

ARTIFICIAL INTELLIGENCE AND RECOGNITION OF QUALIFICATIONS: OPPORTUNITIES AND RISKS FROM AN ENIC-NARIC PERSPECTIVE

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EXECUTIVE SUMMARY

Keywords: Artificial intelligence – qualification recognition – higher education – credential evaluation – ethics – education fraud – Lisbon Recognition Convention (LRC) – equity – recognition workflow – learning outcomes – European regulations – internationalisation – Bologna Process.

The rapid developments of artificial intelligence technologies are increasingly posing questions about the ethical and practical implications of their use in the learning, teaching and assessment processes.

This publication reflects on the relation between artificial intelligence and recognition of qualifications. Whether this relation may result in an opportunity or a threat, will be developed in the text through a set of questions concerning the possible implications of the use of artificial intelligence in the recognition sector. These questions arise from CIMEA's experience and have been framed in the context of existing literature and policy documents on the subject, considering five dimensions: equity, recognition workflow, learning outcomes, European framework and regulations and international academic mobility. Moreover, the document attempts to explore the impact on credential evaluation, both in the perspective of recognition workflow, as well as the impact on credential evaluators' daily work.

The document is targeted at higher education institutions, ENIC-NARIC centres, authorities with jurisdiction in the field of recognition and other entities who, for various reasons, are involved in the recognition of qualifications.

INTRODUCTION

“Can machines think? [...] I believe that at the end of the century the use of words and general educated opinion will have altered so much that one will be able to speak of machines thinking without expecting to be contradicted” (Turing, 1950).

This is how Alan Turing talked about the possible existence of intelligent machine thinking in 1950, in his work “Computing machinery and intelligence”. More than a half century later, the answer to his question appears to be affirmative, as Artificial Intelligence (AI) is a constant presence in people’s lives and in different sectors of society. Among these sectors, education has currently been undergoing many changes due to the current AI impact in the traditional education delivery modes. But how can AI be applied in the framework of the very sector of society, education, that aims to develop human thinking? And is it possible to apply it without moving the “human focus” too far away? How AI impacts on the four purposes of education: preparation for employment, preparation for life as active citizens in democratic societies, personal development and the development and maintenance of a broad, advanced knowledge base? (Council of Europe, 2007)

In general terms, AI is defined as

“A set of sciences, theories and techniques whose purpose is to reproduce by a machine the cognitive abilities of a human being. Current developments aim, for instance, to be able to entrust a machine with complex tasks previously delegated to a human” (Council of Europe, 2021).

The widespread debate on **AI and education mainly** concerns the use of conversational agents in schools and universities, therefore questioning the ethical and practical implications of its use in the learning, teaching and assessment processes. However, among the broad variety of issues connected to the relation between AI and education, the consequences of the use of AI in supporting mobility of students and graduates, and more specifically its impact on the recognition of qualifications sector has not been deepened yet, although the issue has been recently raised (Bergan, 2023).

The scope of the document is to contribute to the discussion on the use of Artificial Intelligence in education and in particular in the sector of recognition, by identifying and analysing some of the key questions that this use can pose, rather than necessarily providing ready solutions or all the answers.

The main questions underlying this document are what are the opportunities and what are the threats related to the use of AI technologies, and to what extent may they constitute a threat to a quality education, for instance to academic integrity (QQI, 2023), or – on the contrary – can be used as a means to make the education sector move in a more ethical, just and inclusive direction (European Commission, 2022)¹.

Starting from these general questions, the focus of this document is to analyse and reflect on the impact of AI in recognition of qualifications. More precisely, the question is if and how AI can support fair recognition of qualifications in line with the principles of the Lisbon Recognition Convention, the international convention which entered into force in 1997 that constitutes the regulatory framework for recognition of qualifications at pan-European level.

As a transversal issue connected to the use of AI, academic integrity and the principle of fair recognition stated in the Lisbon Recognition Convention, the theme of ethics serves as the common thread underpinning the reflection. Starting from this, the document draws on the experience developed by CIMEA in recent years to raise some questions related to the potential use of AI in education and recognition, also in light of the literature and policy documents on the subject.

Before delving into the potential impact of AI on recognition, the document briefly introduces a few elements on the technological dimensions, as preliminary information to approach the topic.

As already stated, the reflection on the use of AI technologies in recognition is conducted across five dimensions: equity, recognition workflow, learning outcomes, European framework and regulations and international academic mobility. For each of these five dimensions, a few questions are raised, as a way to support a shared reflection and understanding of the opportunities and risks of AI in recognition.

The following chapter goes through the credential evaluation methodology trying to identify, in a hypothetical scenario, what tasks and activities of the assessment flow can be supported thanks to AI. Furthermore, the profile of credential evaluator in the light of AI developments is sketched.

¹ These topics were extensively covered during the QQI Artificial Intelligence Week 2023 (for which recordings and materials are available at: <https://www.qqi.ie/events/artificial-intelligence-week>), during which the use of ChatGPT in education and its consequences on assessment have played a significant role.

BACKGROUND

In its role as Italian ENIC-NARIC centre, and in line with the national strategy², in the last few years CIMEA has been increasingly looking into the phenomenon of Artificial Intelligence, as the main distinction dominating the recognition sector so far, the one between **the digital and the analogic** dimension, saw the appearance of AI as a third factor. In fact, it is important to differentiate between digital solutions which do not imply the use of AI (e.g., the use of Blockchain technologies for the issuance of documents) and digital solutions which do imply it as their core element (e.g.: AI Language Models, OCR – Optical Character Recognition). It would appear that the analogic-digital divide is seemingly not exhaustive anymore and it is therefore making way to a **tripartite distinction: analogic solutions, digital solutions, advanced digital solutions implying the use of AI**. The work that CIMEA has been carrying out for the last few years, deals mainly with its involvement in and coordination of international projects which focus on new technologies in the recognition sector, especially in the light of the abovementioned distinction. Among these, it is worth mentioning the Erasmus+ project [FraudSCAN – False Records, Altered University Diploma Samples Collection and Alert for NARICs](#), run from 2018 to 2020 and coordinated by CIMEA, in partnership with the ENIC-NARIC centres from Belgium Flemish community, Denmark, Estonia, the Netherlands and Sweden. The project consortium worked to the realisation of two main deliverables: the FraudSCAN database and the *Guidelines for establishing an Alert Mechanism on academic fraudulent documents*.

The FraudSCAN database collects the scanned copies of fraudulent qualifications (confirmed as such by the competent authorities) and qualifications issued by Diploma Mills. The database has been further enriched in a second phase of the project, namely the project [FraudS+ - False Records, Altered Diploma Mills Qualifications Collection](#), in place from 2020 to 2022, coordinated by CIMEA and involving the ENIC-NARIC centres from France, Germany, Ireland, the Netherlands and Sweden, in cooperation with the European Students' Union. At the present day³, the

² In line with the global trend, Italy has been exploring the phenomenon of AI for the last few years, by delving into how it can be applied in the different social sectors. One of the first documents describing the Italian approach to AI is the white paper Artificial Intelligence at the service of the citizen (AgID, 2018), realised by the Agency for Digital Italy. The white paper sets the application of AI in the public administration system as the main policy priority, having as milestones data quality and neutrality, responsibility in terms of accountability and liability, transparency and openness, and protection of the private sphere. The Italian strategy for the application of artificial intelligence driven by the Ministry of Economic Development (as it was named in 2020, year of the strategy plan release), aims to stand in direct connection with the European strategy, as well as in line with the agreements of the international forums such as G7 and G20, with the Italian Constitution and the principles of anthropocentrism and integrity as affirmed in the framework of the United Nations' Sustainable Development Goals (Ministero dello Sviluppo Economico, 2020).

³ Data refer to the consultation of the database on 02/11/2023.

FraudSCAN database contains 421 documents: 360 confirmed falsified documents and 61 diploma mills. *The Guidelines for establishing an Alert Mechanism on academic fraudulent documents* have been published in 2020 and are available only to ENIC-NARIC centres, in the restricted area of the networks' website. With the description of the Alert Mechanism, the Guidelines proposed a strategy to ENIC-NARICs to support the detection of fraud through AI, trained with historical data coming from the database of fraudulent qualifications. The Alert Mechanism is not in place yet, due to a lack of common interpretation of the General Data Protection Regulation (GDPR) application in the different partner countries. Still, the development of such a model represented a concrete new possibility of implementation of AI to support the recognition process for the ENIC-NARIC centres in detecting fraudulent documents.

The implementation of such new technologies in the credential evaluation workflows of the ENIC-NARIC centres was also the core of the project [DigiNet – Digital Innovations in Credential Evaluation and the Networks](#), which ran from 2020 to 2023. It was coordinated by the ENIC-NARIC centre from The Netherlands, in partnership with CIMEA and the ENIC-NARIC centres from Estonia, Germany, Poland, Sweden, France and Canada, and in cooperation with the Groningen Declaration Network, EMREX and the International Association of Universities (IAU). The objective of the project was to support the implementation of digitalisation strategies for credential evaluation in the partner ENIC-NARICs. Results were gathered in a final project publication, titled [Digitalisation of credential evaluation workflows. Practical guidelines for the ENIC-NARIC Networks](#), which provides a series of principles to design and implement digital solutions on the basis of which centres can redefine their internal workflow. In this light, the need for digital and technological skills is urgent, and the upskilling and reskilling of competences in order to keep up with constant technological innovation is becoming more and more pressing: the project [ARISA – Artificial Intelligence Skills Alliance](#), coordinated by Digital Europe in cooperation with other 16 partners from the higher education sector, VET sector and industrial sector, is trying to address this need by developing, implementing and disseminating a new digital skills strategy for AI that aims to contribute in mapping the skills requested at the European level and to upskill and reskill EU workforce in order to enhance a human-centred and socially driven AI. The project started in 2022 and will run until 2026. Within its activities, new training curricula on AI will be designed: the role of CIMEA will be focused on matching this AI skills training with the European guidelines and recommendations on certification of micro-credentials.

The project [MARTE – A technological approach to micro-credentials](#) is co-funded by the European Union under the Erasmus+ programme, started in January 2023 and will run for 24 months. The project, coordinated by CIMEA, involves the ENIC-NARIC centres from Ireland and the Netherlands as project partners and the University of Pisa, Iuav University of Venice and Leica as third parties. The main aim of the project is to explore the possible application of automatic recognition to micro-credentials by applying AI technology to learning outcomes.

The application is aimed at verifying whether there are common patterns and characteristics in the structure of learning outcomes and if these patterns can be used to apply automatic recognition to learning outcomes of micro-credentials. More specifically, the project is articulated in three main stages:

- mapping of the existing repositories of micro-credentials in partner countries.
- Application of text-mining technology to the learning outcomes of the gathered micro-credentials to identify common patterns and characteristics.
- Starting from the findings of the previous two stages, piloting the design of a micro-credential provided by a non-academic actor and recognised by a higher education institution.

Since 2018, through these various experiences, CIMEA has been trying to dig deeper into the above-mentioned AI factor by measuring and assessing how AI technologies could impact both on the internal workflow and, broadly speaking, on the field of credential evaluation. This document aims to share a series of questions that came up while experiencing these changes, in order to propose a critical reflection on the relation between AI and credential evaluation.

ARTIFICIAL INTELLIGENCE IN HIGHER EDUCATION: ETHICAL PERSPECTIVES

AI: a mix of technologies and techniques

Digital skills and knowledge of the basic technical aspects of the AI technologies are the key to understand its potential application and impact. This technical analysis is outside the scope of this document, but there are at least two basic concepts that should be introduced.

First, Artificial Intelligence is not a unique technology. It is characterised by a variety of different technologies and techniques, the main of which can be considered the following: Machine Learning (ML) - which can in turn be characterised as deep, supervised or unsupervised learning - Natural Language Processing (NLP), expert systems; vision, speech, planning and robotics. These techniques can be applied either separately or in combination with other techniques. On top of that, they can also be embedded in other software suites and browsers as well as apps and *ad-hoc* tools to enhance their functionality.

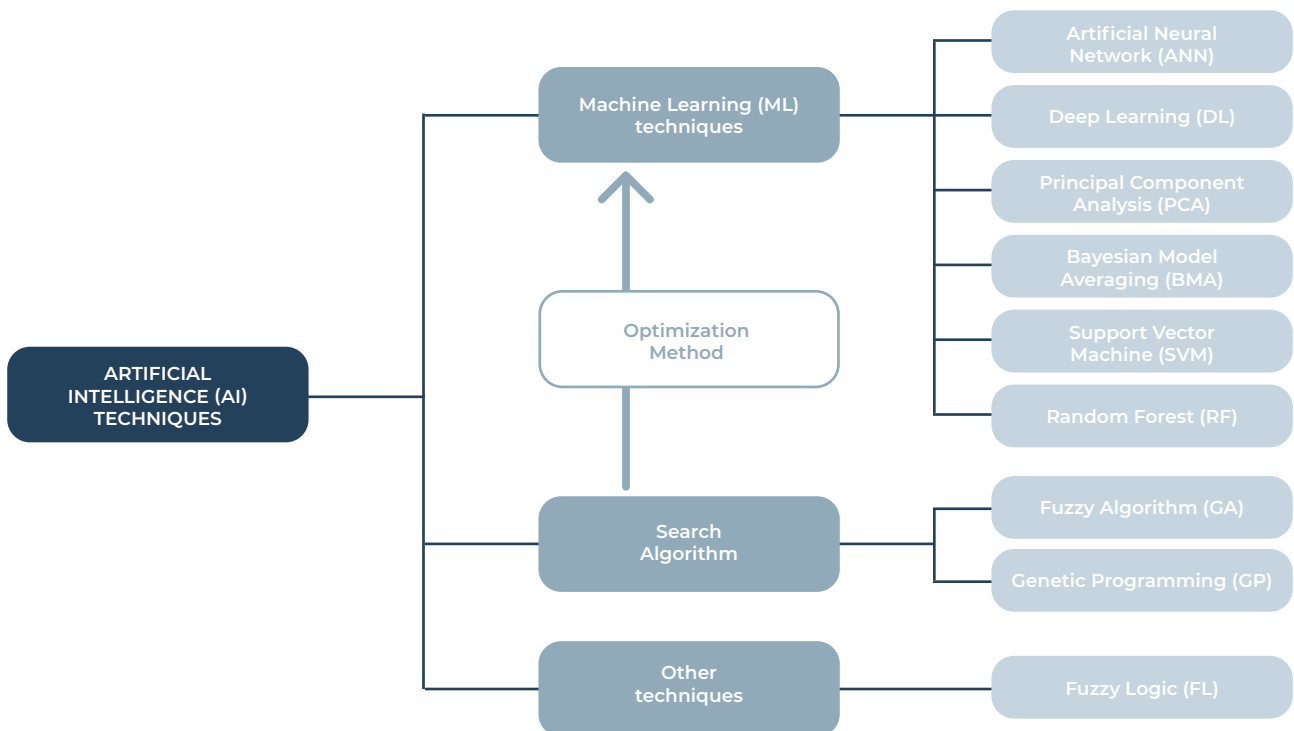


Figure 1. A classification table of AI and ML techniques (Gaudio et al., 2021).

Second, it is common to differentiate between two typologies of AI: **weak or narrow AI (NAI)** and **strong or general AI (AGI)**. The difference basically lies in the capabilities of each of them. While weak AI can deal only with one main task (for instance in facial recognition systems), strong AI is capable of dealing with multiple and complex tasks, and is characterised by seven distinctive features (Gordon, 2023):

- Rationality.
- Intelligence, meaning ability to automatically learn from past experiences and find new meanings.
- Autonomy, being totally independent from human control.
- Multitasking.
- Interactive, capable to act comprehensively with the surrounding environment and human beings.
- Self-awareness.
- Ethical, able to take decisions based on moral thinking.

Strong AI does not yet exist in practice, but many scholars believe that it will soon be a reality, as it has already been identified as one of the critical issues that humanity will face from the middle to the end of the 21st century (Gordon, 2023). In connection with this, it has to be mentioned that another issue related to AI is the so called “black-box problem”, which indicates the fact that it is impossible for humans to know the mechanisms and the reasons that bring an AI system to reach conclusions or to take decisions, even regarding weak AI, as if those mechanisms and reasons stay hidden in an impenetrable black box. This is why there are serious concerns regarding the development of strong AI, as humans will most likely be unable to impose sufficient control over it (Gordon, 2023). Therefore, from an ethical perspective, it is impossible not to think of the implications that such an uncontrolled technology might cause from the social point of view if applied, for example, at the public administration level: how would biases be kept under control? How would the use of data be governed?

Opportunity or threat? An analysis across five dimensions for AI in recognition

The same issues can be considered also with respect to other sectors of society. In fact, despite the advantages and opportunities that the AI might bring in education, some concerns regarding its actual application and its ethical implications are currently under discussion at the international level. The purpose of this paragraph is to reflect from a critical perspective on these implications, through the analysis of five different dimensions describing the impact of AI in the education and recognition sector.

1 | Equity

The report of the Council of Europe titled *Artificial Intelligence and Education. A Critical View through the Lens of Human Rights, Democracy and the Rule of Law* (2022) analyses the social and ethical challenges posed by the connection between AI and education. Among the problems identified in the report, the inequity in the access to digital technologies has a great relevance. AI is inevitably tied to a high level of digitalisation, as AI systems such as ChatGPT or any other ITS system depend on the availability of such technologies. Therefore, an unregulated use of AI could also lead to a greater digital divide and could create further marginalisation due to technological and financial disparities between different territories. Not to mention that, inasmuch as many AI tools and initiatives are often led by for-profit corporations (Council of Europe, 2022), ensuring equal access to all learners/users regardless of different cultural backgrounds, living conditions and political status could be problematic, as well as guaranteeing the production of diverse and pluralistic knowledge. The risk connected to AI and other new technologies that are supposed to further diversify our knowledge systems is that only a few of them totally dominate our “interface with knowledge”, by exercising monopolistic powers and consequently giving strong advantages only to certain cultural views (Giannini, 2023).

Given that the massive amount of data that generative AI relies upon to constantly improve its performance is mostly available to the big international technology companies, the risk of unequal access to this data is a big challenge to face (Miao & Holmes, 2023). This situation could produce two relevant counter effects: on the one hand, “data-poor” regions and marginalised communities could be further excluded and “colonised” by world-views and cultural values of the Global North; on the other hand, there could be even less pluralism and free expression of ideas, as they will have even less chance to be represented not only at the political level, but also in the public sphere (Miao & Holmes, 2023). Therefore, one of the main challenges for governments and institutions is – at the current time – to make sure that the new AI tools provide inclusive knowledge that does not benefit only some categories of society at the expense of the others. From the recognition perspective, unequal distribution of resources may also question the effective implementation of the principle of “fair recognition”, as stated in the Lisbon and Global Recognition Conventions.

- AI usually needs a massive amount of data to work effectively. But what happens if a centre or a higher education institution does not have an equally massive archive of such data (qualifications, results of assessment already carried out)?
- Considering the geographical distribution of resources feeding AI, the digital divide, the differences in quantity and quality of digital data on the higher education system of a certain country, can we expect an increased inequality among different regions in the world concerning assessment and quality of recognition procedure? Which measures can guarantee that a quality recognition is granted to qualifications from such countries?
- How to guarantee fair recognition of qualifications of (partially) AI-based learning paths? How to avoid bias and discrimination?
- If from a certain country there is usually a higher number of fraudulent qualifications, will the system be more inclined to indicate fraud even if it is not the case? And vice versa, if from other countries the level of fraudulent qualification is usually very low, would the system be likely to spot fraudulent qualifications?
- In the light of the significant amount of data needed to nurture and train AI, who would be responsible for such processes? Can higher education institutions and/or ENIC-NARIC centres do this on their own or can we expect the creation of recognition hubs? If this is the case, how do we ensure that such hubs are cooperative and not competitive? What will the costs associated with the development of AI and of such big databases be? Will AI be a wise solution comparing costs and benefits in relation to the scope of the institutions dealing with qualifications recognition, or are the costs (economical, ethical, etc) still too high to be applied in practice?

2 | Recognition workflow

One of the promises associated with AI is that it can contribute to greatly automatise routine work and tasks. Consequently, one angle of reflection is to understand how the developments in AI technologies can contribute not only to the simplification and automatization of the recognition workflow, but also to possibly increasing the quality standards of evaluation procedures.

- Can AI contribute to automatise, at least partially, the assessment procedure? What tasks can be delegated to AI? Would it be possible for a HE institution or for an ENIC-NARIC centre, to receive a qualification, assessing it automatically through a comparison with other similar qualifications received from the same country/institutions, and automatically have the recognition result once more according to previous outcomes of assessment? If this is possible, to what extent is the result trustworthy and without bias or discrimination?
- AI tools are becoming very sophisticated and interesting when it comes to translation from different languages. What will be the role of AI in simplifying access to educational documents in original languages? Can AI help overcome translation obstacles and consulting educational documents in the original language even if the credential evaluator does not have any competence in the language of the document?

- How can AI support fraud detection? Is it possible to use AI to detect anomalies and signs of possible fraud in the qualifications, again comparing against other similar qualifications received? In other terms, can AI contribute to detecting document fraud? And can the final decision, both on the assessment and on the authenticity, be taken by AI? Or should a human intelligence still have the final say?
- From the opposite perspective, can AI be a powerful tool in the hands of dubious providers and fraudsters? Can AI replicate a qualification completely identical to the original? Can we trust qualifications in the time of AI?
- The more complex a task is, the more the sensitivity of the decision of delegating it to the AI increases. Will the credential evaluator be therefore responsible for higher-added-value tasks?
- AI needs a huge amount of data, and these data should be kept up to date, maintained, and organised to allow their consistent use. Will data analysis be a necessary competence for credential evaluators and/or for the institutions carrying out recognition procedures?
- How to ensure privacy and protection of personal data, considered the big amount of data needed to feed AI?

3 | Learning outcomes

In the framework of the European Higher Education Area, a paradigm shift relates to the conception of higher education learning outcomes. Since 1999 the focus has moved away from an input-based approach (contents of the course, number of classes taken, study time, etc) towards an outcome-based approach in higher education, in other terms to a student-centred approach, through the definition and adoption of learning outcomes in higher education. Learning outcomes are defined as statements of what a learner knows, understands and is able to do on completion of a learning process (European Commission, 2015).

Can we trust learning outcomes in the era of AI? This question is related to the dimension of teaching and learning, and to academic integrity. As in every large-scale technology advance in education, AI has brought new ways for students to engage in academic misconduct (Eaton, 2022). The traditional concept of plagiarism, defined as copying from others without proper reference, cannot be applied to AI tools such as ChatGPT: the text they produce can be not only completely original, but in some cases they can also be totally wrong (Eaton, 2023). Furthermore, conversational agents such as ChatGPT, do not provide references for their text, and if requested, the reference can be inexistent. Hence, in the so-called age of post-plagiarism in which it is impossible to determine when human writing ends and machine writing begins, the role and responsibility of both higher education institutions and of the whole higher education community becomes more and more crucial (Eaton, 2023). As affirmed by the European University Association (2023), higher education institutions could focus on how to ensure an ethical use of AI tools, for example by adopting such means as the obligation to reference the use of AI in academic work or its restriction to specific types of learning and assessment.

As an additional point, higher education institutions could redesign their assessment methods and systems to incorporate the use of AI (such as ChatGPT or other Large Language Models) by not losing sight of the importance of the fundamental knowledge needed in each sector of higher education that can be acquired only by traditional learning modes (Newton, 2023).

In fact, the UNESCO *Guidelines for Generative AI in Education and Research*, suggest that teachers, educators and policy makers in education rethink learning outcomes by considering the following four categories:

- values: the human-centred design of education has to be a milestone, and the way in which technology relates to education has to be made explicit.
- Foundational knowledge and skills: they are the key for education, but they need to reflect the new AI-rich environment.
- Higher-order thinking skills: they will have to be supported by collaboration between human thinking and AI.
- Vocational skills needed to work with AI: learners need to develop new skills to operate in job domains in which AI can do better than humans.

A critical issue for the recognition sector might arise relative to the possible improper use of AI tools during degree courses: if the new AI tools are employed for academic cheating, they could lead to the award of a qualification that would not be fake, but just obtained by using improper means. How could a credential evaluator determine whether the qualification is a “proper” one (Bergan, 2023)? What would be the role of the stakeholders working in the recognition sector? The Global Recognition Convention (Article 3) establishes that the Parties have to eradicate fraudulent practices in higher education “by encouraging the use of contemporary technology and networking activities among State Parties”: technology itself, within the context of the cooperation with higher education institutions and a well-built regulation framework, should be part of the solution. New technologies could be tools to counter education fraud, if they serve a comprehensive and systemic strategy of policies, legislation and practices to promote ethics, integrity and transparency in education (Recommendation of the Council of Europe on Countering education fraud, 2022). In this sense technology is never “neutral” because it is always designed according to some implicit or explicit values, within a culture and with a culture in mind (Floridi, 2023).

From a recognition perspective, a few questions are:

- Can we trust learning outcomes in the era of AI? Or can the AI serve as a sort of learning outcomes mill, supporting demonstration of acquisition of learning outcomes, also through assessment, that are not really knowledge and skills that the individual has?
- Some AI technologies use methodologies of text analysis that can help to identify recurrent words and clusters of terms, and it is possible to cross-reference them with other texts, for instance job descriptions by employers, the skills as defined by ESCO, as required by the

labour market, as indicated in the relevant scientific literature, etc. In this sense AI can help to identify the level of match between learning outcomes and skills and knowledge required by the labour market. Would AI be of help in writing learning outcomes in a more transparent, solid and clearer way?

- So far the conversation on automatic recognition of qualifications has been concentrated on a system level recognition for access to Higher Education, and has been defined as “the right for holders of a qualification of a certain level that has been issued by one Member State to be considered for entry to a higher education programme in the next level in any other Member State, without having to go through any separate recognition procedure” (Council of the European Union, 2018). But institutions can set specific requirements for admission to specific programmes, e.g. a number of ECTS in specific subjects, specific courses taken, etc. With AI technology (for instance natural language processing) it is possible to identify similar patterns and clusters of words in different texts. In other terms, it is possible to understand to what extent the learning outcomes of two different qualifications are similar. Can this be a precondition for full automatic recognition of qualifications also from a learning outcomes perspective? Can this support automatism also of the admission process to Higher Education, and not only the access?
- Can AI support the appropriate match between graduates with the relevant skills and the needs of the labour market?
- The UNESCO Beijing Consensus on Artificial Intelligence in Education (2019) states the potential of AI should be exploited in “building integrated lifelong learning systems to enable personalised learning anytime, anywhere and potentially for anyone”. If AI is really an engine that can support analysis and match of knowledge and skills, can it help in implementing recognition of prior learning? In this sense can it be seen as a tool to support widening the opportunities for access to lifelong learning? And if the answer is yes, what are the enabling conditions?

4 | European frameworks and regulations

Another dimension to analyse the impact of AI related to internationalisation and mobility of students, is the European and international framework. In some jurisdictions, regulators are looking carefully to the topic and are introducing relevant regulations.

The fast developments of AI technologies, makes the need for regulations in this context even more urgent for different reasons, including the general increased awareness on data privacy issues, and the possible use of learner data for commercialisation purposes not related to education (Bulay, 2023).

In the European Union context, the *Proposal for a Regulation of the European Parliament and of the Council laying down harmonised tools on artificial intelligence (artificial intelligence act)*

and amending certain Union legislative acts⁴, adopts a risk-based approach by defining four levels of risk in AI:

- unacceptable risk.
- High risk.
- Limited risk.
- Minimal and no risk.

The first category refers to all AI systems that contradict EU values, for example by violating fundamental human rights. It applies to all practices that can manipulate people by exploiting their vulnerabilities, or that are directed to vulnerable groups such as children or persons with disabilities. The third and fourth categories, as specified in the proposal, pertain to all AI systems which have some kind of transparency requirements, as in the case of the information to flag the use of an AI system when interacting with humans. AI systems classified as high-risk systems are those for which “requirements of high-quality data, documentation and traceability, transparency, human oversight, accuracy and robustness, are strictly necessary to mitigate the risks to fundamental rights and safety posed by AI and that are not covered by other existing legal frameworks” (European Commission, 2021). Education and vocational training are included in this category: this proposal tries to set specific rules and requirements for high-risk AI systems, in order to make them trustworthy and valuable tools.

What will happen at European level, and if and how will countries and institutions cooperate on the topic of AI also at international level? And how can international cooperation support a sound implementation of AI that is in line with the value and principles of European cooperation in higher education?

More precisely, a few very general questions are the following:

- can AI support the consistent implementation of the key commitments of the European Higher Education Area, namely qualifications frameworks and ECTS, implementation of the Lisbon Recognition Convention and quality assurance?
- Can AI support automatic recognition? If yes, how?
- In relation to the policy development and given the relevance of the topic, should we expect major reforms in the regulatory framework on recognition?
- Will the need for indications and regulations be from a recognition perspective? Will there be the need for more discussion about the Lisbon Recognition Convention and its related documents?
- If yes, what will be the key points for discussion and how will it impact on the signatory countries’ policies on AI in qualifications recognition?

⁴ “Following the Commission’s proposal in April 2021, the regulation could enter into force late 2022/early 2023 in a transitional period. In this period, standards would be mandated and developed, and the governance structures set up would be operational. The second half of 2024 is the earliest time the regulation could become applicable to operators with the standards ready and the first conformity assessments carried out” (European Commission, 2023).

5 | International academic mobility

One of the applications of AI in education are the new tools to support teaching such as Intelligent Tutoring Systems – ITS (Crompton & Burke, 2023). The ITS systems can tailor-make educational methods and activities to each student's characteristics and needs, therefore, they prove to be particularly useful in university classes that, due to the new typologies of courses (such as MOOCs), can reach many hundreds of students. What's more, due to the emergence and improvement of distance and online learning technologies, a new trend has been developing in the recent years: students are more and more used to work at their own pace, adapting their learning path to their individual needs. Consequently, AI-driven learning in higher education could have a solid ground to develop, if it is true that it can personalise students' learning experiences in order to reach their desired learning outcomes by tailoring learning pathways to each student's need (Escotet, 2023). Another element of interest is that AI can have a positive impact on international academic mobility, as it can support international students overcome such barriers as language and cultural differences or unfamiliarity with local education systems (Wang et al., 2023). In fact, AI-learning methods such as adaptive testing, chatbots to support learning and research can greatly improve the educational experience of international students⁵, thus having the chance to further increase international academic mobility flows and, consequently, requests for recognition.

- Can AI support the internationalisation and mobility of students? If yes, how?
- Can AI be of help for international students to try to overcome some of the obstacles and barriers to mobility (e.g., language issues)? If yes, how?

⁵ In particular, in Wang et al. there are four main examples of the possible AI-applications in higher education: personalized learning experience; adaptive testing (that could adapt the complexity of questions to each student's knowledge and background); predictive analytics (that provides insight on the behaviour and performance of the students to let educators intervene early); chatbots for learning and research such as ChatGPT.

**AI AND RECOGNITION
OF FOREIGN QUALIFICATIONS:
EXPLORING THE IMPACT
ON CREDENTIAL EVALUATION**

This section explores the possible usage and effects of digital solutions employing the use of Artificial Intelligence on the Credential Evaluation sector.

With this regard, a distinction should be made between the indirect and the direct impact of AI on Credential Evaluation itself. The term *indirect impact* is meant to describe the fact that credential evaluators will find themselves evaluating study paths comprising educational units completed with the use of AI, in which case it will be crucial to establish to what extent this was the case and whether the use of AI can be considered legitimate (Bergan 2023). The term *direct impact*, on the other hand, is referred to the fact that AI is likely to be used by the institutions involved in the recognition of foreign qualifications to streamline their evaluation process (UNESCO, 2018).

While this section will mainly focus on the direct impacts of AI in the field of Credential Evaluation, its aim is to analyse how AI could impact on a credential evaluator's daily work, as a consequence of a generalised change of work in the education sector (Council of Europe, 2022). Consistent with the scope of this document, this section will be dedicated to sharing the questions that CIMEA has faced while tackling the topic of AI linked to Credential Evaluation as to whether and how the former can support the latter, or even improve its quality standards. The text that follows does not therefore aim to give definitive answers, but rather to share the main questions CIMEA has collected so far, so as to foster a further and broader discussion on the topic.

This section is divided into two main paragraphs, dealing respectively with the **assessment of the comparability** of the qualification and the activities linked to the **verification of its authenticity**. From a methodological point of view, it should be further noted that this section refers to the EAR Manual II Edition (NUFFIC, 2023) and to the [Digitalisation of credential evaluation workflows. Practical guidelines for the ENIC-NARIC Networks](#) publication (NUFFIC, 2023).

Assessment of the comparability of a qualification

Step 1: Identification of the elements of the qualification

The first step for a credential evaluator consists in identifying the elements of the qualification in the documents submitted by the student. This is a first task which could be performed by AI tools, which could additionally summarise them through pre-established models or tables, so as to allow the credential evaluator to immediately identify the problematic elements to be deepened, if any. While the five elements of a qualification are quality, level of the qualification, workload, profile and learning outcomes, there follows a more detailed list of the different sub-elements which AI could check:

- the official status of the qualification.
- The status of the awarding (and teaching, if present) institution and of the study programme.
- The length of the programme in years.
- Workload.
- The level of the qualification according to the European Qualifications Framework (EQF) and – in case of Higher Education qualifications – the cycle of the Bologna Process.
- The nature of the qualification (academic, professional).
- The access requirement.
- The academic (and professional) rights.
- Learning outcomes.

An AI assessment of these elements would be quite straightforward for EHEA qualifications, where higher education systems have undergone almost 25 years of harmonisation and of adoption of common framework and transparency tools. For EHEA qualifications information is transparently described in the Diploma Supplement and using a common reference framework.

With this regard it would be interesting to assess how AI can perform in case of qualifications issued in education systems belonging to non-EHEA countries, especially with reference to the last five elements listed above.

AI could also be used to support the identification of relevant learning outcomes of qualifications for different scopes ranging from academic to purely professional purposes.

Step 2: Checking for substantial differences

In the assessment phase, one task is to verify the absence of any substantial difference between the qualification to be evaluated and the corresponding qualification in the receiving education system which the former is being compared with (CIMEA, 2021). It would be interesting to investigate if and to what extent AI could autonomously and reliably identify substantial differences. With this regard some distinctions can be made:

- There exist some cases of substantial differences for which (inter)national evaluation practice has consolidated over the years and therefore it might be clearer which elements (with their respective thresholds) should be considered, such as the minimum years of schooling required

in a certain system to international students for access to higher education.

- However, there might be some less straightforward cases in which the golden rule of a “case-by-case” methodology might need to be applied, also according to national and/or institutional policies. In these latter cases the role of AI should be investigated further to understand to what extent and in which form it can support the credential evaluator in their final decision.

Step 3: Establishing and expressing the comparability with the corresponding qualification in the receiving education system

The contribution that AI might give to the final step of the credential evaluation process can be analysed by distinguishing between the two sub-steps that characterise this last phase, i.e.:

- the final data entry as regards the student’s personal details and the information about the qualification itself (awarding institution, issuing year, duration of the programme, credits earned, level of the qualification, etc.). Here technology could be of great support to the evaluator as it could provide them with a pre-filled in version of the evaluation draft. The data mechanically ‘captured’ and reported from the qualification should be simply reviewed by the evaluator, but, in any case, the likelihood of the draft containing an error should be significantly lower than if the document was drafted by a human.
- The drafting of the comparability itself, which expresses the rights that the qualification in question can give in the receiving country according to the body performing the assessment. Along with the identification of substantial differences, the drafting of a written evaluation expressing the access possibilities provided by a foreign qualification is possibly the most sensitive and the least “mechanical” task. Also here it is therefore possible to identify two different macro-cases:
 - on the one hand qualifications for which the assessment is particularly straightforward thanks to the standardisation of the elements of the qualification and the presence in the system of previously assessed similar qualifications and recognition decisions. In such cases the evaluation is likely to be a pre-established one and the AI could simply match the elements mentioned above with the standard evaluation for such scenarios, thus making no new, creative contribution. Of course, even in such scenarios, it is worth asking if it should not be the credential evaluator to have the final say through a last human control of the output suggested by AI.
 - In other cases, though, the study path might be more articulated or more difficult to describe and evaluate, also due to the absence of similar files in the system, making the role of the credential evaluator crucial in using their own knowledge and expertise in assessing the qualification based on a case-by-case methodology. In this respect, it is worth asking whether the AI Language Model could be of any support in the credential evaluation sphere and more specifically if and to what extent this type of generative AI will be able to autonomously propose new recognition decisions. With a view to the principles of the Lisbon Recognition Convention it would be important to establish if such an evaluation could be considered as fair and therefore LRC compliant. Should there be future discussion on the topic of digitalisation, AI and the LRC, there would certainly be significant value in addressing these fundamental questions.

Verification of authenticity and fraud detection

With regard to the verification of the authenticity of a qualification AI can either support the credential evaluator directly when it comes to using digital verification methods, or provide an indirect support by granting an early-warning mechanism through the visual analysis of possible fraudulent documents, against a standard check list of elements to be checked (CIMEA, 2018). More in detail:

- as regards the first scenario, AI could for instance **fill in the verification databases automatically** (e.g. the Ukrainian Unified State Electronic Database on Education - USEDE⁶, or other university-specific verification portals), thanks to its OCR technology, thus understanding which data are required for the verification, identifying them in the credential, autonomously filling in the fields required, and eventually launching the verification, as well as understanding the result (if necessary comparing the output of the verification with the same metadata in the credential, thus confirming if they do or do not match). This would result in a significant saving of time for the credential evaluator, even more so if it avoids language barriers that might be encountered by evaluators (the USEDE database is currently available in Ukrainian only, which implies that knowledge of the Cyrillic alphabet is also required to correctly fill in the verification form). Of course, while being very effective from a strictly technical point of view, this topic cannot be covered without considering the privacy concerns that such a use of AI might imply, not to mention the fact that CAPTCHA codes might be a significant barrier to a successful application of AI technology to the mentioned ends.
- AI may also make it easier to **identify false diplomas** more efficiently and quickly than a human can do by comparing and checking the relevant features of the documents to be analysed against an already available database. It is important to underline that the necessity of training the AI with pre-existing data and input enhances the relevance of well-structured databases to “feed” the AI with. Among other institutions, the ENIC-NARIC centres have already stored a significant amount of structured data which could well be used as a solid base for future work in this direction. More specifically, elements and patterns that could be checked by AI range from purely graphic elements (the awarding institution’s logo, the colours of the certificate, or the stamps affixed to the document) to the way in which the information is organised (e.g. the presence of standard phrasings to express a certain piece of information), or the consistency and logical accurateness of the information reported (e.g. whether the Rector’s name matches with the actual acting Rector according to the year of issue of the document). This activity could be linked with what is already carried out by ENIC-NARIC centres, such as the Guidelines for establishing an Alert Mechanism on academic fraudulent documents (see pp. 11-12 of this document), which may provide a significant input to further develop the application of AI in this sphere.

⁶ The original name of the database in Ukrainian is Єдина державна електронна база з питань освіти (ЄДЕБО).
URL: <https://info.edbo.gov.ua/edu-documents/>

The reliability and efficacy of such a system remains to be tested. It would be interesting to examine in which cases the AI is most reliable and, on the contrary, which features of a counterfeit document are more likely to be missed by AI or to mislead the machine. Another dimension to be explored is if and to what extent AI can support detecting diploma mills (Council of Europe, 2022), for instance making textual search and matching with archives of already known diploma mills or verifying accreditation in official databases of accredited higher education institutions.

Impact on a credential evaluator's daily work

Trusting the promise of AI to automatise the more routine work, it is possible to imagine that AI could provide a significant contribution as regards time-consuming and low-added-value tasks currently performed exclusively by credential evaluators. This is particularly relevant for different reasons:

- firstly and from an organisational perspective, such activities are particularly difficult to deal with in case of a sharp increase of recognition requests, especially when the receiving institution (higher education institution, ENIC-NARIC centre, etc) can count on limited staff.
- Secondly, accuracy in the evaluation reports is likely to increase, at least as regards distraction mistakes currently caused by the human factor.
- Thirdly, these time and energy savings would in turn allow credential evaluators to dedicate more time to higher-added-value activities, both in the evaluation of single qualifications and in research activities which could provide relevant information which could quicken the evaluation process even further.

These possible changes might also have an impact on the skills and competencies required from a credential evaluator. They would certainly need to increase their awareness and understanding of the AI, its tools and ways of functioning, and at the same time it might be required that a credential evaluator further develop and hybridise their competencies, with more digital competences, data analysis and research skills, as well as critical thinking capabilities. All of the latter are of course already crucial at present, but they could increase their significance in the (near) future if AI starts to cover more and more lower-added-value activities currently performed by credential evaluators themselves.

FINAL CONSIDERATIONS

AI is already changing the way of thinking and learning, producing a **high level of disruption** (Newton, 2023), something completely different from the technological achievements experienced in the last few years (Floridi, 2023).

The reflection on the impact of AI on recognition of qualifications in the education sector is very much open. The questions organised across the five dimensions described in this document, namely equity, recognition workflow, learning outcomes, European framework and regulations and international academic mobility, would like to act as a contribution to the ongoing debate. Observing the evolution of the technologies linked to AI, it will be necessary to explore what will be the change of perspective in rethinking and redesigning the processes related to the recognition of qualifications and the internal organisations that assess qualifications, like higher education institutions, ENIC-NARIC centres, etc, moving towards new AI-based solutions. AI could not be applied to analogical processes, but – on the contrary – will demand a new organisation of data and processes. Possible implementation of AI technologies pushes to rethink the way work is organised, data is managed, and the knowledge and skills required to deal with the new challenges.

The questions arising from the possible future implications of AI in the field of recognition of qualifications need to be addressed with a systemic approach, intended as the strategic cooperation among the stakeholders operating in the field: higher education institutions, ENIC-NARIC centres, Ministries of Education, organisations who are generating innovation on AI.

Many challenges and opportunities lie ahead for the recognition world. In order not to get lost in the maze of AI, the policy making process should be holistic, uniting ethical, social, technological and educational implications in a comprehensive, student-centred approach, and from a recognition perspective upholding the values and principles enshrined in the Lisbon Recognition Convention.

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