaching (Rands et al., 2017). The professional development activity of a group of faculty improving their craft may affect hundreds, if not thousands of students.

The BevEd SIG formed organically to address specific problems or issues faculty faced. Lave & Wenger (1991) looked at other professions categorized as situated learners, where those most experienced were at the center of knowledge. Others with less knowledge are often on the periphery. Without a community of peer learners that guide faculty through the myriad of factors within the profession, faculty would be slow to evolve and potentially stagnate. In the beverage teaching profession, there is not often a course or degree related to the daily realities and duties of faculty. In the absence of a course or degree in 2020, the BevEd SIG helped to fill the void.

Situated learning theory, as described by Lave & Wenger (1991), can be applied to faculty learning communities. Within the BevEd SIG faculty learning community, more experienced faculty share their knowledge with junior faculty (and sometimes in reverse) to improve teachers' skill, thereby improving student learning (Elliott et al., 2016; Horvath et al., 2019). Previous studies demonstrated how faculty can learn new pedagogies within a virtual learning community by descriptions and examples of how the more experienced faculty succeeded (Rands et al., 2017). The BevEd SIG virtual learning community shared pedagogical approaches regarding teaching students how to taste wine.

In the summer of 2020, the BevEd SIG met weekly online through Zoom. The membership population was comprised of 120 university beverage teachers in the United States. Each week an average of 22 members would discuss realities of the workplace, concerns, challenges, and potential solutions. As the weeks progressed, the discussion inevitably turned to the tasting portions of the beverage courses. The pandemic had created a swift transition to online learning.

The BevEd SIG organically became a virtual learning community, with each member learning from another and the group exponentially educating its membership. Discussions concerning the complications in teaching within the professions, such as culinary arts, beverage science, and other clinical fields, were exacerbated because the classes were laboratory-based, experiential, or placed in the real world (Horvath et al., 2019). A complex skill, like the sensory perception of tasting, involved a variety of planned activities for students to inculcate the chemo science of taste applied to wine (Jackson, 2008; Yang & Lee, 2020). The industry supports the experiential learning of sensory perception because students "can adopt good sensory practices with limited resources and support their business decisions" (Lesschaeve & Noble, 2010, p. 189). The skill of tast-

ing and evaluating wine is essential in the industry, including wineries, distributorships, wine sales, serving, bartending, and training.

Beverage, and in particular wine, has always been an applied field where faculty have the unique challenge of teaching students how to evaluate wine. Moreover, teaching students the sensory evaluation of wine is an established practice in wine courses. This task is normally conducted in a controlled environment, or laboratory, where students could see, feel, smell, and taste the sensory aspects of wine, guided by a teacher. The BevEd SIG formed in a situated learning manner to address the challenges associated with the change from a clinical laboratory to a virtual learning setting (Lave & Wenger, 1991).

Out of an abundance of safety, university administrations required switching modalities from face-to-face to online without discussion or planning with teachers. The literature offered no pedagogical advice to the BevEd SIG on how to execute wine tasting online. Studies had investigated the possibility (and the impact) of a multisensory project on student engagement in online courses. Purinton & Burke (2020) created an innovative, practical, five-senses assignment designed to teach brand management while engaging students in the topic and with each other. Specifically, the students were provided with a food product from a well-established brand (the product was mailed to the students in advance of the class) and were tasked with creating viral videos to promote the product. The experience positively supported teacher-student relationships.

Purinton & Burke (2020) concluded that the hands-on approach to demonstrating marketing principles is a useful strategy to increase student emotional engagement and participation. While the study offered a valuable example of a multisensory activity to increase student engagement in an online course, it focused only on one exercise, which was intentionally added to the curriculum to test its role in student engagement. The implication was the course curriculum could be taught without this multisensory exercise. In contrast, the sensory perception component is an *integral part* of wine courses. Members of the BevEd SIG believed deleting, or not including, the sensory evaluation component of a wine course to be detrimental to the overall learning for the student and the teacher-student relationship. The unprecedented need to quickly adapt wine courses' curricula during the pandemic to implement the multisensory activities in online and/or hybrid modalities presented immediate challenges addressed by the BevEd SIG.

TRADITIONAL SENSORY PERCEPTION PEDAGOGY

Traditional sensory perception exercises, according to the participants of the BevEd SIG, were complicated, intense, interpersonal, orchestrated, and instruction-heavy experiences. The teacher-student relationship was often positively influenced during the sensory perception tasting component of the wine course (Henry & Thorsen, 2018). Tasting the wine also required hands-on involvement by the teacher, who would often pour the wine as well. Students were trained in note taking specific to the sensory perception tasting exercise and often graded and judged on the

notes. Care was taken by the teacher in the wines chosen for a given lesson. The order in which the wines were to be tasted, the specific characteristics and knowledge associated with each particular grape varietal, vineyard, and place of origin of a given wine were also common metrics for the tasting curated by the teacher. Glassware was kept clean and residual-free so as not to interfere with the sensory perception of the wines being tasted. Buckets were provided for students to expectorate the unused or disliked wine. Water pitchers were filled and placed in between students to facilitate both rinsing their glasses and staying hydrated. Video and slide presentations often accompanied the sensory evaluation tasting experience. Details of the set up for each course were consistent. The idea of teaching through the glass or using the actual wine to learn about the sensory perception properties that are associated with a given product, made for intense and intimate knowledge sharing between the teacher and student.

ADDRESSING THE ISSUES

The first topic for the BevEd SIG to address was overcoming the challenges of a virtual learning community that involved learning to taste wine. Some teachers still taught face-to-face, some online only, and others a hybrid of the two modes of delivery. Administrations made clear that the few remaining in-person wine courses could move to the online modality at any time in the term when the safety of the faculty or students was in question. The case study describes the phenomenon of how the BevEd SIG assisted both experienced and novice faculty to navigate from the periphery (unskilled) to the core of the virtual profession (highly skilled virtual teachers). The authors are all members of the BevEd SIG virtual learning community. The issues that arose during the meetings centered on improving a teacher's online teaching skill set and sharing knowledge on teaching students to taste wine. Two specific questions emerged from the group meetings:

1. What are the challenges of teaching the sensory perception component of wine courses during COVID-19?
2. What solutions are being considered to implement the sensory perception component of wine courses during COVID-19?

DATA AND METHODS

An exploratory single case study was employed for this investigation (Yin, 2018). The exploratory case study involved the members of the BevEd SIG, a subset of the International Council on Hotel, Restaurant, and Institutional Education (ICHRIE). The faculty within the BevEd SIG study provided a convenient opportunity to examine and address the most pressing issues facing the group, regarding how to teach students to taste wine online.

We collected data from two sources. First, at the start of the Fall 2020 academic semester, we collected data from members of the BevEd SIG regarding the challenges of teaching the sensory perception component of wine tasting during the COVID-19 pandemic. Data was gathered from the conversation field notes and communication among

Table 1: Challenges of teaching the sensory perception (SP) component of wine courses during a pandemic

FULLY FACE-TO-FACE OR HYBRID COURSES	FULLY ONLINE COURSES
Course Structure	
<ul style="list-style-type: none"> • Course must be designed to hold SP component in person and theory portion online. • Additional sections of each course need to be created to meet social distancing requirement. 	<ul style="list-style-type: none"> • Course must be designed to hold SP component and theory portion online.
Room Layout	
<ul style="list-style-type: none"> • Beverage evaluation rooms not large enough to accommodate all students typically enrolled in course when social distancing is required. • How many students can be in beverage evaluation room at one time must be determined and classroom redesigned. • Sensory perception portion of course taught in local wineries and restaurants. New beverage evaluation room needed at university. 	<ul style="list-style-type: none"> • Suggestions were to have a checklist for each student's needs regarding materials to facilitate the process.
Student Requirements	
<ul style="list-style-type: none"> • Must wear masks during classes that require SP work. Take them off during SP work. • Must be flexible if SP portion of the course and its requirements change prior to course beginning or during the semester/quarter. 	<ul style="list-style-type: none"> • Stay current with course format. • Stay current with SP supplies and how to obtain them.
Professor Requirements	
<ul style="list-style-type: none"> • Design course to be delivered face-to-face, hybrid, or online depending on administration requirements. • Stay informed of local government and university regulations regarding beverage alcohol consumption. • Stay informed of local government and university regulations in place to limit virus transmission. • Learn and adopt methods to assist students with the added stress of attending university during a pandemic. • Teach additional sections of each course to meet social distancing requirements. • Encourage students to follow all current federal, state, and local recommendations for limiting the spread of the virus when out of class. 	<ul style="list-style-type: none"> • Redesign theory portion of face-to-face course to meet students' needs in an online environment. • Creatively design SP portion of class in a manner that overcomes online course challenges. • Encourage students to follow all current federal, state, and local recommendations for limiting the spread of the virus.
Wine and Glassware	
<ul style="list-style-type: none"> • Some wine generally used for the class is not available for purchase locally. • Wine, glassware, and other supplies stored in various areas apart of beverage evaluation classroom. Social distancing not possible due to other classes in process. 	<ul style="list-style-type: none"> • Legal constraints that prohibit the mailing of wine from professor to student. • Long lead time required to mail wine from winery to student. • Mailing wine increases variability between the same wines • Most wines are not available in retail stores in all regions in the U.S. • Few wines are available in single serving or tasting sizes.
Hygiene Supplies	
<ul style="list-style-type: none"> • Determine which disinfectant supplies are approved by the FDA as a virucide. • FDA approved disinfectant supplies must be available for purchase. • FDA approved disinfectant supplies must be purchased and brought to classroom. 	<ul style="list-style-type: none"> • None that are course related.

members via a virtual meeting, specifically created for the BevEd SIG membership. The data were analyzed using descriptive statistical data to identify the prevailing patterns in verbal and written communication and qualitative analysis of topical data. The main insights from the instructors' responses about challenges and suggested solutions are summarized in **Tables 1 and 2**.

Second, as a reflection on the suggested solutions, a short, open-ended survey of instructors who contributed to

the data used in this case study was developed. The survey was sent out at the end of the Fall 2020 semester and asked instructors to evaluate the solutions they had initially proposed. The instructors reflected on the sensory activities implemented during the semester by splitting their responses into two categories: what worked and what did not work.

Table 2: Solutions being considered to implement the sensory perception (SP) component of wine courses during a pandemic

FULLY FACE-TO-FACE OR HYBRID COURSES	FULLY ONLINE COURSES
Course Structure	
<ul style="list-style-type: none"> • All SP work done in early part of course schedule • Classes divided into multiple sections to meet social distancing requirements 	<ul style="list-style-type: none"> • Sensory perception portion of course taught synchronously. • Color evaluation of wine taught using samples displayed by professor. • Theory portion of course taught synchronously or asynchronously. • Virtual guest speakers from wineries, beverages distributors, wine consultants, etc. • Encourage students to attend local tasting events with set parameters, if available.
Room Layout	
<ul style="list-style-type: none"> • Students given same assigned seat for all classes. • One door assigned as entrance and another as exit. • Seats placed six feet apart. • Course supplies combined and placed in one location attached to classroom. 	N/A
Student Requirements	
<ul style="list-style-type: none"> • Masks on during class except when evaluating a wine or eating food. • Face shield on after masks removed for wine evaluation. • No moving around during class • Step back from desk when wine being poured. • Screened with health-related questions prior to entrance into class. • Temperature taken prior to entrance into class. • Clean own desk and seat after class. 	<ul style="list-style-type: none"> • Pick up wine supplies from school or local retail store.
Professor Requirements	
<ul style="list-style-type: none"> • Redesign course to meet day-to-day changes needed to meet university safety guidelines. • Mask on during class • Mask and face shield on during class • Gloves on during class • Keep students in seats during class. • Screen students with health-related questions prior to class. • Take students temperature prior to class. • Clean all desks and seats after class. • Encourage students to follow all current federal, state, and local recommendations for limiting the spread of the virus when out of class. 	<ul style="list-style-type: none"> • Redesign course to be delivered online. • Creatively determine a method to teach SP of wines in an online course. • Purchase and make wine supply kit for students to pick up from professor. • Purchase and make wine supply kit for students. • Mail kit to students. • Encourage students to follow all current federal, state, and local recommendations for limiting the spread of the virus.
Wine and Glassware	
<ul style="list-style-type: none"> • Reduce number of total wines evaluated during the course. • Only professor or teaching assistant pours wine. • Only professor or teaching assistant cleans glassware. • Students bring own glassware to class and clean all of them at home. • Use single use "glassware" that is biodegradable. 	<ul style="list-style-type: none"> • Wine supplies (wine aroma and mouthfeel wheels, wine color chart, wine samples) available for student pickup from the university. • Wine supplies available for student pickup from local retail store. • Wine supplies (lower fee) mailed to students: wine aroma and mouthfeel wheels, wine color chart, instructions on making and supplies for creating "wine" aroma samples. • Wine supplies (higher fee) mailed to students: wine aroma and mouthfeel wheels, commercially available wine aroma kit. • Wine supplies (lower to higher fee) purchased by students: from one to 12 of the noble wines from wineries that have product in most U.S. states. List of wines provided by the professor. • Students describe wines during evaluation online so others can learn from each other. • Gift cards sent to students to reimburse for laboratory fees. • Students use any glassware they have available.

FULLY FACE-TO-FACE OR HYBRID COURSES	FULLY ONLINE COURSES
Hygiene Supplies	
<ul style="list-style-type: none"> • University provides students and professors with room cleaning supplies. • University provide students and professors with hand sanitizing supplies. • Clear shield in front of the professor 	<ul style="list-style-type: none"> • Students supply all hygiene-related supplies.

FINDINGS

A few teachers opted not to teach the tasting component for reasons, including: not having enough prep time, the unknown cost of the wine, student accessibility to the wine, and restrictive and punitive laws in their geographical locale. While the teachers had different reasons for opting out of teaching the tasting component online, all agreed both the student experience and teacher-student relationship suffered as a result.

The challenges of teaching the sensory perception component of wine courses during a pandemic data are summarized in [Table 1](#). The table was broken into two columns; challenges of teaching the sensory perception component of wine courses during a pandemic in fully face-to-face or hybrid courses are listed on the left column and challenges related to fully online courses are listed on the right column. Six themes emerged and each theme was associated with at least one challenge. Difficulties faculty faced when delivering the sensory perception component of wine courses during the pandemic during face-to-face or hybrid instruction included ensuring that the facility was safe with respect to hygiene, spacing, and materials, and the constant threat of having to shift to a fully online format. Challenges in the fully online courses, included redesigning the course structure, and requiring students to obtain materials, with obtaining the wine itself being the primary issue.

The members of the BevEd SIG also considered several potential solutions to these challenges. [Table 2](#) lists the potential solutions instructors considered when implementing the sensory perception (SP) component of wine courses during the pandemic. The content in [Table 2](#) is organized in two opposite columns; the first column to the left listed solutions considered in fully face-to-face or hybrid courses, while the second column to the right listed the solutions considered in fully online courses. For in-class tasting sessions, solutions included scheduling at the beginning of the semester, dividing into smaller class sections, and a range of safety protocols for both the teacher and the students. For online courses, solutions included synchronous meetings with the teacher demonstrating techniques and then asking students to describe the wine, and a variety of methods to provide supplies to students, including specific wine tasting kits designed by the teacher.

At the end of the semester, instructors provided their feedback regarding which solutions they believed worked. The findings from the follow-up survey are summarized in [Table 3](#). The insights for fully face-to-face or hybrid courses are summarized in the left column and for fully online courses are compiled in the right column of [Table 3](#). Instructors teaching face-to-face classes either removed the

sensory perception component, reduced class sizes, or scheduled all sensory perception activities at the beginning of the semester.

Students expressed appreciation for the face-to-face experience. Instructors commented that it felt like a normal tasting, although the timing and logistics were challenging, which led instructors to propose that content should be simplified and students should bring their own materials to class. Online wine courses either removed the sensory perception component or provided various options for students to pick up the wine, including wines of varying price points.

The results were mixed, with some instructors reporting that students successfully obtained the wine and engaged in the synchronous tasting sessions, while other instructors reported a series of problems that made their efforts unsuccessful in these two respects. The instructors proposed creating wine tasting kits for students to pick up from a central location during the first week of class, holding tasting sessions in-person but outside and with fewer students, eliminating sensory perception from the curriculum, or mailing wine aroma kits to students as opposed to wine.

The insights from this study were used to develop a protocol for delivering wine sensory perception training for in-class and hybrid format classes, which is available in [Appendix A](#).

DISCUSSION AND IMPLICATIONS

The BevEd SIG identified challenges, suggested and implemented solutions, and reported on the outcomes of implementing the proposed solutions. Two overarching themes emerged from the case study:

1. The sensory evaluation of tasting wine can be successfully accomplished using an online mode of delivery,
2. Pedagogy, the theories and the methods for teaching, are affected by technology and must evolve.

Past pedagogy best practices for face-to-face teaching of the sensory perception of tasting wine do not translate fully to the online environment.

The horse and the automobile offer a useful analogy for the implication for understanding the cognitive dissonance between technology and teaching. When society moved from horseback as a mode of transportation to the new technology of the automobile, there was a time of turbulence and rejection of the automobile, much like the change to teaching online. Imagine someone attempting to put a horse saddle on an automobile and thinking the old technology would simply, and without issue, incorporate the new technology. In essence, education is experiencing a

Table 3: Reflection on proposed solutions for sensory perception (SP) component of wine courses during a pandemic

FULLY FACE-TO-FACE OR HYBRID COURSES	FULLY ONLINE COURSES
Sensory Activities	
<ul style="list-style-type: none"> No sensory perception work attempted. Tasting done in small groups bi-weekly during early part of semester. Focused on basic styles and common brands so that students could purchase at least a few wines if they had to miss the tasting. Wine and food pairings done in class. Convenience foods used (e.g., cheese, sliced meat). Wine component completed during the first 10 days of class. Divided students into three sections. One day of tastings done per group. Held during early part of semester. 	<ul style="list-style-type: none"> No sensory perception work attempted. Students picked up kits containing small containers of wine prepared by a local winery. Tastings done synchronously. Students were told of two wine options for them to purchase for each class. One was at a high and one at a lower price point. Tastings done synchronously. Took wine kits to students' homes and held tastings synchronously. Students purchased wine from local stores. Tastings done synchronously. Non-alcoholic beverages purchased by students and tasted during class to learn to detect wine structural components. Tastings done asynchronously.
What Worked	
<ul style="list-style-type: none"> Felt like a normal tasting. Pre-poured all wines, which minimized close contact with students. Students voiced appreciation for the face-to-face experience. Students did not get inebriated during the lengthy wine evaluations. 	<ul style="list-style-type: none"> Called local company to setup wine list for students to pick up. Students found this process easy. Students, instructors, and assistants not put at health risk. Students turned on their cameras and verbally engaged during the tastings. Students enjoyed and were engaged in the sensory activities more than during similar activities held face-to-face.
What Did Not Work	
<ul style="list-style-type: none"> Increased class setup time. No laboratory assistant allowed in room. Took more time due to students handling of masks, gloves, and shields. Students did not do the preliminary out-of-class work. Thus, it had to be covered during tastings. Too many wines evaluated in each session for adequate learning. Difficult logistics getting all samples needed for a semester of tastings in one week. Attendance decreased as the semester progressed. 	<ul style="list-style-type: none"> Students could not be seen, tastings guided, or questions answered due to asynchronous format. Limited number of wine samples able to fit in kits. Students with COVID-19 were unable to pick up kits. Taking the kits to students' homes was inefficient. Split wine into smaller sizes, but could not ship or distribute per state laws. Gave students a list of wines to buy, but they did not buy the same wines which resulted in chaotic tastings. Except during the tasting sessions students engaged very little with the class and left their cameras off. Many students did not participate in optional tastings as they couldn't afford it. Three computer screens were not enough to be able to see the class of 60 students during tastings and have a visual teaching aid open at the same time. Students moved during the semester and thus were not able to pick up their samples or have samples delivered to them.
Changes Proposed	
<ul style="list-style-type: none"> Students bring supplies to class (For example, water bottle, tasting guide, and hand sanitizer). Provide students with health guidelines for all activities related to attending class and participating in tastings during each class. Hold students accountable for the tasting component of the class. Keep it simple. Focus on basic wine styles and familiar brands so that students are able to purchase at least a few on their own if they had to miss the tasting. Be patient with yourself and the students. Cover that which is critical to achieve maximum learning in a limited time. Allow the students to explore more on their own. Collect food and beverage safety protocols from government agencies and wineries. Review and create one specific for your establishment. Train assistants and students and stick to the protocol very carefully 	<ul style="list-style-type: none"> Create tasting kits with small containers of wine over laid with nitrogen. Have students pick them up from a central location during the first week of class. Turn the non-alcoholic tastings into a reflection assignment to ensure they are being completed. Teach small tastings sessions outside (maximum of 15 students) and delivery theoretical content online. If class must be taught completely online, eliminate the tastings and focus on the theoretical content. Mail each student one of the commercially available scratch-and-sniff guides to wine sensory evaluation.

similar situation transitioning from face-to-face to online learning. New pedagogies need to be developed for teaching online, like the solutions proposed by the BevEd SIG.

The study identified challenges, developed solutions, and implemented new pedagogies for the sensory perception evaluation of wine online. Further studies are under-

way by researchers in the BevEd SIG to continue the process of understanding, developing, and implementing new pedagogies specific to the online teaching of the sensory perception of wine. Implications are not limited to higher education, as managerial implications also emerged. Managerial implications extend to and include the tasting component of wine, understood as industry best practice of experiential training for staff and selling to customers. The majority of businesses already include online components. The interaction between people in a virtual business transaction is an evolving aspect in the online business environment. Understanding best practices for executing the sensory perception tasting of wine would be an advantage to a company. Technology is stimulating change in employee expectations, job descriptions, and client interaction. Managers who understand how best to leverage new technologies to deliver sensory perception experiences in a virtual environment will have a competitive advantage.

CONCLUSION

In March 2020, universities switched to online learning in response to the COVID-19 pandemic. The use of technology, asynchronous scheduling, and the semi-anonymous nature of online courses created challenges for engaging students and the teacher-student relationship. The problem

was especially relevant for curricula with multisensory components like wine tasting. In Summer 2020, the BevEd SIG became a virtual faculty learning community of both experienced and novice beverage instructors. The group discussed their experiences and addressed the pedagogy, logistics, and potential problems of maintaining the sensory perception (seeing, smelling, and tasting) component as an integral part of wine courses regardless of the class format. The experiential learning of sensory perception as the skill of tasting and evaluating wine is also essential in the industry, including wineries, distributorships, wine sales, serving, bartending, and training. The evaluation of the challenges of teaching the sensory perception tasting component of wine courses during COVID-19 and the solutions developed by the BevEd SIG to address them can be considered best practices for wine course instruction and experiential training for staff and customer sales and events.

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APPENDIX A: Sample Wine Tasting Protocol

GENERAL OVERVIEW OF COURSE DELIVERY

- *[Course name and number]* is scheduled to be delivered in a *[specify mode]* on *[day/time]* at *[place]*.
- **Alternate attendance** will be implemented:

Option A

- A three-hour class time will be split into two sessions: 50 percent of the students will attend class *from – to [add time]*; and 50 percent will attend *from – to [add time]*. A ten-minute break between the sessions will be used for **cleaning and setting up the classroom** for the next session.

Option B

- Fifty percent of the students will attend class on *[add day]*; and 50 percent will attend class on *[add day]*.
- The remaining instructional time will be **supplemented with online content** that will be posted on Blackboard one week prior to class session. Knowledge of the online supplement material will be **assessed by quizzes** at the beginning of class sessions.
- Face-to-face class sessions will be reserved for **key concepts overview, Q&A, and wine tasting sessions**.

WINE TASTING PROTOCOL

- Students will be **sitting at a six-foot distance**. The instructor will determine the seating configuration.
- To ensure physical distancing of at least six feet, **visual cues** (i.e., **floor markings** and **desk signs** to indicate where the students should sit and stand) will be implemented.
- Students will be responsible for **bringing their own clean set of wine glasses** in individual boxes to wine tasting sessions.
- At the beginning of the semester, students will be

given individual **sets of tasting supplies** (aroma wheels, tasting notes templates, glass circles, disposable spit cups, zip locks, etc.) Students will be responsible for bringing this tasting set to class.

- Students will be required to **wear masks at all times, with the exception of the actual wine tasting time**.
- Students will also be **encouraged to wear face shields** during the tasting.
- **Teaching Assistant** will be the only person to **pour the wine and distribute food samples** for wine and food pairing sessions. While pouring, Teaching Assistant will be **wearing a mask, a face shield, and rubber gloves**.
- Prior to distributing any samples to class, Teaching Assistant will always **sanitize the gloves with 90 percent rubbing alcohol**.
- Teaching Assistant will utilize **contactless pouring protocol** (e.g., wine bottle **not** to touch wine glasses)
- For wine pouring, students will be asked to **step away from their desks**. While waiting for the wine to be poured, **students will maintain a six-foot distance between Teaching Assistant pouring the wine and the other classmates**.
- Upon completion of the class session, students will be responsible for placing their **spit cups in a resealable plastic bag and disposing them outside of the classroom**
- **Entry/Exit:** A plan will be developed and communicated to the **students for maintaining social distance while entering and leaving the classroom**.
- Teaching Assistant will be responsible for **cleaning and disinfecting desks and any other commonly touched items** (e.g., doorknobs) **before/after** each class session.
- Teaching Assistant **will be wearing gloves** when performing cleaning, sanitizing or disinfecting activities.
- Instructor will ensure **availability of sanitizing gel, wipes, and EPA-registered disinfectants in the classroom**.