

Citizen Science as a Tool for Connecting beyond the ESL Classroom



Carolyn Gascoigne

University of Houston-Downtown, USA // gascoignec@uhd.edu

ABSTRACT: The following conceptual and historical examination imagines and applies citizen science as a methodological framework and linguistic landscaping as a technique with the shared goal of providing language students with opportunities to engage with their own as well as other communities. It also presents a sample project fusing citizen science and linguistic landscaping in pursuit of linguistic and cultural awareness as we continue in our discipline’s rich tradition of cultivating connections with local and global communities.

Keywords: citizen science, linguistic landscaping, intercultural citizenship, community-engaged learning

Introduction

Over the last few decades, there has been a growing call for educators and students to deepen connections to our local and global communities. This tenet is evidenced by the explosion of service-learning pedagogy and research throughout the late 1990s and early 2000s (Celio et al., 2011). It is also underscored by the American Association of Colleges and Universities’ (AAC&U) 2020 call for all academic disciplines to embrace opportunities for students to apply knowledge “to real world situations” (p. 4) while also promoting “active involvement with diverse communities and real-world challenges” (p. 2). Core principles of this evolving educational ethos include applied learning, globalization of the curriculum, and intercultural competence.

As some academic disciplines struggled to connect their students to the world beyond academia, language educators have long welcomed this challenge. Indeed, connections, communities, and intercultural competence have been priorities for language professionals for decades (Byram, 2021). This early and advantageous positioning is evidenced by and reflected in early models of intercultural competence (Byram, 1997; Canale & Swain, 1980; Van Ek, 1986), ACTFL’s World-Readiness Standards for Learning Languages (ACTFL, 1996), and EFL Policies, Programs, and Practices (Blatchford & Schachter, 1978).

As the profession continues its quest to humanize language learning by cultivating a climate of understanding and inclusion and facilitating “intercultural citizenship” (Byram & Wagner, 2018, p.149), we can look beyond the boundaries of our discipline for inspiration. While paradoxical on the surface, tools

and methodologies born in the natural sciences have been successfully reapplied to the disciplines of language acquisition and pedagogy as well as sociolinguistics. To this end, this paper first investigates citizen science as both a methodological and a pedagogical tool within the natural sciences. Next, we consider its reapplication within sociolinguistic research by exploring the potential of citizen science to further our quest to build connections, promote language awareness, and cultivate intercultural competence in the language learning classroom. Finally, we describe a small-scale student-led research project that employs citizen science methodology.

Citizen Science

While difficult to capture within a uniform definition or method, citizen science is generally understood as a form of research encompassing a range of practices that involves public participation by amateurs in the production of scientific knowledge. It commonly refers to some type of voluntary, collaborative, or broad-based involvement of community members in a research project that is typically, but not exclusively, designed or managed by a professional researcher (Fan & Chen, 2019). According to the American Association for the Advancement of Science (n.d.), citizen science involves public participation in scientific research where non-professionals contribute observations, data, or analysis in order to advance scientific knowledge.

Public participation in large-scale projects, or crowdsourcing, can be found in our everyday lives, from volunteer contributions to Wikipedia to real-time information provided by drivers in the Waze navigation app. Numerous citizen science projects also use crowdsourcing, by soliciting input from the public. The U.S. Fish and Wildlife Service, for example, conducts research that relies on citizen volunteers who share wildlife sightings, classify sounds, and help analyze images (Sauer et al., 2017). Similarly, NASA's Active Asteroids and Asteroid Data Hunter initiatives draw on citizen stargazers to help track asteroids and map lunar craters (Peterson et al., 2022).

Citizen science techniques, such as crowdsourcing, require a rapprochement of two customarily discrete worlds: the scientific research community and the public. As such, citizen science redefines the relationship “between the researcher and the researched [as well as] the traditional way we conceive science and who has the authority to do it” (Svendsen, 2018, p. 139).

Citizen Science as Pedagogy

The benefits of citizen science are not strictly unidirectional. The researcher or research institution benefits from the methodology by increasing the breadth of data collection or of data processing (Strasser et al., 2019). Yet, benefits to the participants also occur. Svendsen (2018), for example, stresses a concomitant aim of citizen science of providing participants with research experience, stimulating curiosity, and furthering understanding, awareness and stewardship (p. 137). Without benefits to the public, some projects run the risk of alienating participants or fostering a climate of mistrust. So, while not originally conceived as a pedagogy, educational outcomes of citizen science projects are often pursued. Pedagogical benefits to the public (or students) can include improved awareness and understanding of content (Phillips et al., 2018), increased interest and engagement (Svendsen, 2018), increased self-efficacy

(Smith et al., 2021), and the development of collaboration and research skills (Molek-Kozakowska & Laihonen, 2024).

More specific to the language learner, citizen science offers a vehicle for the language student to reflect on his or her own identity and community through participation in situated linguistic exploration. Critical cultural awareness advanced by Bryam and Wagner (2018) requires a critical reflection of the learner's own identity and community, including dynamic processes employed across a variety of contexts as prerequisites for study and exploration of new languages and cultures. Central to Bryam's (2021) model of intercultural competence is a capacity to explore one's own stereotypes and potential prejudice. These skills, attitudes, knowledge, and intercultural competencies are essential for student engagement within our increasingly multilingual and multicultural societies. By ensuring that new notions of language and culture are scaffolded or schematically linked to the learner's world, students are open to appreciate the value of language learning as an intercultural citizen.

Language, Linguistics, and Citizen Science

As an epistemic practice, citizen science is frequently employed in the natural sciences, such as biology (Allen, 2009), biochemistry (Coren, 2011), geology (Haklay, 2013), chemistry (Marshall, 2012), and astronomy (Peterson et al., 2022). Citizen sociolinguistics (Rymes & Leone, 2014) captures the cross-pollination of citizen science techniques from the natural sciences to sociolinguistics. More recently, the disciplines of language teaching and linguistics have begun to embrace citizen science and crowd-sourced data collection (Jung & Lee, 2018; Molek-Kozakowska & Laihonen, 2024; Purschke, 2021; Rymes, 2020; Svendsen, 2018; Svendsen & Goodchild, 2024; Tiedmann, 2018). Numerous web-based platforms, mobile apps, cloud computing, and social media technologies have been used to help linguists explore and democratize language use and learning. Tateoba, for example, is a collaborative online database of sentences and translations in over 400 languages. Users can not only search for words, translations, and sample sentences, but also contribute new sentences and translations of their own (Tiedmann, 2018).

Lingscape (Purschke, 2021) is another large-scale, crowd-sourced language-focused citizen science project. Lingscape seeks to explore how different languages and dialects coexist and interact in public spaces. Individuals are invited to photograph and upload images to a mobile app or website. While the original question explored the coexistence of languages such as French, German, Luxembourgish, English, Portuguese and Italian in Luxembourg, the project has expanded globally with contributions feeding an interactive linguistic landscape map.

Less common, however, are examples of co-creative or “extreme” (Haklay, 2013, p.117) citizen science where the lay person is permitted to influence the research question, the methodology, and or engage in some level of analysis or interpretation of the data (Molek-Kozakowska & Laihonen, 2024). Yet, language-focused research projects involving citizens in more than crowd-sourced data collection are increasing.

In an effort to study the language practices of school aged Norwegians, Svendsen et al. (2015) invited 4,500 students to serve as citizen scientists and contribute to a large-scale data set on the use of English in a project called, “Taking the Temperature of Language.” Students were asked to explore the dataset themselves in order to analyze relationships between linguistic and social diversity by sharing samples and insights into their use of slang. The Norwegian project not only invited participation through data collection, but it also went a step further by encouraging citizens, or students in this case, to engage in analysis as well.

Similarly, Molek-Kozakowska & Laihonen (2024) collaborated with 55 high school students in Opole, Poland to explore local linguistic diversity and multiculturalism. This project, however, also had a secondary pedagogical objective of fostering language awareness among language students. Unlike large-scale crowd-sourced projects where participants play a limited and specific role, the Opole initiative represents a co-creative or extreme endeavor in that students (with some guidance and parameters) were able to select both the topic of study and methodology for their language-focused citizen research project. Students' topics ranged from perceptions of various local dialects to exploring the linguistic generation gap between teenagers and their older relatives. The most common methodologies used by students were surveys or interviews. One group engaged in corpus analysis while another employed linguistic landscape techniques. The authors conclude that co-creative citizen science linguistic research is a useful tool for enhancing language students' language awareness within a local context, as well as improving their analytic reasoning skills and methodological awareness.

Jung and Lee (2018) involved 7 students in sociolinguistics projects by folding linguistic inquiries into a post-secondary Korean language class. Using YouTube and blogs, students conducted media-based sociolinguistic research. Students not only collected media-based data, but much like Molek-Kozakowska and Laihonen (2024), students crafted their own research questions, conducted analysis, and shared their findings with the larger community. As with most citizen science projects, the amateur, or the student in this case, was guided and supported by the professional researcher, who had the dual role of professor.

With an aim toward expanding the impact of citizen sociolinguistic research by employing an emic perspective, citizen science projects, such as Lingscape (Purschke, 2021), Taking the Temperature of Language (Svendsen et al., 2015), or the Opole project (Molek-Kozakowska & Laihonen, 2024), engage and empower language users and community members by actively involving them in sociolinguistic research. By involving non-professionals (including students) in research projects, citizen science expands who possesses sociolinguistic knowledge, who is qualified to collect it, and which data should be captured (Svendsen, 2018).

Much like Jung and Lee (2018), Molek-Kozakowska and Laihonen (2024), and Svendsen et al. (2015) involved students in the role of citizen scientists with an aim to involve them not only in the collection but also analysis of linguistic data, the following project uses citizen science as a practice to involve students in sociolinguistic research. Similar to the Lingscape project (Purschke, 2021) and one of the 18 Opole projects (Molek-Kozakowska & Laihonen, 2024), the following initiative employs linguistic landscaping techniques. Linguistic landscapes are defined as the observable and collective public manifestations of language use (Gorter, 2006). The selection of citizen science as a method and linguistic landscaping as a tool was intended to create a learning environment that provides an opportunity to connect to the community, contextualize knowledge, and consider intercultural and translingual realities.

Citizen Science, Language, and Culture: An Application

The following small-scale, student-led project employs citizen science methodology, coupled with linguistic landscaping techniques, with an eye toward generating additional opportunities for students to connect to local and global communities and apply knowledge to real-world situations” (AAC&U, 2020, p. 4). As part of a first-year undergraduate course devoted to exploratory language and culture at the University of Houston-Downtown offered during the spring semester of 2025, students were invited to engage in sociolinguistic research. The goal of the research project was to begin to map and to explore the use of languages other than English, as well as non-standard varieties of English, as found in the local linguistic landscape. The pedagogical goals of the project, on the other hand, were more varied and included the ability to:

- Evaluate assumptions and develop defensible conclusions based on interpretation and analysis of sociolinguistic content.
- Synthesize and deliver organized and well-constructed arguments about language variation and its social implications using multiple modalities.
- Analyze or interpret empirically derived sociolinguistic data and infer logical conclusions.
- Apply theory or findings from empirical research to contemporary sociolinguistic problems to explore civic engagement and identity.
- Identify the interplay among individuals, groups, institutions, and events within the context of society and culture.

To meet the pedagogical goals of the course and to encourage student connections to local and global communities, students were asked to use linguistic landscaping techniques within a student-driven, but instructor-guided, sociolinguistic research project. In this case, students were asked to photograph samples of linguistic data as found in their own communities as it appears in public spaces such as advertisements, billboards, shop signs, notices, official postings, or graffiti. In addition to contributing linguistic tokens via images to a growing collective dataset, students also engaged in their own analysis and interpretation of their findings. This type of activity encouraged the students to explore not only language tokens, but also the “identities, values, and relationships within a given territory, region, or area” (Heubner, 2009, p. 70). As such, they were not only involved in data collection, as is often the case in crowd-sourced contributions, but they engaged in analysis as well. In an oral and visual presentation of their research, students were invited to explore and analyze how language operates within various societal and cultural contexts, with a focus on interactions among individuals, groups, and institutions, by examining language (as data) in the surrounding linguistic landscape.

A brief summary of the assignment and directions given to students is as follows: This assignment invites you to explore and analyze how language operates within various societal and cultural contexts, with a focus on interactions among individuals, groups, and institutions, by examining language use (as data) in the surrounding linguistic landscape. It also asks you to reflect on your own attitudes and beliefs regarding other cultures and communities and explore ways to apply sociolinguistic awareness to civic identity and engagement.

Your charge is to collect and analyze language tokens in the linguistic landscape (e.g., media, billboards, shop signs, official notices, graffiti, etc.) to examine one of the following topics:

- Option 1: Explore the relationship between language and culture as evidenced by your samples.

- Option 2: Explore interactions between individuals, social groups, and civic institutions as evidenced by your samples.

Product: You will give an 8–10-minute oral and visual presentation where you share the results of your linguistic landscape analysis, emphasizing the social and civic implications of your findings.

As part of a larger research agenda, students were then invited to share the results of their own projects with the larger community by presenting their findings at a linguistic landscape symposium exploring the linguistic landscape of Houston. Cumulatively, this student-led research project fusing citizen science and linguistic landscaping in pursuit of linguistic and cultural awareness created opportunities for students to engage with their own as well as other local communities, while also practicing skills aligned with other learning outcomes such as analysis and interpretation of sociolinguistic content, evaluation of assumptions, interpretation of empirically derived sociolinguistic data, exploration of civic engagement and identity, and delivering well-constructed arguments.

Conclusion

For today's language educator, language teaching and learning involve more than linguistic knowledge or competence. Equally important in our increasingly interconnected, global environment is the fostering of intercultural and linguistic competencies. Teaching language for intercultural competence acknowledges the student's own identity as well as his or her personal linguistic and cultural experiences but also asks students to consider their otherwise unquestioned world views by momentarily decentering themselves and their perceived expectations and beliefs.

Applying citizen science techniques within language learning contexts, such as the project described here, offers an opportunity to deepen students' intercultural competencies by providing authentic and contextualized practice of target skills, attitudes, knowledge, and awareness while engaging in sociolinguistic research. Both citizen science and linguistic landscaping have been employed as a pedagogical intervention with an aim of enhancing language awareness, encouraging opportunities to create meaningful connections, and increase intercultural communicative competence through situated linguistic exploration.

This project did not attempt to measure pre- and post-treatment gains of any kind. Instead, it explores an expansion and reapplication of methodology and techniques across disciplinary lines by applying citizen science techniques to a student-driven research project within a language classroom. While not a research study, the present conceptual and historical examination reimagines and applies a combination of citizen science as a methodological framework and linguistic landscaping as a technique with a mutual goal of preparing language students to engage with both their own as well as diverse communities. It also presents a small sample project fusing citizen science and linguistic landscaping in pursuit of linguistic and cultural awareness as we continue in our discipline's rich tradition of cultivating connections with both local and global communities while stressing the importance of preparing students to navigate a diverse and interdependent world.

The Author

Carolyn Gascoigne is a Professor of Language and Humanities at the University of Houston-Downtown. Her teaching interests focus on second language acquisition, bilingualism, and linguistic landscapes. Her publications have appeared in outlets such as the TESOL Encyclopedia of English Language Teaching, Foreign Language Annals, the French Review, and Hispania, among others.

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References

- American Association for the Advancement of Science (n.d.). Public engagement with science: Citizen science. AAAS. <https://www.aaas.org/programs/public-engagement/citizenscience>
- American Council on the Teaching of Foreign Languages (ACTFL). (1996). *World-readiness standards for learning languages*. <https://www.actfl.org>
- Association of American Colleges and Universities (AAC&U). (2020). What liberal education looks like: What it is, who it is for, and where it happens. <https://www.aacu.org/trending-topics/what-is-liberal-education>
- Allen, D.M. (2009). Amateurs and professionals. In P. Bowler, & J. Pickstone (Eds.) *The Cambridge History of Science. The Modern Biological and Earth Sciences*. Cambridge, UK: Cambridge University Press, pp. 15-33.
- Blatchford, C. H., & Schachter, J. (1978). *On TESOL '78 : EFL policies, programs, practices: selected papers from the twelfth annual convention of Teachers of English to Speakers of Other Languages, Mexico City, April 4-9, 1978*.
- Bonney, R., Phillips, T. B., Ballard, H. L., & Enck, J. W. (2016). Can citizen science enhance public understanding of science? *Public Understanding of Science* (Bristol, England), 25(1), 2–16. <https://doi.org/10.1177/0963662515607406>
- Byram, M. (1997). *Teaching and assessing intercultural communicative competence*. Clevedon, UK: Multilingual Matters.
- Byram, M. (2021). *Teaching and assessing intercultural communicative competence: Revisited* (Second edition.). Multilingual Matters. <https://doi.org/10.21832/9781800410251>
- Byram, M., & Wagner, M. (2018). Making a difference: Language teaching for intercultural and international dialogue. *Foreign Language Annals*, 51(1), 140–151. <https://doi.org/10.1111/flan.12319>
- Canale, M., & Swain, M. (1980). Theoretical bases of communicative approaches to second language teaching and testing. *Applied Linguistics*, 1(1), 1-47. <https://doi.org/10.1093/applin/l.1.1>
- Celio, C. I., Durlak, J., & Dymnicki, A. (2011). A Meta-analysis of the impact of service-learning on students. *The Journal of Experiential Education*, 34(2), 164–181. <https://doi.org/10.1177/105382591103400205>
- Coren, M.J. (2011). Foldit gamers solve riddle of HIV enzyme within 3 weeks, *Scientific American*, September 20. <https://www.scientificamerican.com/article/foldit-gamers-solve-riddle>
- Fan, F., & Chen, S.L. (2019). Citizen, science, and citizen science. *East Asian Science, Technology and Society*, 13(2), 181–193. <https://doi.org/10.1215/18752160-7542643>
- Gorter, D. (2006). Introduction: The study of the linguistic landscape as a new approach to multilingualism. In D. Gorter (Ed.), *A new approach to multilingualism*. (pp.1-5). Multilingual Matters. <https://doi.org/10.21832/9781853599170>
- Haklay, M. (2013). Citizen science and volunteered geographic information: Overview and typology of participation. In M. Goodchild, S. Elwood, & D. Sui (Eds.), *Crowdsourcing Geographic Knowledge* (pp. 105–122). Springer Netherlands. https://doi.org/10.1007/978-94-007-4587-2_7
- Huebner, T. (2009). A Framework for linguistic landscapes. In E. Shohamy & D. Gorter (Eds.), *Linguistic landscapes: Expanding the scenery* (pp. 70-87). Routledge.
- Jung, J.Y., & Lee, E. (2018). Citizen sociolinguistics: Making connections in the foreign language classroom. *The Korean Language in America*, 22(1), 1–24. <https://doi.org/10.5325/korelangamer.22.1.0001>
- Marshall, J. (2012). Victory for crowdsourced biomolecule design. *Nature*, January 22. <https://www.nature.com/news/victory-for-crowdsourced-biomolecule-design-1.9872>

- Molek-Kozakowska, K., & Laihonen, P. (2024). Fostering language awareness through Citizen Science: Results and implications of a project with Polish teenagers doing language-related research. *Language Awareness*, 34(2), 476–494. <https://doi.org/10.1080/09658416.2024.2428184>
- Peterson, K.A. et al. (2022). Using a global network of telescopes to update the ephemeris for the highly eccentric planet HD 80606b and to ensure the efficient scheduling of JWST. *The Astronomical Journal*, 163(6), 274. <https://doi.org/10.3847/1538-3831/ac8dee>
- Phillips, T., Porticella, N., Constatas, M., & Bonney, R. (2018). A Framework for articulating and measuring individual learning outcomes from participation in citizen science. *Citizen Science: Theory and Practice*, 3(2), 3. <https://doi.org/10.5334/cstp.126>
- Purschke, C. (2021). Crowdsourcing: Participatory research and the collaborative reconstruction of linguistic landscapes within Lingscape. *Linguistic Vanguard*. <https://doi.org/10.1515/lingvan-2019-0032>
- Rymes, B. (2020). *How we talk about language: Exploring citizen sociolinguistics*. Cambridge University Press.
- Rymes, B., & Leone, A.R. (2014). Citizen sociolinguistics: A New media methodology for understanding language and social life. *Working Papers in Educational Linguistics*, 29(2): 25–43.
- Sabaté-Dalmau, M. (2022). “Localizing English in town”: A linguistic landscape project for a critical linguistics education on multilingualism. *International Journal of Bilingual Education and Bilingualism*, 25(10), 3580–3596. <https://doi.org/10.1080/13670050.2022.2067978>
- Sauer, J. R., Niven, D. K., Pardieck, K. L., Ziolkowski, D. J., Jr., & Link, W. A. (2017). Expanding the North American breeding bird survey analysis to include additional species and regions. *Journal of Fish and Wildlife Management*, 8(1), 154+.
- Smith, H., Allf, B., Larson, L., Futch, S., Lundgren, L., Pacifici, L., & Cooper, C. (2021). Leveraging citizen science in a college classroom to build interest and efficacy for science and the environment. *Citizen Science: Theory and Practice*, 6(1), 29. <https://doi.org/10.5334/cstp.434>
- Strasser, B. J., Baudry, J., Mahr, D., Sanchez, G., & Tancoigne, E. (2019). “Citizen science”? Rethinking science and public participation. *Science & Technology Studies (Tampere, Finland)*, 32(2), 52–76. <https://doi.org/10.23987/sts.60425>
- Svendsen, B. A. (2018). The dynamics of citizen sociolinguistics. *Journal of Sociolinguistics*, 22(2), 137–160. <https://doi.org/10.1111/josl.12276>
- Svendsen, B., & Goodchild, S. (2024). Citizen sociolinguistics: What we can learn from engaging (young) people in language research. In B. Svendsen, & R. Jonsson (Eds.), *The Routledge Handbook of Language and Youth Culture* (pp. 407–420). Routledge. <https://www.taylorfrancis.com/chapters/edit/10.4324/9781003166849-38/citizen-socio-linguistics-bente-svendsen-samantha-goodchild>
- Svendsen, B. A., Ryen, E. and Lexander, K. (2015). *Ta tempen på spraket! Forskningsrapport* [Report on the Research Campaign 2014: Taking the temperature of language!]. Oslo: Norwegian Research Council. <https://miljolare.no/aktiviteter/ord/>
- Tiedmann, C. (2018). The Tatoebai Translation Challenge. *Proceedings of the 11th International Conference on Language Resources and Evaluation*. (CLREC 2018), Miyazaki, Japan. European Language Resources Association (ELRA). <https://aclanthology.org/volumes/L18-1/>
- Van Ek, J.A. (1986). *Objectives for foreign language learning: Volume I-Scope*. Strasbourg: Council of Europe, Council for Cultural Co-operation. <https://www.scribd.com/document/497742852/Van-Ek-Objectives-for-Foreign-1986>
- Wangdi, J., & Savski, K. (2023). Linguistic landscape, critical language awareness and critical thinking: promoting learner agency in discourses about language. *Language Awareness*, 32(3), 443–464. <https://doi.org/10.1080/09658416.2022.2115052>