Place-Making for Informal Learning in an Online Programming Course

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Co-Design

Place-making Interest-driven Learning



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In this article, we report on exploratory research that documented the informal student-generated interactions in Piazza, an open-source discussion system. This research leverages the concept of place-making to understand how students co-designed Piazza as a place for their learning of the Python programming language in an advanced programming online course at a large northeastern university. Our analysis shows how students used Piazza in specific ways to connect their informal learning to their formal class learning. We suggest that educators and instructional designers can leverage a place-making approach to grant students learning opportunities by having them co-design their learning.

Introduction

It is widely recognized that the design of online learning settings impacts learners' motivation and academic success (Keller & Suzuki, 2004; Sun et al., 2008). As such, learning designers and scholars have actively sought out how different design characteristics and approaches to online learning affect learners (e.g., Kumar et al., 2019). Briefly, these studies have showcased how constructivist-oriented design frameworks, such as the Community of Inquiry Framework (Swan et al., 2009) and pedagogical strategies that leverage authentic learning opportunities centering on learners' needs and interests are crucial for student engagement and success (Martin & Bollinger, 2018; Herrington et al., 2014). Embedded in these approaches to learning design is the understanding that learning is a social and relational process. Good learning design, thus, should account for interactional learner experiences by providing online learners with regular opportunities to interact with their peers, their course instructors, and their course content (Horton, 2012).

In this article, we report on exploratory research that documented the informal and organic student-generated interactions in an open-source discussion system (Piazza). We argue that the informality and unwritten rules of Piazza allowed learners to design a *place* for *their* learning where they connected their immediate needs to their formal "inclass" learning. As such, we identify learner-initiated interactions in Piazza and discuss how each pedagogical

encounter supported their learning of the Python programming language. Through these interactions, we suggest that learners configured Piazza into a "place" for their learning through the informal interactions they pursued and the practices they adopted. We leverage these interactions to consider potential design opportunities where learners can become co-designers of their learning.

Our motivation for this research is to identify how opportunities for learners to configure and co-design aspects of their learning environment impacts their learning. Despite growing interest in the design of online learning environments, this research complements current scholarship by highlighting how online learners undertake roles as agents of purposeful design in-time for their learning when provided the space to do so. As such, we view co-design as a method for learner agency which is understood as an important contributor to academic success (Luo et al., 2019). This form of agency may be partly limited due to the realization that proper online learning design takes significant time and preparation, a characteristic that was quite evident when universities switched to emergency remote teaching amid the COVID-19 pandemic (Hodges et al., 2020).

In the following section, we review existing literature that explores how students are co-designing and configuring their online learning environments. This review will lead to an explanation of our theoretical perspective, and how place-making can be leveraged as a design concept.

Place-making and Co-configuration in Online Learning Settings

Although literature focused specifically on place-making in online learning settings has had little exploration, the push to explore how learners might configure their learning environment is not new. While considering the role of learners and their design choices in learning settings, Ryberg and Ponti (2005) suggest that there

emerges the need for a design practice in which learners are more involved in the symbolic activity of re-creation of meaning which is intrinsic to place-making. They need to understand the space, but they also need to engage directly in collective practices of construction of place (p. 4).

Admittedly, when learners engage in any online learning space, their contributions and experiences should inevitably shape the construction of that environment (Hickey et al., 2020). Building a community of learners, thus, is critical because it enables learners' agency and connection with their classmates and instructors (Moore, 2014). Correspondingly, we believe that Ryberg and Ponti's (2005) suggestion calls for more learner input in the design of learning settings from the "ground up," shifting the design of online learning from a strict educator and designer endeavor to a collaborative practice where learners, teachers, and designers actively re-shape and contribute, in part, to the design of *their* virtual space.

Recently, educational researchers have attempted to unearth how students' place-making practices have influenced their learning in online environments. Gallagher et al. (2017), for example, explored online learners' domestic place-making and found that online students frequently configure their personal spaces in specific ways when attending to their online coursework. Albeit not focused on learners' virtual configurations and place-making practices, their work identifies that learners' spatial constructions influence their learning. Subsequently, educational researchers have begun exploring online learner's "co-configuration" – a priori to place-making – in online learning settings. Co-configuration refers to how students actively customize and make adjustments to the learning environments that have already been designed for them (Sun & Goodyear, 2020).

Sun (2018) investigated the place-making practices of online students enrolled in a Chinese language learning course. Akin to Ryberg and Ponti (2005), as well as Gallagher and colleagues (2017), Sun found that these Chinese language learners made significant adjustments to their personal domestic learning spaces when attending to their classwork. More importantly, Sun (2018) also found that these learners configured online spaces collectively with classmates that did not exist before the start of the semester to support their learning. Sun describes how the students' interest and learning of Chinese cascaded into student-to-student collaboration and communication in other digital realms, including Skype, Facebook, WeChat, and Google Docs. Separate from the course requirements, these new learner-initiated and coconfigured digital spaces became important places that supported students' informal group work and language learning. As such, these sites, although not location-based, became social places for informal learning where participation was voluntary, initiated by the learner, reflective of their needs and interests, and embedded in meaningful activity (Callanan et al., 2011; Gutiérrez & Rogoff, 2003).

Similarly, Hollett and Kalir (2017) found that when given the opportunity, learners will design their online spaces to meet their personal and professional needs. Through an investigation of learners' interactions in Slack and Hypothesis.ie, Hollett and Kalir (2017) illustrated how learners brought together a wide array of resources in digital spaces to configure and make a place for their informal and formal learning. These learner-supported designs represented the "productive tension between the structure of a priori objective (primarily with course content) and the emergent patterns of participation that cultivated how learning was meaningfully accomplished" (p. 244). As such, we recognize that online learners in these studies configured informal spaces adjacent to their formal environments to support their learning. Recognizing these sites as student-initiated places for informal learning (Callanan et al., 2011), our research was guided by the following research question:

How do students' use Piazza to support their learning of the Python Programming language?

In the following, we build off of the reviewed literature to present our theoretical perspective. We present place and place-making as concepts that can be potentially leveraged for design. Then, we elaborate on the background of our research, including contextual information and our methodological choices.

Theoretical Perspective

Theories of "place" have an extended lineage within the fields of cultural and human geography and anthropology, and are becoming increasingly popular in learning sciences research, broadly (Kostogriz, 2006). These theories, in turn, have been an effective way of envisioning and defining educational settings, as increased use of place in research has provided opportunities to explore the intersection between learning settings and social life (McKenzie & Tuck, 2015). Frequently, places are identified by using location descriptors, and they tend to be familiar and obvious – one's home, town, school, local store – their reference often denoting ownership or association to an individual. To help make sense of place, *space* is often used in distinction. As such, space is traditionally more of an abstract concept when compared to place. Space is not neat and orderly, rather it is something that gets layered with social meaning to become a place (Cresswell, 2015).

For us, there have been two perspectives that have helped to develop our understanding of place. First, Casey's (1996) philosophical account of place highlights the "gathering" nature of place. For Casey (1996),

Places are at once elastic – for example, in regard to their outer edges and internal paths – and yet sufficiently coherent to be considered as the same (hence to be remembered, returned to, etc.) as well as to be classified as places of certain types (e.g., home-place, workplace, visiting place).(p. 44)

In Casey's writing, places are malleable to those that gather in them but have qualities that define them to the individuals. Places, then, always reflect the needs, lived experiences, and interests of those who inhabit them.

In addition to Casey's work, Massey's (2005) conceptualization has been influential for our orientation. Massey (2005) identifies the relational nature of place, where place is defined by its "throwntogetherness," and as a result, is frequently "unfinished." In short, place in human geography is defined by the characteristics of its environment and the influences that act upon it. Places aren't just locations but spaces that have "some relationship to humans and the human capacity to produce and consume meaning" (Cresswell, 2015, p. 14). Place-making, follows similarly, stemming from the interactions of individuals as they come together and modify a space to fit their needs (Cresswell, 2015).

In educational research, theories of place and place-making are being leveraged to conceptualize and analytically understand the relational and complex lived experiences of learners across space and time. Although place-making is not a familiar concept to the learning design community, we suggest that by theorizing learners' social interactions in

Piazza as place-making practices, we can provide new collective design pathways for learners, educators, and designers.

Background and Methods

This exploratory research investigates the natural and ongoing learning experiences and interactions in an online *Advanced Python Programming* course at a large northeastern university. Through the presentation of three vignettes, this research aims to unearth how learners place-making practices in Piazza support their informal and interest-driven learning. This article, in particular, ruminates on learners' place-making experiences in *Piazza* and how they co-configured Piazza as a place for code sharing and informal communication. In the following, we elaborate on the context of this research, the use of Piazza, and our methods.

Course Context

The data presented in this article stem from observing an upper-level online programming course. Specifically, this course focused on the advanced application of the Python programming language to develop and customize Geographic Information Systems (hereafter GIS), design user interfaces, solve complex geoprocessing tasks, and leverage open-source materials. Throughout our observations, this online course was an intimate experience for students, often enrolling less than twenty students and running on a condensed semester schedule of 10-weeks instead of the traditional 15-week track.

Students enrolled in *Advanced Python Programming* had a range of backgrounds and experiences, and were working professionals (e.g., geospatial analysts for law enforcement, environmental agencies, and the IT industry), most of whom had already received a bachelor's degree in a related field. So, students taking the course were expected to have some programming skills and experience, and it was common for enrolled students to have familiarity with a range of programming languages, including *Python, R, ArcGIS*, and *C++*. Frequently, these students were seeking an extra certification for their current or prospective job. Additionally, these students were often geographically dispersed across the world. As such, the asynchronous format of the course provided accessible learning opportunities for students as they logged in at inconsistent times and juggled family, work, and school obligations.

The instructor and learning designers for *Advanced Python Programming* used Canvas to house all content for the course, including readings, working files, activities, and assessments. Since code-sharing is a familiar method for distributing work among programmers (Warren et al., 2014) both the learning designers and instructor realized the need for a tool that would allow students to communicate and share code, free of formatting errors. Unfortunately, the discussion forums in Canvas did not have this ability so the learning designer sought out alternatives that could integrate effectively with Canvas. Piazza, in turn, was selected because of its ability to provide users a digital platform to share code asynchronously. In the next section, we briefly describe some of the main characteristics of Piazza and discuss how it was used as an adjacent space to the Canvas course.

Piazza

Piazza is marketed as a learning management system that allows students and instructors to ask questions in a forumstyle format, where discussions can be moderated and endorsed (Figure 1). Although dated, the forum-style interface is familiar to other online forum spaces (e.g., Reddit, stack overflow) and provides users with quick and intuitive navigation. Along the top menu bar, content (e.g., forums) can be separated into topics or modules (e.g., lessons) similar to navigation in popular learning management systems, such as Canvas. Along the left side of the interface, content headings and statistics (e.g., the number of contributors to post) are neatly displayed. When a conversation has been selected from the menu on the left, the whole thread appears as the main screen, displaying questions or comments by the original author, content (e.g., python code), and answers or comments from any contributors to the conversation.

Figure 1

The Piazza Interface



A picture of the Piazza interface

Methods

In this article, we present a case study (Yin, 2014) focusing on student-generated interactions in Piazza. This case is described through three vignettes that detail how learners in an *Advanced Python Programming* course configured Piazza to support their learning of the Python programming language. In each vignette, we focus on a specific configuration method that learners employed in Piazza. We used purposive sampling procedures, selecting the course because of our professional work commitments and its capacity to provide student-driven learning experiences in Piazza, and inspired by the work of virtual ethnographers (e.g., Hine, 2000), we immersed ourselves in the interactions in Piazza over the course of two semesters to understand learners' use of Piazza. Our primary source of data was our observations of the interactions, and due to the nature of our work, as designers, we were regularly required to "check in" to the course. As such, our work responsibilities supported our analysis. During these check-ins, we were able to monitor students' participation in Piazza and make note of who's participating, how they're participating, and the context of their participation. This ability to conduct weekly check-ins granted us the privilege to trace student interactions and participation across time. Even more, to document our observations, we captured screenshots of the interactions.

Leveraging principles of Interaction Analysis (Jordan & Henderson, 1995), we documented virtual interactive "hotspots" – moments of rich student-generated interaction – through the screenshots collected. These screenshots were then shared among research team members and we used moments of "trouble and repair" (Jordan & Henderson, 1995) as an entry point for our analysis. As such, this research was interpretive in nature and much more work needs to be done before extending large-scale generalizations. In pursuit of internal reliability, the research team converged weekly to discuss and reexamine findings. Individual observations and identified themes were compared between researchers to produce a reliable and representative group of themes (Braun & Clark, 2006). Furthermore, the research team collected additional data through student surveys and interviews. However, data collection from the survey and interviews was greatly disrupted due to the COVID-19 pandemic.

In the next section, we present three vignettes that exemplify how students used Piazza in informal ways to support their formal learning. We show how Piazza, as an unregulated space, became an environment that students actively

shaped to support their interests and personal learning.

Findings

In the following, we highlight three representative examples of how students configured Piazza to support their in-themoment learning of the Python programming language. In the first vignette, we show how students' frequent use of Piazza as a help forum mirrors the collaborative work being conducted in professional learning communities like *Stack Overflow.* In the second vignette, we provide an example of how a student uses Piazza as a sounding board, similar to our first example, but the unregulated nature of Piazza creates an opportunity for the student to engage with their thinking across space and time. In our third vignette, we show how two students leveraged Piazza to share resources and make a place for their collective problem-solving.

This may be a silly question, but . . .

The students' interactional practices in Piazza often mirrored the practices that are associated with professional programming communities like *Stack Overflow.* As such, students would use Piazza as a place to ask questions about their code. Notably, these interactions were triggered by students running into code "trouble," or situations in which they tested their code but did not receive the desired result. So, as students experienced issues with class activities and projects, they leveraged Piazza as a space to initiate informal conversations.

In this first example, a student reports their "trouble," an error message they have received while copying programming files (Figure 2). This student initiates their request for help by stating "This may be a silly question, but" thus positioning their interaction as an informal endeavor. The student's initial request for help reflects the informal nature of Piazza, and how in this community, learners became comfortable using the platform by asking and answering practical questions that were related to their formal class learning.

Figure 2



A Student's Post of an Error Message

A picture of a student reporting an error message

In response, many problems posted by learners were met with practical, utilitarian answers. Indeed, the responses from other students, and occasionally from the instructor, reflected the informality of their configured spaces, as students

had the freedom to answer questions as they saw fit. Evident in the students' response to the original question is that their informal question and answer (Figure 3) – presentation of "trouble" and offer of "repair" – highlights a production-centered focus on solving problems and improving solutions.

Figure 3

A Student Responding to the Error Message

S the students' answer, where students collectively construct a single answer		
I just went through this yesterday and ended up copying the folders that contained the "_" files over. Things didn't wo did work with the folders.	rk with just the files starting with the $^*_^*,$ but they	
edit · good answer 0	Updated 10 months ago by I	
the instructors' answer, where instructors collectively construct a single answer		
Hi control in the set approach is to copy the whole folders across - then they're picked up automatically because they're in the right place within those folders. It may be worth running through the manual process as well just to make sure that all of the individual pieces are being installed correctly. If you're still having trouble though please let us know. It's an unfortunate but common occurrence that installing external libraries into conda can occasionally be difficult. The difficulties come from having inconsistencies in your own environment (and i had similar issues to these a couple of days ago building a new environment of my own). In my case the solution was to use the manual steps in the lower half of https:// (albeit with all of the installs in a single line : conda install beautifulsoup4 gdal jupyter etc.		

A picture of a student's response to an error message

Through this encounter, and other similar student-student question and answer interactions, students made Piazza into a low-stakes informal environment that could offer highly valuable rewards.

In a similar informal pedagogical encounter, Greg requested help as they were experiencing issues importing their code. Again, we see the informal nature of Piazza playing out in both the initiating post and in Tony's response. Indeed, Greg informally queries for help ("What am I missing?") and receives a direct, and to-the-point, response from Tony ("Try removing that and see if it makes a difference . . . Best of Luck!") (Figure 4). Instead of offering an elaborate solution to the problem, Tony's response illustrates the informality of the interaction. He simply identifies the problem and offers a straightforward solution, a customary form of interaction in similar learning communities. The two students then debrief on their learning and experience, leading them to a discussion of the role that specific syntax played in their interaction.

Figure 4

Tony Helping Greg with Their Syntax

Unread Updated Unresolved Following	0-	Tax ther Consile + Question Monory.
New Post Q, Search or add a post		I This class has been made inactive. No posts will be allowed until an instructor reactivates the class.
Filtering by: le	\odot knoces	1
WEEK 11/34 - 11/30		S dearen dat Q il II a
Failing to get getExistingDirectory for Helio, I am trying to define a folder for output with QFIeDIalog using: def defineOutpath0; = select.	11/27/19	Main not importing waterbodies.Stream
 An instructor librals there are good followups Accessing 'water' tag for areal features Hello, I am trying to construct the areal features - focusing on lakes, and have identified way 129649734 as the test id 	11/27/19	evaluated of the the counters of the test cause of the provide state of the provide state of the test of test
Having trouble pre-sorting the GeoPac Hello, I have tried many ways to produce CeoPackapes that are pre-sorted by the length attribute of their features. I ca	11/27/19	Faceback (most recent call last): File "main.py", line 7, in emodule> invect exclusion/invector
fromPolygonXY vs fromPolylineXY Correct me if fm arrong, but the use of fromPolylineXY is functionally the same: send a list of Qg	11/26/19	<pre>import waterboulds File "Cluberslohmathan\Gogle Drive\Grad School\PSU_GIS_Cert\GEGG 489\Lesson4\clementi_L4_Deliverables\ aterbodies.py", line 4, in cmodule> import main</pre>
OMessage Box Question I was trying to add complete and error dialog boxes to my CUI using OMessageBox for Assignment 4, similar to Assignment • 2 Unresolved Followups	11.26/19	File "C:Ubers\Denthan\Google C:vvbGrad SchoolV9U_GiS_Cert\EEGG 489\Lesson4\clementi_L4_Deliverables\usin.py", In: 109, in cmobile? result = waterbodies.Stream.fram@SWAp(w, node50Lct) ttributerror: module 'waterbodies' has no autribute 'Stream'
Main not importing waterbodies.Stream Hi all, So I'm testing the functionality of my stream class currently and I am getting an AttributeEvror when I try	11/26/19	clas Strant Fourd at waterbadies
Constructing a Stream Object Troubles Hello, J am having some trouble constructing the stream object from a test script I compiled focusing on way/D #5001457.	11/25/19	class Stream(Linea/Waterbody) # Instantiated subclass of Linea/Waterbody defnotbielt, came, generate() # Installar same, generaty, and length instance variables superStream andmctbame_generations
Running Main.py from the BusTrackAn Sorry, my bad. Post deleted Howard • An instructor thinks this is a good note	11/24/19	det from/CMARiag/issg: allholder.) # Override from/CMARiag of Waterbody if warg/tag/tag/tag/tag/tag/tag/tag/tag/tag/ta
'm not at my home right now so I c nakes a difference. Best of luck!	an't dou	- An instructor - An instruct
edit 1 good answer 2		Updated 1
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Resolved Unresolved 9 mon 7 7 7 7 7 7 7 7 7 7 7 7 7	ths ago	of recursive import statement?
Tony I our class definitions import main to work	9 month isn't ne , but the	a sigo: That's what I've gathered. So long as we are just returning materials from our class file, importing the main.py in cessary. I think of It like in terms of importing accyp (which I imagine is filled with classes), arcpy doesn't need to inverse (main importing accyp) is required.



By providing a less-regulated space for students to make their own, Piazza became a place where students could pursue their learning through questions and answers. Characteristic of informal learning, their learning was learnerinitiated, embedded in meaningful social activity reflective of the work of GIS professionals but didn't follow a structured curriculum or face assessment (Callanan et al., 2011). As a result, their co-configuration of Piazza, and their engagement and interactions not only reflected those of programming professionals and enthusiasts but, more importantly, allowed them to engage in interest-driven learning practices.

I've been stumped

In many ways, students made Piazza into a public forum that could be returned to across time and space. As a result, students often initiated interactions that not only received varying levels of feedback but created learning opportunities that could be revisited. In this vignette, we show an example of a student who hasn't been able to figure out a workaround for an error code they keep receiving. More specifically, the student poses a question regarding an error message in their code and has been "stumped on for a while" (Figure 5). In a more regulated environment (e.g., a Canvas discussion forum) with conventional methods for engaging in discussions, this may have prompted an immediate response or a set of student responses.

Figure 5

A Student Poses and Answers Their Question

Denial Updated Diversitient Following New Post Q, Search or add a post	0.		
New Post Q, Search or add a post	Q.	Ban User Console + Question Hotory	C dada bita
		Problem with workers	
Effering by 1	o freened	Ive been stumped for a while on a	n error Tm getting. When I run the scriptical it progresses to the point at which it is supposed to start the workers but the workers aren't called
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the been stumped for a while on an error the	88	B fully factory factory 10 1 1 10	Entre Extend 0 - 0
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An excerpt from a student discussion

Reflective of how students used Piazza in this course, however, the nature of this pedagogical encounter is much different than one would expect in a traditional discussion forum setting. Instead of a student's post automatically generating a set of student replies (a traditional discussion forum participation strategy), the student's trouble leads to self-guided experimentation and a search that results in them answering their question. Remarkably, their interest-driven practice can be interpreted as a significant investment in the social sphere of the forum as they, intrinsically, returned to their story-so-far, explaining that they found help in another classmate's post and identified their "repair" method. Instead of leaving the problem unsolved or waiting to see if the instructor would offer help, the student chose to post their solution to the problem, informing the rest of the community – whether they were experiencing the same problem or not – and contributing to an evolving socially constructed knowledge base. Significantly, the "remembering" nature of the students' place in Piazza enabled the student to find help in an older post by another student.

Piazza as a Place for Joint Problem Solving

Place-making in Piazza should not just be seen as direct questioning and answers though, as how places are made reflects the wide-ranging needs of those who inhabit them. As such, our third example illustrates how students often used Piazza to pursue collective problem-solving. In this example, Mark reports that they are having trouble successfully running a portion of their code script and asks some clarifying questions while also assuming where his error might be originating (Figure 6). At a roadblock, Mark, in a manner similar to our previous examples, posts his trouble. However, being such a complicated problem, the conversation takes multiple turns and includes sharing multiple lines of code and input from both another student and the course instructor.

Figure 6

Mark Posts Their Trouble



A picture of a student posting a challenge they are experiencing

Figure 7

Jamie Begins to Troubleshoot Mark's Problem



A picture of a student responding to another student in a discussion forum

Mark's trouble is initially responded to by another student, Jamie (figure 7). Jamie addresses Mark's original questions while asking for more details, trying to share an example of his code (repair), and identifying a specific element in their

code (51 responses of False) (Figure 8). The conversation again turns, as Mark shares their "sql string" and Jamie identifies the root cause of the error, a syntax issue, and provides two options that successfully resolve their issue.

Figure 8

Mark and Jamie Follow Up

Resolve	
irk	8 months and
I am i	mporting the same way:
_	
fr	om multicode import worker
My q	Jery is:
qu	ery = '"' + field + '"' + ' = ' + str(oid)
good (comment 0
Ja	(Doing a guick definition guery set builder in PPO on the states layer returns OR IECTID = 14.)
	boing a quick deminition query sqi builder in PHO on the states layer returns Obocomb = 14.
	try this for the query
	<pre>query = """{} = {}""".format(field, str(oid))</pre>
	or
	query = field + ' = ' + str(oid)

A picture of a student responding to another student in a discussion forum

After they worked out the error, the instructor enters the conversation, offering their feedback. Despite the instructor's knowledge of the topic, they don't receive deference, contributing to the conversation with their clarifying question and advice, and Mark responds with a copy of their code and confirmation of their success (Figure 9).

Figure 9

Mark Confirms the Code is Working



Example of students conversing with one another in the discussion forum to solve a problem

Even with Mark's confirmation that their code had been repaired, the conversation takes another turn with Jamie responding and adding their question (Figure 10). Mark responds again with their successful code, crediting Jamie and the instructor's advice. The nature of this interaction illustrates the unfinished and "always becoming" nature of place (Massey, 2005), as even when the problem seemed to be resolved, the conversation took three more turns with the instructor offering their advice, Jamie's response, and the instructor following up one more time after Mark shared their code. Unlike the first two vignettes, Mark's problem was not something that could be repaired with a quick response. Rather, repair required a collective approach to problem-solving.

Figure 10

Mark, Jamie, and the Instructor All Following Up on the Original Problem

Jamie	pesky env variables.
	I'm still curious why my code throws an error for the query when I use " " as written but there are some other things that are acting weird (like the realative/absolute paths, Spyder not starting without having to reset every other time, Pro throwing %1 errors for numpy) so I may blow away reinstall Pro and recreate the Pro python env. I fought with an install of conda prior to installing Pro and I am wondering if it has left some artifacts in my system.
Mark	s months ago Successfully tested it with the following query syntax, for both the command line and script tool:
	<pre>query = f"""{field} = {str(oid)}"""</pre>
	Combination of your syntax suggestion and f-string formatting.
Instructor	overwriteOutput, try with placing that line in the other file instead, the one that contains the worker() function. That should do the job. The reason this makes a difference is because the worker processes and the main process all have their own independent version of arcpy.env.
Mark 1	with the addition of overwriteOuput to the other file. Thanks for the suggestion!
Reply An e	to this followup discussion example of students and the instructor conversing about a problem in the discussion forum

The three examples of student-initiated place-making in Piazza show the interactional moves that students make to coconfigure their learning space. In the first vignette, we share how Piazza was configured into a place that mirrored the practices and ways of interacting in more professional learning communities. In the second example, we share how Piazza was treated as a place that didn't require specific ways of interacting. Instead, not all questions were always answered, resulting in continuous effort on the part of the originator of the post to address the error. In our final vignette, we show how students frequently used Piazza to engage in joint problem-solving ventures, requiring the sharing of code and resources. In this manner, the students made Piazza into a place that supported their informal learning, as they designed it to be socially collaborative, embedded in meaningful activity, and shaped iteratively through their immediate needs (Callanan et al., 2011). Although their actions were deliberate, the mailability of Piazza allowed students to tie their informal learning with their more formal class-specific learning in-time.

Discussion and Implications

From both a theoretical standpoint and our observations of interactions in Piazza, we believe that we can derive some potential opportunities for future research, as well as design suggestions for online learning settings. Significantly, Piazza became a place as it was layered with social meaning stemming from interactions around Python code and formal concepts related to their coursework. The ability to interact informally in a self-regulated manner though left much of students' learning up to them. Indeed, students could actively choose how they wanted to use Piazza, and could shape its future uses as well, from a simple question and answer forum to a space where students could engage in joint problem-solving ventures similar to GIS professionals. With each interaction, students produced novel questions, new understandings, and additional resources that, along with their classmates, they could return to throughout the semester. Some students participated more than others, some rarely participated at all. However, our analysis shows that students did co-configure Piazza to meet their learning needs, and as a result, we suggest that a place-making design practice can lead to powerful agential learning opportunities for students.

Further, Piazza was chosen for its ability to easily integrate with Canvas and provide a platform that students could access and contribute to. In fact, Jamie spoke to their participation in Piazza, stating:

My daughter, she's in gymnastics and guitar lessons and stuff. So, after work, I'd pick her up from school and take her to those events. And that's where I would do a lot of my reading [in Piazza] – on my cell phone.

For Jamie, the ability to access Piazza and contribute to ongoing pedagogical encounters across time and space supported their interest and expertise in Python programming. In the same vein, because it was less regulated than a typical course discussion, students felt free to contribute without having to worry about the formality of their responses. As seen in all of the vignettes, despite the instructor's access to Piazza, students' contribution and use of the forum didn't follow rigid rules or expectations.

While we are not attempting to propose any new rigorous guidelines for designing formal online learning environments, our examples illustrate how students, when granted the opportunity, can configure their online spaces to create robust digital learning environments that meet their needs and support their learning, as well as the learning of their peers. Students in our research used Piazza to pursue interest-driven and often informal learning, where their experiences were constructed by them and members of their community.

Our data suggest that there is a need to better understand how students, when given the opportunity, create collaborative digital learning spaces adjacent to their formal learning environments that can support their interests, professional practices, and informal and formal learning. Additionally, we suggest that a place-making perspective can open up new design considerations for online learning designers and educators. At the very least, place-making as a design perspective opens up additional questions for exploration and research. For instance, as online educators and designers, (1) how might the concept of place-making affect our design practices, broadly? (2) How can we incorporate design practices in online learning environments that have enough elasticity to be shaped and reshaped by students throughout a semester? And, (3) how can we create conditions in online learning environments that proactively encourage learners to curate digital spaces for their learning?

In our vignettes, we revealed how Piazza was co-designed by students to support their informal learning. Even more, we have demonstrated how learners in this Advanced Python Programming course used Piazza to engage with their peers in similar ways to GIS professionals. We argue that student-designed, maintained, and run spaces can become important places for students to collaborate, share ideas and resources, and pursue learning pathways. We do not suggest that every online teacher or designer implement Piazza or forego using evidence-based design frameworks to design online environments. However, we encourage online instructors and designers to seek out ways that students can become more involved in the design of their learning from the outset.

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