

STEMS², Social Presence and Sense of Place in a Hybrid Distance Program

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What happens when a program rooted in place-based education (PBE) is delivered via a hybrid model? This paper shares findings from a qualitative case study with the first cohort of students at the University of Hawai'i at Mānoa pursuing a Master of Education in Curriculum Studies with a concentration in STEMS² (O'Neill, Ah Sam, Jumalon, Stuart, Enriquez, in press) designed to understand student perceptions of their teaching and learning experiences in the program. Data was collected through questionnaires and focus groups. The analysis was framed by Community of Inquiry Framework developed by Garrison, Anderson and Archer (2000) with focus on social presence and sense of place. The results revealed how the hybrid model combining face-to-face and online instruction helped the students and instructors connect to the curriculum and each other, resulting in rich educational experiences that promoted both personal and professional growth.

Keywords: Distance education, Hybrid learning, Sense of place, Social presence, STEMS²

Introduction

Engaging students is a great challenge in any classroom. Online classes amplify these challenges where feelings of isolation and confusion contribute to student drop out (Northcote, 2008; Rovai & Jordan, 2004). Educators turn to hybrid models combining online and face-to-face (FTF) classes to address the shortcomings of online instruction. The combination enables community building, increasing the quality of student-faculty contact which leads to improved student motivation, persistence and satisfaction (Martyn, 2003). While sense of community is important, attention to sense of place is critical in establishing the sense of identity held by individual students and teachers in order to promote active participation and discourage students from disengaging (Northcote, 2008).

Recognizing the importance of sense of place to place-based-education (PBE) and hybrid instruction, this paper presents a subset of findings from a qualitative case study (Yu, 2016) on students enrolled in a 13-month hybrid Master of Education program with a concentration in STEMS² (O'Neill, Ah Sam, Jumalon, Stuart, Enriquez, in press). The study sought to answer two research questions:

- 1) What are student perceptions of their hybrid teaching and learning experiences in STEMS²?
- 2) Which teaching and learning practices to students perceive to be effective and what opportunities do they suggest for improvement?

The findings framed with Garrison, Anderson and Archer's (2000) Community of Inquiry (CoI) Framework have been limited to sense of place and social presence.

STEMS²

Developed by Tara O'Neill, Associate Professor of Science Education, through her experiences with Hōkūle'a and A'o Hawai'i, STEMS² is a construct, pedagogy and a master's concentration at the University of Hawai'i at Mānoa. Guided by STEM, multicultural, sense of place and place-based, and indigenous education philosophies, the construct integrates science, technology, engineering and math (STEM) with the social sciences and sense of place (S²). STEMS² involves studying STEM within the context of society and place, giving STEM purpose. By cultivating relationships to place, and connections between academic content and the people and places in the community STEMS² educators seek to instill a sense of civic responsibility and encourage their students to take action. Studying the world through a STEMS² lens means that we critically think about how STEM is being used and should be used to bring about change in our community. The opportunities STEMS² provides for students to connect to the content, the community, and then back to their own lives results in increasing student academic engagement and achievement (O'Neill, et al., in press).

As a pedagogy, STEMS² education utilizes place-based and project-based learning, encouraging students to draw on their sense of self as local and global citizens to emulate the processes of professions in a variety of fields (i.e. historians, engineers, etc.) to design solutions to real problems in their communities (O'Neill et al., in press). Learning journeys are a critical component of the STEMS² pedagogy. Like field trips, learning journeys seek to create opportunities for students to learn through first-hand experiences outside the classroom. Learning journeys, however, differ from the traditional field trip because the place- and culture-based experiences are meant to be the starting point for learning that extends beyond the time spent at a particular site through individual and group reflection and the connection of multiple experiences strung together in the STEMS² program and beyond. In addition to STEM concepts, the learning journeys are focused on reinforcing values such as community, conservation, stewardship, indigenous knowledge, social justice, and leadership. The places visited become partners, and activities are often paired with a service-learning component, further allowing the students to build relationships with people and place by giving back to the host organization by helping with projects that sustain the organization's mission. Students are encouraged to learn from each other, not just instructors or leaders from the host organization.

The master's concentration utilized a cohort model and hybrid delivery that combines face-to-face (F2F) and online instruction in a 13-month master's program. While most of the other hybrid programs in the College of Education spread F2F class sessions evenly throughout each semester, the unique hybrid delivery model for the four-semester program began with a three-week F2F in the summer, synchronous online courses in the fall and spring and concluded with another three-week F2F session in the following summer.

In STEMS², the summer learning journeys followed a progression used at Sunnyside Environmental School that started with personal experiences, moved to external environments, delved deeper to explore roots and relationships, and then considered the experiences of indigenous peoples (Smith and Sobel, 2010). Students began by writing a “Where I’m From” poem, examining and sharing their personal heritage and experiences, then visited various sites on O‘ahu including the Ala Wai Canal and Coconut Island exploring the external environment. Exploring roots and relationships, the students learned about water quality, oceanography and coral bleaching affecting those areas, and visited Waikalua Loko I‘a, a native Hawaiian fishpond, in order to consider the experiences of indigenous peoples and learn about native Hawaiian sustainability practices. The service learning project at Waikalua Loko I‘a involved the removal of invasive algae from the fishpond. In the process of helping the host organization, students learned to how to identify invasive algae and how algae affect the water quality in the pond.

By spending full eight-hour days together on O‘ahu, then being together for 24 hours a day for nine days traveling around Hawai‘i island exploring watersheds, cultural sites and observatories, students developed relationships with each other, not just the people and places they visited. On Hawai‘i island, students were divided into small groups that shared the responsibility for preparing meals for the entire cohort. Being away from family, friends and work obligations meant that students spent downtime together, socializing through games, singing, and other activities to relax and pass time. Personal interactions laid the foundation for daily sharing with the group regarding the most valuable learning moments and various reflections written in their STEMS² notebooks. Students engaged in discourse that allowed them to learn from the collective experience.

In the fall and spring semesters, classes were held online, meeting once per week for two and a half hours on Blackboard Collaborate (version 12.6), a web conferencing tool. The online classes built upon the experiences in the summer to assist students in better understanding the theoretical frameworks that make up the STEMS² construct and pedagogy, which were the basis for the learning journeys. Blackboard Collaborate allowed for guest speakers to supplement the readings and present to the class as a whole. The breakout room feature also allowed students to participate in small group discussions.

Online instruction was further supported by Lulima, the University of Hawai‘i’s customization of Sakai (<https://www.sakaiproject.org>), a free and open source online course management tool. Lulima was used extensively in STEMS² to facilitate communication, share course readings, and submit assignments. Students were often required to respond other students’ assignments with thoughts and feedback using forums and discussions tools. The online learning supported the final semester where students were given opportunities to apply what they learned in the first three semesters by taking a leadership role in planning parts of the learning journey.

Sense of Place

Sense of place is at the forefront of STEMS². It honors the special character of a place and defines who we are in that place. Gruenewald’s (2003) statement that “people make places and

that places make people” (p. 621), is critical to the STEMS² construct that encourages students to solve real-world problems in their communities by drawing on their STEM knowledge in addition to their personal experiences and culture.

This is especially important in Hawai‘i where Hawaiian culture and tradition connects people to the land through its landscape, genealogy, and history (Kana‘iapuni & Malone, 2006). Hawaiian mo‘olelo (traditional legends) tell us that Papahānaumoku, earth mother, and Wākea, sky father, gave birth to the Hawaiian Islands and to kalo (taro) from which the Hawaiian people originated. The connection to ‘aina (land) extends beyond the need to care for the environment, to the need to care for one’s ancestors.

Linking various subjects (science, math, language, social studies, etc.) to the work of people, and places in the community is central to the goals of the STEMS². These connections promote civic responsibility and push students to become advocates in their communities. Michael Umphrey, a Montana educator, stated that children will be more committed to caring for the community when it is seen as the source of who they are (as cited in Smith & Sobel, 2010). This commitment to caring is accomplished when students get to know about their community’s members, feel an attachment to its places, and are proud of their roots (Smith & Sobel, 2010).

Thus, students in the STEMS² program spent the first three weeks of the program engaged in a summer learning journey, visiting more than a dozen different locations on O‘ahu and Hawai‘i islands learning about STEMS² from people committed to building their communities and caring for their places. In exploring their own relationships with places, students discovered different ways to incorporate sense of place in instruction. Gruenewald (2003) tells us that “places teach us who, what and where we are, as well as how we might live our lives” (p. 636). Using Gruenewald’s construct, the classroom as a place, has the power to shape student’s identities and set paths for how they live beyond the classroom.

Social Presence

In order to build community in STEMS², it is important that each teacher and student establish their sense of identity because it shapes their sense of place and serves as a prerequisite for sense of community (Northcote, 2008). Brook and Oliver stressed the importance of sense of place in online communities in order to maximize the quality of student learning (as cited in Northcote, 2008). Northcote, Garrison, Anderson, and Archer (2000) also recognize sense of place and sense of community as being essential to worthwhile learning experiences, and add that the two cannot be separated from each other.

In their Community of Inquiry (CoI) framework, Garrison, Anderson and Archer (2000), present: a worthwhile educational experience is embedded within a Community of Inquiry that is composed of teachers and students—the key participants in the educational process. The model of this Community of Inquiry assumes that learning occurs within the Community through the interaction of three core elements... cognitive presence, social presence, and teaching presence. (p. 88)

Within the CoI framework, social presence represents the students' ability to be themselves in both F2F and online settings, and it ensures an environment of trust, open communication and community (Vaughan, Cleveland-Innes, & Garrison, 2013).

Social presence contributes to collaborative learning environments by supporting questioning, reflection, and discourse (Vaughan, Cleveland-Innes, & Garrison, 2013). In order for teachers and students to learn from each other, the classroom must be a safe learning environment where ideas can be openly expressed. Garrison, Anderson, and Archer (2000) assert that social presence is critical to the success of the educational experience in programs like STEMS² where "it is important that participants find the interaction in the group enjoyable and personally fulfilling so that they will remain in the cohort of learners for the duration of the program" (p. 89).

Methods

This paper presents findings from a qualitative case study (Yu, 2016) designed to gain a deeper understanding of hybrid teaching and learning by examining student perceptions of their experiences in the STEMS² program. Attitudes and opinions of students in the first STEMS² cohort were solicited in two ways during the students' third semester: a) questionnaires, and b) focus groups interviews. The cohort contained a mix of 26 individuals with various roles in education: elementary, middle and high school teachers in public, private and charter schools, curriculum coordinators, and employees of non-profit organizations and institutions of higher education (IHE). Most of the students lived and worked in various urban and rural areas of O'ahu although two lived on the neighbor islands.

All enrolled students were invited to participate by responding to an electronic questionnaire distributed via Google Forms. The first section asked questions about general background information. The second section contained seven Likert-type questions that asked students about their comfort, satisfaction, engagement and sense of community during their STEMS² experiences in the summer, fall and spring. A space was provided after each question for participants to add explanations for the assigned rating if desired. The questionnaire concluded with an opportunity for participants to provide a narrative response with regard to most memorable experiences in STEMS², suggested changes to program, ideal learning environment, and reasons for choosing the program. Twenty-one of 26 enrolled students completed a questionnaire.

In addition, nine of the 21 students also participated in a focus group interview. Seven additional volunteered to participate in a focus group, but were not able due to scheduling conflicts. Students met in groups of two to five people for semi-structured interviews. To accommodate students' schedules and personal preferences to provide their feedback online or in person, participants could decide whether to join a focus group online via Blackboard Collaborate or in person. The same prompts were presented regardless of the venue (online or in person). Participants were given five minutes to write about their likes and dislikes in STEMS², then

began the discussion by sharing what they wrote. The focus group discussions were transcribed and shared with the participants to check for accuracy.

Questionnaire responses with a Likert-type scale were aggregated and examined for trends while the responses to open-ended questions were compiled to find emerging themes. An open coding (Corbin & Strauss, 2007) strategy was used on the narrative data from the open-ended questionnaire responses and focus group transcripts. The emergent themes were triangulated across students and between focus group and questionnaire data to check for validity. Each participant had an opportunity to review their contribution to the study before the project was completed.

The results were framed using the CoI framework and the findings section presents data specific to Social Presence from all 21 participants who completed a questionnaire, and descriptive data telling the story and sense of place of the nine students who participated in a focus group interview. Juanita and Kaleo's (participant selected pseudonyms) stories are highlighted due to their interesting experiences and observations with regard to sense of place and social presence.

Results

Sense of community was particularly strong with the students in STEMS². When asked about their most meaningful/memorable experiences in the program 15 of the 21 participants mentioned their classmates in some capacity, whether it was getting to know them, working with them, or the support received from them. The bonds between students were built on shared experiences in the summer learning journey, from having shared values, and in knowing that they could rely on each other for academic, moral and professional support. One student confirmed this, writing *our community like a safety net always there, that I could always reach out to grab if need(ed)*.

Students and faculty built a community that became the foundation for the online learning climate in the fall and spring by working and learning alongside those who restore fish ponds in windward O'ahu, protect Mauna Kea, and make new discoveries at Keck Observatory. Juanita confirmed this in the focus group, stating:

But I think it was pretty powerful to be together pretty much 24-7 for a while before we actually had the online. ... I think there was that trust and relationships that we built that led to the powerful conversations and the ease to which we can just be and say whatever we need to say to each other via the chat box, aloud you know, without actually seeing each other.

Like Juanita, many students credited the summer F2F as the starting point of their ability to openly express themselves during online classes in the fall.

Although the community building in the summer helped to alleviate the challenges of participating in online classes, the transition in the fall semester was difficult for many students. The questionnaire showed a dramatic decline in comfort in participating in class discussions from summer (see Figure 1). Just as Garrison, Anderson and Archer (2000) and Rovai and

Jordan (2004) suggest, several students mentioned that synchronous classes held online via Blackboard Collaborate did not support sharing emotions, “seeing” each other, and interacting with others as they did FTF. While the students built a community in the summer that fostered open communication in the fall, doing so online was not comfortable for most.

10. How would you describe your comfort in participating in class discussions in the STEMS^2 classes held during the

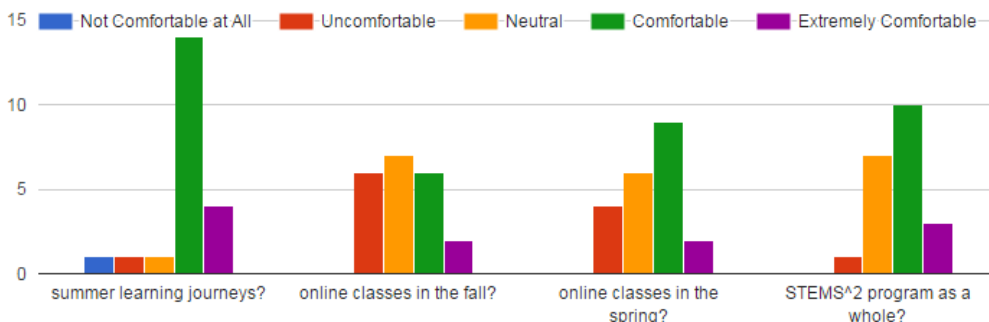


Figure 1: Questionnaire Results Showing Student Comfort Levels in Class Discussions

Northcote pointed out that feelings of discomfort and alienation can cause students to lose their sense of place online leading them to drop out (2008). This happened to Kaleo. However, after voicing his feelings of isolation and desire to quit, his cohort rescued him by suggesting that they meet in person and join the online class sessions together from a single location. Kana‘iapuni and Malone (2006) assert that “from a sense of place grows a sense of *kuleana* (responsibility)” (p. 298). This group’s sense of place grew into their sense of *kuleana* to help each other. Although meeting in person at one location was initiated in response to Kaleo’s concerns, the other members found that it also provided them with FTF connection, accountability of focusing in class, and moral support. The summer learning journeys also played a significant role in developing the students’ *kuleana*. This was demonstrated when Kaleo said, *I think the summer session is what saved us*, and the other four focus group participants unanimously agreed.

In order to “survive”, the students employed different measures to enhance their educational experience. The online environment made several strategies possible that could not happen in a FTF class. For example, the students mentioned taking screenshots, watching the class recordings, and messaging each other during class if they did not understand what was going on. Others mentioned multi-tasking strategies that allowed them to attend class while meeting their “real-life” obligations. The online instruction placed greater responsibility on the students to monitor their own learning because the teacher could not see them. Sense of self and knowing what kind of learner they were became very important online.

Understanding their strengths and limitations in their learning environment was crucial to student success. When some focus group members mentioned texting and Facebooking other students during online classes when they were confused, Kaleo stated that it would not work for him. He

added in the focus group, *Yeah see, I can't do that. My brain would fall apart.* Another student, who completed a different online program prior to STEMS², shared how he learned to be successful online when he wrote:

I have learned through my online experiences how to use this medium as a learning opportunity. Some online sessions are better than others and it helps when everyone participating has a basic level of comfort and understanding of how these learning opportunities are different than face-to-face.

Defining their sense of place and honing the skills they needed to connect to the course, the instructors, and academic content in the fall, helped more students feel comfortable in the spring (see Figure 1). As one student explained, *I got the hang of Lulima, Blackboard, reading/writing, etc. in the fall, and am now very comfortable with the whole process this semester (spring).*

As mentioned earlier, Garrison, Anderson, and Archer (2000) indicate that social presence is crucial in creating successful educational experiences (p. 89). Students revealed the learning and growth they achieved as a result of the social presence created. One student wrote:

Spring became very interesting and inspiring I think, because everyone in the cohort began really sharing out the amazing work they are doing. I feel I've grown so much as an educator, witnessing all of the possibilities demonstrated by my peers.

Several students indicated that learning extended beyond professional development into personal growth as represented by this student who wrote *90% of what I have been provided in this program is directly related to me becoming a better teacher, facilitator, person and teammate. The work challenged me academically, personally, and increased my efficacy within my work.*

Conclusion

In learning about sense of place, STEMS² participants were cognizant and reflective in considering their individual identity in the classroom. The real-world experiences during the summer FTF presented opportunities for them to make sense of each activity through their own lens, not someone else's. Just as research supports (Garrison, Anderson & Archer, 2000; Northcote, 2008; Vaughan, Cleveland-Innes, & Garrison, 2013), this not only contributed to a strong sense of community but also enabled them to adapt according to their individual needs when classes transitioned to an online space. The result was a rich educational experience that participants found to be rewarding both personally and professionally. Juanita summed it up best in the focus group, saying *I think that's what I'm most excited about is I now have this new sense of me based on this sense of place that I never had before experiencing this program.*

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