AI Cookbook

Work Package 2: Analysis of different potential uses of AI tools and applications in Migrant classes

2.2 Analysis of the capabilities of AI across the four pedagogical areas of DigCompEdu: Resources, Teaching and Learning, Assessment, and Empowering Learners: Part 2 - Field Research

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AI Enhanced Learning Cookbook for Empowering Migrants

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Introduction

The AI Cookbook Project

The AI Cookbook project enhances digital transformation in adult education for migrant learners by empowering educators through AI integration. Focusing on professional development, it provides practical training in AI tools to create personalised, culturally responsive learning experiences while addressing digital readiness challenges.

Aligned with DigCompEdu standards, the initiative combines hands-on skill development with ethical considerations, helping educators overcome skepticism and build resilience in diverse classrooms. Using an innovative recipe approach, the project transforms theoretical knowledge into actionable strategies for effective digital pedagogy.

Methodology

This study employs a mixed-methods approach to examine AI's role in migrant education through six key research questions, addressing resource development, teaching applications, assessment improvements, learner empowerment, educator competencies, and teacher engagement strategies. The methodology combines a comprehensive literature review with field research to bridge theoretical insights with practical implementation. The literature review synthesises global perspectives from academic publications, case studies, policy frameworks, and technical documentation, initially collated and reviewed by the project team and then analysed thematically using Google Notebook LM to identify trends, challenges, and best practices. Complementing this, field research—through interviews, surveys, and focus groups with educators, migrants, and experts—captures real-world experiences of AI tools in diverse learning environments. Primary participants include adult educators and migrant learners, with secondary insights from AI specialists and community intermediaries, ensuring a holistic understanding of needs and opportunities. Together, these methods inform actionable recommendations for the AI Cookbook, grounding AI integration in both evidence and lived realities.

Research Questions

- How can AI enhance resource development and delivery for migrant education?
- What AI applications are most effective for teaching and learning in migrant contexts?
- How can AI improve assessment processes for migrant learners?
- What AI tools best empower migrant learners to take control of their learning journey?
- What are the competences for teachers and trainers using AI for digital education?
- How can we engage teachers and trainers in using AI for teaching migrants

Field Research

The field research aims to gather real-world insights on the use of AI in migrant education. Through interviews, surveys, observations, and focus groups, the study explores how educators, learners, and organisations experience AI tools in learning environments. The findings will inform the AI Cookbook, providing practical recommendations for AI integration in adult education.

Target

The main target groups for the research were educators working with adult migrants and the adult migrants themselves. Secondary targets were experts in AI, experts in education, experts in migrant communities and also young migrants and the intermediaries who work with them.

Results

The following results highlight a complex landscape shaped by diverse technological readiness, pedagogical approaches, and the unique vulnerabilities of migrant populations.

Context and Challenges in Migrant Education

The context of migrant education is marked by significant challenges that influence AI implementation. High diversity in language proficiency and educational backgrounds within a single classroom is a primary concern, making differentiated instruction crucial. Furthermore, many learners face traumatic experiences, cultural adjustment difficulties, unstable housing, and limited time due to work or family responsibilities, all of which impact their focus and study time. A fundamental barrier is the inconsistent digital access among learners; some may share a single device per household or lack stable internet. There is also a need for tailored materials, as generic resources often do not cater to specific linguistic backgrounds like Arabic or Farsi speakers learning Greek. The necessity for teachers to adapt to new technologies and the oversaturation of information further add to the challenges.

Educator Experiences and Perceived Benefits of AI

Educator experience with AI tools varies from very limited use of basic translation tools and brief experimentation with platforms like ChatGPT to more active use for specific tasks. Some educators use AI to find and organise content, create new exercises, and design engaging activities. Others use AI for generating texts, dialogues, and lesson plans tailored to specific themes or industries. More innovative uses include cloning one's voice for feedback, building AI models for feedback on student work, and exploring conversational agents or interview simulators.

The perceived benefits of AI are linked to addressing the challenges of diverse classrooms and limited resources:

Increased Learner Motivation: AI can make learning materials highly relevant to learners' personal backgrounds, languages, jobs, or fields, which significantly boosts motivation.

Differentiation and Personalisation: AI is seen as a powerful tool for creating differentiated and individualised materials that cater to varying levels and backgrounds within a class. This can help learners engage more deeply with content relevant to them. AI can support individual learning plans and materials and create personalised learning environments where students receive support at their own pace without fear of being a hindrance.

Administrative Efficiency and Time-Saving: AI can save significant time for teachers by helping with tasks like creating materials, planning lessons, quickly compiling information (e.g., literary timelines, suitable examples), summarising texts, and organising material. This frees teachers to focus on the educational relationship with students.

Content Creation: AI can generate varied and original content, exercises, dialogues adapted to specific situations, and practice scenarios.

Language Support: Benefits include instant feedback on pronunciation/grammar, personalised practice outside class, generating questions to deepen understanding, creating level-adaptive materials, and providing language support tools like vocabulary widgets. AI simulators for sector-specific language are also identified as a benefit.

Enhanced Learning Processes: AI can support deeper exploration of topics, allow students to ask questions repeatedly, help identify strengths, and meet needs beyond the traditional classroom. It can also act as a "sparring partner" in assessment, offering summaries or alternative perspectives.

Barriers and Concerns Regarding AI Implementation

Despite the potential benefits, significant barriers and concerns exist:

Teacher Readiness and Resistance: A major barrier is that many teachers do not see the benefits of AI, this can be due to a lack of experience teaching with technology and a lack of professional development. Some find the technology difficult to use or don't have the time to learn yet another digital tool. Resistance also stems from feeling uncomfortable with the technology, which requires both competence and willingness. The pace of technological change can be overwhelming.

Lack of Training and Support: There is a clear need for structured guidance and professional development on how to effectively use AI tools, evaluate them, and integrate them into teaching and learning. Teachers often feel left alone experimenting with tools, which is time-consuming.

Accuracy, Bias, and Misinformation: AI tools can produce "hallucinations" (plausible but incorrect information), are sometimes inaccurate in grammar explanations, and outputs require critical evaluation and verification. A significant concern is bias in AI outputs, which often reflects dominant Western perspectives and can embed these biases, creating an uneven playing field. This includes portraying non-Western individuals in stereotypical roles.

Digital Access and Equity: If learners lack consistent access to devices or stable internet, introducing AI tools can widen existing educational gaps. This highlights the need for equitable access to technology.

Privacy and Data Concerns: Migrant students may be undocumented or wary of data tracking. There are concerns about AI platforms collecting and processing personal data, potentially reinforcing harmful stereotypes. The lack of clear, simplified explanations about data use is a barrier. Using U.S.-based services also raises GDPR concerns.

Over-Reliance and Lack of Critical Thinking: There is a concern that students might stop thinking for themselves or blindly trust AI outputs. Students need to be guided to use AI to generate questions rather than seek definitive answers. Overuse might signal poor task design.

Assessment Challenges: It is difficult for teachers to determine whether student work was created by the student or significantly assisted by AI, making grading and fair assessment problematic. Using AI to evaluate student work ethically is a concern.

Technical Limitations: AI tools can struggle with dialects, complex grammar, recognising non-Western credentials or accents. Many tools are not designed for low-literacy learners or specific cultural contexts. Language limitations in training data mean many languages are underrepresented, hindering accuracy, especially for critical information.

Lack of Clear Guidelines and Trust: There is a lack of clear definitions on acceptable AI use, disagreement among teachers, and unclear integration strategies. A lack of trust in these programs exists.

Risk of Teacher Displacement: A concern exists that schools might cut staff if AI is perceived to "replace" teachers.

Support Needs for Educators and Learners

Addressing these barriers requires targeted support for both educators and learners:

Educators need structured training on how to use AI tools effectively, understand their potential and limitations, craft prompts, interpret results critically, and integrate AI into lesson planning. They also need awareness of ethical implications, bias, and misinformation risks. Digital skills training is essential.

Strong support from school leadership is essential to manage change, address resistance, establish clear guidelines and frameworks (like GDPR compliance), and support professional dialogue among colleagues.

Students, especially beginners, need basic digital literacy support and, critically, access to devices. Providing computers to all learners would ensure equal opportunities.

AI tools or apps that function without constant internet access are crucial due to inconsistent connectivity.

There is a need for AI content reflecting specific migration contexts (e.g., job applications, healthcare visits), and for tools that better reflect diverse, non-Western backgrounds, names, roles, and cultural contexts. AI should adapt to the specific contexts and experiences of migrants.

Learners need clearer, simplified explanations about how their data is used, potentially through notifications. Platforms should ensure strong privacy protections and transparency.

Students need structured opportunities to experiment with AI, coupled with discussions about its limitations and appropriate use.

There is a need for more robust, specialised, and context-aware AI models, particularly in languages other than English, and potentially closed-domain models tailored for education and specific academic fields.

The Human Element and the Role of the Teacher

Throughout the interview process, there was a strong consensus that AI should not replace the teacher but act as an effective supplementary tool. The teacher's role remains vital. Human judgment and critical thinking are essential when using AI. AI cannot replace human empathy for trauma-related needs. It cannot sense the mood in the room, understand subtle signals from students, or adapt to emotional needs.

Human contact and the educational relationship are invaluable components of education. Learning takes place in context, and social and emotional factors are crucial for understanding and motivation. Skills like building relationships, collaborating, and understanding social cues require interaction with other people. While digital technology is a complement, human teachers are responsible for the overall educational experience, facilitating learning, creating a supportive environment, and providing human connection which is essential for migrant students to thrive. Teachers must also be willing to let go of some traditional authority and become facilitators when using AI.

Learners also strongly value in-person, real-life opportunities to practice the target language. Supportive, non-judgmental environments where mistakes are welcomed are crucial for vulnerable learners. While comfortable with digital tools for support, real-world interaction remains a key part of their learning process.

While AI presents opportunities for enhancing personalised learning and administrative efficiency in migrant education, its successful integration is contingent upon addressing the profound challenges related to teacher training, equitable access, ethical concerns (bias, privacy, accuracy), and the fundamental recognition that AI is a tool to support, not replace, the essential human connection and pedagogical expertise provided by educators. Leadership support and a culture of shared understanding are vital for navigating this evolving landscape.

The interview participants collectively emphasised that AI holds potential for enhancing adult migrant education, primarily by supporting teachers and personalising learning for students, but its successful and ethical integration depends heavily on addressing teacher training, ensuring equitable access, maintaining human oversight, and navigating complex cultural and privacy considerations.

Practical recommendations

Prioritise Teacher Training and Support: A recurring theme is the need for structured training and support for teachers. Teachers need to learn how to effectively use AI tools, understand their strengths and limitations, evaluate their suitability for migrant learners, craft prompts, and integrate them into lesson planning. Without adequate training, teachers struggle to see the benefits or implement AI effectively. This transition is in the main, seen as a leadership responsibility. Professional dialogue and planning among colleagues can help identify where AI adds value.

View AI as a Support Tool, Not a Replacement: The sources consistently emphasise that AI should assist, not replace, the teacher. It should be used as a supplementary tool. The

human teacher remains vital for providing the overall educational experience, sensing the mood of the room, understanding subtle signals, and adapting to emotional needs. Human intelligence is essential for proofreading and quality control of AI outputs.

Use AI for Differentiation and Personalisation: AI can be a powerful tool for creating differentiated and individualised materials that cater to each learner's level, background, interests, and needs. This is particularly valuable in classrooms with diverse proficiency levels. AI can adapt content, such as tailoring texts to different reading levels while keeping the core subject matter consistent. It can also support personalised practice for students outside of class.

Use AI for Content Generation and Administrative Efficiency: AI can free up teacher time by assisting with tasks like creating assignments, dialogues, lesson plans, and working materials. It can help compile literary timelines, find suitable examples, summarise student essays, and organise material. By automating these administrative tasks, teachers can dedicate more time to the invaluable educational relationship with students.

Integrate AI for Specific Language Support: AI can provide specific tools for language learning, such as offering instant feedback on pronunciation and grammar. It can help create job-market shortcuts through simulators for sector-specific language or offer tools like accent normalisation. Conversational chatbots can provide opportunities for basic practice. AI can also help in actively incorporating students' linguistic backgrounds through translanguaging. Using voice cloning can provide accessible feedback for students who struggle with reading.

Address Access and Digital Literacy Gaps: Recognise that not all learners have equal access to technology or consistent internet. Where possible, devices should be made available to all learners to ensure equal opportunities. Learners, especially beginners, may need basic digital literacy support. Consider exploring and utilising offline solutions or tools that function without constant internet access. Simple, accessible technologies like QR codes or WhatsApp can also be useful.

Prioritise Relevance and Cultural Sensitivity in Content: AI-generated content and scenarios should be relevant to learners' personal lives, job contexts, and migration experiences. It is crucial that AI tools reflect diverse, non-Western contexts and avoid portraying people in stereotypical or limited roles. Efforts should be made to ensure cultural adaptation of AI content to the specific country context (e.g., job applications, healthcare visits).

Promote Critical Thinking and Human Judgment: Learners and educators should be encouraged to be critical when using AI and not blindly trust its outputs. Teach students to verify information and question what qualifies as factual and reliable (content criticism). AI can be used to generate questions or alternative perspectives rather than just definitive answers. Supplement AI-generated information with additional research or consultation, especially for cultural context. Educators should guide student use to prevent over-reliance.

Be Mindful of Privacy and Ethical Concerns: Educators and learners should be aware of how AI platforms collect and process personal data. Concerns exist around the risk of reinforcing stereotypes through data use and the sharing of sensitive information. Prioritise platforms that ensure strong privacy protections, transparency, and informed consent. Clear,

simplified explanations about data use are preferred. GDPR compliance must be considered from the outset.

Integrate AI into Pedagogical Strategies: Consider how AI can support specific teaching methods, such as using it for homework or preparation in a flipped classroom model to free up class time for meaningful interactions and conversation. Chatbot-facilitated discussions can promote participation and critical thinking, especially among hesitant students. AI can also be used as a "sparring partner" in assessment, offering summaries or alternative perspectives for the teacher's professional judgment.

Acknowledge and Address Assessment Challenges: It is currently difficult to distinguish between student-generated work and AI-assisted content, which poses challenges for grading and fair assessment. AI should not take over student text assessment. There is a need for clear guidelines on acceptable AI use in assignments and careful consideration of the ethical implications of using AI for assessment.

Foster a Culture of Openness and Questioning: Create an environment where it is acceptable and encouraged to say, "I don't understand, can you explain?" when discussing AI. This helps demystify the technology.

Recognise the Importance of Human Interaction: While AI can be a powerful tool, human contact and relationships remain an invaluable component of education. Learning involves social and emotional factors, and human interaction is crucial for developing relationships, collaboration skills, and understanding subtle social cues. Digital tools are a complement, and respondents suggest organising *more* group teaching and physical meetings.

Seek Clear Guidelines and Leadership Buy-in: The lack of clear definitions and shared guidelines on acceptable AI use is a challenge. Strong support from school leadership is essential to establish frameworks and avoid a "Wild West" scenario.

Consider the Cost and Availability of Suitable Tools: Many useful AI tools require payment, which can be a barrier for students. There is also a need for robust, language-specific models tailored for educational use, which may not yet be widely available or affordable.

Conclusion

The field research underscores AI's potential to enhance migrant education by improving language support, and streamlining administrative tasks. However, successful integration hinges on addressing key challenges: equitable access to technology, comprehensive teacher training, ethical concerns (bias, privacy, and accuracy), and preserving the irreplaceable role of human educators in fostering empathy and critical thinking.

Practical steps include prioritising professional development, designing culturally responsive AI tools, and establishing clear guidelines for ethical use. By viewing AI as a supportive, not substitutive tool, educators can maintain the human connection essential for migrant learners' success. Leadership commitment and collaborative strategies will be vital to navigate this evolving landscape effectively.