# AI for Acclimation: Assisting Displaced Students in Refugee Facilities through Activity-Driven Lessons

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**Abstract.** This experience report illustrates how an activity-based AI education program can shape displaced students' data literacy and sense of belonging, preparing them for their career and civic engagement. The participants were between 13 and 18 years old and housed at a facility near Athens, Greece. Based on interviews, surveys, and classroom observations with students and faculties, we identified increased student attentiveness, community-building, and trust in peers and faculties. For practitioners and policymakers in refugee education, this project initiates further endeavor in devising culturally responsive curricula and pedagogies that can both improve displaced students' academic performance and enhance their socioemotional wellness.

**Keywords:** Refugee Education, AI Education, Data Literacy, Sense of Belonging

## 1 Introduction

In its 2019 report on refugee education under crisis, the United Nations Higher Commissioner for Refugees (UNHCR) estimated that there would be approximately 20 million adolescents displaced from their native countries [19]. These students often feel isolated in their host countries. Spending most of their childhood and teenage years in exile, displaced youth continue to experience precarity far into adulthood due to the dearth of social support [19]. Education has been shown to be a potential catalyst for fostering a sense of belonging and purpose among displaced individuals. Still, a staggering 3.7 million refugee children remain out of school, with only 24% of them enrolled in secondary education [19].

Education is not a luxury but a fundamental human right, one that displaced children are being deprived of. In an increasingly digitized world, there is a growing importance of technical fluency amongst displaced individuals. In particular, knowledge in artificial intelligence (AI) and data science has great potential in benefiting displaced youth's resettlement [7]. STEM knowledge and AI education offer an opportunity to cultivate the essential skills for displaced individuals so that they can gain access to family-sustaining careers, for a secure career pathway facilitates their integration into the host countries and develop a sense of inclusion in a different social context [15].

This experience report offers just this possibility for displaced students to envision a prospective future with AI and data literacy. Documenting a comprehensive five-day intervention program, this report demonstrates how this interactive hands-on training on AI and data science can empower displaced youth, equipping them with skills to navigate within a rapidly digitizing world so that they can lay out the roadmap for their personal development.

## 2 Project Design

### 2.1 Contexts and Participants

Our AI summer camp for refugee students collaborated with a local non-profit organization in Greece. The organization is dedicated to providing shelters, scholarships, and educational and vocational training for the displaced youth there. Thanks to their support, we were able to conduct our program at one of their venues near Athens, Greece. We also gathered a cohort of participants from our partnerships with the organization.

The classroom was inside a multiple-story housing facility, with a homey ambience and children's drawings as wall decors. Despite the small size of the classroom, it contained most of the essential tools for instruction: two white boards, a set of colorful markers, two laptops, a projector and a screen. We put together two long tables in the middle of the room and placed the chairs around, so that students could sit in a circle facing each other. Seating arrangement facilitated students' collaboration during activities. The venue had access to the internet, allowing for plugged activities. We also installed cooling fans to alleviate the summer heat. Snacks and drinks were provided to accommodate students' dietary needs.

On the first day, 15 students showed up at the facility, some of them joining from camps outside of Athens. There were 12 boys and 3 girls, all aged between 13 to 18 at the time of the study. (Due to the unforeseen heat waves in Athens, 10 students remained for the entire program. One girl joined midway, making a total of 6 boys and 4 girls by the end of the program.) Interviews with faculties revealed students' diverse cultural backgrounds. They originally came from Middle Eastern, African, and Eastern European countries including Somalia, Pakistan, Afghanistan, and Ukraine. After their arrival in Greece, they spent most of their time in gender-segregated refugee shelters. They had been in Greece for varying durations, ranging from less than a year to 4 years. Most students' secondary education was disrupted in their countries of origin. After settling in Greece, participants received learning opportunities from the shelter, subsidized by scholarships for attending local institutes. Students took classes, 1-on-1 lessons for different subjects, and workshops at community or private schools.

Although schooling for refugee youth in Greece had no fixed locations, they were able to learn textbook knowledge and develop language skills, mainly in English and Greek.

### 2.2 Goals and Purposes

This project serves several impactful purposes. Our main drive for introducing an activity-driven curriculum to a Greek refugee center is to offer displaced youth equitable learning opportunities in AI. Beyond academics, this project aims to engender real-world benefits by pioneering an innovative curriculum that future endeavors can refer to. More specifically, this experience intends to explore how AI education - encompassing data and technology fluency - facilitates displaced students' resettlement. Besides evaluating students' academic achievement, we also highlight the development in their socioemotional wellness. We want to demonstrate that AI education is more than passing down technical knowledge but also creating a life-altering opportunity.

### 2.3 Program Overview

Our five-day activity-driven program provided the participants with comprehensive AI education. Each session lasted 90 minutes and adhered to a structured thematic framework, the 5 Big Ideas in AI [16]. These ideas include Perception, Representation and Reasoning, Learning, Natural Interaction, and Societal Impact [16]. This framework leads students to become knowledgeable citizens in technology and society [11]. The lesson plan incorporated 2 to 3 ideas in each lesson, with a specific emphasis on AI's social impacts and its close relevance to daily lives. As visualized in Figure 1, each of our sessions revolved around societal impact, especially ethical design and usage of AI, while introducing the other 4 concepts.

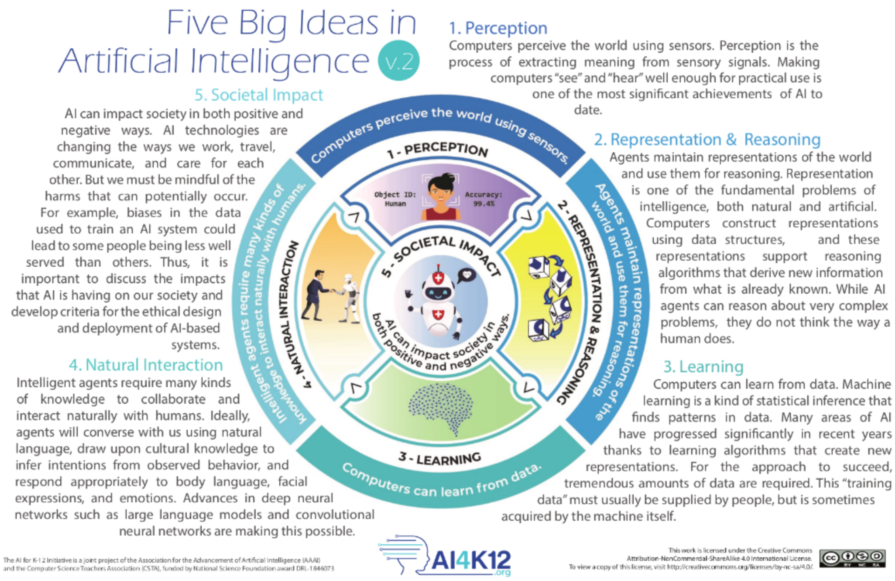


**Figure 1: The 5 Big Ideas of AI**

To complement the 5 Big Ideas, the intervention program also aligned with the International Society for Technology in Education (ISTE) Standards for Students [2] that link AI knowledge to citizen cultivation. Upon finishing the program, students were expected to gain the momentum to become empowered learners, digital citizens, and computational thinkers [5]. The program ensured that students not only grasped AI concepts but also developed the critical skills needed to thrive in civic life: creativity, collaboration, communication, and problem-solving. The ISTE standards prompted students to navigate technology responsibly, prepare them for future careers in a digitized world, foster a strong connection to their new community, and encourage their active participation as informed citizens to engender positive impacts via AI [2, 5].

The program combined both plugged and unplugged activities. In this way, students without AI or STEM backgrounds could still grasp the concepts and mechanisms of the technology. Plugged activities, such as Teachable Machine, Cloud Calypso [18], BERT Chatbot [17] and ChatGPT, provided students with first-hand interactions with AI sensors, language models, and facial recognitions. These tangible applications aimed to demystify the AI black box, concretizing conceptual knowledge into hands-on experiences. Due to the limited number of devices for plugged activities, we also incorporated unplugged, or non-digital, activities for students to understand how AI functions. Unplugged activities still retained their interactivity, with small-group projects like decision trees and building PB&J. These activities can teach students about basic data science and logics without digital installations. The Appendix enlists the overall layout of the lesson plans.

Pedagogy wise, teachers incorporated Know-Want-Learn (KWL) charts. At the beginning of each lesson, instructors created a table where students collaboratively noted what they already Know, what they Wanted to know, and following the lesson, what they had Learned [10]. The goal was to encourage a continuous cycle of knowledge acquisition, inquiry, and reflection. The KWL chart helped guide the course of the learning process, focusing directly on students' academic and personal interests. It also informed teachers about the immediate progress students had made after the training.

## 3 Positionality Statement

We would like to highlight our fluidity on the insider-outsider spectrum [9], as our intersectional identities complicated the interactions with the participants. Graduate and undergraduate students conducted this project, under the instructions of a college professor and an AI education expert. All members were based in higher education institutes of the United States. Because we came from US institutions and are primarily English speakers, we could potentially bring in assumptions about students' language skills, knowledge basis, and learning patterns. We addressed this concern by contextualizing the curriculum and teaching methods that centered around students' cultural backgrounds. The student authors and one of the professionals retain international backgrounds, namely, East Asian, Middle Eastern, and Greek. Non-western upbringings allowed for greater mutual understanding and respect towards our diverse participants. Having an insider perspective to Greek culture and society enabled us to connect with local organizations, communicate with refugee facilities, familiarize the team with the research context, and obtain proximity to the participants during interviews [9]. Simultaneously, other authors could balance out the insider's favorable biases so that we reached a more nuanced documentation of the program. Thanks to the positions as student researchers, we were able to establish a relatively equal rapport without hierarchies. Both of our on-site team members are female, which could also serve as role models for the girls in our program, as they might feel underrepresented in STEM-related fields. By similar tokens, our team consists mostly of women and gender non-conforming authors. Knowing the systemic marginalization in AI and STEM prompted us to create more resources and support for minoritized individuals. In sum, we found ourselves navigating the local contexts as insiders in one situation while outsiders in another [9]. But it was precisely this interchangeability that encouraged us to self-reflect, adjust instruction methods, modify course materials, and empathize with our participants.

# 4 Experience Report

## 4.1 Overall Experience

On the first day, students were uncertain about a new learning environment with instructors from abroad. For much of the time, they kept quiet during the video demonstrations about AI technologies. When the instructors asked questions about what they had gleaned from the video, few students responded, partially because they still needed time to adjust to a new setting. The tense atmosphere began to thaw as instructors encouraged the students to write freely on the white board. They actively jotted down their goals in the KWL chart. In the W column, they demonstrated enthusiasm in design thinking and AI ethics, such as how to train their own AI models and whether AI could be dangerous. They combined their hobbies and interests (e.g., sports, math, NFTs, etc.) with their learning objectives, relating their lived experience to classroom participation. Accordingly, the instructors brought in relatable examples in class. For instance, based on students' passion for sports, teachers presented short videos of AI versus human soccer players, as an introduction of what AI could achieve. Many students gasped or showed signs of amazement, asking "How does AI do that?" Once an example stimulated their interest, students tended to participate in subsequent activities with greater attentiveness. At the end of each class, as a result, they had plenty of takeaways to contribute to the L column in the chart.

Students preferred fast-paced, collaborative, and competitive activities over long slideshow presentations or documentaries. They engaged in the class even more when the activities aligned with their lifestyles and hobbies. Inspired by their fondness of competitive sports, one of the activities involved Tic-Tac-Toe matches with an AI model. The game piqued students' competitiveness, driving them to take on the AI for multiple trials. The instructors also combined art education with AI applications. During the lesson on generative AI, students were asked to mimic famous artists' styles in their own drawings and test if the AI model could recognize their drawings based on existing categories. Several students paid great attention to details in their creations, devoting a lot of time and effort into perfecting a Picasso-inspired drawing. They wanted their art to get the "approval" from AI. These activities left them with greater impressions on AI mechanisms. Most of them highlighted their takeaways from those activities or emphasized specific applications when they were filling the KWL chart. More importantly, students no longer saw AI as a mythical concept but as an integral part of their daily lives. They became more eager to pursue AI-related knowledge and share their achievements with others.

Whether unplugged or not, gamified activities captivated students' engagement as well. One of the unplugged activities let students customize their peanut butter and jelly sandwich recipes. In this scenario, the teachers acted as an AI model while the students were giving instructions and rules to complete building the sandwiches. The student would receive a time-out if their instructions failed to successfully build the sandwich. This game taught students about the necessity of specified instructions for an AI model to operate. After they devised the proper instructions and completed their sandwiches, students could eat the products of their learning. This reward system motivated students to proceed onto the following activities. Plugged activities produced comparable results. During the Quick! Draw game where students let the AI software identify their drawings, they all cheered whenever the AI guessed their images correctly. Similarly, students joined the "guess the animal" game with ChatGPT. They gave descriptors to the chatbot about an animal they had in mind and counted how many trials it took for the model to reach the right answers. Participants learned that AI was not omnipotent and that ChatGPT might not be as good as a human player in a guessing game. Bringing out students' agency, games allowed participants to feel they were in charge of an AI model when they gave it commands. Participants could spontaneously build their own ways of knowing through directly interacting with the technology. Both educational and entertaining, game-based activities reduced the barriers for students to grasp AI mechanisms and identify possible shortcomings.

Previous studies have concluded that students will become self-motivated learners if teachers meet the 3 core socioemotional needs: autonomy, relatedness, and competence [13, 20]. Overall, our experience is commensurate with these criteria. The KWL chart and games encouraged students' autonomy, or their ability to articulate their own ideas to the instructors [13]. Hands-on activities boosted students' competence and enhanced their proximity with AI applications. During the activities, students were able to collaborate with peers. Teamwork strengthened their relatedness, that is, the development of interpersonal relationships [13, 20]. On top of that, the reward systems in the PB&J game served as a stimulus that could become the threshold of extrinsic motivation [13]. When students were rewarded, they were more likely to improve their performance to obtain approvals and eventually nurture intrinsic motivations to learn [13].

### 4.2 Ethics and Inclusivity

Several vignettes from our program underscore AI ethics and classroom inclusivity. Occasionally, one or two students would say non-inclusive languages to their peers, or when reacting to the people mentioned in the course materials. Some words came from internet memes that could entail racial stereotypes. Disruptive as it appeared, we believe this phenomenon stemmed from students' trauma or chronic stress inflicted by displacement. Past literature has interpreted similar situations. Reference [14] argued that minoritized students' discourse in STEM classes is often seen as unacceptable and disruptive because teachers hardly recognize the divergent ways these students interact with scientific knowledge. Furthermore, refugee students see their surroundings through their cultural imprints [14]. Using non-inclusive language does not automatically mean they intend to harm, but is likely due to students' lack of exposure to the addressed communities in their upbringings.

Reference [14] continued to suggest teachers adopt an asset-based approach to conventionally disruptive scenarios. Even students' mistakes, when recognized and held accountable, could open up grounds for learning [14]. Rather than resorting to disciplining, the instructors transformed lurking tensions into examples of AI ethics interwoven with diversity and inclusion. In the activity with facial recognition, the teachers demonstrated how data biases could reproduce racial inequity through machine learning models. Students tried out a Snapchat filter that could turn photos of real people into images of anime characters. But students noticed that the generated images were predominantly characters with lighter complexions. One student pointed out the racial biases in the training data for this filter. The instructors then debriefed the participants that a biased AI model would fail to represent or celebrate human diversity. If students would like to design and utilize AI for social good, then they themselves need to first unlearn their internalized stereotypes.

In another activity with language learning models, the teachers explained to the class that, because of AI's lack of conscience, it would pick up taboo words from its surroundings and verbally harm its users. To be sure, explicitly showing harmful languages in a chatbot would raise ethical concerns. But students who had learned the mechanisms of machine learning all understood how easy it could be for a language model to regenerate pejorative words. Many students expressed they did not want AI to say bad things to them, so after this activity, they became extra cautious with their speech and behaviors. Later on, some participants proposed using Cloud Calypso as a digital reminder for courtesy: the AI robot would "chirp" every time a student uttered an inappropriate word. This anecdote documents students' deliberate deployment of an AI agent for a just cause. These pedagogical techniques validated the humanity in every student, handling tense situations with grace and respect. Instead of enforcing harsh rules that ignored students' deeper psyche, the teachers leveraged AI ethics-related activities to spell out why bias reduction and diversity is imperative to navigating AI for positive societal impacts.

### 4.3 Data Literacy

We evaluated students' data literacy by comparing their performance on pre- and post-program surveys. According to the pre-survey, most students correctly answered the questions about basic machine learning. They knew AI could learn from data and identify keywords or features in facial and speech recognition. All students knew that AI could categorize different artworks based on their distinct styles. In contrast, before taking the lessons, students were not familiar with data biases, AI ethics, language models, and generative AI. When students took the quiz again after the program, they saw an improvement in the overall scores, with one of them receiving a full mark. Although we could not infer statistical significance from the quantitative data, this experience showed that individual students could strengthen their AI-related knowledge after participating in this program. Further research with a larger sample size would help enrich our preliminary findings.

The qualitative instruments from classroom observations and interviews yielded richer information about students' data literacy before and after the program. Many students had previous knowledge in AI technology. Though most students only knew AI as a "cool concept" and could not give exact definitions, quite a few of them showed genuine interest in unveiling the black box of this technology. They understood that AI is an intelligent machine trained by human engineers and that AI overlaps with robotics and coding. They all had smartphones that enabled them to use social media. Their online presence implies that they might have been interacting with AI agents on a regular basis. Students were caught up with recent topics in AI such as ChatGPT. One student knew that data biases exist, but most of them did not know in what exact ways data biases could generate harm. To summarize, our participants came prepared with entry-level AI and STEM knowledge but had not received systemic education in these topics. Nevertheless, they were eager to explore more about the technology.

The program catered to the areas students needed improvements, namely, the practical and ethical aspects of AI. Students leveraged their previous coding knowledge during the Cloud Calypso activity so that they could translate their existing technical literacy into hands-on experience. In the post-program interviews, students expressed their deepened understanding of sensors in facial recognitions. Besides, students had also raised their awareness of data biases that could perpetuate racial stereotypes, as in the demonstration with the Snapchat filter. By the end of the lessons, students had obtained a more comprehensive and nuanced view of AI technologies. One student shared that AI could cause harm to vulnerable populations if the human engineers fail to check their biases. They realized that data biases would aggravate social inequities. This program taught more than how AI works but also critical insights into AI's ethical considerations.

### 4.4 Sense of Belonging

Sense of belonging manifested in inter- and intra-group scopes. Inter-group belonging refers to displaced students' adherence to their life in Greek. We have identified two key themes of inter-group sense of belonging: 1) familiarity with local culture and 2) trust in teachers and faculties at the shelter. According to the teachers at the shelter, many of these children received scholarships from local schools along with internship opportunities over the summer. Students also expressed their fondness for making new friends with local residents. During the program, students gradually fostered trust with the instructors as they collaborated and communicated. Those who previously were reluctant to contribute started raising their hands to answer questions or voluntarily taking part in group activities. They were less afraid of asking questions and partaking in in-class discussions. Students learned to show greater appreciation to their instructors. They began greeting the instructors before and after each class. Some volunteered for housekeeping. Towards the end of the program, students all said "Thank you" to the teachers. These behaviors indicate that students had found an accepting community through an educational venue. The trust built here could later bloom into their acclimation to local schools and society.

Intra-group belonging is reflected from students' changing dynamics within the cohort throughout the program. Initially, students were tightened up in their own cliques. Thanks to the aforementioned pedagogical adjustments, students gradually broke from their niches and worked with other peers. On the third day, a lot more laughter emerged among the cohort. Laughter could directly reflect joy among the participants, but it also entails a deeper socioemotional implication. In STEM classrooms for displaced and marginalized students, light humor and plays can foster a safe space for communicating ideas without embarrassment and proposing different ideas at greater ease [14]. Our program provided displaced students with a venue for mingling based on their common objective of learning AI knowledge. At the same time, students managed to deploy their humor as assets to develop peer support [14]. Students took initiatives to cooperate and coordinate. When they shared reading material, some students suggested everyone pass the book around so that no one would be left out. They would also call out other students' attempted interruptions of the class. These gestures were commensurate with findings that refugee students were aware of inclusivity and would leverage mutual support to care for the less active participants and ensure a safe space for all [14].

# 5 Implications

## 5.1 For Educators

This experience can inspire practitioners in the field of STEM and AI education for refugees. First and foremost, our program supports the notion that digital literacy could facilitate displaced youth's lives in their host country, especially in terms of socialization and community [7]. Despite the differences amongst displaced students, AI knowledge could serve as a common language that bridges the cultural gaps. In the plugged activities, our participants transcended cultural differences by working together with advanced technological devices, thereby fostering transnational bonds and coethnic friendships [7]. Further, knowing how to navigate AI technologies and digital devices can bring displaced youth closer to their host country. They cultivate their sense of belonging through constant negotiation with their new surroundings and the people there [8]. AI-based social media platforms can play an indispensable role in students' cultural acclimation. As we observed in class, students frequently used applications like TikTok to explore and express themselves. Their social media savviness merged seamlessly with the knowledge of facial recognition, machine learning, and data biases. Such knowledge, in turn, assisted students with the ethical use of social media as tools of community-building and digital storytelling.

In addition to the design of content knowledge, pedagogies equally determine students' experiences and outcomes. Programs for displaced youth require culturally responsive, age-appropriate, multilingual and multimodal methods [12]. Our program has shown that displaced youth would learn more effectively when the teachers broke down dense AI jargons into relatable examples presented in audiovisual formats. Students grew more interested in learning about AI when said knowledge was combined with their hobbies and cultural traditions. This combination reveals the close relevance between AI technology and students' lived experience, which then motivates them to delve deeper into the topic. During the program, we also recognized that, due to the disruption of secondary education, displaced students' knowledge levels varied. That means there is no one best way of teaching. Instead of imposing a homogenous, standardized expectation to all students, instructors ought to adapt their teaching methods with greater flexibility. The extensive use of multimodal materials, such as images, videos, interactive chatbots, and artistic expressions, proved helpful to students' attentiveness and motivation regardless of their knowledge levels. To summarize, in future programs, educators can simplify the technical terms and center students' voices in co-constructing AI knowledge. Accessible teaching materials can overcome language barriers and thus stimulate effective learning [6].

AI ethics and tech-criticality deserve greater attention in curriculum design for displaced students. A recent report [1] observed that marginalized students often feel reluctant to partake in STEM and AI-related courses because said courses fail to address injustice and inequity. However, students from underrepresented backgrounds care most about the complex social and political implications of technology [1]. From our experience, discussions around AI's ethical concerns encourage displaced students to stay vigilant about its potential harm to communities like theirs. With a critical inquiry into AI applications and data selection, students are able to design and utilize the technology more responsibly. In this regard, educators should center the course materials around ethics and societal impacts, explicating the inextricable link between AI and vulnerable communities.

The final point for educators pertains to assessment. For this program, we designed a short questionnaire with 10 multiple choice questions that covered all of the 5 Big Ideas. Multiple considerations went into the assessment design. Given that students' knowledge levels and language fluency differed, we simplified the phrasing in the prompts and included pictures to visualize the prompt. The questionnaire also used age-appropriate language that students could easily comprehend. We managed to keep the length of assessment within 20 minutes. In this way, the assessment period would not take too much away from the class time and students would be less likely to feel worn out from answering the questions. If subsequent research of this sort uses quantifiable metrics for knowledge assessment, it can adopt the principles of comprehensiveness, age-appropriateness, and accessibility.

### 5.2 For Policymakers

For policymakers, this experience report can serve as a point of departure for popularizing similar programs among refugee students. Our program espouses the rationale that displaced youth deserve access to quality education and data literacy, for they retain the potential to become proactive participants in the job market and civic life of their host countries [3]. Even though our participants account for only a few of the displaced youth in Greece, this cohort has demonstrated their strong willingness to learn about an emerging technology, and to utilize that with mindfulness of ethical concerns. Through a humanizing lens, policymakers ought to recognize displaced youth as talented and agential human beings with dignity. They must see displaced students not as an extra hurdle but an asset to the whole society.

Shifting the mindset of policymakers drives policy change. Policymakers may start emphasizing AI education among refugee youth, because technical knowledge can lower the entry barriers for their adaptation in an increasingly digitized society [3]. More importantly, educational spaces allow these students to mix and mingle. What students can gain from an AI program is more than skills and content knowledge but strong attachments to the place, the people, and the culture [4]. With the merits of full-spectrum personal development, policies can gear towards activity-driven STEM or AI programs for refugee students. Partnering with researchers, NGOs, and private sectors, policymakers can funnel budgets and human resources to local communities, so that more programs like this one can reach more students in need.

Because research is an iterative process, each following project can build onto the previous one, unraveling new insights and methods. This feedback loop can provide policymakers with the most up-to-date and credible information from the ground up. Our project is one example of rooting in local realities and documenting our experience in the field. Direct interactions with the population yield first-hand narratives about displaced students' lived experiences. These stories and observations fill in the gap between policymakers' assumptions and refugee students' actual needs in specific contexts. In essence, research informs policies that in turn drive research forward to address new challenges.

### 5.3 Limitations

No program is perfect, and therefore we need to address some limitations or room for improvement, so that future programs of this kind could deliver a more enriching experience. Due to the small and fluctuating class size, we did not observe the gendered differences in students' in-class performance and learning outcomes. Neither did we analyze the influence of students' shifting from gender-segregated shelters to a mixed classroom. Further inquiries may delve into the nuances across gender identity among displaced students. Our program could also be better with a pilot study before launching the lessons. Gauging students' knowledge base and language fluency in advance will leave ample time for us to design a more accessible curriculum and a more accurate assessment. This is especially needed as we plan to increase the number of participants in future studies. Last but not least, given the nature of this study, we focused on a highly specific context. However, there is a plurality in what AI education for refugees looks like. Consequently, a different context may require a modified lesson plan. Therefore, the replicability of this study is limited. That being said, we believe our program did reveal some universal principles: an interdisciplinary and interactive curriculum, a student-centered classroom, and a humanist and culturally responsive perspective. Despite the limitations, our program can nevertheless inform relevant scholars, educators, and policymakers about the meaningfulness of teaching AI literacy to refugees.

## 6 Conclusion

Our study sets out to acclimate displaced youth to an increasingly digitized world via an activity-driven AI program. From interviews, classroom observations, conversations, and surveys, we saw our participants making progress over the course of the program. Students gained momentum in pursuing AI-related courses and careers, and also raised awareness of data biases and ethical concerns. Equipped with AI knowledge and data literacy, they began to forge community ties with peers and locals. They could also envision themselves leading a new life in Greek society with their crucial skills. Instructors' contextualization of AI education played an indispensable role in improving student learning. The responsive pedagogies validated displaced youth's lived experiences and personal interests, cultivating a student-centered and supportive environment [6]. The program established a trustworthy student-teacher relationship [4] that paved the way for a greater sense of belonging. Above all, this learning opportunity served as an invaluable venue for displaced students to socialize, thus facilitating community-wise solidarity in a new place they could call home [8, 4].

The current study initiated AI education for displaced youth and achieved preliminary progress. An activity-driven, student-centered, and culturally responsive AI program serves as the catalyst for displaced youth's academic achievements and personal empowerment. AI knowledge may help transform displaced learners into digitally literate citizens who can then deploy their technical skills to civic life. Our findings suggest the need for similar projects in the near future. Additional research should take place in other refugee facilities of various geographical and cultural contexts. A larger cohort of students is also needed. To track the persistent effect of the intervention, we need a longitudinal study with semester-long programs. Subsequent projects should continue to fulfill students' intellectual needs by combining their lived experience with the learning materials. The curriculum should continue to strive for age-appropriateness and accessibility in terms of multilingual and multimodal learning. Coordination can make a difference on the teaching and learning experience, such as the student-teacher ratio, duration of the class, and infrastructural conditions. In-class practices should premise displaced students' assets and agency derived from their unique upbringings. Additional inquiries also pertain to teachers' identity that may induce role model effects on students of diverse demographic backgrounds. With the aforementioned suggestions in mind, we hope the continuous provision of AI learning resources will lead displaced youth to not only technical fluency, but also a future of curiosity, connectedness, and confidence that would open up endless possibilities.

## References

1. Barretto, D., LaChance, J., Burton, E. & Liao, S. N. (2021). Exploring Why Underrepresented Students Are Less Likely to Study Machine Learning and Artificial Intelligence. In *Proceedings of the 26th ACM Conference on Innovation and Technology in Computer Science Education V, 1* (ITiCSE '21). Association for Computing Machinery, 457–463. https://doi.org/10.1145/3430665.3456332
2. Black, N. B., & Brooks-Young, S. (n.d.). *Hands-on AI projects for the classroom: A guide for elective teachers*. ISTE Ltd.
3. Brar-Josan, N. J. (2015). *Developing A Sense of Belonging During Resettlement Amongst Former Refugee Young Adults*. Doctoral Dissertation, University of Alberta. Education & Research Archive. https://doi.org/10.7939/R3H708C1N
4. Çakir, Z., Yalçin, S. A. & Günsel, Ş. (2022). The Effect of Engineering Design-based STEM Activities on the Refugee Students' Sense of School Belonging. *Journal of Science Learning, 5*, 478-487. https://doi.org/10.17509/jsl.v5i3.39846
5. Crompton, H., & Sykora, C. (2021). Developing instructional technology standards for educators: A design-based research study. *Computers and Education Open, 2*, 100044. https://doi.org/10.1016/j.caeo.2021.100044
6. Delen, İ., Aktuğ, S., Helvacı, M.A. (2020). The Need for Contextualized STEM Learning Environments for Refugee Students in Turkey. In: Sánchez Tapia, I. (Eds.) *International Perspectives on the Contextualization of Science Education*. Springer, Cham. https://doi.org/10.1007/978-3-030-27982-0_5
7. Gilhooly, D. & Lee, E. (2013). The Role of Digital Literacy Practices on Refugee Resettlement: The Case of Three Karen Brothers. *Journal of Adolescent & Adult Literacy, 00*(0), 000–000. https://doi.org/10.1002/jaal.254
8. Herslund, L. (2021). Everyday life as a refugee in a rural setting – What determines a sense of belonging and what role can the local community play in generating it?. *Journal of Rural Studies, 82*, 233-241. https://doi.org/10.1016/j.jrurstud.2021.01.031
9. Holmes, A. G. D. (2020). Researcher Positionality -- A Consideration of Its Influence and Place in Qualitative Research -- A New Researcher Guide. *Shanlax International Journal of Education, 8*(4), 1-10.
10. Kennedy, C. (2020). Know-Want-Learn (KWL) Charts. *Journal of Faculty Development, 34*(3), 75. https://link-gale-com.tc.idm.oclc.org/apps/doc/A651906882/AONE?u=columbiau&sid=bookmark-AONE&xid=da94eec5
11. Lao, N. (2020). *Reorienting Machine Learning Education Towards Tinkerers and ML-Engaged Citizens*. Massachusetts Institute of Technology, USA.
12. Linder, M., Lippmann, J., Korzeng, A., Schewnin, A. & Nentwig, S. (2018). MINTegration: STEM Activity for Refugee Kids. In Rusek, M. & Vojíř, K. (Eds.) *PROJECT-BASED EDUCATION IN SCIENCE EDUCATION: EMPIRICAL TEXTS XV.* 29-34.
13. Ryan, R. M. & Deci, E. L. (2020). Intrinsic and extrinsic motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions. *Contemporary Educational Psychology, 61*, 1-11. https://doi.org/10.1016/j.cedpsych.2020.101860.

14. Ryu, M., Tuvilla, M. R. S. & Wright, C. E. (2019). Resettled Burmese Refugee Youths' Identity Work in an Afterschool STEM Learning Setting. *Journal of Research in Childhood Education, 33*(1), 84-97. https://doi.org/10.1080/02568543.2018.1531454
15. Schaubroeck, J. M., Demirtas, O., Peng, A. C. & Pei, D. (2022). "I" am affirmed, but are "we"? Social Identity Processes Influencing Refugees' work initiative and community embeddedness. *Academy of Management Journal, 65*(2), 403–426. https://doi.org/10.5465/amj.2020.0033
16. Touretzky, D., Gardner-McCune, C. & Seehorn, D. (2022). Machine Learning and the Five Big Ideas in AI. *Int J Artif Intell Educ, 33*, 233–266. https://doi.org/10.1007/s40593-022-00314-1
17. Touretzky, D. S. (2022). Chatbot with BERT Activity Guide. AI4K12.
18. Touretzky, D. S. (2022). Speech Demo Activity Guide. AI4K12.
19. UNHCR (2019). *Stepping Up: Refugee Education in Crisis*. https://www.unhcr.org/steppingup/
20. Xia, Q., Chiu, T. K. F., Lee, M., Sanusi, I. T., Dai, Y., Chai, C. S. (2022). A self-determination theory (SDT) design approach for inclusive and diverse artificial intelligence (AI) education. *Computers & Education, 189*, 1-13. https://doi.org/10.1016/j.compedu.2022.104582