"We Are What We Eat": Adopting Recipe Writing as a Boundary Object of First-Year Writing and Nutrition Courses

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Abstract: Over the recent past, interdisciplinarity has been theorized as a tool that can help teachers and researchers create new epistemological spaces in higher education. Given the emphases on vocation-oriented programs and STEM-skilled workforce education, two-year colleges have the potential to explore the development of an interdisciplinary collaboration between STEM fields and writing courses. However, WAC/WID scholarship has provided few concrete examples of interdisciplinary partnerships between STEM and writing courses in two-year college contexts. Using a case study of a pilot collaboration between Composition I and Nutrition courses, the authors present practical strategies for engaging students in interdisciplinary writing by treating a specific genre as a boundary object for the purpose of culturally situated solutions in response to problem-based exigences triggered by the unequal impacts of COVID-19. The authors argue that adopting a specific genre-based writing project as a boundary object can help students experience interdisciplinary learning and community-based knowledge making processes and cross boundaries across linguistic and cultural resources.

Introduction

Community colleges have taken the initiative in leading WAC experiments "from the start of the movement" by ensuring "interdepartmental responsibility for the teaching of writing skills" (Palmquist et al., 2020, para. 1). Although interdepartmental partnerships in two-year institutions often did not have official titles, faculty members, administrators, and staff members across departmental lines volunteered to be "change agents" by renovating their curriculum and pedagogical approaches (McLeod, 2007, p. 18). More recently, there has been an explicit argument that it is important to resituate integrative learning and writing program administration by rejecting the deficit ideology that is prevalent in two-year colleges (Hirsch, 2014; Tinoco, 2018). However, little research has focused on how interdepartmental partnerships across the disciplines within the two-year college setting have impacted student learning or faculty perspectives of writing. Even though the importance of WAC/WID programs in two-year college contexts (Roberts, 2008) and partnerships across different institutions including K-12 and community college institutions (McMullen-Light, 2015) has been explained, WAC/WID has yet to demonstrate concrete pedagogical practices of integrative learning through partnerships between STEM courses and first-year composition courses and their impacts on students and teachers in a two-year college setting.

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Recently, interdisciplinarity has been theorized as a tool that might help teachers and researchers create "shared goals" and "epistemological openness and a recognition of the value of each perspective" (Paretti, 2011, p. 3). Students' interdisciplinary learning paths have been well-researched in first-year experience programs (Leibowitz et al., 2011) and graduate programs (Rabbi, 2020). For example, Rebecca L. Harrison and Brooke Parks (2016) studied interdisciplinary learning experiments between STEM courses and writing courses in the setting of four-year research universities. As a more radical framework that can address complex problems and prepare student writers for post-industry environments, Justin K. Rademaekers (2015) suggested a transdisciplinary approach by positing that "transdisciplinary knowledge making" (p. 2) should be a central locus in which educators and researchers rethink "disciplinary epistemology and methodology but also disciplinary terminology and the political/social contexts in which these disciplines might operate" (p. 9). At an institutional level, although two-year colleges often do not have official WAC/WID pedagogy, they have the potential to explore the possibility of interdisciplinary collaboration between STEM fields and writing courses because they not only have strong vocation-oriented programs and STEM-skilled workforce education but also have strived to provide supportive environments for faculty collaboration to create engaging "learning communities" in general education curriculums across disciplines (Soven et al., 2013, p. 3).

Our purpose in this article is to investigate the processes and outcomes of an interdisciplinary project as a pilot collaboration co-created in Composition I courses and Nutrition courses. This pilot collaboration was also supported by an on-campus makerspace-based interdisciplinary initiative voluntarily developed by faculty and staff who were interested in course revisions with a focus on food, a theme that can be connected to multiple disciplines due to its integrative nature straddling biology, health, culture, social justice, and other fields. Although there has been an increasing interest in food, social justice, and well-being in humanities and STEM fields, scholars have not fully attended to the intersections of food literacy, social justice, and health crisis, or their potential pedagogical applications. Instead of demarcating language courses from content courses or service courses from disciplinespecific courses, this group effort aimed at a non-hierarchical collaboration through a common writing assignment, which served as a transactional writing activity between different disciplines. In this project, Composition I courses (online, synchronous) and Biology Nutrition courses (online, asynchronous) employed recipe writing and cooperated on creating a cookbook from lived experiences at the time of the COVID-19 pandemic during the fall semester of 2020 as a pilot project. By using empirical findings from interviews with and writing from students, with a focus on two multilingual transnational students, derived from a case study of English and Nutrition courses at a two-year college, we argue that adopting a recipe-writing assignment as a boundary object in linked courses can help students not only experience learning across different knowledge systems but also leverage their community-based knowledge and resources to solve complicated problems.

During the summer of 2020, Soyeon, from the English department, and Shuo, from the biology department, developed interdisciplinary units at a two-year college, located in a southcentral U.S. state. At the time of the project, this institution was one of the top twenty largest colleges, with more than 50,000 enrollments (National Center for Education Statistic, 2022), serving diverse student populations in terms of race, ethnicity, class, language, ability, and age. Also, the student population included a significant number of international students. As explained above, this collaboration was supported by an interdisciplinary initiative, the "Interdisciplinary Food Network" (pseudonym), operated by 17 members (2 leadership members, 5 staff members, and 10 faculty members) across disciplines including biology, culinary arts, engineering, history, and English. While other instructors explored their own approaches, Soyeon and Shuo, as a small team within this initiative, aimed to explore food and nutrition literacies during the time of the pandemic through a social justice paradigm. In food justice scholarship, social justice is described as a concept that not only addresses uneven structures in resource distribution but also calls for "a universal respect for the dignity of all peoples, and the promotion of political and social rights that ensure all minority groups can equally pursue their life's interests and voice their visions for change" (Broad, 2016, p. 5). We both agreed with the idea that students could create an

interdisciplinary writing project in which they engage in advocacy work for those less privileged groups who lack resources.

Conceptual Frameworks

This article builds on the extensive theory that has explained food justice (Broad, 2016) and coalitional action (Walton, Moore, & Jones, 2019). By coalitional action, we mean that collective thinking and intersectional action processes are required to address problems and unequal access to resources. This article envisions an interdisciplinary partnership as a coalitional action that enabled the linking of first-year writing and nutrition courses. Our collaboration model was similar to what is referred to as *linked* courses, following the definition described as "courses in which faculty may work to coordinate syllabi and assignments, but teach most of their courses separately," as opposed to *paired* courses, "in which two or more courses are team taught in an integrated program" (Soven et al., 2013, p. 5). We taught our courses separately while sharing the theme of food and recipe writing as a common assignment and team-taught one unit focused on justice-oriented food and nutrition literacies. While Rademaekers (2015) discusses transdisciplinary collaboration in upper-division writing or discipline-specific courses, we negotiate disciplinary differences in general education curriculums by paying attention to two-year college-specific contexts, in which upper-division writing courses are barely offered while disciplinary conventions are expected to be taught.

By using our linked courses as a case study, we contend that by devising a specific genre-based writing assignment, such as recipe writing, as a "boundary object" (Star & Griesemer, 1989; Wilson & Herndl, 2011) and as a project that can bring "community culture wealth" (Yosso, 2006), faculty can design an interdepartmental collaboration that can help students develop problem-solving mindsets and culturally situated approaches to problems. Here, we see genre not only as a social action that comes as a rhetorical response to recurrent situations rather than classified systems of texts (Miller, 1984) but also as an object that "help[s] mediate disciplinary differences in collaboration" (Rademaekers, 2015, p. 11). Particularly, the concept of rhetorical genre systems helped us to select recipe writing as an approach that could offer affordances and limitations. In our project, recipe writing is not only a transactional genre but also critical thinking-based writing where ethnicity, identity, and audience awareness intersect with each other. Obviously, recipe writing has a clear objective of delivering information to specific audiences like other genres widely used in STEM fields, such as lab reports and quantitative reasoning-based statements. To be more specific, we adopt the notion of a "boundary object" to address "communicative barriers" and negotiate "entrenched disciplinarity" (Rademaekers, 2015, p. 2). Wilson and Herndl (2011) explained that contingent zones, often marked by their nonhierarchical differences and "methodological symmetry" (p. 149), are constituted by boundary objects. Based on these notions, we employed recipe writing as an interdisciplinary nexus and negotiable genre that can be localized for each discipline, rather than as a neutral or formulaic genre.

We also chose recipe writing not only as a transdisciplinary object but also as a *trans*boundary praxis because it can help students leverage their community-based knowledge and diverse languages and cultures and utilize those resources to create a kairotic response to the COVID-19 crisis in and out of the academy. Drawing from Tara J. Yosso's (2006) notion of "community cultural wealth," described as "an array of knowledge, skills, abilities and contacts possessed and utilized by communities of color to survive and resist macro and micro-forms of oppression" (p. 77), this article explains how this pedagogical innovation encouraged students to negotiate different disciplinary boundaries and navigate their community-based food ecologies, languages, and cultures through empirical inquiries such as observations, dietary analysis, and food community interviews to launch a virtual cookbook. To be more specific, the notion of community cultural wealth has the potential to bring out students' *familial capital*, which is defined as "cultural knowledges nurtured among *familia* (kin) that carry a sense of community history, memory and cultural intuition" (Yosso, 2006, p. 79) at the intersection of the humanities and science disciplines. As this recipe is centered on community-based knowledge and resources, the recipe as a genre is embedded in student writers' mediational and critical thinking

processes in which they incorporate community-based food knowledge and linguistic and cultural traditions that are different from dominant or stereotypical recipes. However, we maintain that teachers should not limit this community-based approach to bringing out "resources" but extend it to create the material practices of engaging resources in classrooms by sharing recipes and participating in knowledge-making processes. In this sense, our pilot collaboration joins the tradition of humanities that recently pursued integrating embodied and materialist approaches as exemplified in feminist food rhetoric (Del Hierro et al., 2019; Durá et al., 2015; Sachs & Patel-Campillo, 2014; Swacha, 2018) pedagogies and more recently in the 2017 Taco Literacy project piloted by Steven Alvarez in writing studies. Food literacy, particularly critical food literacy or foodways during the pandemic, indicates intersected community problems and encourages students to work on concrete, material, and place-based problems and rethink biological, cultural, discursive, and technological intersections.

Linked-Courses Design Processes and Faculty and Student Experiences

Networking Wilson and Herndl's (2011) notion of a "boundary object" and Yosso's (2006) concept of "community cultural wealth," we explain course structures and collaborative practices between Nutrition courses and Composition I courses and then deliver faculty's lived experiences and students' learning experiences through empirical findings, based on semi-structured interviews, artifacts, and observations. In Soyeon's revised Composition I courses, students in two sections of the composition courses investigated notions of health, well-being, and food literacy in the aftermath of the COVID-19 pandemic, collaboratively created a locale-based cookbook with students in Nutrition courses, and worked in 3D modeling design activities by repurposing their written recipes. In Shuo's revised Nutrition courses, students were guided to engage in recipe writing as an extra credit assignment. We set up the following research questions to investigate our interdisciplinary curriculum development:

- How do students understand the writing process in the recipe writing assignment?
- How do teachers in both English and Nutrition courses and staff members understand the impact of recipe writing on developing students' writerly ethos?
- How—if at all—can interdisciplinary projects help students employ their cultural and linguistic resources coming from their home and local communities in their writing?

To answer these questions, Soyeon recruited participants from students, teachers, and staff members who participated in this pilot collaboration after the end of the semester. After obtaining IRB approval, Soyeon collected teachers' and students' artifacts, audio-recorded interviews with teachers, students, and staff members, and written teacher journal entries during the preparation, implementation, and reflection sessions. After completing the fall semester of 2020, interviews with students and artifact data including student writings were collected intensively, while data analysis and memo writing were conducted concurrently.

Composition I courses include linguistically, culturally, and racially diverse students. For example, languages used by student research participants in Composition I courses included Russian and Mandarin Chinese. Their majors were mostly in vocation-oriented programs, including dental hygiene and accounting. This Composition I course was linked with English to Speakers of Other Languages (ESOL) courses, in which international students are required to be co-enrolled if they do not have the designated state-level assessment scores for English or their scores do not meet the standard. The two sections of Composition I had 15 and 19 students, respectively, and in each section, 12 students were co-enrolled in ESOL courses. In Nutrition courses, more than 120 students in total were enrolled in three sections and were invited to create a recipe by using their knowledge gained from the Nutrition course and the familial capital or community cultural wealth they built in their home communities. Here we focus on interviews with and writing from students in the Composition I courses and interviews with one instructor who worked in another collaboration team and three Interdisciplinary

Food Network staff members. The two students who participated in this study were multilingual students who self-identified as being from Russia and China, respectively, and who pursued a dental hygiene major and an accounting major, respectively. Both were enrolled in the Composition I and ESOL courses concurrently and had already obtained B.A. degrees in their countries of origin prior to coming to the U.S.

Table 1: Research Participants

Name	Position	Discipline
Eileen	Student	Dental Hygiene
Chen	Student	Accounting
Naomi	Instructor	Natural Science
Hugh	Staff	Liberal arts
Nathan	Staff	Technology
Brittany	Staff	Liberal Arts

Note. All names are pseudonyms.

To analyze the data, Soyeon used constructive grounded theory (Charmaz, 2006), which emphasizes "constructing analytic codes and categories from data, not from preconceived logically deduced hypotheses" (Charmaz, 2006, p. 4). To conduct coding and data analysis, Soyeon transcribed all the interviews and coded them by using the qualitative methods analysis software Dedoose, and reiterating coding processes to obtain initial codes and focus codes by comparing datasets to see emerging categories. Based on semi-structured interviews and observations, Soyeon analyzed emerging themes. Shuo was involved in representing her Nutrition courses and reflections from her teaching practices.

Linking Composition and Nutrition

As explained above, linking English and Nutrition aimed to create a mutually beneficial space in which each course instructor could reinforce their own Student Learning Outcomes (SLOs) and respond to community problems through a common writing assignment (see Appendix A).

Part 1: Introducing Food Literacy to Composition I Courses

In Module 1, Soyeon invited students to discuss the course theme and engaged them with course agendas such as care, food, healing, and well-being through low-stakes writing. After watching a TEDx Talk by writing scholar Paul Rogers (TEDx, 2015), students discussed the conventional definition of well-being and redefined it as social intersubjective practices beyond individualist "self-care" discourses. Each module has six or seven low-stakes writings (that is, discussion question response assignments) which culminate to a food and nutrition literacy-related final paper and a community food interview-based recipe writing project, along with a virtual 3D design (based on a free web-based 3D design program Tinkercad) as a creative technological component.

- Module 1: Students work on a visual analysis of food-related advertisements during the pandemic.
- Module 2: Students develop a digital analysis on multimodal literacy.
- Module 3: After investigating three definitions of food literacies, students develop a food analysis to suggest ethical implications and provide concrete action plans.

• Digital Exhibition: Students explore recipe writing and a virtual 3D design related to their recipes and present them for a virtual cookbook.

By using selected reading materials and multimedia sources such as Michael Pollan's In Defense of Food on PBS, students mapped the notions of food justice and food literacy. Based on these definitions, students attempted to define food-related problems in their communities including home, school, and local communities. Particularly, in Module 3, Composition I students read Colatruglio and Slater's (2014) article and focused on parsing Slater's (2013) three frameworks of food literacies introduced in it (Colatruglio & Slater, 2014, p. 45): functional food literacy, interactive food literacy, and critical food literacy. Functional food literacy is described as "basic communication of credible, evidence-based food and nutrition information" (Slater, 2013, as cited in Colatruglio & Slater, 2014, p. 45). While functional food literacy offers basic nutritional information, interactive food literacy refers to the "development of personal skills regarding food and nutrition issues" (Slater, 2013, as cited in Colatruglio & Slater, 2014, p. 45). Lastly, the definition of critical food literacy emphasizes "different cultural, family and religious beliefs in respect to food and nutrition (including nutritional health), understanding the wider context of food production and nutritional health, and advocating for personal, family and community changes to enhance nutritional health" (Slater, 2013, as cited in Colatruglio & Slater, 2014, p. 45). Students in Composition I courses were guided to use these three notions to conduct community food interviews and extend what they collected from sources to critical food literacy.

Along with the reading assignment, students conducted community food interviews with their family members, neighbors, or workplace colleagues mostly in a virtual format, in compliance with the COVID-19 safety guidelines of the institution and the Centers for Disease Control and Prevention. In their interviews and transcriptions, students were invited to use languages other than English if their interviewee used non-English languages and to consider translating them in their transcripts and/or in their synthesis paper on food literacy. Taking up translingual approaches to language and writing in composition classrooms, Soyeon had students decide which language will be presented by attending to their own target audience and rhetorical context. Through this community interview, students collected community-based recipes and actively sought healing strategies that could help communities navigate the ongoing health crisis (see Appendix B).

This effort was also supported by on-campus makerspace technician staff members. After completing their synthesis paper, students created brief recipes by integrating nutrition knowledge from community food interviews and then incorporating their recipes into virtual 3D designs. The recipe writing and 3D design processes were intended to be appealing to their audience beyond the classroom and to cultivate genre awareness embedded in the given rhetorical situations and across different media contexts.

Part 2: Enriching Nutrition Courses with a Writing Assignment

Nutrition education aims to not only deliver nutrition knowledge within a single course, but also impact positively on the community by promoting behavior change, nutrition advocacy, and social justice (Contento & Koch, 2020). The Nutrition course, an online asynchronous course, was composed of students from various age groups and a wide variety of cultures, languages, and socioeconomic backgrounds, but despite these differences, everyone's life had drastically changed due to COVID-19. As modern medical pills are ineffective in treating viral infections, food remedies have been eagerly pursued in the hope of boosting immunity to prevent infection and facilitate healing (Isbill, Kandiah, & Kružliaková, 2020). While finding magical foods may not be a realistic solution to the problem, teaching nutrition and advocating healthy eating habits is imperative in helping our students and our communities build strong bodies to fight diseases.

Writing projects have previously been included in teaching nutrition courses at universities (Brown, 2001; Rodriguez, Sen, & Boyette, 2003). Shuo recognized the importance of writing, just as other STEM educators do (Stroumbakis, Moh, & Kokkinos, 2016), but its use has been limited to informal communicative writing such as discussion board posts or short case study reports. The collaboration

with the English faculty provided the Nutrition faculty an opportunity to introduce formal writing in the Nutrition course by developing concrete instructional plans and evaluation tools. To teach writing for Nutrition students, Soyeon's instructional videos were posted in the online course. Instructional videos have been established as effective in facilitating teaching in both STEM and language courses (Chan, 2010; Devlin, Feldhaus, & Bentrem, 2013). The writing project was placed at the end of the semester as an extra credit activity. This design was based on the structure of the course content and the load of curricular activities. The Nutrition course was managed in four modules in Canvas:

- Module 1: Students study the dietary principles, guidelines, and the human digestive system.
- Module 2: Students explore the properties of energy-yielding nutrients: carbohydrates, proteins, and lipids.
- Module 3: Students examine the three non-energy-yielding nutrients (vitamins, minerals, water); understand weight control and fitness.
- Module 4: Students understand how to apply the nutrition knowledge to people at various developmental stages, from unborn to older adulthood.

After studying all four modules, students gained a full view of nutrition. Considering this sequence, the recipe writing project was offered as an extra credit assignment at the end of the modules to provide students an opportunity to reflect on what they had learned. In total, more than one-third of the students (43 out of 124 students) participated in the recipe writing project. They communicated with family or community members, collected food recipes, and made foods with a conscious reflection on the nutrition knowledge they learned from the course. The writing project provided students an additional opportunity for course reflection, thinking, and creation.

Part 3: Nutrition Education for Students in English Courses

To help the English students understand nutrition basics, Shuo conducted virtual workshops, entitled "Eat Healthier, Recover Sooner," for Soyeon's English courses. Shuo began the workshop with a question: "Do you care about what you eat?" Students put their answers into an anonymous poll, which immediately caught their attention and interest. Two additional polls further revealed the changes to their eating behavior and psychological status during the pandemic. Furthermore, attendees had a chance to feel a connection with others after seeing similar feelings and behavior changes by responding to polls. This may have helped to relieve some of the stress from extended periods (ten months) of social distancing and isolation since the COVID-19 pandemic started. Besides polls, Shuo directed students to seek answers to the following three questions: 1) Why should we care about what we eat? 2) When should we care? And 3) What should we eat? By asking and discussing the answers to these questions, Shuo proceeded to introduce the significance of nutrition to health, nutrient requirements for different age groups, and principles of a healthy diet. After introducing the general principles of a healthy diet, Shuo provided students with specific and practical guides to help them choose nutritious foods and plan sound diets. These specific guides included sample menus, MyPlate food guidelines, and the United States Department of Agriculture (USDA) Food database with which students can calculate and estimate their own daily nutrient intake.

Recipe Writing and Boundary Objects

Overall, teachers, students, and staff members understood this recipe writing project in a linked course format in a divergent way, yet with an open mindset, embracing emerging uncertainties and outcomes in the process.

Faculty and Staff Members: Negotiating Boundaries

Instructors and staff members who participated in this initiative commonly emphasized that interdisciplinarity based on the common theme of food is flexible, generative, and suitable for workforce

education programs in two-year college contexts. For example, instructor Naomi in a natural science discipline, who collaborated with an instructor from the history department, stated that the theme of food induces interdisciplinary collaboration: "Food is something that links all cultures. If somebody says, you know, architectural design, like the Eiffel Tower, I don't like talking about it." This reflection connotes that the theme of food itself might have been an agreeable one for instructors from different perspectives to attempt to revise their curricula. In another interview, Brittany, working as a staff member in this interdisciplinary initiative, said, "Collaborative work...is necessary to break silos and to enhance students' understanding of the world we are in." Her interview suggested that interdisciplinarity is related to student success. Like Brittany, Hugh, who was one of the leaders of this initiative, also emphasized the importance of "playing with boundaries": "It gives us the opportunity to play with boundaries that we might not otherwise be able to. But at the same time, we should make sure that it is loose enough." More importantly, this playing is contingent on students' practices and the faculty's curricular design. Nathan, who had ample experience in working with students in workforce education programs, was also aware of the shared concern that students might show resistance and refuse to participate in these new types of instructional practices. As noted above, non-hierarchical coordination based on prior experience and pedagogical approaches among faculty, staff members, and administrators constituted this interdisciplinary initiative, and the recipe writing project between Composition I courses and Nutrition courses was part of this coordination and boundary-crossing experiments based on the shared recognition of the need for interdisciplinary approaches in general education curriculums across the programs and the strategic linked courses design that attended to and institutional contexts and the needs and dispositions of students.

Chen: Situating Nutrition-specific Knowledge in Everyday Cultural Practices

After participating in the Nutrition workshop, students in Composition I courses appeared to gain their rhetorical understanding of recipe writing as a genre and nutritional knowledge as part of their resources. Students were interested in the topics and were actively engaged in learning during the Nutrition workshop. For example, in her brief writing assignment after attending the virtual Nutrition workshop, Chen, one of the multilingual transnational students co-enrolled in Composition I and ESOL courses, explains:

According to Dr. Shuo's lecture, I know that we should care about nutrition through our whole life and a healthy diet is 'adequacy,' 'balance,' 'moderation,' and 'variety.'... I like the sentence 'We are what we eat' that Dr. Shuo mentioned at the beginning of the lecture. People had better be aware of healthy diet through their whole lifetime. Because of people's busy life, people often order foods from restaurants or purchase instant products. Everybody knows foods from restaurants are oily and salty, and cooking skills damage some nutrition. Instant products have high calories. People should try to reduce eating outside or bringing takeout meals, and increase cooking at home, and share foods with family members, if possible, preparing foods and cooking foods with family members. (Discussion Question Response, #19).

The ideas of contrasting food from restaurants to food from home and connecting a healthy diet with family life constitute her reflection writing and authorial voice. Those ideas seemed to further evolve into the central theme of her final writing project. Emphasizing nutrition is not only scientific knowledge but also lifelong practices, Chen associates a healthy diet with her cultural practices such as cooking at home and eating meals with family members. In her Dietary Analysis, an optional brief writing assignment following the Nutrition workshop, she described what her everyday meals were like through documenting her food items over three days and attempted to affirm how her meals were made of various nutrients and how this nutritional practice could lead to one's well-being: "It is necessary for parents to consider food nutrition and cooking skills to increase and keep well-being in adolescents, and a good way for adolescents to keep well-being is to prepare, cook, and share foods with family members" (Dietary Analysis, Discussion Question Response #20).

In selecting dumpling-making as her recipe writing project, Chen also synthesized nutritional knowledge and cultural practices. In her discussion question response, she said, "I love dumplings. I can put anything which I like as filling like meat, vegetable, seafood. Dumpling is traditional food in China" (Discussion Question Response #14). This selection is based on her awareness of the pandemic and public health:

My eating habits have only slightly changed due to the Coronavirus pandemic. I often cook at home because I love cooking whether we lock down or not. I always prepare meat (or seafood), vegetable, and fruits as a meal. Because the COVID-19 pandemic broke out, we are staying at home with our family. I started to learn how to cook deliciously healthy food for my family. I found it was not difficult. Therefore, I think we can always eat healthy food because it is delicious and easy to cook. Healthy food can provide enough nutrition for our body and improve our immunity. (Discussion Question Response, #2).

This critical food literacy, based on her interactive food literacy and awareness of the importance of involving family in cooking practices, particularly in response to a public health crisis, seemed to be further developed in her final project, in which she synthesized her community food interview, self-selected scholarly sources, and her own foodways and nutrition literacy.

In addition, preparing, cooking, sharing food with children can ensure food nutrition and share food knowledge with children. Nutrition is essential to keep people's physical health and ensure children's growth. Family meal is a good idea to keep nutrition and deliver food knowledge to children. In our home, family meal means to prepare, cook, and share food together at home. Parents, especially mothers, can teach children the knowledge of food through making food with children. (Synthesis Paper: Module 3 Final Project)

In one of her brief writing assignments, she documented her community food experience and compared the interview result to her life during the pandemic and everyday cooking experiences as cultural practices. Her recipe writing and community food interview helped herself recognize her transnational literacies and community-based knowledge during the pandemic. In the community food interview with her friend, Chen presented how her co-national friend navigated this crisis by transforming her life in quarantine into a nutritionally and emotionally healthier life with a heightened sensitivity to the concept of well-being. She stated:

On November 10, 2020, I conducted a personal interview with my friend, Hua [pseudonym], who is a housewife. She has two adolescent children: a daughter is in eleventh grade and a son is in sixth grade. She said, "I think what you eat with every meal, whether it is meat, eggs, vegetables, etc., the more the variety, the more comprehensive the nutrition." I strongly agree with her opinion. Different kinds of food have different nutrition. For example, vegetables are rich in fiber, vitamin C, minerals, and carotene; fruits are rich in vitamin; meat is rich in protein. She thought that when her children made food with her, they felt fun and happy. She said when she makes dumplings (*jiaozi*), she put some kinds of ingredients such as meat, mushroom, vegetables, and eggs as filling and her children were pleasure for making dumplings and loved eating dumplings because they were delicious. I think making dumplings is wonderful because my family has the similar experience. During this summer break, my son and my niece felt bored, and I suggested we could make dumplings one day. I told them that we could make colorful and various shapes dumplings. My son and my niece thought that they not only made food but also did art works and had a great day. Through this conversation, when parents cook, inviting their children to join them is a good activity to increase the family atmosphere and keep children's well-being.

In the community food interview, her interviewee, Hua, shared her family' dumpling (*jiaozi*) recipe, and based on this interview, Chen compared Hua's cooking practices to her own and further discussed the sociocultural meaning and nutritional benefits of involving children in cooking. In her transcripts, Chen translated the interview materials she collected:

Chen: In your opinion, are there any good or bad effects on your children if you cook with them? 那你觉得和孩子一起做饭, 对孩子有什么好的或者不好的影响吗?

Interviewee: I think it is good for children to keep their well-being if they can participate in cooking and share food with family members. Before the outbreak of the pandemic, their father often ate outside and my daughter lived in school. Just my son and I ate at home and I felt lonely. 我觉得一起做饭,一起吃饭,对孩子身心健康是有好处的. 以前爸爸经常在外应酬,姐姐住校,家里就我和儿子 2 个人,很冷清.

Chen: Could you please talk about the benefits of cooking dumplings? 那你能和我讲一下包饺子的好处吗?

Interviewee: I think what you eat with every meal, whether it is meat, eggs, vegetables, etc., the more the variety, the more comprehensive the nutrition. For example, when I make dumplings, I must put meat, eggs, mushroom, and edible tree fungus and sometimes I add carrots, celery, or root of lotus. Then I feel that they taste good and have enough nutrition. 我觉得每顿饭吃的所摄入的, 不管是调味的, 肉类, 蛋类, 蔬菜一类, 品种越多营养越全面. 像水饺的话, 我为了口感和营养, 我一定会放肉, 鸡蛋, 香菇木耳, 有时候加上胡萝卜, 芹菜, 藕, 反正家里有什么都可以, 这样营养就很全面.

In this community food interview excerpt, Chen showed her boundary-crossing activities across languages, cultures, media, and disciplines. While synthesizing her knowledge from her Composition course and Nutrition workshop, she seemed to be more sensitive to her audience, genre, and the writing process itself by using both Mandarin and English and presenting different types of dough recipes. While translating her interview transcripts, she finds that dumplings (*jiaozi*) are common dishes between her friend and herself and could be a representative food item that is part of their everyday lives and a way of promoting nutrition in the aftermath of the pandemic. By situating what she learned from the workshop (such as discipline-specific knowledge and terminology) into her everyday life—that is, what her community members and she value in their nutritional lives during the pandemic—Chen connects scientific knowledge with her cultural practices and embodied experiences and seems to build her agentive ethos by writing a synthesis paper and a *jiaozi* recipe (see Figure 1 and Figure 2).

In her reflective writing after this interview and food project, Chen stated that her understanding of the writing process changed:

Previously, the writing process was like squeezing toothpaste. When I wrote a paper, I wrote the words and sentences just to reach the required word count. After completing multiple projects in my writing course, I see the writing process as building blocks.[T]hey [writers] put the blocks together and maybe they want to change some blocks to modify the buildings. Eventually, they get the buildings which they want to build.

As shown in this reflection, she came to see her writing process as negotiable, adaptable, and modifiable. Her community food interview process, nutrition literacy, and selected reading materials seemed to help her not only see recipe writing as a boundary object between scientific knowledge and cultural practices but also to change her prior traditional view of writing, in which she needs to generate new ideas for writing (e.g., "squeezing toothpaste"), to a more dynamic one. She explains that in her revised

view of writing, she can assemble her resources by gathering materials obtained from observing and reflecting on her everyday life in her community (e.g., "change some blocks modify[ing] the buildings").

Making Dumplings ("Jiaozi"):

Form the dough into a stick, and then cut into small pieces.

Use a rolling stick to make small pieces of dough into circles (or other shapes whatever you like).

Put the filing into a circle, and then wrap it up.



Figure 1: A screenshot of Chen's "Jiaozi" recipe webpage. She used both "dumplings" and "jiaozi" for her audiences and emphasized the process of making a purple dough from purple sweet potatoes by presenting multiple photos created by her on the right. Photographs by Chen.

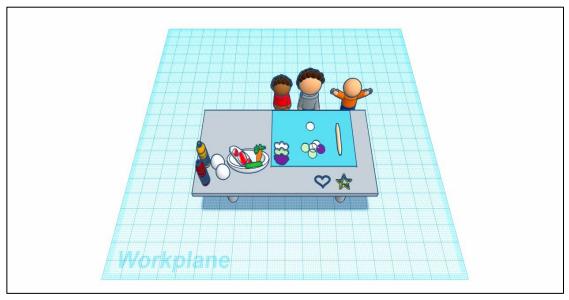


Figure 2: A screenshot of Chen's virtual 3D Design (created on Tinkercad, a web-based 3D design program) in her recipe page, which shows her repurposing the process of a written recipe and her interview-based suggestion (i.e., the importance of involving children in cooking and nutritional education at home) into a multimedia format.

Eileen: Incorporating Genre Awareness and Boundary-Crossing Experiences into Writing

Similarly, in her interview, Eileen, another multilingual transnational student, reported that she experienced some changes in understanding writing after completing the Module 3. She stated that her nutrition literacy, food interview, and recipe writing encouraged her to broaden her understanding of the writing process and recognition of genre awareness beyond lexical and syntactic levels: "It can be helpful when I need to structure and we just do not put items in our recipe right and we had to describe what it is like [emphasis added], so I think it [recipe writing] was useful. It was more important to understand how to structure and to organize even a short writing." As shown above, beyond writing processes, Eileen seemed to build more awareness of their audience and of the genre forms in and out of the academy. In her interview, when asked what she felt about writing a recipe, Eileen said:

You included different aspects...like, we participated in the meeting with technology experts, about how to do design, participating in meeting with a nutritionist. It was wide, we could study the topic with different perspectives...Also, I think it is important, when students engaged in topics, that could like...interest them, not we don't write because we need to write, we got to be interested while we write...we want to know something new and something else about it. Food literacy is this kind of topic.

Overall, the Nutrition workshop appeared to stimulate her interest in learning and communicating about food and nutrition with justice-oriented and critical approaches during the COVID-19 pandemic. The point of her interview suggests that the thematic and boundary nature of recipe writing in the linked courses context might have helped her more motivated in the final writing project required in this course and amplified her engagement in various disciplines and beyond. For example, in her synthesis paper, Eileen used interview transcripts and a recipe for "Caribbean Dish Callaloo" from her husband who was "born in Trinidad and Tobago and grew up on the U.S. Virgin Islands" and "loves traditional Trinidadian food and always chooses to eat healthily" to support her argument that the needs of marginalized communities in gaining nutrition literacy education and food security should be addressed. In the conclusion, Eileen stated:

Currently, with the pandemic and confinement, food problem and lack of nutrition education among the population became even more obvious. This fact makes food and nutritional education even more valuable because it might give people with low income the crucial knowledge and the ability at least to try to choose better and still affordable food for them. (Synthesis Paper: Module 3 Final Project)

The critical and active engagement that Eileen exemplified in this synthesis paper can be compared to what Chen exemplified in community food interviews, synthesis papers, and recipe writings. As shown in the writings of Eileen and Chen, recipe writing seemed to serve as an object that enabled them to cross borders between writing and STEM courses and across boundaries of home communities and the academy through the introduction to real-world problems.

Furthermore, in her interview, while she reported that creating a 3D image for her recipe required significant time despite the support from the workshop session offered by on-campus makerspace technician staff members, Eileen explained that these technological components would be useful for her to present other projects. This awareness of transferable skills including design components was also suggested when she mentioned that her psychology class has been helped by what she experienced in this linked courses project, such as database searching, interviews, dietary analysis, and visualization at the intersection of humanities and science disciplines.

Discussion

Student experiences as shown in the cases of Chen and Eileen and faculty perceptions above allowed us see recipe writing as a boundary object that enabled us to collaborate beyond disciplinary boundaries. Nutrition courses in STEM fields and Composition courses in humanities have distinct methods of making knowledge and thus seemingly do not have direct linkages. By using recipe writing, a flexible yet solid genre, however, we could negotiate a contingent, transitional, yet collaborative space. As Anis Bawarshi (2017) stated, first-year writing courses need to actively engage students in making connections between seemingly different non-related courses: "A significant use-value for FYC can be its role in teaching students how to see and sell connections to various audiences, including audiences that may be predisposed to reject the connections" (p. 98). He further suggested that we should focus on first-year writing's "use-value" rather than "exchange-value" to offer students "opportunities to inhabit transitional spaces and consider the more complex economies involved in knowledge transfer in ways that can serve them well, well beyond FYC" (p. 98). Our case study suggests that a specific writing genre as a mediating object can create a non-hierarchical boundary space and promote potentially transformative learning between two seemingly less associated disciplines in higher education institutions.

In sum, we elaborate on this finding by describing its two features: recipe writing as a generative boundary genre and as community cultural wealth. We situated our position in a break from the conventional teaching practices of first-year writing or developmental writing or other general education programs, what Carmen Kynard (2013) described as "the liberalist construction of middle-class integration" (p. 214). This break we made across STEM and writing courses enabled students to create a space in which they radically strategized their community cultural wealth-based writings into what we call *healing technologies*. By extending the notion of community cultural wealth, we see that recipe writing can be situated as a healing technology that can provide students with tools and tactics that not only decenter knowledge and recover students' familial, cultural, and community-based resources but also contributes to communities by offering concrete strategies to broader audiences beyond classrooms. In sum, recipe writing can serve as a healing technology by offering:

- tools through which college students negotiate disciplines, languages, cultures, and modalities to transform formulaic and normative learning paths into a dynamic space
- tactics through which students, particularly students from linguistically, culturally, and racially diverse students, create healing strategies that can be shared with their home, school, and local communities, in response to the pandemic

Students in English and Nutrition courses suggest a more action-oriented approach by transforming their resources into writing with *use-value* (Bawarshi, 2017). In this sense, at the level of faculty collaboration, recipe writing as a boundary object across disciplines can be potentially expanded to a boundary object between the academy and home communities as well, which have been regarded as being in hierarchical relationship, particularly for students from less privileged groups or from racially, ethnically, linguistically, and culturally diverse backgrounds. At the level of student experience, these findings also suggest that not only what is known as "expressive writing" (Britton et al., 1975, p. 83) or personal writing, but also a transactional genre-based writing such as recipe writing, can be effectively adopted as a mediator that can guide students to situate transdisciplinary knowledge in their everyday lives and cross boundaries across diverse resources, cultural identities, languages, and modalities.

Limitations and Conclusion

Because this experiment is a pilot study of a linked courses-based partnership, it is acknowledged that the sample size of student writing, particularly the number of student research participants, is small and not enough to generalize our results. Thus, more research will be needed based on the future iterations of these collaborative linked courses and on more extensive recruitment processes. This pilot collaboration project led to a more developed partnership between writing courses and nutrition

courses, supported by MLA Humanities Innovation Grants, and maintained the sustainability of interdisciplinary approaches in the spring semester of 2021. In a revised curriculum, we provided students with a series of food justice-themed guest lectures and opportunities to do making activities across diverse modalities (including wood laser cutting and 2D vector designs) related to their recipe writing and nutrition promotion campaigns. To improve curriculum design, still, this project asks us to create more boundary object writing projects beyond recipe writing and to experiment with diverse ways of distributing and circulating students' community advocacy work. To assure confidentiality of the community food interviewees and provide students with safer learning environments, this virtual cookbook was limited to the school campus community and was not open to the entire public. A more creative way of distributing the cookbook, which can promote students' audience awareness and reciprocal interaction with local communities, could be developed in future iterations. Also, further development of more diverse and inclusive reading materials about food authored by international scholars and writers or by Black, Indigenous and People of Color (BIPOC) from North America and elsewhere are necessary to help students bring their diverse backgrounds and home cultures into classrooms.

More importantly, in future iterations, we need to build formal linkages between courses by moving beyond the "foundational level" and heading toward the "established level" (Condon & Rutz, 2012, p. 362). For example, students should be aware of this linkage before they enroll in these interdisciplinary writing and nutrition course sections. As this experiment involved a pilot collaboration, our students were informed of these curriculum structures after they started the semester. Until we explained this relationship to our students, they were not aware of this teaching design in the way that Jeffrey LaMonica's (2013) students were. Although both instructors explained this collaborative teaching approach early in the semester, it is another matter for students to understand this instructional linkage and embrace the importance and exigence of integrative learning. From the programmatic perspective, official micro-credentials and certifications including badges, certificates, designations, and other formal representations should also be considered to maximize student benefit. Lastly, these STEM and composition courses in two-year college contexts should further engage adjunct faculty under equal labor conditions, because two-year colleges heavily rely on contingent faculty to provide general education instruction. Lastly, this collaboration was limited to work between faculty members and was not extended to activities between students in English and students in Nutrition courses beyond sharing common spaces for a virtual cookbook, and thus it is open to future collaboration of students across the linked courses.

Adopting food literacy and recipe writing as a theme of community cultural wealth and a boundary object provoked cross-collaboration beyond disciplinary borders and multimodal and activist approaches to teaching and learning. This interdisciplinary project showcased how teachers can engage students in interdisciplinary or transdisciplinary writing by using a specific genre as a boundary object for the purpose of enacting community advocacy and problem-solving processes. It should be noted that the transdisciplinary collaboration that Rademaekers (2015) discussed mainly in the contexts of research universities and upper-division courses can be contextualized within a diverse range of integration levels and boundary objects through practical approaches in two-year college contexts that often do not have official writing program administrators but do have more flexibility for collaboration across core curriculums and different programs. Given that course modalities are increasingly varied, considering the material affordances and limitations of online synchronous, online asynchronous, hybrid, and face-to-face courses becomes crucial. Using the diversified notions of food literacy, nutrition literacy, and health literacy, this collaborative pedagogy can offer implications for future interdisciplinary experiments between STEM fields and writing courses in two-year colleges and other types of institutions and contribute to advancing ways of coalitional advocacy work through genrebased writing and interdisciplinary boundary objects.

Appendix A

Cross-Collaboration Sequences of Composition I and Nutrition Courses

Courses/ Timeline	August 2020-December 2020								
limenne	Aug.	Sept.		Oct.		Nov.			Dec.
English Composition I	Module	1		Module 2			*Module 3: Exploring Foo Literacy		
Biology Nutrition	Module 1	N	Module 2		Module 3		3	*Module 4: Nutrition During the Pandemic	

^{*}Collaborative Modules

Appendix B

Shared Recipe-Writing Templates for Composition I and Nutrition

1.	This recipe is specifically for	and those who pursue					
	healing in the time of COVID-19.	-					
,	T1. 1 1	(, , , , , , , , , , , , , , , , , , ,					

- 2. This recipe is suggested from _____ (your interviewee's name).
- 3. Recipe writers: _____ (your interviewee's name and your name)
- 4. Ingredients:
- 5. Methods (5-10 steps):
- 6. How does this recipe help people?
- 7. Other notes:

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