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 learning program about AI and STEM can shape displaced students' data literacy, sense of belonging, career outlook, and civic engagement. The participants consisted of a cohort of young students displaced from their native countries whose ages range from 13 to 18 years old, currently housed in a shelter for refugees near Athens, Greece. We triangulated our information sources through interviews, surveys, and classroom observations with students and faculties. Throughout the study, we identified the merits of hands-on activities in terms of increased student attentiveness, community-building, and trust in peers and faculties. Despite the challenges due to extraneous factors beyond the researchers' control, this project initiates further endeavor in devising culturally responsive curricula and pedagogies that can both improve displaced students' academic performance in AI-related subjects and enhance their socio-psychological wellness.

Introduction

In its 2019 report on refugee education under crisis, the United Nations Higher Commissioner for Refugees (UNHCR) estimated that currently there would be approximately 20 million children aged 12-18 displaced from their native countries (UNHCR, 2019). 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 (UNHCR, 2019). 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 (UNHCR, 2019).

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 (Gilhooly & Lee, 2013). Such education offers an opportunity to cultivate the essential skill sets for these individuals so that they can accelerate their acclimation and access to family-sustaining careers, given that secure work provides individuals a pathway to integrate into the target society and develop a sense of inclusion in a different society (Schaubroeck et al., 2022).

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 an interactive hands-on training on AI and data can empower displaced youth, equipping them with skills to navigate a rapidly digitized world so that they can lay out the groundwork for their potential engagement in civic life.

Research Purposes and Questions

This project serves several purposes of generating meaningful impact. 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 academic research, this study aims to engender real-world benefits by pioneering an innovative curriculum that future endeavors can refer to. More specifically, this study intends to explore how AI education - encompassing data and technology fluency - facilitates displaced students' resettlement. Besides assessing the impact of the program on students' academic performance, this study also examines the changes in students' career motivation and willingness to integrate into Greek society. We want to demonstrate that AI education is more than passing down technical knowledge but also creating a life-altering opportunity.

Accordingly, the following research questions guide our inquiry:

- RQ1: What do displaced students' experiences look like in an activity-driven AI program?
- RQ2: How does the intervention program shape displaced children's data literacy, career preparedness, sense of belonging, and civic engagement?

Literature Review

STEM Education for Displaced Individuals

STEM education for displaced students has proven to facilitate displaced students' skill-building and job preparedness. In fact, digital literacy plays an integral part in refugee resettlement. Displaced youth benefit from the ability to navigate technological devices and the internet via community bond, coethnic friendship, and digital storytelling (Gilhooly & Lee, 2013). Digital literacy allows refugees to ease the distress as they are transitioning to a foreign environment. They also overcome cultural barriers with digital devices that help them communicate (Gilhooly & Lee, 2013). Therefore, equipping displaced students with STEM knowledge such as AI and data science can adapt them to the tech-driven host countries.

The status quo of STEM education for refugees confronts several obstacles. First, language barriers impose challenges on students' interactions with instructors and their understanding of the course materials (Linder et al., 2018). This means teachers may first need to identify a lingua franca or cultivate students' linguistic skills before introducing STEM-specific terminologies (Delen et al., 2020). Similarly, students' knowledge base is inconsistent due to the disruptions of schooling back in their home countries (Linder et al., 2018). Another challenge concerns interpersonal connections. Face-to-face interactions have diminished since the pandemic in 2020, but such interactions are imperative for displaced students to not only engage in hands-on activities but also build supportive communities (GESS, 2021). STEM instructors should refine their curricula and teaching methods so that displaced students can maximize their learning outcomes in the post-pandemic transitioning period.

Cultivating the Sense of Belonging

Displaced students need a strong sense of belonging to integrate into a new environment. Belonging manifests in four aspects: comfortability, confidence, acceptance, and purpose (Brar-Jorsan, 2015). Students develop these fundamental qualities through group activities, peer interactions, social support, and acculturation. The educational setting is the space for social bonds and knowledge-building crucial to displaced students' self-efficacy. They are able to befriend peers from the host country and bond with students of similar ethnocultural backgrounds. Skill-building removes entry barriers so that displaced children are qualified for a career when they start participating in civic life (Brar-Jorsan, 2015).

Displaced youth cultivate their sense of belonging through constant negotiation with their new surroundings and the people there (Herslund, 2021). Community is thus indispensable for their acclimation. For instance, local communities can provide meeting venues and mutual aid for the incoming refugees, namely, camps, temporary housing, and public transport (Herslund, 2021). Community support also dispels the risk aversion among displaced children towards a strange environment. Although community members retain limited capacity, volunteer work that organizes socializing activities promotes displaced children's well-being via everyday life assistance (Herslund, 2021).

STEM programs can be one source of belonging. According to the mixed-method report by Çakır et al. (2022), Syrian refugee students experienced an increased attachment to school after participating in an activity-based STEM program. Students also developed more trust towards their instructors, who in turn nurtured comfortability and acceptance (Çakır et al., 2022). By the end of the program, students were more motivated to pursue a STEM-related career in the host country. They reported several indicators of increased belonging: greater safety, friendship with peers, and teachers' support (Çakır et al., 2022). These outcomes provide evidence for the potential of activity-driven STEM programs in shaping students' sense of belonging.

Our project built upon the previous efforts in advancing STEM education among displaced students by introducing them to the emerging field of AI. The current locale of similar research is scattered, suggesting a plurality in curriculum designs and practices. Precisely because there are no one-size-fits-all programs, this report will replay the vignettes from a Greek refugee shelter. We hope to use this experience to diversify the existing inquiries, unraveling new insights and tackling unprecedented challenges. Furthermore, as the literature suggests, there should be a continuous effort in providing displaced students with age-appropriate and socially relevant AI educational programs. Adding to the availability of similar resources, our study will portray another example of AI lessons for refugee students, and present its impacts on their academic performance and socio-psychological well-being.

Theory

Self-Determination Theory (SDT) hypothesizes an individual's development of intrinsic motivation via external stimulants that can stem from reward/punishment systems and assessments from others. Positive feedback, rewards, and fundamental psychological support from outside environments will nurture students' cognitive development, such as self-endorsement and conscious valuing of participation (Ryan & Deci, 2020). In the classroom, students will boost their motivation if teachers meet the core socio-psychological needs: autonomy, relatedness, and competence (Ryan & Deci, 2020, cited in Xia et al., 2022). Curricula and pedagogies driven by the SDT model demonstrate significantly better outcomes than conventional methods. Empirical findings have shown that these lessons not only built up students' knowledge in AI, but also fostered their comfortability with learning about the topic (Xia et al., 2022). Students were more likely to believe in their ability to excel in AI-related courses and to identify themselves as future AI specialists (Xia et al., 2022), suggesting greater learning outcomes and stronger internal motivations.

Students from underrepresented backgrounds tend to show less motivation in studying machine learning and AI. However, the reasons behind are more complex (Barretto et al., 2021). Existing lessons on the topic hardly cover the social and ethical aspects of the technology, which underrepresented students care more about (Barretto et al., 2021). Inferentially, a more motivating curriculum must cater to these students' personal backgrounds and experiences. This is where we grounded our program design in order to optimize our participants' learning.

Method

Program Design

This experience report focuses on a five-day activity-based intervention program aimed at providing comprehensive AI education to displaced children residing in an Athens shelter. Each session lasted 90 minutes and adhered to a structured thematic framework, the 5 Big Ideas in AI (Touretzky et al., 2022). The ideas include Perception, Representation and Reasoning, Learning, Natural Interaction, and Societal Impact (Touretzky et al., 2022). These 5 key concepts essentialize the AI knowledge that leads students to become knowledgeable citizens (Lao, 2020). The lesson plan incorporated two to three ideas in each lesson supported by demonstrable applications such as Teachable Machine and Cloud Calypso (see Appendix).

To complement the 5 Big Ideas, the intervention program also aligned with the International Society for Technology in Education (ISTE) Standards for Students (Crompton & Sykora, 2021; Black et al., n.d.) 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. 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.

Data Collection

We combined qualitative and quantitative methods to provide a holistic view of students' experiences during the program, with a heavier emphasis on the qualitative. We conducted interviews before and after the program with our participants. Students were asked about their familiarity with and interest in AI and STEM, as well as their career plans. In the post-program interviews, we collected feedback from the students about the learning experience to infer their efficacy in continuing their pursuit in related areas. We compared their answers before and after the program to trace the changes in students' attitudes. Besides interviews, we conducted classroom observations throughout the 5 days of the training camp. We observed the behaviors of the attendees and the instructors. The triangulation of both students' and teachers' narratives helped us approach a more complete picture of the in-class dynamics. Lastly, we held conversations with the faculties at the shelter to obtain students' demographic information, such as their age, countries of origin, and daily lives in the shelter.

We used pre- and post-program surveys to collect quantitative data. The quantitative method supplemented our interview questions so that we could assess students' overall level of data literacy before and after the training. The survey consisted of 9 multiple choice questions and one draw-to-match question. Students earned one point for each correct answer and none for each wrong answer. The questions assessed students' understanding of basic AI mechanisms and applications, as well as knowledge in data bias reduction. All students' identity remained anonymous and their answers confidential.

Analysis

We analyzed our qualitative information through memoing, coding, and annotation in NVivo 14. After transferring the observation notes and interview transcripts to the software, we identified the most frequently referred codes, including attention span, data literacy, and socio-psychological wellness. In terms of quantitative surveys, we only collected descriptive data due to a limited sample size and other unpredictable circumstances. The following subsections will present our findings that answer the guiding research questions.

Participants

On the first day, 15 students showed up at the facility, some of them joining from other camps elsewhere in Greece. There were 12 boys and 3 girls, all aged between 13 to 18 by the time of the study. (However, because of the unforeseen heat waves in Athens, only 10 students made it through the entire program. One girl joined midway, resulting in a total of 6 boys and 4 girls by the end of the program.) According to the information from their lead faculty, these students came from diverse cultural backgrounds. They were displaced from Somalia, Pakistan, Afghanistan, Ukraine, and other conflict-torn regions. After their arrival, they spent most of their time in refugee shelters that were gender segregated. They had been in Greece for between less than a year to 4 years. Most students did not have access to secondary education in their countries of origin. Their schooling was largely from the on-site lessons in the shelter, subsidized by scholarships for access to local institutes. Students attended 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 basic knowledge and develop language skills.

Overall Experience

Responsive pedagogies ensured the lessons were well-organized and enhanced students' engagement. Teachers incorporated Know-Want-Learn (KWL) charts; before each lesson started, instructors created a table where students collaboratively noted what they already **K**now, what they **W**anted to know, and following the lesson, what they had **L**earned (Kennedy, 2020). The goal was to encourage a continuous cycle of knowledge acquisition, inquiry, and reflection. On the first day, students were uncertain about a new learning environment with different instructors. For much of the time, they kept quiet during video demonstrations and when instructors started to ask interactive questions about students' AI knowledge, few students were willing to respond. On the other hand, when students were asked to come to the board and fill in the KWL chart, they showed more interest in volunteering. They wrote down what they wanted to learn during the session, such as how to train their own AI models and whether AI could be dangerous. The KWL helped stimulate their willingness to learn by centering their voices and needs in the classroom. In the following days, students contributed to the KWL chart with more self-reflections. They combined their hobbies and interests (e.g. sports, math, NFTs, etc.) with their learning objectives, relating their lived experience to classroom participation. All students were increasingly active to fill in the K and L columns of the chart, meaning that they had grasped onto the knowledge from previous sessions.

Contrary to their reluctance during teachers' slideshow presentations, students showed more curiosity and attentiveness during hands-on activities, especially when the activities aligned with their personal interests. Most students shared competitive sports as a hobby. 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. While watching a video of a soccer match between AI and human players, they kept asking "How did the AI do that?" 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 drawings to get the "approval" from AI. The drawing activity stimulated students' artistic expressions while also encouraging students' interactions with AI products. These activities left them with greater impressions on the mechanisms of AI, for they kept repeating their takeaways from the activities or emphasizing specific applications when they were filling the KWL chart. After a series of activities, 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.

Students were particularly engaged by game-based activities, including unplugged ones. One of the unplugged activities let students customize their PB&J sandwich recipes. In this scenario, the teachers acted as an AI model while the students were giving instructions and rules to complete the recipes. If the teachers failed to build up the sandwich as intended, the students would be disqualified from the game. This game taught students about the mechanisms of an AI model that needs specified commands to operate. After they correctly followed the instructions and completed their sandwiches, students could eat the products of their learning. This reward system fostered students' sense of achievement and motivated them to engage in the subsequent activities. Plugged activities produced similar results. During the *Quick! Draw* activity where students let the AI software identify their drawings, they all cheered whenever the AI guessed their images correctly. They also played a "guess the animal" game with ChatGPT. Students gave descriptors to the chatbot about an animal they had in mind and tested how many trials it took for the model to guess correctly. Students learned that AI was not omnipotent and that ChatGPT might not be as good as a human player in a guessing game. Games allowed students to feel they were in charge of an AI model when they gave it commands. These games centered students' agency that powered their involvement in the rest of the programs and presumably their future endeavors in relevant areas.

The success of the KWL chart and in-class activities fortifies SDT in that the fulfilling of students' needs could evoke students' intrinsic motivation for learning (Xia et al., 2022). The KWL chart and games encouraged students' autonomy, or their ability to articulate their own ideas to the instructors. Hands-on activities facilitated their willingness to learn and excel in the following lessons, thereby boosting their competence in learning AI. During the activities, students were able to collaborate with peers. Teamwork strengthened their relatedness, that is, the development of interpersonal relationships (Xia et al., 2022). Thanks to the activity-driven design and teachers' responsive pedagogies, they met all three of the student demands in the SDT model. On top of that, the reward systems in the PB&J game served as an external regulation that could become the threshold of extrinsic motivation (Ryan & Deci, 2020). When students were rewarded, they were more likely to improve their performance to obtain approvals and eventually nurture intrinsic motivations to learn (Ryan & Deci, 2020). In sum, the program's merits support the theoretical soundness of the SDT model and practical effectiveness of the KWL chart.

Challenges & Adaptations

The program encountered several challenges that nevertheless highlighted the need for responsive pedagogies. There were occasional disruptions such as the use of non-inclusive languages, which we believed could stem from the stress inflicted by displacement. This phenomenon is congruent with previous literature. Ryu et al. (2019) 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 due possibly to their trauma and chronic stress. Rather than resorting to disciplining, the instructors turned the seemingly disruptive behaviors into examples of AI ethics interwoven with diversity and inclusion. In the activity with facial recognition, the teachers demonstrated how racial stereotypes would yield biased AI products. Students tried out a Snapchat filter that could turn real people into anime characters, but the results were largely characters with light complexions. One student pointed out the racial biases in the training data for this filter. This activity raised awareness to the class that AI designed with personal biases would generate negative societal impacts. 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. Students thus realized the negative influences of vulgar speech on the AI speech model and would avoid using pejorative words. Recognizing the humanity in every student, these pedagogical techniques transformed tensions into room for learning opportunities. Instead of enforcing harsh rules that might not apply to the students, the teachers leveraged AI ethics-related activities to spell out why bias reduction and diversity is imperative to deploying AI for good.

Students' attention span required teachers to reconsider the content and logistics of the lessons. Initially, several students found it hard to concentrate on the lessons or participate in the activities. When teachers were reading over the presentation slides, several students were on their cellphones or chit-chatting amongst themselves. The length of the two-hour lessons also made students impatient towards the latter part. In response, the teachers adjusted the logistics in the following ways to address students' incoherent attention span and ensure they made the most from the program. First, the teachers shortened the lessons by 30 minutes while keeping the essential materials from the original curriculum. When students knew they could be dismissed sooner, they had more incentives to focus on the ongoing lessons. Additionally, teachers rearranged the seating. Rather than everyone facing the teachers, the students sat in a circle around a table. Thus, students could collaborate on an activity more effectively when they sat closer together.

Language barriers and environmental factors beyond researchers' control should also be considered. Although students received language education prior to the program, their fluency varied greatly. This affected their willingness to complete the survey written in English. Language could also impact students' participation because if the concepts were densely phrased, they would lose track midway. Besides, classroom environments influenced students' behaviors. The site of the research, Athens, experienced heat waves during the time of the program. Compounded by the limited space in the facilities, the hot weather aggravated students' impatience. Both of these variables added noise to the research, which reminded us that our future efforts should consider the students' knowledge basis and the conditions of the research sites more carefully.

Data Literacy

According to the descriptive data, the range of the students' pre-survey score is 6, with a minimum of 2 and a maximum of 8. The mode is 5, as 7 of the initial 15 students earned this score. 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, students were not familiar with data biases, AI ethics, language models, and generative AI. Due to unforeseen circumstances, the response rate was low for post-survey, with only 5 of the original 15 students turning in their results. This greatly diminished the validity of our survey. Nevertheless, within the available results, 4 of the 5 students saw an improvement in their knowledge assessment, one of them receiving a full mark. Although we could not infer statistical significance from the quantitative data, this experience showed that individual students might still have improved AI-related knowledge after participating in this program. Further research with a larger sample size and a more accessible survey 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 how AI is created and utilized. They understood that AI is an intelligent machine trained by human engineers and that AI overlaps with robotics and coding. They all had smartphones, implying that they interacted with AI agents on a regular basis. Students were caught up with recent topics in AI such as ChatGPT. One student had basic knowledge of data biases, but most of them did not know why data biases would generate harm. To summarize, our participants were moderately familiar with AI and STEM but had not received systemic education in these topics. Nevertheless, they were eager to explore more about this emerging 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 Calypso activity so that they could translate their existing technical literacy into hands-on experience. Students told in the post-interviews that they deepened their understanding of how sensors worked on AI. Besides, students also deepened 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 largely obtained a more comprehensive and nuanced view of AI technologies. One student said a takeaway from the program was that AI could cause harm to vulnerable populations if the human engineers fail to check their biases. They realized that data biases would reproduce existing inequities. It could be inferred that the program had made initial progress in elevating displaced students' data literacy.

Career Preparedness

The pre-interviews showed that, in general, the participants were hesitant about their exact occupations in the future. That being said, most of them would like to partake in STEM-related jobs after they finish school. Their choices were partially related to their schooling experience in Greece where they had developed an interest in scientific subjects like mathematics and physics. Top answers regarding their ideal jobs include mechanics, architects, and mathematicians. A handful of students wanted to become social media influencers. This might derive from their daily interaction with online content creators. We extrapolate that by the time of the program, these students had displayed an enthusiasm in technology-related career options that are likely to involve AI.

After the program, the students were interviewed with the same questions on career outlook. Comparatively, students were more aware of integrating AI knowledge into their career planning. One student who enjoyed soccer as a hobby wanted to combine AI coding with the sport. He also planned to explore generative AI more with his own drawings that imitated famous artists' styles. Another student remained unclear about his specific job title but acknowledged the importance of technical fluency. Since he planned to engage in physics-related fields, knowledge in AI and data would accelerate his career path. A third student would like to continue the exploration in math and robotics. The AI lessons inspired this student to consider research on AI applications that could assist people's lives. The student was curious about why AI is currently unable to experience taste, prompting new lines of AI inquiry. From the snippets of students' interview responses, we infer that although a short-term AI training program might not fundamentally alter students' career directions, it can help students envision themselves in AI- and STEM-related occupations.

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 Greek lifestyles, 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 the locals. One student built close relationships with a Greek person from outside of the camp. During the program, students gradually built 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 to ask questions and join 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. The sense of belonging in this community could later bloom into the students' complete resettlement in Greece.

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, indicating the establishment of a stronger solidarity. 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 (Ryu et al., 2019). 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 (Ryu et al., 2019). 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 (Ryu et al., 2019).

Civic Engagement

Prior to the program, most students were unsure about the connection between AI or data literacy with civic life in Greece. They could vaguely name some social sectors related to technology, such as public transportation and cybersecurity. One student was more confident in technical knowledge helping people integrate into society through educational advancements and social media savviness. At the end of the lessons, however, students were able to grasp the possibilities of AI in contributing to Greek society. The general sentiments transitioned from the pre-program uncertainty to hopefulness. One student firmly believed he would step up in Greek civic life "because [he] can understand technology now." Another student saw a number of ways AI could apply to the real world based on the practical activities in class, though he did realize the issues with accessibility. By similar tokens, one participant highlighted AI ethics and equity. This student acknowledged the myriad ways AI could benefit society by making people's lives more convenient, but these applications must be executed fairly without inflicting harm. From the examples in class, students understood that biased design in AI could (re)produce existing bigotry. The participants generally started to consider the societal impacts of AI and how this technology would be positioned in their lives as sensible citizens who could empathize with other vulnerable populations.

Conclusion

Our study sets out to acclimate displaced youth to an increasingly digitized world via an activity-driven AI program. This AI program drew upon SDT as previous research has shown to increase refugee students' overall academic performance and internalized motivation (Xia et al., 2022). From interviews, classroom observations, conversations, and surveys, we saw our participants make progress over the course of the program. Students gained momentum in pursuing AI-related courses and careers and also raised awareness of data biases. Equipped with AI knowledge and data literacy, they started to see themselves as change-making agents to Greek society. Instructors' contextualization of AI learning materials played an indispensable role in students' learning experience. The responsive pedagogies validated displaced youth's lived experiences and personal interests, cultivating a student-centered and supportive learning environment (Delen et al., 2020). The program established a trustworthy student-teacher relationship that paved the way to students' 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 their new host country (Herslund, 2021; Çakır et al., 2022).

Admittedly, our study contains several limitations regarding data collection instruments and program design. First, without a pilot study on students' overall academic backgrounds, the assessment survey was not as accessible to our participants. This could reduce the validity of the survey when some students struggled to complete or failed to turn in the survey. The questions only came in English while students had different levels of fluency, so the lack of multilingual versions might impose barriers onto the participants. Second, we recognize the shortcomings in our program logistics, namely, the timing of each session. The lessons started early in the morning but several students needed to fast during the period for religious reasons. As a result, they found it hard to concentrate in class because they had not eaten breakfast. Our program could have been more inclusive if it considered students' religious backgrounds. Other logistical issues were concerned with classroom conditions and local climate at the research site. These details could potentially skew our results. Future studies ought to keep environmental factors in mind. Finally, gender could be a delimitation to our study. Due to the small and fluctuating sample size, we did not observe the gendered differences in students' in-class performance and learning outcomes. Neither did we analyze the factor of students' shifting from gender-segregated shelters to a mixed classroom. Further inquiries may delve into the nuances across gender identity among displaced students.

That being said, 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 social construction. Our findings suggest the need for similar projects in the near future. Additional research should take place in other refugee facilities of various locations and with different cohorts of displaced students. A larger sample size is needed for a more reliable quantitative result. To track the persistent effect of the intervention on students' civic engagement, a longitudinal study with semester-long programs is required. Subsequent programs of similar kinds should continue to fulfill students' intellectual needs by combining their experience with the learning materials. The curriculum needs greater accessibility in terms of language fluency and age-appropriateness. Logistics 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 on displaced students' assets and agency, with extra considerations on their cultural practices. Additional inquiries also pertain to teachers' identity that may induce role model effects on students of diverse demographic backgrounds. With the aforementioned improvements in mind, we hope the continuous provision of AI learning resources will lead displaced youth to not only technical knowledge, but also a future of belonging and civic engagement that would open up endless possibilities.

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Appendix

Table 1. Excerpts from Lesson Plan.

Session Theme	Activities	Big Ideas	ISTE Standards
Day 1: What AI Does Well and Does Not Do As Well	Tic-Tac-Toe Ask students to play against Aaron Wong's AI model and count the winning records.	All 5 Ideas	Empowered Learner Knowledge Constructor
	Guess the Animal with ChatGPT Use the prompt "Let's play a guessing game. I will think of an animal and you should ask me yes/no questions so that you can guess it"; Ask students how many questions it takes for ChatGPT to		

	guess the animal correctly; Ask students AI completes which of the two tasks better.		
Day 2: Training Data and Machine Learning	Quick! Draw Students draw and play with Google's AI to guess the drawings. Sorting Dataset (Unplugged) Give out 50 word cards with 45 cards of vehicles and 5 non-vehicles; Students organize the cards to the correct categories; If the card is miscategorize-d, explain that this is a kind of data bias.	Representat-ion & Reasoning Learning Societal Impact	Knowledge Constructor Computational Thinker
Day 3: Senses vs. Sensors	Cloud Calypso Facial Recognition Students let Cloud Calypso identify their facial expressions; Explain that Cloud Calypso identifies facial features to detect emotions. PB&J (Unplugged) Students give commands to instructors to make a PB&J; When	Perception Societal Impact	Empowered Learner Innovative Designer
	completed, ask students to identify how many and which of the five basic senses the robot needs to finish a task.		
Day 4: Generative AI (AI and Art)	Teachable Machine Students train their own model using different art styles; Upload pictures and test if the model can categorize; Students mimic an artist's style and let the model guess their drawings.	Learning Societal Impact	Empowered Learner Digital Citizen Knowledge Constructor Computational Thinker Creative Communicator
Day 5: Group Activities	BERT Chatbot Students work in groups following Chatbot with BERT Activity Guide; Students lead presentations of findings, limitations, and demos after testing the model.	All 5 Ideas	N/A