International Initiatives and Regional Ecosystems for Supporting Artificial Intelligence Acculturation

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Abstract National and international initiatives to support AI education are discussed in this chapter. Following an examination of the various initiatives undertaken in OECD countries, the chapter highlights the House of Artificial Intelligence (MIA) activities supporting AI acculturation to the regional educational and industrial ecosystem in the French Rivera. The chapter delves into these achievements, detailing partnerships, educational outreach, entrepreneurship initiatives,

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and the nuanced approach to addressing gender biases in AI education. Through the different workshops, students are empowered to actively contribute to AI's evolution, transforming from consumers to creators. Gender perspectives are explored, tackling stereotypes and biases. The chapter concludes with a spotlight on the Smart Hive project, an interdisciplinary initiative fostering sustainable development through AI, exemplifying the MIA's role in creating a regional ecosystem for AI acculturation.

Keywords AI education · AI acculturation · Hackathon · Gender · Entrepreneurship

Introduction

As artificial intelligence (AI) technologies become more common in many areas of civic life, helping people of all ages become more comfortable with AI is becoming an important part of being a critical and active citizen (Alexandre et al., 2021). The necessity of providing all citizens with the knowledge and critical thinking skills necessary to actively engage as informed and discerning agents in a societal landscape where AI advancements are permeating is what gives acculturation to AI its importance. In line with the broader goal of acculturating citizens to AI, there are initiatives such as Terra Numerica and the *Maison de l'Intelligence Artificielle* (MIA), the "house" of AI, in Sophia Antipolis in France.

Different OECD countries have developed initiatives oriented toward the general public, including massive open online courses (MOOCs), outreach activities at different moments of the year, and also activities such as expositions. To identify the different initiatives, the OECD.ai repository integrates an important number of initiatives at the governmental level, financial support, and organizations. Among these initiatives, some OECD countries have specifically addressed citizen acculturation, formal education, and information education. OECD.AI serves as a global hub for AI policy, offering freely accessible tools and resources to all stakeholders. With a focus on AI risks, accountability, potential

futures, incident tracking, and the environmental impact of AI, it collaboratively engages a diverse network of over 250 experts to inform policy responses and create a comprehensive platform for AI policymakers worldwide.

At the school level, different initiatives have emerged in the last few years to support the introduction of AI fundamentals to learners in primary and secondary education. These initiatives sometimes emerge from the teachers' initiative, but in other cases, they are promoted through Ministry of Education initiatives. The review of Schiff (2022) identified 30 countries that have issued national artificial intelligence (AI) policy strategies outlining plans and expectations for AI's. He evaluates 24 of these strategies concerning the educational sector. Schiff (2022) observes that discussions regarding the use of AI in education are mostly instrumental, focused on developing an AI-ready workforce instead of considering AI's ethical and societal impact.

In 2023, the National Artificial Intelligence (AI) Strategy and the EdTech Masterplan 2030, as outlined by the Singaporean Ministry of Education (MOE), advocated for the integration of an adaptive learning system to support mathematics education. The system will also feature a Language Feedback Assistant for English to support the learning process by allowing the teacher to focus on the complex tasks and activities associated with teaching. In India, the "AI for All" initiative proposes an online program for citizens with the goal of demystify AI. The U.S. Department of Education Office of Educational Technology's recent policy report, "Artificial Intelligence and the Future of Teaching and Learning: Insights and Recommendations" (Cardona et al., 2023) emphasizes the imperative to disseminate knowledge, involve educators, and enhance technology plans and policies regarding AI in education. The report defines AI as a swiftly advancing technology for pattern recognition and automation, guiding educators on how to leverage these technologies to achieve educational objectives while assessing and mitigating any associated risks.

At the university level, initiatives such as EFELIA, or the "Ecole Française de l'IA" (French School of AI), have facilitated the development of student accessible courses to support the development of AI fundamentals across various domains. The modules cover AI's role in the

humanities, linguistics, and social sciences emphasizing image and text analysis. Additionally, the program explores AI's impact on cultural and creative industries, its role in applied foreign languages, and its applications within healthcare ecosystems and biology. The EFELIA course delves into the intersection of AI with law, administration, and public service, addressing the associated challenges of AI's use in these disciplines. A specific course on AI for school teachers spans primary, middle, and secondary education levels, offering insights into integrating AI into educational practices. The series also includes a module focused on AI in adult education, reflecting the diverse applications and implications of AI across various use cases.

In the European context, outreach initiatives to facilitate the acculturation of citizens to artificial intelligence (AI) encompass a multifaceted approach. Educational workshops and training programs conduct hands-on sessions across cities, enabling citizens to actively engage with AI applications and participate in discussions emphasizing responsible AI use. Public awareness campaigns, such as the European Commission's "AI Watch"[1] utilize social media platforms to disseminate information about ongoing AI developments and share the AI policies of different European countries. Community engagement events, like AI meetups, provide forums for citizens to interact with local AI experts, fostering dialogues on AI's impact on daily life. Online platforms, exemplified by the website "AI4Good"[2], offer easily accessible resources, including videos and articles, to demystify AI concepts and broaden citizens' understanding. Partnerships between AI industry leaders and educational institutions result in AI-focused educational programs, ensuring students are equipped with essential AI knowledge. In France, the PIA program, supported by the Ministry of Education, has supported companies such as EvidenceB to develop math (*AdaptivMaths*[3]) and language learning platforms (*AdaptivLangue*)[4] integrating AI technologies. Initiatives such as AI hackathons encourage citizens to collaboratively develop

[1] https://ai-watch.ec.europa.eu/.

[2] https://ai4good.org/.

[3] https://www.evidenceb.fr/produits/adaptiv-math.

[4] https://www.evidenceb.fr/produits/adaptiv-langue.

AI solutions addressing societal challenges, promoting creativity and developing problem-solving skills. Policy advocacy forums, such as the AI Observatory (OBVIA[5]) create spaces for policymakers, industry leaders, and citizens to collaboratively shape AI policies based on public input. Collaborations with NGOs ensure a diverse range of voices are included in AI discussions, emphasizing societal impacts and ethical considerations. Multilingual outreach strategies, employed by the European AI Alliance,[6] ensure that information about AI is accessible to citizens across language barriers. Lastly, the European Commission's guidelines on the ethics of AI in education provides recommendations for educators and parents alike on responsible AI use in educational settings (European Commission, Directorate-General for Education, Youth, Sport and Culture, 2022). Collectively, these initiatives represent a proactive and diverse approach across Europe to engage citizens in understanding, discussing, and shaping the societal impact of AI.

AI Acculturation in the House of Artificial Intelligence

Third places have the potential to facilitate a broad spectrum of AI activities. Developed with the goal of acculturating the general public to AI and serving as a hub for start-ups and upscaling initiatives, the Maison de l'Intelligence Artificielle (MIA) is an ambitious third-place project open to everyone. MIA's activities are inclusive, welcoming kindergarten to-high school aged learners, teachers, families, and professionals from diverse domains, with the overarching aim of fostering a deeper understanding of AI.

According to MIA director, Ms. Isabelle Galy, the primary concern associated with AI acculturation is the possible proliferation of misunderstandings among the younger participants. Specific AI educational activities use robots to illustrate AI concepts or emphasize algorithms and data. Instances where intelligence is personified in representations

[5] https://observatoire-ia.ulaval.ca/.

[6] https://digital-strategy.ec.europa.eu/en/policies/european-ai-alliance.

involving robotics frequently foster erroneous expectations regarding the capabilities of AI and frequently correspond with science fiction narratives. Likewise, an overemphasis on algorithms and data alone may result in overly digital illustrations, potentially blurring the distinction between digital tools and AI for learners. Such misrepresentation can create biases that will be difficult to rectify later in their education. In order to address this, it is critical to implement a multiperspective approach to AI acculturation. This strategy should incorporate machine learning methodologies and the computational modeling components of artificial intelligence across a range of AI technologies and use case illustrations. The purpose of this all-encompassing approach is to provide participants with a nuanced comprehension of AI and prevent the formation of erroneous perceptions.

One of the proposed activities at the MIA is the use of generative AI, exemplified by ChatGPT, which has proven effective in examining how AI forms a representation of the world through an encoder and how it reproduces the generated world through a decoder. This technology enables a multi-approach pedagogy based on definition, researcher works, technology, engineering, outcomes, and human understanding. An additional noteworthy aspect of the MIA is the exhibition of AI-focused companies. French industrial ecosystem start-ups and AI companies exhibit their technologies at these demonstrations, with an emphasis on the necessity to improve the comprehensibility of information for end-users. These showcases promote a dialogue-based comprehension of AI technologies developed by national companies among end-users (including professionals, students, and teachers) of diverse ages and backgrounds, thereby providing substantial advantages for both parties involved. The MIA benefits from a highly significant scientific and technological environment. The French Riviera is an AI hub, and AI-producing companies, research laboratories, and the 3IA create educational demonstrators to assist young learners in forming a genuine understanding of what AI is and to comprehend its importance in their studies of mathematics and language proficiency. Furthermore, this aspect highlights the possibility that organizations situated in various nations could create AI-driven technologies that are customized to meet particular cultural requirements.

Within the diverse array of activities offered, the Arc-en-ciel project (2020–2023), spearheaded by MIA, in collaboration with Université Côte d'Azur, Alpes-Maritimes Department, INRIA, Academie de Nice and CNRS, is dedicated to fostering awareness of artificial intelligence (AI) among middle school students in the French Riviera. This initiative encompasses four pivotal projects: educational activities at the MIA, school or extracurricular internships, addressing biases and gender stereotypes in AI, and activities conducted beyond the walls within the departmental territory. The chapter provides a comprehensive exploration of both the achievements and the extensive partnerships that facilitated them. Simultaneously, the SMART Deal project, managed by MIA in Sophia Antipolis is committed to supporting digital transformation. This initiative aims to raise AI awareness in middle school students over three years, emphasizing practical AI education, dispelling misconceptions, and offering mentorship to highlight potential study pathways and career opportunities in the field of AI. This chapter presents the achievements of the Arc-en-ciel project, including the organization of school and extracurricular internships, visits to the MIA by school groups, and scientific mediation activities carried out directly in French Rivera's middle schools. It also provides context around the founding of the project, describing the various partnerships and agreements that led to the opening of the MIA in 2020, its mission, and the collaborations it maintains with the Université Côte d'Azur, mainly on questions of teaching AI and gender equity, and through the collaboration of partners such as AlterEgaux.

The Outreach Curriculum for the Acculturation to AI

The outreach curriculum for AI acculturation encompasses diverse activities, including AI use case demonstrations at the MIA, school visits, extracurricular internships, and training provided by the Regional Academic Delegation for Digital Education (DRANE) in collaboration with the MIA. The MIA mediation team, in consultation with

grade-level teachers and the target audience, meticulously selects scientific and cultural activities. Prioritizing effective communication, the team considers primary and secondary messages, audience, AI techniques, required participants, and logistical details such as equipment weight should there be a need for transportation. Currently undergoing a trial and refinement phase, these activities aim to enhance effectiveness and broaden outreach. This approach highlights the project's dedication to tailoring AI education outreach to middle school students and teachers. Additionally, training was provided on-site to 30 teachers in collaboration with Terra Numerica. Another initiative, Teacher Wednesdays, supports in-service AI acculturation and allows teachers to explore diverse AI applications in education.

Entrepreneurship in the Age of AI

The objective of this project is to equip students with entrepreneurial skills. Specifically, it seeks to develop student agency in an environment increasingly influenced by AI, enabling them to transform their environment (Engeström & Sannino, 2013). In this way, students assume the role of creators, innovating with digital technology and AI, rather than merely consuming AI tools. Students are encouraged to "take charge" with the understanding that they can actively contribute to AI's evolution by acknowledging interests, confronting fears or beliefs, and addressing any apprehensions about its foundational use. This approach also develops student representations (Ghotbi & Ho, 2021).

The "Entrepreneurship in the Age of AI" project, offered during the final year of middle school, includes observation and extracurricular internships. Observational internships pair participants with companies to observe AI use cases and explore potential career paths. Week-long extracurricular courses during holidays involve large-scale AI projects, incorporating kinesthetic experiments, unplugged algorithmic activities, and ideation challenges with design thinking principles. Participants tackle problems like "How can AI assist in sports?" or "How can AI contribute to managing energy consumption?" by creating empathy maps and prototypes using LEGO blocks or digital tools. The week

concludes with student project presentations and jury evaluations, emphasizing perseverance, cooperation, and creativity.

Gender Perspectives in the Acculturation to AI

The technology field, and AI in particular, is significantly impacted by gender stereotyping and bias (Franzoni, 2023; Marinucci et al., 2023). The Arc-en-ciel project acknowledges these challenges and aims to catalyze a transformation in attitudes and practices, concurrently increasing awareness among educators, mediation specialists, and students regarding the consequences of gender bias in AI. For instance, Norouzi et al. (2020) found that girls exhibited less confidence than boys in computer programming skills during an AI initiation project. In response to these persistent stereotypes, a collaboration between members of the French Rivera Diversity Club and the AlterEgaux organization initiated a project with three main objectives: creating a digital handbook, conducting studies on gender bias in mixed groups, and organizing intervention classes for International Women's Rights Day.

The digital handbook, a thirty-page guide, invites participants to identify gender stereotypes and question their prejudices through short educational activities. The second objective involved studies in partnership with the LINE lab at the Université Côte d'Azur and AlterEgaux. Data was collected through feedback mechanisms including student questionnaires, observations during mediation activities, and an interactive game titled "Diversity in AI professions" offered to participants of extracurricular internships. Preliminary findings noted boys' tendency to monopolize speech and attention in mixed groups, often at the expense of their female counterparts. A similar phenomenon was observed in other MIA interventions, accentuated by a lack of examples modeling gender equality, the absence of epicene language, and a dearth of female role models. Boys often positioned themselves at the front of the room, demonstrating a heightened interest in the subject matter even before sessions commenced. Facilitators also observed that their interventions had a more pronounced impact on boys' outcomes than on girls, regardless of the facilitator's gender.

The third objective involved classes organized by MIA, AlterEgaux, and the Women Hacker Action Tank (WHAT06) to discuss diversity in science and career pathways in digital and AI-integrated fields. Held in conjunction with International Women's Rights Day, these classes provided participants with the opportunity to meet inspiring female role models and engage in roundtable discussions focused on breaking down barriers for women in technology. These classes, and the meaningful connections they inspired, demonstrate that values such as cooperation, flexibility, perseverance, analysis, organization, creativity, leadership, and precision transcend gender boundaries.

The Smart Hive Interdisciplinary Project

As part of the Fête de la Science celebration, MIA presented various activities, notably an AI hackathon aimed at crafting a smart hive. Dubbed the IAckathon, students actively participated in a design thinking approach to formulate an AI-based solution. The outcomes of this event, with involvement from college FabLabs responding to a call from the Regional Academic Directorate for Digital Education (DRANE), were showcased at the World AI Cannes Festival (Fig. 6.1).

The IAckathon aimed to execute an interdisciplinary project, seamlessly integrating AI while aligning with the sustainability objective. The theme of the intelligent hive was chosen for its promise to span various disciplines, extending beyond scientific subjects. Sustainable development was addressed through perspectives such as biodiversity preservation and resource conservation via edge computing (Shi et al., 2016). During the event, students from four Alpes-Maritimes middle schools made substantial contributions including participating in an interdisciplinary exploration of smart hives, where they collaborated closely with a beekeeper and conducted hands-on experiments with IoT sensors for data acquisition. Their activities included optimizing sensor placement, analyzing energy requirements, and exploring machine learning applications to enhance understanding of bee colony activities.

Fig. 6.1 World AI Cannes Festival

A Regional Ecosystem for Supporting AI Acculturation

Establishing a regional ecosystem for fostering AI acculturation, the MIA actively collaborates with various stakeholders in scientific, technical, and industrial sectors. This collaborative approach allows stakeholders to share their perspectives, collectively raising awareness among students through local, national, and international initiatives. The overarching goal is to enhance the methods of educational mediation through this collaborative effort.

Over the past years, Terra Numerica and the MIA have undertaken educational interventions within the Arc-en-ciel project. These endeavors focus on highlighting the impact of AI use cases and providing the necessary resources and pedagogical training to demystify AI applications. Supported by institutional, academic, and industrial partners, these activities align with the MIA's comprehensive, multidisciplinary approach to AI. Themes like culture, territory, and daily life enhance use cases by grounding them in real-world scenarios. The Arc-en-ciel project, through its four initiatives, is committed to educating secondary

school students in the Alpes-Maritimes department on the use and implications of AI. Further initiatives, including participation in events like the Science Festival and Brain Week, aim to move beyond school age students to enhance digital literacy for all residents of the department.

Discussion

The dynamic landscape of AI acculturation shows different initiatives at the regional and international level. Among these initiatives, the House of Artificial Intelligence (MIA) is an important initiative in the acculturation of AI for a large number of stakeholders including students and their teachers, but also the AI industrial ecosystem. Projects such as 'Entrepreneurship in the Age of AI' and the IAhackatons serve to empower students not only as users of AI, but as active contributors to its transformative journey through interdisciplinary collaboration, sustainability goals, and the integration of AI into diverse citizenship challenges. The chapter concludes by underscoring the importance of regional ecosystems, emphasizing the MIA's collaborative efforts with Terra Numerica and other stakeholders, shaping an inclusive and enriching educational experience for students and promoting collaboration within the French Rivera's AI ecosystem. Within the different initiatives, we aim to highlight the gender perspectives, tackled through strategic projects and interventions, exemplify a commitment to fostering inclusivity, and dismantling biases in the AI domain. The continued consideration of the gender perspective should be stressed not only at regional levels but also at the international level to ensure the development of AI technologies that reduce gender bias and promote human–AI collaboration for a diverse group of users.

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