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Students' Experiences with Community in an Open Access Course

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Abstract

Online open access courses have become regular offerings of many universities. Building community and connectedness is an important part of branding and success of such offerings. Our goal was to investigate students' experiences with community in an open access course. Therefore, in this study, we explored the sense of community of 342 participants in an open access chemistry course. We found that participants did not rate a sense of community as important to them, and did not report feeling very connected to the online course. We will discuss opportunities for building community features in such courses in the future.

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Online open access courses have become regular offerings of many universities. Building community and connectedness is an important part of branding and success of such offerings. Our goal was to investigate students' experiences with community in an open access course. Therefore, in this study, we explored the sense of community of 342 participants in an open access chemistry course. We found that participants did not rate a sense of community as important to them, and did not report feeling very connected to the online course. We will discuss opportunities for building community features in such courses in the future.

INTRODUCTION

Much attention is being given to open courses because of their power to transform and make education accessible to new groups of learners: working adult students, international learners with limited access to higher education, retired individuals and lifelong learners (Caswell, Henson, Jensen, & Wiley, 2008; Selingo, 2013). The cost of providing the coursework in an open format is incurred in its development and then copying and offering the course multiple times is nearly free, which allows universities to contribute to the dream of universal education (Caswell, Henson, Jensen & Wiley, 2008). Many universities have begun to focus on providing Open Educational Resources (OERs) from library collections and publications, arranged into free open courses (Bell, Billings, Shih, & Morris Baumli, 2013). OERs can be defined in several ways; however, UNESCO's (United Nations Educational Scientific and Cultural Organization) definition is widely used. They define OER as:

> Open Educational Resources (OERs) are any type of educational materials that are in the public domain or introduced with an open license. The nature of these open materials means that anyone can legally and freely copy, use, adapt and reshare them. OERs range from textbooks to curricula, syllabi, lecture notes, assignments, tests, projects, audio, video and animation (UNESCO, 2015).

As noted previously, many of these OER materials are organized into courses. These materials can range in size, and some MOOCs could fall into the category of OERs. Cormier and Siemens (2010) noted that "a massive open online course (MOOC) is a potential byproduct of open teaching and learning" (p. 32), so it should be unsurprising to learn that MOOCs have caused educators to rethink many aspects of online coursework. Although MOOCs are a relatively new phenomenon in higher education, they have shifted perspectives on what it means to teach online. For example, there were always questions about student persistence in traditional online courses, but MOOCs have caused some to rethink whether questions of persistence and completion are relevant to those types of courses (Kolowich, 2013). These open courses have brought up questions related to traditional college experiences such as an academic calendar and alternative credentialing programs (Selingo, 2013). Many universities have expended large amounts of money to build open courses through consortia like edX and Coursera without much data yet on the expectations and preferences of students engaged in these courses (Selingo, 2013). There have also been more recent questions about the people who decide to participate in MOOCs; their experiences once they are a part of a high-enrollment, open access course; what they are looking for and who they are as students (Liyanagunawardena, Adams, & Williams. 2013). However, very few studies have investigated what it means for students to take open access courses that the creators of those courses do not define as MOOCs.

To better understand a portion of students' experiences with open online courses, we conducted a study that examined students' sense of community in an open access chemistry course. We would like to emphasize that the free, for-credit course that we evaluated was not designed to be a MOOC, but the course allowed open access and had an enrollment of approximately 8000 students. Although some of the students in the course and others outside of the course would refer to it as a MOOC, the instructor for the course was quite clear in describing it as an open access course and resource.

Purpose

MOOCs and other open access online courses are relatively new genres of online learning, yet students in such courses may experience some of the same benefits and challenges associated with traditional, limited-enrollment online courses. For example, although numerous studies show that students appreciate the flexibility of online courses, several studies also show that students sometimes feel isolated in online courses (Blackmon & Major, 2012; Zembylas, 2008; Veletsiagos & Navarrete, 2012). Much attention has been paid to the open nature of the resources, but not much on the student experience. For example, the UNESCO (2015) guidelines for OERs in higher education discuss many technical features of copyright and how to support faculty and libraries in developing OER content, but never mentions community and teaching practices while discussing these multiple ways to provide content to students. Some recent articles (Mazoue, 2013) have called on higher education to look at the student experience with open courses. Therefore, we wanted to investigate students' experiences with community in this relatively large open access online course.

Significance

Because the continued growth of online learning could also mean

the continued growth of MOOCs and open access online courses of various sizes, faculty members, administrators, and students could benefit from research-based conversations regarding students' experiences with these courses. Our study adds much-needed data to the current dialogue regarding MOOCs and open access teaching and learning, particularly data related to course community and students' experiences.

REVIEW OF THE LITERATURE

Although very few studies examine students' experiences in MOOCs and open access online courses, some of the works that are available investigate students' experiences with communities or within a community of practice (CoP) in a MOOC. For example, Saadatdoost, Sim, Mittal, Jafarkarimi, and Hee (2014) used a netnography to study community in a Coursera MOOC. More specifically, they analyzed the community forum in Coursera to understand the MOOC community or possible MOOC community of practice, and they found that learners participated in the discussion forums to make friends, get questions answered, and learn new material (Saadatdoost et al., 2014).

Other studies have alluded to the idea of community in MOOCs. For example, Kop, Fournier, and Mak's (2011) study examined the support participants provide each other in MOOCs. Students created Facebook and Twitter groups outside of the MOOC classroom as a means of peer support. Although a relatively small number of students participated in the groups, the creation of these outside groups indicated a need, at least for some of the students, for community beyond the forums provided within the course proper. Like the students in the Saadatdoost et al. study (2014), students in this study looked for ways to connect to each other. The in-course discussion forum area was the only area for open discussion between the students in the class. Instead of using a forum within a MOOC platform alone, however, they used other social networking outlets as well.

Several studies have investigated students' experiences with more traditional online courses; more specifically, numerous studies have discussed students' experiences with community in online classes. For example, Yang, Cho, Mathew, and Worth (2011) investigated how classroom community impacted the amount of effort students put into online versus face-to-face courses. Drouin (2008) examined the role students' sense of community played in their level of satisfaction with online courses and the likelihood that students would participate in future online courses. Drouin found a significant relationship between students' interactions with each other in online courses and their feeling of community. Young and Bruce (2011) also investigated community in online courses; however, they examined the connection between community and students' level of engagement in the course. Song, Singleton, Hill, & Koh (2004) found that (71%) students reported that a lack of community was a barrier to their success and satisfaction in an online course.

Instructors in Liu, Magjuka, Bonk, and Lee's (2007) study did not think that community was "relevant" to online classes because "the advantages of online learning are flexibility and self-paced learning" (p. 16). However, the study also indicated that although close to 25% of the students surveyed felt lonely while taking online classes, close to 90% of the students felt a sense of community in their online courses, and nearly 60% of students never felt lonely in the

courses presented in the study. The study also noted that students in the courses who had "preexisting community," which means that they had worked with each other before, wanted to work with each other again.

FRAMEWORK

The theoretical framework for this study is based on the work of McMillan and Chavis (1986) to measure sense of community. This framework has been applied to online learning and has been looked to as a measure of student success in online learning (Rovai, 2002) McMillian and Chavis (1986) defined community to include four elements: "membership," a feeling of belonging to the community being studied; "influence," a feeling among participants, specifically class members, that their participation matters to other members; "reinforcement," students feeling that their needs are met by participating in the community; and "shared emotional connection," students feeling an interest and connection to the community. McMillan and Chavis developed the Sense of Community Scale to measure all four sense of community elements embedded in their model. Looking at a course using the model proposed by McMillan and Chavis allows the researchers to understand the interplay of content, class activities, and instructional choices (i.e. grouping students, presenting students problems to solve, etc.). The Sense of Community Scale has been validated and applied to various groups, adults to adolescents, and has been adapted to look at community formation within online learning environments. For example, in a study on communities in online games, Chuang (2015) connected McMillan and Chavis's community index with theories related to gratifications theory and massively multiplayer online role playing games (MMORPGs).

McMillian has more recently clarified the theoretical perspectives of the sense of community body of work. In a response to a 2010 work by Nowell and Boyd (see McMillan, 2011), McMillan explained that the sense of community is a descriptive theory and is not value-laden. This framework provides a lens to explore what is happening in a community without any positive or negative attributes assigned to the data collected (McMillan, 2011). This type of descriptive theory provided us with a strong framework to explore a new technology with complex interactions and different expectations of community without comparing it to others or applying value as good or bad. Instead, it is a descriptive framework to explore students' experiences.

McMillan and Chavis's (1986) underlying model was also used as a theoretical framework for the work of Rovai (2002), who developed the Classroom Community Scale that looks specifically at learning and connectedness and is often applied to online learning contexts. In another study where he used the scale, he found a significant relationship between sense of community and cognitive engagement in the course (Rovai, 2002b). He also found that these factors influenced the persistence of the participants.

The concept of a community of practice (CoP) also informed our approach to this study. A community of practice is more than just feeling part of a course. Wenger, McDermott, and Snyder (2002) outlined that a community of practice unites participants in a shared repertoire of skills, common mission, and mutual engagement. This mutual engagement involves opportunities to solve problems and discuss topics to find solutions and complete class tasks. Communities of practice are not haphazardly created,

but must be cultivated through course activities and planned interactions. To enable the formation of communities of practice, course design must allow students opportunities to show their skills and engage in group activities to develop significant interpersonal and professional connections.

METHODS
Context
Students were enrolled in a Chemistry of Beer course that was offered in both open and for credit contexts. This was a first offering from a southwestern research level university using their own proprietary, open and for-credit course management system. The launch of the system was highly advertised locally, but due to the topic, discussion forums and online communities such as REDDIT were used for promoting the courses widely among members. The course had a total enrollment of about 8000. 437 students completed enough work to be awarded badges.

Demographics
The students in the Chemistry of Beer course were age 18-up. The most well represented age group was 30 to 35 years old (23.2%); 25 to 29 represented about 17%; and 41 to 45 accounted for another 18.6%. See Figure 1 for a full breakdown of participants' ages.

Figure 1: Age of Participants
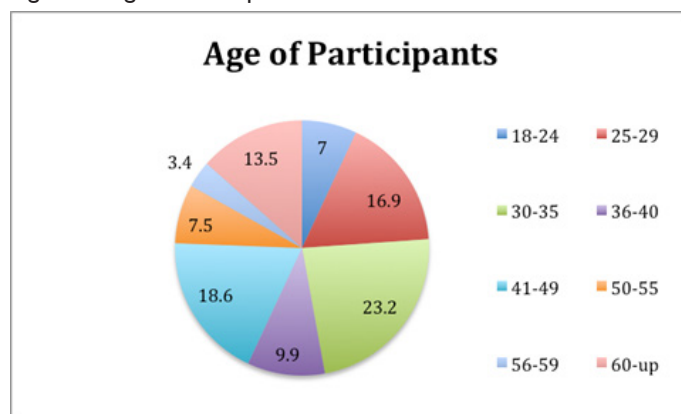
Although 42% of students had completed an online course before, 58% had never completed an online course, and 79% had never enrolled in or completed an open course. Participants joined the course after hearing about it from a variety of sources, the most common being online forums about beer making. See Figure 2.

Course participants had varying levels of knowledge and skills. For example, participants indicated they had some coursework in chemistry (one or two classes in high school or college), chemistry degrees, or degrees in other sciences. Participants also mentioned having experience with home brewing or a combination of education and experience with home brewing. A total of 441 people responded to the survey, with 295 completing all items. A total of 303 respondents completed enough course requirements to receive a final grade; 437 received badges from the open course, and 205 respondents completed the seven quizzes in the course.

Method
In addition to leveraging the model and measuring instrument

Figure 2: Participant Referrals to Open Course
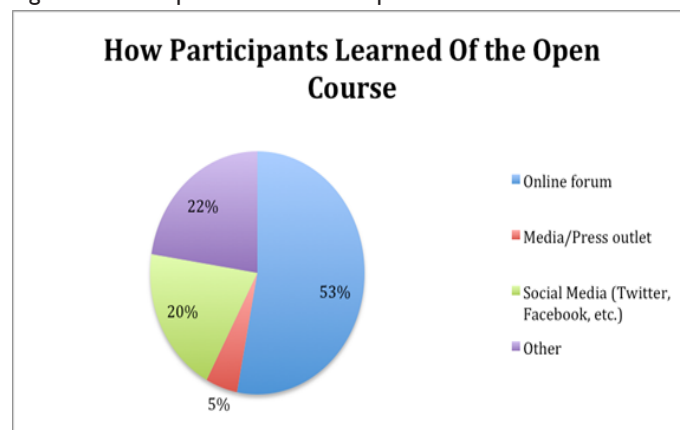
provided by McMillan and Chavis (1986), and using principles outlined in the Community of Practice model, we adopted a pragmatic worldview for the purposes of this study. With a pragmatic worldview, we focused on the research question and "[used] all approaches available to understand the problem" (Creswell, 2009). Such a mixed method mode of inquiry uses quantitative and qualitative components (Creswell, 2009). More specifically, we used what Creswell (2009) described as sequential mixed methods. We began by collecting quantitative data as a part of the community index, and we included our own open-ended questions to gather qualitative data and to further explore students' experiences with community in the course. The choice to use mixed methods was based on our desire to elucidate various points we could not glean solely through the quantitative data. We used Qualtrics to format and send the survey link to students in the course. We sent the link to students three times over the course of the semester. They received no incentive to complete the survey beyond encouragement to participate so as to improve the experiences of future students. Though students were sent email reminders regarding the survey, each student was asked to complete the survey only once. All participants of the course were sent the request to complete the survey using the online communication system, and their login emails were later triangulated to see how many students had completed the course activities.

Quantitative Process
For the quantitative aspects of the study, we used demographics and two scales to measure the online community experience of participants. The first scale, the 20-item Classroom Community Scale (Rovai, 2002), contains 20 positively and negatively worded items that seek to measure sense of community in a learning environment. The scale has two subscales, Connectedness and Learning, with 10 items each. These Likert-type items range from 1 – strongly disagree to 5 – strongly agree. This scale was developed and validated using online learning communities (375 students in 28 different online courses) and was found to be valid and reliable (Rovai, 2002).

The second scale we used was the Sense of Community Index 2 (SCI-2) (Chavis, Lee, & Acosta, 2008). This scale is a modification of the McMillan and Chavis (1986) sense of community scale that has been used widely and tested for validity, fit, and factor loading in various populations (Chipuer & Pretty,1999). The Sense of Community Index 2 has four subscales that measure a participant's

sense of community membership, influence in a community, how the community is meeting the participant's needs, and a self-reported sense of shared emotional connection to the community. These Likert-type items have values from 0 (not at all) to 3 (completely). Each subscale has 6 items. For example, one item from the needs subscale reads, "I get important needs of mine met because I am part of this community." The community measurement subscale includes the statement, "I put a lot of time and effort into being a member of this community." The combined four scales comprise the total sense of community value. The scale begins with an overarching question, "How important is it to you to feel a sense of community with other community members?" This item had a range of 1 (I prefer not to be part of this community) to 6 (very important).

Qualitative Process

For the qualitative aspects of the study, we used pragmatic qualitative research. According to Savin-Baden and Major (2013), "[r]esearchers may take up a pragmatic approach when they want to provide a descriptive account from an interpretive perspective and believe that no other research approach...presents a better approach for examining a particular research topic and question..." (p. 171). We selected pragmatic qualitative research because no other mode of qualitative inquiry fit the goals of our mixed methods study. Our goal was to extend our understanding of participants' experiences with community in an open access course by giving participants the opportunity to relay those experiences through open-ended questions. Savin-Baden and Major (2013) stated that pragmatic qualitative research "marks the meeting point of description and interpretation, in which description involves presentation of facts, feelings and experiences in the everyday language of participants, as interpreted by the researcher" (p. 172). Following this precept, we allowed participants to share their experiences in their own words, then analyzed and interpreted that data to identify the various themes.

When analyzing the qualitative data, one of the authors went through the initial coding process and recorded the various themes. Those initial themes were used as a coding key for a joint coding session wherein both authors coded the data together as an added measure of validity and reliability. The figure below details the steps of the qualitative data analysis process:

Figure 3. Coding Process	
Step 1	One researcher reviewed the qualitative data and recorded themes based on that cursory coding process
Step 2	The initial themes were used as a key for co-coding involving both researchers
Step 3	Both researchers coded the qualitative data and compared those themes to the themes on the coding key
Step 4	Both researchers determined if the codes on the coding key needed adjustment, had remained the same, or required expansion to derive valid qualitative results of the study
Step 5	Themes were finalized and recorded in the Results section of the paper

During Step 4, the authors decided to remove two of the subtopics that appeared in Step 3: "Language barriers" and "Different style of brewing." Those subtopics were removed because each was expressed by one participant, meaning one participant mentioned "language barriers" and one participant mentioned a "different style of brewing." The other subtopics were expressed by numerous participants. Although the removed subtopics are valuable contributions by two participants, they could not be considered themes. The updated coding chart is as follows:

Figure 4. Cursory Themes	
Cursory Theme 1	**Reasons for Taking the Course**
	Brew better beer/Improve brewing skills
	Learn more about chemistry
	Learn more about beer
	Learn more about chemistry as it related to beer
	Career growth
Cursory Theme 2	**Perceptions of Contributions to Course Community**
	Complete assignments
	Complete quizzes
	Participation in discussion
Cursory Theme 3	**Being "Blocked" from the Community**
	Technology challenges (Chrome, iPad interface problems, not familiar with course technology/tools)
	Lack of chemistry knowledge
	No response to questions about course or quizzes
Cursory Theme 4	**Students' Expectations of Course Community**
	Did not expect community in an open access course
	Did not desire community in the course
Cursory Theme 5	**The Impact of Time on Course Community**
	Did not have time (work, family, other obligations)
	Did not make time (did not take course seriously)

These themes were finalized by the authors and are addressed in the Results section of our paper, as noted in Step 5.

RESULTS
Quantitative Results

The Classroom Community Scale (Rovai, 2002) has two scales, one measuring Connectedness and the other measuring Learning. Table 1 summarizes the results of the Classroom Community Scale. Overall, on a scale of 1 to 5, participants reported a medium to low sense of community with a mean value of 2.59. The value participants assigned for connectedness was 2.87. That number was higher than the value participants assigned for learning, which was 2.32.

TABLE 1. Classroom Community Scale Results			
	N	Mean	Std. Deviation
Classroom Community Scale	337	2.59	.51
Connectedness	342	2.87	.54
Learning	342	2.32	.58
Valid N (listwise)	337		

The Sense of Community Index 2 (SCI-2) (Chavis, Lee, & Acosta, 2008) started with an overarching question: "How important is it to you to feel a sense of community with other community members?" On a scale of 1 to 6, 345 respondents had a mean of 3.28 with a std dev of 1.11. Their responses on the Overall Community scale were a mean of .84. The values reported for the scale on needs derived a mean value of 1.34, membership was .53, influence was .85, and shared emotional connection was .64. See the full results in Table 2.

TABLE 2. Results of the SCI-2 Scale			
	n	Mean	Std. Deviation
Importance of Community	345	3.28	1.11
Overall Community Scale	301	.84	.47
Needs Subscale	324	1.34	.64
Membership Subscale	329	.53	.40
Influence Subscale	320	.85	.51
Shared Emotional Connection Subscale	317	.64	.60

Qualitative Results

In order to share our qualitative results, we share with you the categories that were developed according to the method discussed above. We include quotes from participant responses in order to illustrate the data that formed the categories and to help the reader form a rich idea of the perspectives that were represented in each category.

Reasons for Taking the Course

When asked why they took the course, participants provided a number of responses. While some participants took the Chemistry of Beer course out of general interest in open access courses and the course topic, participants also expressed a desire to improve their home brewing skills/brew better beer and increase their knowledge of chemistry or science as related to beer. Some participants stated that they wanted to use the course to help them further their careers in brewing. For example, one participant stated, "I wish to open my own microbrewery in the UK, and as a Biology teacher and long time [home] brewer it seemed a logical first step!" The most frequently cited reason for taking the course (108) was a general interest in beer and brewing. Ninety participants discussed their interest in chemistry as it relates to beer. Thirty-four participants discussed taking the course to advance their careers, and their career goals included the following: opening a microbrewery in the future, pursuing a degree in beer making, advancing an existing career in the beer industry. One hundred eight students said they took the course specifically because of their interest in beer or beer brewing, 31 said make "better beer," seven said chemistry, 75 said they were curious or wanted personal growth (learning). For example, one participant stated, "… I wanted to challenge my brain and expand on my knowledge of beer and I got more than I expected…." Overall, students indicated that they would take another open course: 315 said yes, 28 said maybe, and only 11 said no.

Perceptions of Contributions to Course Community

Participants were given options on the survey to indicate how much they believed they had contributed to the course using choices that represented actual choices they could make in the course (i.e. taking quizzes, posting to discussion forums, etc.). Moreover, in case the type of contribution they felt they made was not listed, participants were given the option of "Other" to describe their contributions to the course. The most common choices participants selected to describe their contributions to the course were as follows: "complete assignments" (328) and "complete quizzes" (330); notably, only 84 survey respondents listed participating in discussion forums as a contribution they made to the course community.

The participants who selected "Other" also noted that they discussed the course with other brewers, family members, friends, and others taking the course. However, those discussions took place offline. One person participated in the offline discussion via a Twitter hashtag group.

Being "blocked" from the Community

There were a number of reasons participants cited for being blocked from the course community: technology challenges, lack of chemistry knowledge, and lack of response to questions they posed in the discussion forum about course quizzes.

Technology Challenges

One participant indicated that several technology challenges hindered her/his participation in the course community. The participant stated:

> Most [challenges] relate to IT issues. e.g. inability to view videos offline, and hard to print the written material to read and refer back to. The community aspects could be improved with the grouping. I've joined a group but there are not facilities for a forum for that group. It could also encourage f2f meetings with group members. e.g. I'd love to grab a beer and talk about the content of the course with other members from Sydney, but the site doesn't facilitate that.

Another participant indicated enjoying the course experience overall, but noticed a few technology-related issues:

> It is a good course. I develop distance learning education material and software... I noticed that there continued to be small glitches in the mobile version of the course... not a big deal as it was either fixed or I used a standard computer to complete things. In terms of the content, it was good.

Similarly, another participant enjoyed the course despite challenges with technology. The challenges for this participant, however, were more personal:

> I have a lack of knowledge in using my computer to be involved with the community. That is my problem, what to click in order to talk to someone or add to the conversation. Otherwise I just enjoy learning and reading what others say.

TABLE 3. Contributions to the Course		
How did I contribute to the course?	n who chose	n who did not choose
Complete assignments	328	138
Complete quizzes	330	136
Participate in the discussion forum	84	342
Other	55	41

Lack of Chemistry Knowledge

Some participants' lack of chemistry knowledge prohibited them from participating in the class. For example, one participant stated, "I participated only briefly in the course and stopped because I wasn't able to keep up with the chemistry…" Similarly, another participant wrote, "I was completely unprepared for the chemistry; I don't think I read the prerequisites deeply enough. Far too advanced for me, sadly. Great course, though." Although some participants expected to participate in the course more, their lack of chemistry knowledge hindered that participation. For example, one participant stated, "I am disappointed I fell so far behind. It was difficult without any Chem since High School, but I was hanging on through the first 5-7 weeks." Another participant shared the following statement:

> The one piece of feedback that I would give is that it would be helpful to have an optional, preintroductory lesson that is a summary of chemical concepts and notation that is used in the course. I felt that some of the chemistry was a little over my head and took a lot of work to understand.

Other participants engaged in limited participation because of their lack of chemistry knowledge: "After the first quiz, I realized I didn't have enough prior knowledge of organic chemistry, so I decided to just go through the course without taking the [quizzes]."

No Response to Questions Posed About Course Quizzes

In a few instances, there seemed to be a relationship between lack of chemistry knowledge and a participant receiving no response to questions posed about course quizzes. That connection seems automatic—students who do not feel comfortable with the course material would likely ask questions about the material. In the aforementioned instances, however, each time a participant mentioned not having questions answered, that participant almost always also mentioned a lack of chemistry knowledge. For example, one participant stated that the course "Moved too fast in the chemistry sections and every time I questioned a test question I was ignored." Likewise, another participant said:

> I was warned that I would need to understand organic chemistry but I am taking the course anyway. Some if it [I] understand and some of it is completely over my head. I hope that the parts I don't understand will not keep me from understanding the things that I think are important about brewing better beer. I usually think of a question I wished I had asked in the section after where it should have been asked. The couple of times I have asked a question it went unanswered I guess because nobody saw the question since we had gone on to the next section. I have learned a lot of things I wondered about before the course and some things I didn't even know I wanted to learn.

Students' Expectations of Course Community

Comments from students regarding their expectations of course community included remarks regarding the class size, their having had no expectations of community in an online environment, and their lack of desire for community in the course.

Class Size Too Big

Some students felt overwhelmed by the size of the course and indicated that the class size negatively impacted their interaction with the course community. For example, one student stated:

> There are too many people taking the course for the professor to provide any meaningful interaction. I enrolled under the assumption that I would be viewing the course streaming online from a classroom and could perhaps ask questions like when you audit a class. You can't learn if you can't ask questions and with about 8,000 people enrolled initially and at this point still 1,000……. I guess my expectations were unrealistic.

While the aforementioned student's comment indicates an obvious concern about the size of the course, the comment also suggests that the student had some expectation of course community. Another participant wrote: "Overall, [the course] was enjoyable, but I wish we had known from the beginning what the current enrollment number was. Knowing that there were 9,000+ students would have changed expectations for interaction and responsiveness." Again, the student seemed to enter the course with the expectation of community and felt that he or she would have shifted those expectations given earlier knowledge regarding class size.

Did Not Expect Community in an Online Environment

Some participants could not understand why they would be asked about community in an online environment, presumably because they did not think community was possible in an online course. For example, one participant stated:

> This whole section of the survey was not applicable to me since I am not on campus and the only community is online -which at my age I do not consider community. Of course as I have learned with my son, Academia have a whole new world they sometime[s] live in and what community means to them may be entirely different.

One student wrote, "As an older learner, I'm a little surprised at the emphasis on the community and the forum. I suspect this is a desire of younger learners who are so involved in forums and social media." Both participants lacked any expectation of community in an online environment.

Did Not Desire Community in the Course

Several participants indicated that they had no desire for community in the course. A participant stated:

> I am more of an independent learner, and therefore have not reached out to interact with others taking the course. I have seen some of the comments and discussions through the course site though and they all seem very insightful and collaborative. I feel that if I chose to become more involved with the other members that it would be a positive experience.

Likewise, another participant echoed the idea that community was present, but indicated s/he had chosen not to participate in

that community, stating, "The course has been fine, I haven't been as involved in the 'community' aspect of the course as I possibly could be but that has been by my own choice and is not a reflection on the communit[y] or its leaders." Other participants provided statements indicating they did not see a connection between signing up for the course and expecting community. For example, one participant said, "I feel guilty now, not getting involved with the 'community.' To me, this was just an opportunity to further my understanding of the chemistry of beer; not to join a community. I already have several brew clubs that I participate actively with." Another participant shared the following: "…[A]ll these questions about the community, most of them I've answered not at all. But this is in no way a failing in the course instructors. It's just that community is not what I was looking for in this course." Similarly, another participant stated:

> There were a lot of questions in this survey about community, so I feel it's important to you. Although I'm a very active member in other communities, I… was not encouraged to participate in this one, I'm also not looking to join a community when I'm doing an online course. So if that was part of the goal of this course, it was lost on me.

Several other participants expressed a similar sentiment, stating, "I do have a close connection with the brewing community in general, but was taking this course for the academic knowledge, not the social aspects," and "Not sure why this survey is interested in the 'community.' I'm taking the course to learn - not to be social."

The Impact of Time on Course Community
Time had an impact on the way students experienced community in the course. Participants either did not have time to participate in the course or they chose not to make time to participate in the course.

Did Not Have Time (Work, Family, Other Obligations)
Some students continued participating in the course at their own paces because of obligations outside of the course. One participant noted:

> As someone that is busy with their family… this course allows me to keep learning at my own pace and is an opportunity I value a great deal. I may not have all assignments in on time, or be busy on the discussion boards, but the ability to learn this information is great.

Another participant expressed a similar sentiment:

> I never thought I would go back to study again (more than IT-related, work related) so this has opened up a whole new world of learning. The online nature makes it so much easier with full time job as a Manager in IT, wife and three kids. I have not had the time to involve me more in the community but I have got a lot of help from the community as we are so many so the question one has is almost always already answered.

Limited time also impacted another participant who wrote, "My participation has been fairly nominal and I haven't spent the time I'd like in the course." The combination of lack of chemistry knowledge, a theme discussed above, and limited time impacted some participants. For example, one student noted:

> I came into this course with very little understanding of biochemistry and organic chemistry. As a result, some of the subjects discussed were over my head a lot of the time. I was able to study on some more of the basics in my own time to help with the class, but it was difficult to find the time. Still, the course was very educational and I'm glad I took it.

Did Not Make Time (Did Not Take Course Seriously)
For some participants, the nature of the course (free, open access) influenced the level of effort they chose to devote to the class. For example, one participant stated, "…[m]y participation was very limited. I found that when there was no financial incentive I dropped the course very quickly and did not put any effort in."

DISCUSSION
The stories and the numbers from the current study provide valuable information about students' expectations of and experiences with community in an open access course. Furthermore, the current study also indicates that in some areas, instructors and students are still tussling with the idea of what MOOCs actually are: Does professorial intent make the course a MOOC? If the course was not designed as a MOOC but has participant numbers and a delivery format that are consistent with MOOCs, then does that make the course a MOOC? As third-party providers and institutions continue to make these courses available, having a mutual understanding of what the courses are and what makes the courses what they are will be beneficial to the instructors and the students.

Many aspects of our study were consistent with extant literature on MOOCs specifically and online courses generally. For example, 10 people who participated in our study already had STEM degrees and wanted to link that to their hobby. Several other participants had advanced degrees. Kolowich (2013) noted that a Penn State study of a MOOC showed that many participants already had two- or four-year degrees (40 percent) and advanced degrees (44 percent). Our findings about degree demographics for participants in this open access course are similar, as seen in Figure 1.

Both quantitative scales, the Classroom Community Scale and the SCI-2, were influenced by McMillan & Chavis (1986) and were compatible measures looking at similar characteristics of learners. In their responses to the Sense of Community Index (Rovai, 2002), participants did not report having a strong sense of community in the course. They felt slightly connected, but thought that their learning was more individual than community based. In response to the SCI-2 overall question, "[h]ow important is it to you to feel a sense of community with other community members?", learners indicated they only moderately valued a sense of community in the online course. The subscales indicated that students felt that their needs were well met (1.34) on a scale of 0 to 3. However, participants did not especially feel they were members of the community (.53), nor did they report feeling particularly emotionally connected (.64); however, they did feel moderately more influential in the online learning community (.85).

Students' responses were consistent across the questionnaire. Part of their rating of community may have been related to their expectations. Students in the course were asked about their

expectations of interaction with faculty and other students. When asked to compare their experiences with their expectations, most students felt their expectations were met or greatly exceeded for interaction with the professor. When asked how their experiences interacting with other students matched their expectations, most students reported that the expectations and experiences matched because students either had no expectations or they were not interested in interacting with other students. For example, one participant explained, "(my expectations and experience were [the]) same but that's because I did not care to take the time." If students had no expectation or want for community, it is unlikely that they would put in the time and effort required to develop or foster community in a course. Acknowledging that the learners only moderately felt that a need for community was important (as shown as the overall question on the SCI-2), it is not surprising that they did not value community features or feel a great sense of community. This conclusion aligns with the findings of Liu, Magjuka, Bonk, and Lee (2007).

Community was not a communicated expectation of the course. The large enrollment in the course may have also played a role in participants' low expectation of community. Students may have assumed that a feeling of community would be difficult in such a large course. Highlighting community features may help learners to connect with each other and to assign high value to community interactions in the online course. In addition to communicating community expectations, instructors and instructional designers may find that encouraging students to reflect on their own expectations in relation to course expectations could improve the student experience. Many students wrote that they regretted not participating more in the "community." We might ask how the community was made available to them and whether they were given an opportunity to adjust their preconceptions or views that online learning necessarily involves completely independent learning.

As shown by the qualitative results, many of the participants came to this course from other established communities related to beer and beer making. They may have felt more connected to their existing community membership and relied on those communities for their sense of connectedness and community learning. This, too, is similar to findings in Liu, Magjuka, Bonk, and Lee (2007), which showed that students who had enjoyed membership in preexisting communities wanted to work with each other again, within those same communities. Future studies should explore the interaction among existing community memberships as compared to community formation in an online open course. Researchers may also wish to look at how interactions in the preexisting groups differ from interactions that occur in the online course groups to better understand student interaction and community needs.

From our study, we learned that different course members in the Chemistry of Beer course had different expectations of community. For example, one student requested that more participation be "forced." Conversely, another wrote:

> The idea of community seems overdone. I am taking this course for information and to check my previous knowledge. I think the chemistry part of beer making is challenging and wonder if the brewing industry uses very much of it. Some brew masters I have talked with are more like chefs in that they know how to bake and prepare food, but know very little about the chemistry. Obviously, chemistry is important

yet, as I said, this seems like too much information for the task.

The qualitative data also indicated that although some students felt that their questions about the course were addressed via the community discussion forum, others continued to feel disconnected from the community because their particular questions were not answered.

Both our qualitative and quantitative findings have implications for understanding the future development of MOOCs and other open access courses. The extant literature on online courses indicated that students often felt isolated. Those courses were not MOOCs; in fact, many of those courses during that time had course numbers in the 20s and 30s. If students felt isolated and had a lack of community in classes with 20 or 30 students online, then understanding if students have that same feeling in classes in the hundreds or thousands is an important task. What we found is that while some students were overwhelmed with the number of people in the class, other students did not expect a sense of community because the course is online— which tells us about their perspectives on the course in question and online courses more generally. Some of the students were adamant about not wanting community and saw their experience in the open course as a personal learning experience. It leads us to the question, are some open courses viewed more like a personal information search rather than a membership or community experience?

By gathering data on students' participation in forums, quizzes, and the like in conjunction with a question about community, we learned what participants equate with being community participants. For some students, contributing to the course may mean that they are contributing to the course community; for other students, completing quizzes and assignments may mean that they are just fulfilling requirements and not connecting to the overall course community. In other instances, students may see community as responding to (and receiving responses from) others in the discussion area. Again, however, those interactions could also be viewed as a part of being in a class, and not necessarily being a part of a course community. For future MOOC and open access course development, the data mean that instructors, researchers, and administrators could benefit from more data on why students enroll in these types of courses. If students do not see the MOOC space as a place for community, then that could mean that any efforts to encourage community in those courses could be viewed as unnecessary to those students, even counterproductive. However, if students see these large courses as a space for community, and even if they find community there by surprise, as did some of the participants in the current study, then that could bode well for their experiences in the course and the company, institution, and/or instructor providing the course.

FUTURE STUDIES AND LIMITATIONS

The topic of course we studied was the Chemistry of Beer. While this course had a prerequisite of basic chemistry coursework, our data indicate that most participants came to the course based on their interest in brewing beer. Their interest may have provided intrinsic motivation to study the topic, which could have skewed the results. However, as more open courses are offered, their format provides opportunities for professors and instructional designers to work together to deliver boutique courses that represent particular expertise and also attract participants based on their various

interests. The reduced cost of offering developed courses multiple times allows faculty to use these courses to share personal passions and also provide the courses as an invitation to future study, even in traditional programs (Mauzoue, 2013).

This study was exploratory. The Sense of Community framework allowed us to explore what was occurring in the course without assigning values (McMillan, 2011), and the open ended questions allowed us to have the participants assign value to their experiences. We asked many questions in an open format, unsure of how participants would answer and intentionally unwilling to limit their contributions. We did not collect academic artifacts from participants, and the only demographic data we collected are those data shown in the earlier sections of the study. We did not ask participants if they were taking the course for credit and instead focused on their general responses to why they enrolled in the course. In retrospect, we could have added the question about course credit to that section of the survey. In future studies, we would use our results to create categorical responses to allow for comparison, including cross data analysis between expectations and actual experience. Also, because some participants used multiple email addresses—one connected to the survey and one connected to the course—we could not directly correlate survey responses with course completion. For future work, however, researchers could ask about course completion in the survey, as the correlation between course completion and survey completion could be an informative one. Our developed categories contribute to the field by advancing the development of future instruments to study the MOOC or open course experience with larger populations. Future studies of these boutique courses could examine how/if certain elements of MOOCs or open access courses help establish community, resulting in a compilation of best practices. Because completion rates are often brought up when discussing MOOCs, researchers could also examine the possible effect feelings of community have on completion rates. There is also room for more qualitative data related to MOOCs. Our study showed, as a previous study had, that students did not expect to have a sense of community in their online course. However, it would be valuable to know why students do not expect to have a sense of community in MOOCs and/or in traditional online courses. It would also be of interest to see if the instructor defined clear community expectations or allowed students to define participation and ground rules for the course before delving into content. This kind of clear communication or scaffolded norm building could produce very different community and expectations of community. Another avenue for future study could involve examining students' sense of community based on the sources provided to the community, particularly open access resources and resources provided by other members of the community. The study could investigate how students perceive the shared knowledge based on their own knowledge of the topic, in addition to their acceptance of that knowledge.

CONCLUSION

The discussion about MOOCs, OERs and other open learning options has migrated to questions of sustainability or if the MOOC movement is dead (Selingo, 2014). Selingo (2014) reminds readers that MOOCs and other open access courses are in their infancy and much like the internet itself will undergo changes and require critique and reflection. Many organizations continue to encourage OER development to provide higher education opportunities to those for

whom they were not accessible before (UNESCO, 2015). Through the results of our study, we found that community is not well established in these open online courses, and by adding community supports, open access courses could contribute to the dream of universal education (Caswell, Henson, Jensen, and Wiley, 2008). This may be the next stage in OER course development, taking a deeper look at the student experience, and we found that measuring students' sense of community is a promising place to begin. By developing a better understanding of students' expectations and sense of community in open courses, instructional designers, researchers, and administrators can better design these learning experiences for maximal impact and return on investment.

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