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Exploring Affective Dimensions of Authentic Geographic Education Using a Qualitative Document Analysis of Students' YouthMappers Blogs

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Abstract: Research suggests numerous cognitive benefits of authentic learning experiences. Beyond cognition, there are additional dimensions for learners who engage in authentic learning experiences. In education, the affective experiences of authentic learning and the role of students' social interactions remain largely unexplored. This paper examines students' affective and social experiences derived from blog posts published on the YouthMappers website. YouthMappers is an international network of university students who create open map data for humanitarian and development programming. In an analysis of two years (2016–2017) of 82 blogs from the YouthMappers network, students from the U.S. and abroad report motivating experiences fueled by social events and gatherings. The participants also find value in communicating with, encouraging, educating, and supporting their peers. Geographic region and gender also play a part in their accounts. This paper seeks to advance research in student affect and social interactions during authentic learning experiences. Positive affective and social experiences may be employed to create authentic learning experiences, building impactful social and emotional experiences for globally-diverse students.

Keywords: affect; authentic learning; blogs; enthusiasm; geography education; interest; mapping; motivation; social learning

1. Introduction

In modern P-20 education, there is a discrepancy between the types of learning that occur in school and their application to real-world situations. This barrier prompts national-level conversations among educators and researchers to explore possibilities for enhanced alignment [1]. Schools remain centered on *drill-and-response* instruction, with a focus on memorization to meet benchmarks on standardized, high-stakes tests [2,3]. This style of teaching and learning neglects the practical skills and knowledge applications needed to be a successful or accomplished adult [4,5]. Students struggle translating their acquired knowledge to real-life situations. That difficulty is a byproduct of decades of non-student centered, test-focused schooling [6]. Horn [7] indicates that "increased high-stakes test scores do not equate to increased learning" (p. 32). Moreover, educators struggle with assessing students' acquisition of cognitive (learning) and non-cognitive (practical, soft) skills [8] and fostering positive affect (emotions) help facilitate student enjoyment of and active engagement in learning [9]. The combination of these skills and positive emotions towards learning are needed to be successful in

a growing and interconnected world [5]. Contemporary research suggests that students must be active and engaged in order to effectively learn the material; students are more likely to learn when they can connect new knowledge with previous knowledge [2]. Yet, many classrooms operate with the mindset that students are passive recipients of disconnected knowledge.

This research explores students' reported experiences when empowered to take an active role in the learning process through an authentic learning opportunity. By exploring their experience (expressions) from the students' perspective (utterances), we may gain a better understanding, beyond content-driven learning, of the emotional and social dimensions of authentic learning for students. Using both an inductive and deductive qualitative document analysis and a conceptual framework of authentic learning standards and positive affect (e.g., motivation, enthusiasm, and interest) related to authentic learning. Through these methods, we investigated students' open-ended writing (blog entries) upon participation in authentic learning experience [10]. This study is unique because it examined students' emotional and social experiences (compared to learning), who participated in YouthMappers activities (an authentic learning activity). Also, because YouthMappers operates worldwide, this research provides a unique opportunity to examine trends within a diverse international sample in addition to gender differences. In order to maintain the focus on students' affective dimensions of learning, only a select group of salient concepts directly related to affective and social experiences from participation in YouthMappers were considered. From this analysis, we discuss the emotional or affective benefits of authentic learning from students' utterances in their blog entries, related to motivation, enthusiasm, and interest for learning, as well as which social interactions enhanced these affective benefits as individuals and as a group. Overwhelmingly, students reported experiencing the positive affect that is strongly related to robust learning and the importance of social experiences within the authentic learning activity.

1.1. The Case for Authentic Learning

In response to this issue, authentic learning has become a relevant approach to reevaluate the purpose of public education. If public education aims to prepare students to be successful in adulthood, then students need to tackle relevant issues using real-world scenarios. Authentic learning is defined as the "experiences that reflect real world ways of knowing and doing. It is thought that such experiences allow learners to transfer knowledge from formal education to practice, and so provide opportunities for meaningful learning" [11] (pp. 1–2). It represents "learning that is seamlessly integrated or implanted into meaningful 'real-life' situations" [12] (p. 412). Authentic learning posits that students are more likely to be engaged, motivated to learn, and better prepared for adulthood. This is not to say other forms of school activity are lesser than what is defined as authentic learning, as there is no clear dichotomy between what are authentic and inauthentic experiences. Rather, school-based learning should be preparation for real-life learning by focusing on practical skills and relevant topics.

Authentic learning can include instructional techniques, student learning outcomes, and affective experiences students can develop towards their learning. In classroom instruction, authentic learning compels students to foster deeper thoughts, formulate difficult questions, investigate various sources of information, and solve challenging problems [5]. This teaching approach "allows students to explore, discuss, and meaningfully construct concepts and relationships in contexts that involve real-world problems and projects that are relevant to the learner" [2] (p. 1). As a result of authentic learning experiences, students invest in their learning through enhanced interest and enthusiasm [13] (p. 7). This claim is supported by research in fostering academic engagement [14] and student motivation [15–17]. Positive affect is significant in promoting authentic, life-long learning [18–21].

1.2. Research in Student-Centered, Authentic Learning

Discussion has focused on the roles of educators and instruction in administering authentic learning interventions. Research is lacking on student perspectives. An inclusive, authentic learning environment necessitates the voices and perspectives of students of their own experiences [22]. In a

study by Nicaise et al. [22], researchers interviewed three classrooms of students, following a week-long simulation where 59 students role-played a space shuttle mission, to evaluate their perceptions of the ascribed authentic activity. More than half of the students used the term 'real-life' to describe the learning environment, indicating that it mirrored the projects of Aerospace engineers and required them to collaborate. Further, they found that several students were so inspired that the project confirmed their interest in Aerospace as a career. Most students (53 out of 59) reported that the learning activity was successful, a unique and complex endeavor compared to other classroom experiences that required them to integrate various contents and skills. However, 18 students reported some element of negative feeling from the authentic learning experience. Some students viewed the simulation as a theoretical event rather than a learning opportunity. Some students thought the teacher was 'too busy' or inattentive. Others were daunted by processes of self-selecting an idea and self-monitoring. Research by Dabbagh and Blijd [23] uncovered similar student perceptions, where students struggled when managing expectations, ambiguity, and complexity, even though they appreciated the authenticity of the activity and were able to make connections with previous knowledge. Further, the authors found that the students felt underprepared for this type of learning. The resulting feelings of anxiety and confusion, however, tended to fade away as time passed. These student perceptions lead to important considerations for authentic learning, especially scaffolding the experience, when students have no prior experiences engaging in authentic work. Educators should be mindful of class sizes, to maintain the necessary attention and guidance warranted to monitor multiple student projects. Most students have little experience with this type of learning; they may need additional support to manage their own progress. The educator must take on the role as a facilitator rather than a leader of learning [22]. In short, the present research emphasizes listening to student perceptions to improve understandings of authentic learning.

1.3. Authentic Learning in Technology-Enhanced Contexts

Per Lombardi [24,25], authentic activities are no longer constricted to in-person practice; they can be carried out through web-based learning. Web-based learning environments provide access to many of the same resources that professionals use. And through these online resources, students gain experience working with uncertain information, uncovering complex patterns, and understanding the messiness of true research where there is not typically a single correct answer. These technological experiences provide opportunities for tutoring, concept mapping, prompt feedback, personal reflection, and alternative decision routes. Internet-based technology also contributes to community participation, another essential feature of authentic learning. Community participation serves as a tool for students to collaborate and construct knowledge with other individuals outside of the classroom.

Place-based approaches represent the typical centerpiece of discussion for connecting learning to local communities [26,27]. Similarly, an international collaboration component can take on the qualities of place-based approaches, particularly when learners connect through online exchanges to real places and peers around the globe [28–30].

1.4. YouthMappers, a Technology-Enhanced Authentic Learning Experience

YouthMappers [10] is a global consortium of university-based student-led groups, organized to create open spatial data for community development or humanitarian needs. YouthMappers was launched in 2015 with support by the United States Agency for International Development (USAID) GeoCenter and by researchers and students at Texas Tech University, George Washington University, and West Virginia University. This consortium creates opportunities for students from around the world to map unmapped places, especially in developing countries. This global movement currently consists of 'chapters', or student-led groups or clubs, at 120 universities in 38 countries. YouthMappers aims to support a generation of mappers using web-based open geospatial technologies (i.e., OpenStreetMap) to create map data by identifying locations of buildings, roads and other features on satellite imagery and add detailed attributes such as types of buildings (hospitals, schools),

street names or directional information from local student knowledge. In turn, these maps are actively used in real-world projects by humanitarian and development actors such as the International Federation of Red Cross, Red Crescent, Doctors Without Borders, USAID, World Bank, UN relief agencies, among others [31]. Examples include identifying evacuation routes for volcanic hazards; enumerating households for malaria spray campaigns; identifying areas for women and girls' health services provisions related to HIV and AIDS; mapping real-time recovery operations; developing routes to deliver relief for earthquake and hurricane victims, to name a few [10]. Students may map a location in person by creating data attributes or taking street-level photos. They may also map places remotely through available satellite imagery. YouthMappers and associated organizations connect students to a network of professionals and peers as they are learning and using open mapping technologies. Consequently, they gain knowledge of development issues in places both near and far. Participation in YouthMappers offers global learning opportunities, contributes to a socially engaged citizenry, enhances scientific capacity worldwide, and fosters leadership [10].

Authentic learning underpins the YouthMappers initiative by purposeful design. Participating students work to solve real-world problems, locally and globally. They use higher-order thinking, problem solving, critical thinking, and creativity, as they work together to solve problems of *resilience* [31]. This process occurs through a community of learners as students collaborate within their own YouthMappers chapters and among other YouthMappers chapters. Participants are continuously making edits to OpenStreetMap, which serves not only as an interactive map but as an open spatial database that impacts people's lives. Following the mapping activities, students have the option to evaluate, discuss, document, and reflect on their experiences through the YouthMappers blog. We can reasonably conclude students have engaged in authentic learning if the construction of knowledge, disciplined inquiry, and value beyond school are found [5,32]. We may consider further the potential affective experiences of those authentic learning experiences.

1.5. Reflective Writing (Blogs) in the Authentic Learning Process

Jonassen [33] suggested that an authentic activity engages the learner in a way that assists them in their own meaning-making. For authentic learning, it is essential to provide students with avenues to reflect upon and monitor their learning. Khamasi [34] found that students who kept journals were able to foster knowledge creation and connect affect to the learning. That phenomenon was found in passive, teacher-centered learning environments (p. 23). Lombardi [24] recognized that authentic pedagogy relies on the reflection and documentation students' achievements:

> to the emergence of a new set of technological tools, we can offer students a more authentic learning experience . . . [with] the Internet and a variety of communication, visualization, and simulation technologies, large numbers of undergraduates can begin to reconstruct the past, observe phenomena using remote instruments, and make valuable connections with mentors around the world (p. 2).

The blogs created by the YouthMappers have authenticity because students are given no prompt [13]. Participants are encouraged, but not expected, to write a blog about any aspect of their YouthMappers experience. This paper treats these blog entries as products of participant learning and experiences. This study is limited by social-desirability bias because the students who choose to write a blog entry may be more inclined to write enthusiastically about their experiences. The levels of enthusiasm found in these blog entries may not be representative of the entire YouthMappers community. This bias does not necessarily detract from the authenticity of the YouthMappers learning experience. The freedom in blog writing gives a deep and genuine quality to these personal accounts. The outlet provides valuable insight to student's perceptions of authentic experiences [35].

Open-ended writing, like journals and blogs are viable products of authentic learning tasks, designed to showcase the student's work, chronicle experiences, and promote reflection on his or her

learning. Reflective writing is important for researchers because it is a reliable means to assess learning in authentic experiences [24].

1.6. Theoretical Framework

This research study used a conceptual, standards-based framework [5,32] to verify and explore students' affective experiences within an authentic learning activity. The theory of authentic learning is rooted in constructivism, which is "heavily influenced by the student's prior knowledge, and by the values, expectations, rewards and sanctions that shape the learning environment" [32] (p. 4). Jean Piaget's constructivism employs a student-centered approach, where students make meaning (learning) through the interconnection of ideas and their own experiences [36]. Vygotsky [37] had advanced constructivist theory by stating the social importance of learning, where knowledge is constructed through interaction with others, especially more capable peers.

Definitions of authentic learning vary across individuals and academic disciplines; but there are many components that remain consistent. Among the various interpretations of authentic learning, the idea of meaningful real-world experience is a unifying theme. Newmann and Wehlage [38] proposed a framework to refine the meaning of authentic instruction and learning. That framework included five standards of authentic instruction, based upon three criteria (i.e., construction of knowledge, disciplined inquiry, and value beyond school) of *authentic intellectual work* [5,32]. These are *higher-order thinking; depth of knowledge; connectedness to the world beyond the classroom; substantive conversation,* and *social support for student achievement.* Students engage in higher-order thinking when they manipulate material to reconstruct its meaning, allowing them to solve problems and uncover new understandings for themselves through application, analysis, and synthesis of information, rather than recalling or understanding factual knowledge.

Per Newmann and Wehlage [38], students exhibit a depth of knowledge when they make "clear distinctions, develop arguments, solve problems, construct explanations, and otherwise work with relatively complex understanding" (p. 3). Learning becomes relevant when the students address real-world issues and apply their new knowledge to personal experiences. Rather than follow a predetermined script, educators provide social support when they communicate expectations for students to learn meaningful skills, share ideas, take risks, and cultivate a climate of mutual respect. Standards, descriptions, and indicators are located in Appendix A. Newman and Wehlage understand that education may not be exclusively authentic in every situation. They argue that it is reasonable to begin shifting instruction toward these five standards. King et al. [5], tailored this framework to social studies education [39]. These authors constructed assignments and types of student work to accompany the five aforementioned standards.

Rule [40] analyzed 45 journal articles regarding authentic learning to identify the overarching and reoccurring themes among them, when four themes emerged. The first theme of authentic learning involves problems rooted in the real world. Authentic learning targets an actual issue that could potentially impact people outside of the classroom, allowing students to become 'emotional stakeholders' in the project. Similar to the Newmann and Wehlage [38] framework, the second theme presented by Rule [40] emphasized that students should engage in the aforementioned higher levels of thinking. Third, authentic learning occurs through discourse within a community of learners. Students work together to identify and solve the problem and the project is based within a community setting. Finally, authentic learning prompts students to make choices and take ownership of their learning, which results in increased empowerment and motivation to learn. Students are placed at the center of learning; they help decide what to learn, how instruction and knowledge is delivered, and what materials are used [13]. Authentic learning is a multidisciplinary subject in which educators provide guidance and scaffolding rather than act as knowledge disseminators [12,24].

There are a number of reasons why authentic learning is important for student progress. It benefits long-term memory retention, while performance on standardized tests encourages short-term retention [41]. Authentic learning helps students become "enculturated" in their discipline of

interest before they enter the field; it teaches them how to be accountable for their work beyond the classroom [24]. Research by Curtin University [42] has indicated that authentic learning gives students the ability to transform educational information into useful and practical knowledge. Furthermore, it encourages students to assimilate unfamiliar knowledge, exposes them to a variety of activities and perspectives, improves application to real-world circumstances, and provides opportunities to produce a polished product while practicing professional skills and judgment. Research also indicates that students who are involved in authentic learning are more motivated to learn, even in the face of initial difficulty or frustration [24]. Because of their engagement and interest, they often begin to inquire about the topic on their own initiative [2].

Affect refers to the psychological domain of feeling or emotion. It interacts with the cognitive domain. Cognition relates to what is learned, which makes it a major focus in educational research. Scholars have found strong relationships between affect and learning [43,44] ston Affect relates to the theory of constructivism: "According to the constructivist theoretical frameworks, a person's affective states are expected to systematically influence how they process new material" [45] (p. 243). The exploration of affective experiences of students is critical in cultivating a better understanding of their social and emotional experiences when engaged in learning, especially authentic learning.

2. Materials and Methods

In the research literature, scholars have explored the relevance of authentic education, not from the point of view of the instructor, but from the students' perspective. Prior studies suggest that reflective or open-ended writing allows for college-aged students to explore their experiences as both authentic task and assessment [24,35,46]. Furthermore, informal writing (like blogs) and its process can serve as an authentic qualitative assessment [34]. As previously reviewed, informal writing, like voluntary blogging, can provide unique insight into students' experiences in an authentic learning activity. This lends well to use of the YouthMappers blogs (utterances) as data source, as they are venues to explore the students' focus of authentic activity, illuminating affective expressions about authentic learning that may not be captured by traditional, cognition-focused assessments [35]. However, it is critical for researchers to determine what aspects of the authentic activity were meaningful to the students. With most research examining cognitive (content-based) outcomes of learning, according to Maina [13], there is a dearth of research regarding how "authentic learning involves increasing *motivation* and *enthusiasm*, helping learners to make decisions concerning their learning as well as identifying nontraditional ways learning is enhanced and accounting for such learning" (p. 7). Motivation was coded from responses that related to this construct, including descriptions of inspiration, aspiration, enlightenment, determination, persistence, challenge, deriving meaning, reward, or memorable and unique experience. Enthusiasm was coded as reporting eagerness, nervous excitement, as well as fun or joy derived from the authentic learning experience. Interest was coded by action words of being alert, attentive, amazed, wondering, surprise, fascination and awe.

2.1. Research Questions

This study aims to explore the affective aspects of students' blogs about their experiences with YouthMappers. YouthMappers blogs were coded to discern how student bloggers describe the authenticity of the activities they participated in as YouthMappers participants. The research questions nclude:

- What themes emerge in students' blogs that relate to authentic learning? How do blog experiences align with the standards of authentic learning by King et al. [5] and Newmann et al. [32]?)
- Did the blogs express affective expressions (through utterances) of motivation, enthusiasm, and interest?
- How might the roles of gender and (geographic) region influence the participants' affective dimensions of learning?

- What types of social interactions (e.g., mentoring, collaborations, friendships, etc.) were reported that enhance the affective experiences of students?

2.2. Data Selection

Student blogs for 2 years (2016 and 2017) were accessed online from the YouthMappers website. Selection criteria included only blogs from students who spoke directly to their YouthMappers (authentic learning) experience. Excluded from analysis were blogs promoting network events or opportunities (e.g., contest, call for applications), providing technical assistance (e.g., creating a chapter), or promoting a tool (e.g., Java OpenStreet Map—JOSM). Blog posts from YouthMappers staff were also excluded. In sum, 14 blogs from 2016 and 24 from 2017 were omitted from the data set. The remaining 82 YouthMappers blogs were selected, parsed into relevant utterances according to the conceptual framework, coded, and analyzed [10]. Names were omitted from the collection and analysis to avoid identifying specific students. Students' blogs were then grouped into categories of gender and geographic region (location of their university in which they were presently living and/or working) for analysis. The blogs were sourced from four major geographic areas: The United States (U.S.), Africa, Asia, and South America where males (41%) and females (43%) were nearly equally represented (16% did not indicate gender). Students studying outside of the U.S. were aggregated by smaller geographic regions and from the following countries: East Africa (i.e., Uganda, Kenya, and Malawi), West Africa (i.e., Nigeria and Ghana), Southeast Asia (i.e., Bangladesh, India, and Nepal), East Asia (i.e., China and South Korea), Europe (i.e., Italy), and South America (i.e., Peru and Colombia). For data analysis purposes, the single student in Europe was incorporated into the U.S. data set. Table 1 shows the demographic statistics of regions from which the bloggers reside in the data set.

Table 1. Demographics and Descriptive Statistics of YouthMappers Data Set.

	Total	Females	Males	Did not Provide
All Students	**82 * (100%)**	**35 (43%)**	**34 (41%)**	**13 * (16%)**
Students in the U.S.	25 (30%)	12 (34%)	10 (29%)	3 (25%)
Students outside the U.S.	56	23	24	9
Students in Africa	**33 (40%)**	**10 (29%)**	**16 (47%)**	**7 (58%)**
East Africa	10	4	0	5
West Africa	20	5	14	2
South Africa **	3	1	2	0
Students in Asia	**17 (21%)**	**8 (23%)**	**8 (24%)**	**1 (8.5%)**
East Asia	3	1	1	1
South East Asia	14	7	7	0
Students in Europe	**1 (1%)**	**1 (3%)**	**0 (0%)**	**0 (0%)**
Students in South America	**5 (6%)**	**4 (11%)**	**0 (0%)**	**1 (8.5%)**

Geographic Regions are based upon the *United Nations geoscheme*; * One blog held no demographic information, neither gender nor geographic region; ** South Africa refers to the country, not the geographic region.

2.3. Data Analysis

The blogs were collected and coded using a deductive (from the conceptual framework) and inductive (emergent) content analysis approach [47]. The study began with relevant research on elements of authentic learning and affect as guidance for the establishment of category and subcategory codes [48]. To understand how students quantified their authentic learning (research question one), emergent themes were created to categorize the data (i.e., the focus of the students' authentic learning activity). Such activities included mapping for personal understanding, mapping for real-word issues, and mapping for social change (see Table 2). Then, using the University of Wisconsin authenticity framework, five categories (codes) were added to align the blog on YouthMappers experiences to the literature on authentic learning: higher-order thinking; depth of knowledge; connectedness to the world; substantive conversation; and social support for student achievement [40]. Each blog needed to contain at least two affective utterances to represent an authentic learning experience and be

incorporated into the data set. Each blog (N = 82) was read and double coded by the same coder with a minimum of two and a maximum of three authentic learning constructs. Each blog was analyzed for a third time and coded for instances of motivation, enthusiasm, or interest. Utterances were identified, highlighted in text, and entered into a spreadsheet.

During the coding process, the types of affective categories included expressions of appreciation, involvement, commitment, purpose, empathy, pride, empowerment, and strength. Students' utterances were coded according to whether the response referred to the writer's individual experience or the experience of the group. For example, "I felt empowered...," *I* wish to thank...," or "I was grateful..." were coded as individual. Other utterances like, "everyone felt empowered...," "*We* wish to thank . . . ," or "we were overwhelmed with gratitude..." were coded as feeling (affect) part of a group or collective. Utterances were counted and entered into a spreadsheet.

Inductive coding was used to allow for social interaction themes to emerge. Inductive analysis helps to identify the "non traditional [sic] ways learning is enhanced and accounting for such learning" [13] (p. 7). In a first pass, utterances were identified and highlighted in text for each blog related to social interaction. In a second pass, themes emerged to delineate specific social activities that related to the authentic learning experiences. This aided in reducing the raw information (blogs) into shortened outlines for establishment of themes [49]. During the second pass, examination was focused on the types of social interaction. Eight "social interaction" themes emerged: communicating, encouraging, educating, and supporting peers; working with collaborations, coalitions, and networks; establishment of friendship/s; social events and gatherings; recognition and acceptance; mentoring; presentations and leadership opportunities; and recruitment (i.e., starting a YouthMappers chapter). Social learning themes and indicators can be found in Appendix B. Responses were categorized, sorted into themes, counted, and entered into a spreadsheet. All data, for each research question, were disaggregated by gender and region. Chi square analysis was used to determine any significant differences between categories and frequency counts.

2.4. Trustworthiness

Standards of trustworthiness (i.e., credibility, transferability, dependability, and confirmability, respectively) were incorporated in the planning and analysis of the research [50,51]. To address the issue of credibility, one advantage of using a deductive reasoning process is that there is extant knowledge on the phenomena of authentic and affective learning, and as such there is knowledge to draw meaning from the data set [52]. Therefore, using a coding schema sourced from theory (deductive) and informed by prior empirical research (inductive) provides vital credibility to the authors' methods in both coding and analysis of the data set.

Dependability and confirmability were established using transparent data collection, coding schema, and multiple coders. Intercoder reliability was performed to evaluate the efficacy of the coding schema in reaching the same conclusion [53]. This study used a categorical intercoding schema to determine the degree of intercoder reliability [54]. The second coder holds advanced degrees in geography with a focus on geography education. The second coder co-scored a blog with the first coder, such to garner a better understanding of the coding schema and coding method. The second coder independently analyzed 28 blogs (34% of the entire sample of 82 eligible blogs) independently of the first coder. In analyzing affective utterances (research question 2), there was coder agreement on 67.5 codes out of a total of 77 codes from 28 blogs, for an intercoder agreement of 88%. Exploring the influence of gender and region and affect (research question 3), there was coder agreement on 110 codes out of 110 total codes, for an intercoder agreement of 100%. Last, in coding for types of social interactions that occurred during authentic learning (research question 4), there was a coder agreement on 181.5 codes out of 191 total codes from the 28 blogs, for an intercoder agreement of 95%. Among research questions one, two and three, total agreement was 94%. Also, the use of a conceptual framework, grounded in extant theory, ensured blogs were coded according to the community of practice standards for authentic learning and affective learning.

3. Results

Descriptive statistics are summarized from the data by research question. Three themes arose from students' blogs: mapping for personal understanding (individuals' reports of understanding or learning content); mapping for real-world issues (e.g., application of content through creating access, cultural or historical documentation, or environmental protections); mapping for social change (e.g., vulnerable communities, climate literacy; empowering youth; geographic awareness and women's issues). Frequency counts and percentages were established to determine how often which authentic learning activities were described within the data set. Tables 2 and 3 show the frequency and percentage in which the 82 selected blogs described authentic learning (emergent themes) and standards related to authentic learning (research question one), by gender (Table 2) and region (Table 3), respectively. A chi-square test of independence was performed to examine relationships between categories with 95% confidence. Males and females similarly reported each of the three emergent categories with no statistically significant difference between them. Among the 15 students who did not disclose their gender had significantly fewer (X2 (2, N = 99) = 6.74, $p < 0.05$) reports of mapping for personal understanding (N = 1), disproportional to the 43 male (N = 18), and 41 female (N = 17) blog.

Table 2. Frequency of Authentic Learning Emergent Themes in YouthMappers Blogs by Gender.

Authentic Learning Emergent Theme	All Blogs (N = 82)		
	Females	**Males**	**Did not Provide**
	(N = 41)	**(N = 43)**	**(N = 15)**
Mapping for Personal Understanding	**17 (41%)**	**18 (42%)**	**1 (7%)**
Mapping for Real-World Issues	**15 (37%)**	**16 (37%)**	**11 * (73%)**
Creating Open Access to Information and/or Study Natural or Man-made Catastrophes	9	10	9
Cultural or Historical Preservation	2	0	0
Providing Environmental Protections or Enriching Areas for Human Life	4	6	2
Mapping for Social Change	**9 (22%)**	**9 (21%)**	**3 (20%)**
Aiding Vulnerable Communities	1	1	0
Developing Climate Literacy	0	1	0
Empowering Youth	3	5	2
Enhancing Geographic Awareness	0	0	1
Women's Issues and Support	5	2	0

Some students' blogs provided an additional theme; each student's blog had at least one theme; * Chi Square analysis indicated a significant result, $p < 0.05$.

A chi-square test also indicated that the relationship between students mapping for personal understanding between U.S. and International groups was significant (X2 (2, N = 98) = 7.63, $p < 0.05$); international students were more likely to map for personal understanding than their U.S. peers, whereas U.S. students were significantly more likely (X2 (2, N = 98) = 4.49, $p < 0.05$) to map for real-world issues compared to their international peers.

Each blog contains a minimum of two standards of authentic learning with a maximum of three. Students reported being connected to the world (N = 47, 25%), followed by social support for their achievement (N = 43, 23%), having substantive conversations (N = 34, 18%), engaging in higher order thinking (N = 32, 17%), and developing their depth of knowledge (N = 31, 17%) (Tables 4 and 5). In nearly half of all blogs, the most abundant affectations involved feeling connected to the world and social support for achievement (N = 90, 48%).

Table 3. Frequency of Authentic Learning Emergent Themes in YouthMappers Blogs by Region.

Authentic Learning Emergent Theme	United States [a] (*N* = 26)	International (*N* = 56)		
		African	Asian	South American
	(*N* = 32)	(*N* = 42)	(*N* = 19)	(*N* = 5)
Mapping for Personal Understanding	**5 * (15%)**	**14 (33%)**	**11 (58%)**	**4 (80%)**
Mapping for Real-World Issues	**20 * (63%)**	**17 (41%)**	**5 (26%)**	**1 (20%)**
Creating Open Access to Information and/or Study Natural or Man-made Catastrophes	13	12	3	1
Cultural or Historical Preservation	2	0	0	0
Providing Environmental Protections or Enriching Areas for Human Life	5	5	2	0
Mapping for Social Change	**7 (22%)**	**11 (26%)**	**3 (16%)**	**0 (0%)**
Aiding Vulnerable Communities	0	2	0	0
Developing Climate Literacy	0	1	0	0
Empowering Youth	6	3	1	0
Enhancing Geographic Awareness	0	1	0	0
Women's Issues and Support	1	4	2	0

Some students' blogs provided an additional theme; each student's blog had at least one theme; * Chi Square analysis indicated a significant result, $p < 0.05$; [a] The one European student was added to the United States student data set; Note that this same includes international students studying in the United States.

Table 4. Frequency of Authentic Learning Standards in YouthMappers Blogs by Gender.

Authentic Learning Standards	All Blogs (*N* = 82)		
	Females	Males	Did not Provide
	(*N* = 81)	(*N* = 77)	(*N* = 29)
Higher Order Thinking	18 (22%)	11 (14%)	3 (10%)
Depth of Knowledge	17 (21%)	11 (14%)	3 (10%)
Connectedness to the World Beyond the Classroom	19 (23%)	19 (25%)	9 (31%)
Substantive Conversation	15 (19%)	13 (17%)	6 (21%)
Social Support for Student Achievement	12 (15%)	23 * (30%)	8 (28%)

Some students' blogs provided an additional theme; each student's blog had at least one theme; * Chi Square analysis indicated a significant result, $p < 0.05$; Each student discussed at least two standards; Some students discussed a third standard; (2.28 standards per student blog).

Gender (Table 4) and region (Table 5) exhibit additional trends and variation. A chi-square test indicated a significant relationship between social support for achievement between female and male students, (X2 (2, $N = 158$) = 5.19, $p < 0.05$). Male students were more likely to relate their authentic learning to social supports than their female counterparts.

Table 5. Frequency of Authentic Learning Standards in YouthMappers Blogs by Region.

Emergent Theme	United States [a] (*N* = 26)	International (*N* = 56)		
		African	Asian	South American
	(*N* = 58)	(*N* = 74)	(*N* = 42)	(*N* = 11)
Higher Order Thinking	9 (16%)	16 (22%)	4 (9%)	3 (27%)
Depth of Knowledge	8 (14%)	13 (18%)	9 (21%)	1 (10%)
Connectedness to the World Beyond the Classroom	20* (34%)	15 (20%)	9 (21%)	2 (18%)
Substantive Conversation	10 (17%)	12 (16%)	10 (24%)	2 (18%)
Social Support for Student Achievement	11 (19%)	18 (24%)	10 (24%)	3 (27%)

Some students' blogs provided an additional theme; Each student's blog had at least one theme; * Chi Square analysis indicated a significant result, $p < 0.05$; [a] The one European student was added to the United States data set.

In terms of region, there is a significant relationship (X2 (2, $N = 187$) = 4.43, $p < 0.05$) between U.S. and international students in reported connectedness to the world beyond the classroom. The chi-square test found no significant relationship among the other variables.

Affective utterances of interest, enthusiasm and interest were coded from 82 sampled student blogs. In all, Tables 6 and 7 show 240 instances of affective utterances of motivation (N = 110), enthusiasm (N = 77), and interest (N = 53) were coded for an average of 2.93 instances per blog. Seen in Table 6, female students made more (1.5 times) affective utterances (N = 135) compared to their male peers (N = 87), yet their distributions are similar among the three affective constructs. Students who did not provide a gender spoke of interest (N = 6) more than enthusiasm (N = 3) in their blogs.

Table 6. Frequency of Affective Utterances in YouthMappers Blogs by Gender.

Construct of Positive Affect	All Blogs (N = 82)		
	Females	Males	Did not Provide
	(N = 135)	(N = 87)	(N = 18)
Motivation	58 (43%)	43 (49%)	9 (50%)
Enthusiasm	51 (38%)	23 (26%)	3 (17%)
Interest	26 (19%)	21 (24%)	6 (33%)

Table 7. Frequency of Affective Utterances in YouthMappers Blogs by Region.

	United States [a] (N = 26)	International (N = 56)		
		African	Asian	South American
	(N = 61)	(N = 97)	(N = 53)	(N = 20)
Motivation	24 (39%)	50 (52%)	23 (43%)	8 (40%)
Enthusiasm	18 (30%)	30 (31%)	19 (36%)	9 (45%)
Interest	19 (31%)	17 (17%)	11 (21%)	3 (15%)

[a] The one European student was added to the United States data set.

A similar trend was found among region (see Table 7), where students reported more motivation and similar, yet lesser levels of enthusiasm and interest. The chi-square test found no significant relationship among the other variables.

To better visualize how affect was reported, blogs were also analyzed based upon the locus of affect, being from the individual or a group or collective perspective. During the first pass, other affective attributes like emotion (appreciation), involvement, commitment, empathy, pride, strength, empowerment, and identity were coded into a single category. During a second pass, the locus of the affect was recorded from the individual or a group. In all, 302 utterances were coded for an average of 3.68 instances per blog and distributions by gender and region are found in Tables 8 and 9 respectively. Among gender, values between males and females were similar, although students who did not provide their gender mentioned experiences as a group (N = 29) nine times the rate of experiences as an individual (N = 3).

Table 8. Frequency of Affective Utterances by Individual and Group in YouthMappers Blogs by Gender.

Locus of Positive Affect	All Blogs (N = 82)		
	Females	Males	Did not Provide
	(N = 137)	(N = 133)	(N = 32)
Individual	40 (29%)	37 (28%)	3 (9%)
Group	97 (71%)	96 (72%)	29 (91%)

Table 9. Frequency of Affective Utterances by Individual and Group in YouthMappers Blogs by Region.

Locus of Positive Affect	United States [a] (*N* = 26)	International (*N* = 56)		
		African	Asian	South American
	(*N* = 80)	(*N* = 139)	(*N* = 57)	(*N* = 20)
Individual	22 (27.5%)	32 (23%)	19 (33%)	7 (35%)
Group	58 (72.5%)	107 (77%)	38 (67%)	13 (65%)

[a] The one European student was added to the United States data set.

Regardless of region, students tended to discuss positive aspects of learning as members of a group rather than as individuals. Positive group affect occurred one-third to one-fourth more than positive individual affect.

Last, social interactions were coded to understand the non-traditional or non-cognitive benefits students derived from participating in an authentic learning experience. From the 82 coded blogs, 606 utterances were coded and categorized into 8 types of social interactions that emerged from the data. On average, there were 7.4 social interactions captured per sampled blog. These codes were then parsed by gender and region as seen in Tables 10 and 11. Participation in collaborations, coalitions, and networks and events and social gatherings comprised nearly half (49%) of utterances between females and males (Table 10). Lesser, but notable interactions included communicating with, encouraging, or supporting peers and engaging in leadership and presentations for both gender groups.

Table 10. Frequency by Type of Social Interactions Reported in YouthMappers Blogs by Gender.

Types of Social Interactions	All Blogs (*N* = 82)		
	Females	Males	Did not Provide
	(*N* = 262)	(*N* = 259)	(*N* = 85)
Communicating with, Encouraging or Supporting Peers	47 (18%)	30 (12%)	15 (18%)
Participating in Collaborations, Coalitions, and/or Networks	67 (26%)	70 (27%)	28 (33%)
Establishing Friendship/s	13 (5%)	8 (3%)	1 (1%)
Events and Social Gatherings	61 (23%)	56 (22%)	12 (14%)
Acceptance and Recognition	18 (7%)	21 (8%)	4 (5%)
Mentoring	16 (6%)	27 (10%)	3 (4%)
Engaging in Leadership or Presentations	29 (11%)	30 (12%)	14 (16%)
Recruitment to YouthMappers (New chapters or members)	11 (4%)	17 (6%)	8 (9%)

Table 11. Frequency by Type of Social Interactions Reported in YouthMappers Blogs by Region.

Types of Social Interactions	United States [a] (*N* = 26)	International (*N* = 56)		
		African	Asian	South American
	(*N* = 182)	(*N* = 263)	(*N* = 125)	(*N* = 34)
Communicating with, Encouraging or Supporting Peers	29 (16%)	44 (17%)	14 (11%)	4 (15%)
Participating in Collaborations, Coalitions, and/or Networks	58 (32%)	72 (28%)	29 (23%)	6 (18%)
Establishing Friendship/s	5 (3%)	11 (4%)	3 (3%)	2 (6%)
Events and Social Gatherings	48 (26%)	43 (16%)	25 (20%)	11 (32%)
Acceptance and Recognition	5 (3%)	15 (6%)	19 (15%)	3 (9%)
Mentoring	9 (5%)	27 (10%)	9 (7%)	1 (3%)
Engaging in Leadership or Presentations	18 (10%)	34 (13%)	17 (14%)	5 (14%)
Recruitment to YouthMappers (New chapters or members)	10 (5%)	17 (6%)	9 (7%)	1 (3%)

[a] The one European student was added to the United States data set.

In a regional context, these two trends continue, especially within the U.S. sample. Although not significant, students in Africa reported slightly more communication, encouraging, and supporting peers (N = 44) whereas students in Asia reported being accepted and recognized for their efforts (N = 19) than other groups.

4. Discussion

This research explores affective dimensions of authentic learning, as well as the social interactions that facilitate affect from the students' perspective upon engaging in authentic learning experiences. Table 1 indicated that the sample was diverse in terms of gender and geographic regions. Students not only engaged in the authentic learning activity to increase their personal understanding, but also for real-world issues and social change (see Tables 2 and 3). This was particularly noticeable among the U.S. students, who had fewer instances of mapping for personal understanding as compared to their international peers, and instead had more discussion of mapping for real world issues. To explain this significant discrepancy, U.S. students may simply have more access to tutorial and tools (prior knowledge of mapping) to their participation in YouthMappers than their international counterparts.

Conversely, some of the first experiences international students had in YouthMappers was in garnering the knowledge and skills to operate the technology. This is result is expected as Fisher [55] said "prior knowledge of learners determines to a large extent what each individual can learn from a particular situation" (p. 70). The author continues to explain that basic facts and skills give students the meaningful foundation to apply the knowledge in a real-world setting. Further research is needed to determine whether there are other social factors that are common across the international educational sites that would explain their tendency to map for personal understanding.

Significant gender variances were found between reports of social support for achievement, males crediting this construct more than their female peers, regardless of geographic location. Social constructivism posits that peer support and involvement is important for learning, regardless of sex, but lacks the nuance of gender differences that manifest in mixed-sex learning environments. Namely that female students receive less peer-to-peer learning benefits when with male students [56–59], suggesting that males tend to dominate social interactions [60,61], especially in technology-based environments [62,63]. Other studies suggest college-aged males value peer interaction more [64] and may be why they reported receiving more benefit from this type of interaction than the females sampled.

In addition, U.S. students, compared to international students, reported more instances of connectedness to the world beyond the classroom. This feeling of connectedness may be influenced by the level of political and geographic isolation of U.S. students from other places of the world [65]. These findings provide context for why U.S. students who travel and study abroad gain a deeper sense of international understanding and global awareness [66–68]. Many U.S.-based students are engaging with the YouthMappers network remotely from their home sites in the U.S. This movement may be an important model for providing more access to international experiences and aiding U.S. college students to develop global competencies through authentic learning.

Motivation was a main affective factor reported in sampled blogs, with no statistically-significant differences across demographic subgroupings. Meaningful authentic work enhances student motivation and consequently fosters higher-order thinking within authentic learning [69,70]. Female bloggers made 1.5 times more positive affect statements than their male counterparts. This echoes research by Bagozzi et al. [71] that females are more emotive and more suited to express their emotional states than males.

There was an overwhelming tendency toward thinking on the collective level rather than the individual level. This phenomenon occurs across genders and nationalities. This finding suggests that students are actively forging group or collective identities within the authentic learning activity. Identity, or shared belonging within a community of practice [72], is an important part of the learning process with constructivist learning environments [73]. Since authentic learning shares

in its constructivist values [32], identity may too be considered an important facet of authentic learning environments. Also, identity plays a central role in fostering student interest and persistence [74,75]. Most research explores identity at the individual level, yet there are additional dimensions to learning when students forge collective identities, defined as a cultural affinity among members as they collaborate to accomplish the community shared goals [76]. Collective identity has been suggested to be an important lever in enhancing learning and persistence in future pursuits of that learning [77]. Since the data indicated no gender or region variance to collective identity formation it may be a powerful strategy to engage all students in authentic learning activities.

Students cited their participation in collaborations, coalitions, and networks as well as events and social gatherings were important factors to their authentic learning experience. This confirms the constructivist underpinnings of authentic learning and provides a deeper understanding to the types of social activity that students find significant, especially online [78]. Our study found some nuance to this finding. For example, students in Africa reported slightly more communication, encouraging, and supporting peers. Students in Asia reported being accepted and recognized for their efforts as important to their learning. Thus, a deeper understanding of culture and cultural inclusivity can help to articulate students' goals and experiences in authentic learning environments. Cultural differences could be a response to Nicaise et al.'s [22] question on the levels of varying success of diverse students in authentic learning environments (p. 93). This information may be helpful when considering and planning social interactions among diverse student populations within authentic learning contexts.

Last, there are some limitations to this research. First, the data set comprised of blogs captured solely from the YouthMappers program. This is important to note because students may experience authentic learning differently among other similar online mapping programs. Since content and delivery of these programs vary, YouthMappers was chosen for consistency. Second, the study collected and analyzed data from a relatively small sample size (82 blogs). These blogs belonged to individuals who volunteered to share their experiences using the blog format, and may not be representative of the entire YouthMappers population. To address this limitation, authors used the two years of blogs that were available online (2016 and 2017) at the time of the study. In the future, this research on authentic learning could benefit from incorporating additional blogs of subsequent years and having more students participate in writing for YouthMappers.

5. Conclusions

This qualitative research provides insights on students' affective experiences while engaged in authentic learning activity. This research did not explore all affective attributes, which can include students' behaviors, attitudes, and values [79]. However, the results of this research may help to develop student-specific affective dimensions, based upon students' own perspectives in authentic learning activities.

Five key points emerge from this research. First, gender differences should be accounted to enhance females' experiences in authentic learning activities. Single-sex, online spaces may ensure that women benefit from authentic learning experiences by strengthening their feelings of individualism and recognition [56,58]. Second, the use of mapping and communications technologies in authentic learning can help foster U.S. students' connections to the world without having to leave the U.S. This type of online access may be a powerful model to help develop U.S. students' global competencies and awareness, an area of needed research. For international students, authentic learning enhanced their personal understanding. Students in Africa increased in their ability to engage in projects that they felt could promote social change. More work is needed to understand how different geographical contexts and levels of technological access influences students' abilities to engage in authentic learning. Third, this research finds immense benefits for emotional and social interaction among diverse groups of students. There is evidence that fostering positive affect (emotions) can enhance both enjoyment and engagement in learning [9]. The elements of social interactions (see Appendix B) can be leveraged for programmatic choices that aim to engage students in authentic learning activities. Fourth, findings

related to collective identity in this study confirm that collective identity is significant for enhancing students' learning and persistence in content domains [76]. Still, there is a lack of research regarding students' collective identity formation within authentic learning environments, warranting further study. Fifth, this research speaks to the importance of reinforcing social interactions through shared reflective writing like open-ended blogging. This type of activity is useful for research [34] and for students documenting their learning [24,33]. As authentic learning expands online and throughout the world, future research should explore cultural dimensions of affective experiences when educating students from different nationalities.

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Conflicts of Interest: Dr. Patricia Solís is a director with the YouthMappers program and Dr. Barclay is a member of a YouthMappers chapter. Therefore, Dr. Solís did not participate in the data collection or analysis, and Dr. Barclay only intercoded data that was previously de-identified by Dr. Hite.

Ethical Statement: This research was discussed with the Institutional Review Board for Human Subject Research at Texas Tech University on 11 November 2017. According to current federal guidelines, Tyler Sims with TTU IRB ruled that a content analysis of the YouthMappers Blog for constructs related to affect, would fall under category of non-human subject research. Therefore, this research was considered ***non-human research*** and did not require IRB approval. Moreover, the IRB office did caution that we avoid all direct quotes. Since the blogs (data) are public, a direct quote could be identifying. Therefore, the authors did report any names, dates, or direct quotes from sampled blogs in the manuscript to protect bloggers' privacy.

Appendix A

Table A1. Authentic Learning Standards, Descriptions, and Indicators.

Authentic Learning Standard	Description	Indicators
Higher Order Thinking	Requiring students to manipulate information to transform meaning.	Synthesizing or manipulating information and developing conclusions.
Depth of Knowledge	Students' depth of knowledge and understanding.	Developing arguments. Solving problems.
Connectedness to the World Beyond the Classroom	Extent to which activity holds value and meaning beyond a classroom context.	Addressing real world problems, Contextualization of personal experience(s).
Substantive Conversation	Significant interaction and communication of unscripted conversation to learn and understand the substance of a subject.	Sustained interaction with activity. Sharing of ideas. Dialogue to promote individuals or collective understanding.
Social Support for Student Achievement	Cultural support of learning community.	Feelings of respect, inclusion, and contributions are valued.

Note: Coding descriptions are sourced from the Authenticity Framework by the University of Wisconsin.

Appendix B

Table A2. Authentic Learning Standards, Descriptions, and Indicators.

Social Learning Theme	Indicators
Communicating with, Encouraging, Supporting, and/or Educating Peers	Working with YouthMappers peers in an informal capacity of support. Working with community peers benefitting from mapping.
Working within (a) Collaboration(s), Coalition(s), or Network(s)	Collaborations include information sharing, program coordination or joint planning on a common goal. Coalitions include collaborations with multiple stakeholders on a common goal. Networks include collaborations and coalitions without accountability (e.g., not working towards an explicit, common goal and no penalty for not participating or contributing).
Establishing Friendship(s)	Expressions of making friends and friendships (not acquaintances or meeting people).
Social Events and Gatherings	Include: Internships, Mapathons, Conferences, Social Media
Acceptance and Recognition	Reporting feelings of acceptance or being recognized: Inside of the group (i.e., YouthMappers) outside of the group (i.e., community, faculty, etc.).
Mentoring	Direct interactions with faculty to learn content or about the geographic community (not social interactions with faculty or listening to lectures).
Leadership and Presentation Opportunities	Presenting to peers or faculty in a formal capacity. Taking on leadership roles (e.g., organizing conferences or Mapathons, directing collaborations, etc.).
Recruitment	Recruiting members to a YouthMappers Chapter Planning or Creating a YouthMappers Chapter.

Note: Themes were emergent from the data, therefore categories were established upon two passes through the data where it was difficult to disentangle.

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