



Digital Intelligence

DQ Global Standards Microcredentials (GSM):

**A Global Interoperable Codification
of Digital Skills for AI and Sustainability**



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Why do we need DQ Global Standards Microcredentials (GSM)?

In the past few years, labour markets worldwide have been shaped by a challenging mix of health, economic, and geopolitical volatility (WEF, 2023). Amidst these challenges, organizations have rapidly transformed by adopting cutting-edge technologies and sustainability standards. These digital and green transformations are creating new job demands across various industries and regions. In a global survey across 46 countries, companies identified macro trends driving business transformation within their organizations. The top three trends were: 1) the increased adoption of new and frontier technologies, 2) the broadening digital access, and 3) the broader application of environmental, social and, governance (ESG) standards (WEF, 2023). However, these positive drivers are offset by growing concerns such as the risks of generative Artificial Intelligence (Gen AI), environmental concerns, geo-economic tensions, and escalating cost of living.

As part of the digital transformation that is occurring in companies today, the use of generative AI (Gen AI) has become a major part of the discourse amongst government agencies and employers as organizations deliberate on strategies to embrace Gen AI, encourage employees to learn how to use Gen AI productively, and regulate the use of Gen AI. However, as highlighted by a global survey

conducted by PwC, employees do not necessarily agree with employers about the need for significant upskilling (PwC, 2023); **only 34% of non-managers believed that their job skills will significantly change in the next five years**. Hence, government agencies and companies worldwide are investing resources to promote and facilitate digital upskilling among employees, thus preparing the workforce for the evolving demands of the digital economy.

To address the urgent need for rapid digital upskilling, educational institutions are increasingly adopting microcredentials. Traditionally, these institutions rely on academic transcripts, but the process of transferring credits and having them appear on a new transcript is often viewed as slow and bureaucratic. Moreover, academic transcripts typically do not provide employers with valuable information about individual's skills and competencies (ICDE, 2019). In contrast, microcredentials serve to validate an individual's competence in the workplace. Across the globe, institutions of higher education have started offering Alternative Digital Credentials (ADCs), distinct from conventional diplomas and degrees, as these can be verified and distributed digitally. Similarly, large corporations like AT&T, IBM, and Walmart, which seek to ensure their staff possesses the requisite competencies, have invested heavily in their own training programs and schools.

Completing such programs typically results in the attainment of digital badges. For example, Cisco offers digital badges linked to certification at various levels –associate, professional, and expert (Cisco, 2020). While ADCs are typically issued by institutions of higher education, digital badges can be offered by a wide range of organizations.

Prior to the pandemic, the number of EdTech companies was already on the rise. However, the post-pandemic era has witnessed a further acceleration in the proliferation of EdTech companies offering a large variety of courses and microcredentials to meet the growing demands of employers. Given all the development and experimentation by institutions of higher education, large corporations, and EdTech companies, there has been a massive growth in the offering of microcredentials leading to a messy learning environment, a lack of global standardization, and a lack of useful information for employers.

In this paper, we introduce DQ Global Standards Microcredentials (GSM), an interoperable codification of skills, that will provide global standardization for a wide range of programs and organizations. These range from digital literacy

in educational institutions to digital skills in companies and organizations. First, we provide an overview of DQ Global Standards 2.0 which is the foundation of DQ GSM. Second, we describe DQ GSM, its characteristics, and how it can be used by different types of organizations for various purposes. Third, we illustrate how DQ GSM can be applied to different domains such as digital literacy, AI literacy and talent development.



DQ Global Standards (DQGS) 2.0



DQ Global Standards (DQGS) is a common framework for digital literacy, digital skills, and digital readiness (Park, 2019).

Digital intelligence (DQ) is a comprehensive set of technical, cognitive, meta-cognitive, and socio-emotional competencies grounded in universal moral values that enable individuals to face the challenges of digital life. DQGS offers a holistic set of digital competencies with a systematic structure as a reference framework. The aim is to enable any organization to adopt the DQGS, and to be able to practically tailor the framework to meet the organization's needs. Any company, government or school can easily adopt and customize the DQGS to its own needs based on its business or educational aims and cultural background.

32 DQ Competencies of the DQGS 2.0



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DQGS is structured around two categories: ‘areas’ and ‘levels’ of digital intelligence. Park (2019) identified eight broad areas of one’s digital life (see Table 1), which grow out of the OECD Education 2030 Learning Framework, the UN Sustainable Development Goals, the Universal Declaration of Human Rights, and the OECD Wellbeing Indicators (Figure 1). The eight areas are Digital Identity, Digital Use, Digital Safety, Digital Security, Digital Emotional Intelligence, Digital Communication, Digital Literacy, and Digital Rights (Park, 2019).

Figure 1: The DQ Framework in alignment with the OECD Education 2030 Framework and UN SDGs



Source: *The Future of Education and Skills, Education 2030, OECD, UN SDGs*

The levels of DQ are based on the definition of digital human capital formation which initially consisted of three components. First, a digitally skilled population, composed of digitally literate and aware *Citizens*, is empowered to accumulate knowledge, skills, and capabilities. Second, this

Table 1: Eight Areas of DQ



Digital Identity

The ability to build a wholesome online and offline identity.
Guiding Principle: Respect for oneself



Digital Use

The ability to use technology in a balanced, healthy, and civic way.
Guiding Principle: Respect for time and the environment



Digital Safety

The ability to understand, mitigate and manage various cyber-risks through safe, responsible, and ethical use of technology.
Guiding Principle: Respect for life



Digital Security

The ability to detect, avoid, and manage different levels of cyber threats to protect data, devices, networks, and systems.
Guiding Principle: Respect for property



Digital Emotional Intelligence

The ability to recognize, navigate, and express emotions in one’s digital intra- and inter-personal interactions.
Guiding Principle: Respect for others



Digital Communication

The ability to communicate and collaborate with others using technology.
Guiding Principle: Respect for reputation and relationships



Digital Literacy

The ability to find, read, evaluate, synthesize, create, adapt, and share information, media, and technology.
Guiding Principle: Respect for knowledge



Digital Rights

The ability to understand and uphold human rights and legal rights when using technology.
Guiding Principle: Respect for rights

allows them to become *Creative* contributors who implement ideas. And third, a digitally *Competitive* workforce is equipped with advanced science and technology talent to innovate, drive growth and enhance impact. The DQGS launched in 2019 consisted of these eight areas and the three levels of Digital Citizenship, Digital Creativity and Digital Competitiveness. In DQGS 2.0, considering the importance of digital inclusion, a fourth level – Digital Connectivity – was added to ensure that individuals are *Connected* to digital technology. Digital Connectivity is a pre-requisite for Digital Citizenship and the other levels. Hence, the four ‘maturity levels’ of DQ are: Digital Connectivity, Digital Citizenship, Digital Creativity, and Digital Competitiveness (see Figure 2). With four maturity levels of DQ across eight areas, 32 competencies are identified as illustrated in Figure 3 and defined in Table 2 below.

Figure 2: Four Maturity Levels of DQ



Figure 3: 32 DQ Competencies of the DQ Global Standards

	Digital Identity	Digital Use	Digital Safety	Digital Security	Digital Emotional Intelligence	Digital Communication	Digital Literacy	Digital Rights
Digital Connectivity	Digital User Identity	Active Use of Technology	Content Cyber-Risk Management	Personal Device Security Management	Emotional Awareness	Online Communication	ICT Literacy	Digital Inclusion Rights
Digital Citizenship	Digital Citizen Identity	Balanced Use of Technology	Conduct Cyber-Risk Management	Personal Cyber Security Management	Digital Empathy	Digital Footprint Management	Media and Information Literacy	Privacy Management
Digital Creativity	Digital Co-Creator Identity	Healthy Use of Technology	Contact Cyber-Risk Management	Network Security Management	Emotional Regulation and Relationship Management	Online Collaboration	Computational, Data, and AI Literacy	Intellectual Property Rights Management
Digital Competitiveness	Digital Changemaker Identity	Commercial and Community Use of Technology	Contract Cyber-Risk Management	Organizational Cyber Security Management	Leadership and Digital Entrepreneurship	Public and Mass Communication	Emerging Tech and Innovation Literacy	Participatory Rights Management

Table 2: Definitions of the 32 DQ Competencies



1. Digital Citizen Identity: Building and managing a healthy identity as a digital citizen with integrity.



2. Balanced Use of Technology: Managing one's life both online and offline in a balanced way by exercising self-control to regulate screen time, multitasking, and one's engagement with digital media and devices.



3. Conduct Cyber-Risk Management: Identifying, mitigating, and managing cyber-risks (e.g., cyberbullying, harassment, and stalking) that relate to personal online behaviors.



4. Personal Cyber Security Management: Detecting cyber threats (e.g., hacking, scams, and malware) against personal data and device, and using suitable security strategies and protection tools.



5. Digital Empathy: Being aware of, being sensitive to, and being supportive of one's own and other's feelings, needs and concerns online.



6. Digital Footprint Management: Identifying, mitigating, and managing cyber-risks (e.g., cyberbullying, harassment, and stalking) that relate to personal online behaviors.



7. Media and Information Literacy: Finding, organizing, analyzing, and evaluating media and information with critical reasoning.



8. Privacy Management: Handling with discretion all personal information shared online to protect one's and others' privacy.



9. Digital Co-Creator Identity: Identifying and developing oneself as a co-creator of the digital ecosystem.



10. Healthy Use of Technology: Understanding the benefits and harms of technology on one's mental and physical health and managing technology use while prioritizing health and wellbeing.



11. Contact Cyber-Risk Management: Identifying, mitigating, and managing risky contact online (e.g., unwanted sexual contact, offline meetings, sexual exploitation).



12. Network Security Management: Detecting, avoiding, and managing cyber threats to cloud-based collaborative digital environments.



13. Emotional Regulation and Relationship Management : Recognizing and managing how one's value system and digital competencies fit with one's digital life. Skillfully managing one's online relationships through cooperation, conflict management, and persuasion.



14. Online Collaboration: The ability to establish clear and effective modes of communication that would allow expression through technologies to collaborate collectively and to achieve intended goals.



15. Computational, Data, and AI Literacy: Synthesizing, creating, and producing information, media, and technology in an innovative and creative manner. Generating, processing, analyzing, presenting meaningful information from data and developing, using, and applying artificial intelligence (AI) and related algorithmic tools and strategies in order to guide informed, optimized, and contextually relevant decision-making processes.



16. Intellectual Property Rights Management: Understanding and managing intellectual property rights (e.g., copyrights, trademarks, and patents) when using and creating content and technology.



17. Digital Changemaker Identity: Detecting, avoiding, and managing cyber threats to cloud-based collaborative digital environments.



18. Commercial and Community Use of Technology: Engaging in commercial, civic and/or political participation for the wellbeing and growth of local, national, and global communities using technology.



19. Contract Cyber-Risk Management: Identifying, mitigating, and managing contractual, commercial or community cyber-risks online, such as organizational attempts to exploit individuals financially or through ideological persuasion (e.g., embedded marketing, online propaganda, and gambling).



20. Organizational Cyber Security Management: Recognizing, planning, and implementing organizational cyber security defenses.



21. Digital Leadership: Identifying and realizing opportunities for growth and value through effective, efficient, and acceptable use of digital technologies.



22. Public and Mass Communication: Communicating with an online audience effectively to exchange messages, ideas, and opinions reflecting wider business or societal discourses.



23. Emerging Technology and Innovation Literacy: The ability to identify, use, and create emerging technology and opportunities to acquire innovative competencies to improve professional life and contribute to the global economy.



24. Participatory Rights Management: Understanding and exercising one's powers and right to online participation (e.g., their rights to personal data protection, freedom of expression, or to be forgotten), while respecting the rights of other online users.



25. Digital User Identity: The ability to have their identity as a digital user - having basic understanding on internet and digital media



26. Active Use of Technology: The ability to actively use various types of digital media and technology.



27. Content Cyber-Risk Management: Identifying, mitigating, and managing risky content (e.g., harmful user-generated content, racist/hateful content, image-based abuse).



28. Personal Device Security Management: Ability to use strategies efficiently to protect personal digital devices.



29. Emotional Awareness: The ability to critically recognize, evaluate, and express one's emotions in digital environment.



30. Online Communication: The ability to use technology effectively to communicate with others online.



31. ICT Literacy: The ability to use efficiently the elementary functions of information and communication technologies (essentially word/image/data processing, Internet and e-mail).



32. Digital Inclusion Rights: The ability to understand their rights to have quality digital access across sectors, SES, and genders.

Themes of the DQGS 2.0

We designed DQGS 2.0 to incorporate digital skills for AI and digital sustainability. As described above, transformations occurring in companies today often involve AI and issues related to sustainability. Hence, DQGS 2.0 includes a comprehensive set of digital skills for individuals to have positive ability, aptitude, and agility to use and control AI and technology to achieve sustainability, digital wellbeing, and prosperity in a rapidly evolving digital landscape. The themes in DQGS 2.0 includes Digital Literacy, AI Literacy and Digital Sustainability and are defined as follows:

1. Digital Literacy:

The ability to use digital technology and media in safe, responsible, and ethical ways.

2. AI Literacy:

The ability to enhance human capabilities by proactively and ethically utilizing AI systems.

3. Digital Sustainability:

The ability to use technology to create positive impact and business opportunities while promoting sustainability and digital wellbeing.

These essential digital skills for sustainability and wellbeing are crucial for individuals to thrive in the age of AI while also contributing to a sustainable and prosperous future for society in both the physical and digital worlds. In the subsequent sections, we will discuss how DQ GSM can be utilized by educational organizations to align, enhance, or certify their digital literacy programs, and how DQ GSM can be used by educational institutions or corporate companies for various programs and purposes related to digital literacy, AI literacy, and talent development.





DQ Global Standards Microcredentials (GSM)

As noted previously, DQ Global Standards Microcredentials (GSM) is an interoperable codification of skills required for supporting a wide range of programs from digital literacy in educational institutions to digital skills for companies and organizations. Interoperability, a term from the software engineering field, has been defined by IEEE as “the ability of two or more systems or components to exchange information and to use the information that has been exchanged” (Radatz et al., 1990; Noura et al., 2019). Currently, despite much digital transformation in society, interoperability is still seen as a challenge in many fields such as business (Belchior et al., 2021), health (Benson & Grieve, 2016), job skills (Vourikari et al., 2022), and public administration (Lodato et al., 2021). In the area of job skills, as described above, employers often struggle to identify applicants’ relevant skills because academic transcripts from institutes of higher learning typically list courses

rather than skills. In this section, we describe how to use DQ GSM in aligning and certifying digital literacy programs for educational organizations. We also describe how to use DQ GSM as a talent roadmap from jobs to certifications to courses for employers and educational institutions, which allows them to match jobs to individuals with the relevant skills and certifications.

How DQ GSM can be used by educational organizations

DQ GSM can help organizations such as ministries of education, schools, and educational providers in developing, aligning, enhancing, or certifying their programs in areas such as digital citizenship or digital literacy. For example, the LEGO Group, in collaboration with DQ Institute, developed a few digital citizenship programs such as Doom the

Gloom, Digitally Smart Guide and Explorer and Build and Talk. LEGO Group's digital citizenship programs, Powered by DQ, explored the eight key areas of DQ mentioned above, and the alignment of the programs with the DQ areas were determined using DQ GSM. Powered by DQ is a comprehensive suite of services that helps clients to increase the quality and visibility of their programs by 1) aligning, 2) enhancing, or 3) measuring and certifying their programs with the 32 DQ Competencies of the DQ Global Standards 2.0. In another example, UAE's Ministry of Education, in collaboration with DQ Institute, developed a Digital Literacy Cross-Curricular Framework (DLCCF). They used DQ GSM to highlight the strengths and areas for improvement in the DLCCF, and enhanced their program based on these recommendations.

DQ GSM has also been used to help certify programs. Certification, Powered by DQ, involves adding proven digital skills assessment, and measuring the impact of programs. The Alannah and Madeline Foundation, based in Australia, sought DQ's support to develop their program and add digital skills assessment with impact dashboards to help stakeholders visualize efficacy and provide stakeholders with relevant data.

In summary, DQ GSM can help educational organizations to 1. identify areas of strengths and areas for improvement in their programs, 2. make strategic decisions on further enhancement of their programs, and 3. certify their programs by adding assessments and measuring the impact of their programs.

How DQ GSM can be used by employers

An interoperable codification of skills like the DQ GSM also provides a talent roadmap, which links jobs to certifications to courses via DQ GSM codes. This talent roadmap is valuable to employers, institutes of higher learning, training providers and job seekers. First, employers are keen to reskill or upskill their employees especially in areas such as digital skills (Hancock & Schaninger, 2020). With DQ GSM, employers can rate every employee with regards to their levels of digital skills. Based on the ratings, relevant training courses can be

identified and recommended. Second, in the talent management process, employers need to improve the person-job fit when identifying candidates for job positions. With DQ GSM, employers can develop a comprehensive list of skills for each job and match them with a detailed rating of candidates' skills based on their qualifications.

How DQ GSM can be used by tertiary institutes of higher learning

For tertiary institutes of higher learning and training providers, DQ GSM helps them to codify courses offered in different programs so that each program can be linked to relevant jobs. The codification also helps learners to identify the appropriate courses and programs that suit their career interests. As global standards are maintained for DQ GSM, learners who are students at higher education institutions, adult learners in the workforce, or students of EdTech companies, can have confidence that programs have the appropriate global credentials. With DQ GSM, policy makers can map clear pathways that link learners to priority skills and relevant careers. This information is critical in helping make policy decisions relevant to both education and the workforce. Since information is used by employers, institutes of higher learning, training providers, individual learners, and government agencies, it is imperative that DQ GSM is interoperable so that all the different stakeholders can codify skills meaningfully.



Illustrating the Interoperability of DQ GSM in Different Domains

In this section, we provide illustrations of how DQ GSM can ensure interoperability in a variety of domains.

Applying DQ GSM to Digital Literacy

In 2023, UAE's Ministry of Education (UAE MOE), supported by DQ Institute, developed a Digital Literacy Cross-Curricular Framework (DLCCF) for their Emirati grades K to 12 school system. Developed through a partnership with the DQ Institute, the DLCCF has undergone extensive consultations and iterations. It is aligned and enhanced with the IEEE DQ Global Standards (3527.1™), and is officially 'Powered by DQ', as part of the DQ Institute's global initiative for digital empowerment.

The DLCCF stands as the first-of-its-kind framework globally, redefining AI literacy for sustainability. In today's AI era dominated by the rapid evolution of Gen AI, this framework empowers Grades K-12 students to amplify their cognitive abilities through proactive and ethical engagement with AI systems. Thus, they can foster creative applications of digital technologies to enhance sustainability and digital wellbeing.

Recognizing the vast potential of Gen AI, and amidst growing concerns over risks like privacy invasion, misinformation, and cyber-threats, the UAE MOE has taken a leadership role. The initiative aims to elevate digital literacy to new heights, harnessing AI's strengths to advance sustainability while addressing crucial aspects of safety, responsibility, and ethics in digital technology. A notable inclusion is the concept of digital entrepreneurship, underscored by Digital-ESG standards. These standards guide organizations to minimize digital, environmental, and social risks, maximizing opportunities through technology.

Digital entrepreneurship includes DQI's concept of Digital-ESG (D-ESG) which is environmental, social, and corporate governance designed for the digital economy, where we are concerned not only about sustainability for the physical world but also for the digital world (Park, 2022). The D-ESG Assessment and Reporting Standards was just launched with the participation of Ban Ki-moon, the 8th UN Secretary-General, Irina Bokova, the former Director General of UNESCO, Kim Yong-Hak, the former President of Yonsei University, and Dr Yuhyun Park, the founder of DQ Institute (DQI, 2023).

Applying DQ GSM to AI Literacy

Globally, about two-thirds of leaders (67%) state their companies are considering ways to use Gen AI. However, a survey of US-based senior IT leaders state that 66% of their workers do not have the skills to utilize digital technology successfully (Salesforce, 2023). In another global survey, majority of respondents reported having difficulty hiring in AI-related roles, with for example, 78% reporting difficulty hiring AI data scientists. Hence, it is not surprising that the most popular strategy to hire AI talent is to reskill existing employees (McKinsey, 2022). Reskilling helps to address the skills gap and may even be cheaper than hiring new employees (Skillsoft, 2023). But the certifications and learning pathways to achieve the necessary reskilling may not be clear and this is where DQ GSM can help. DQ GSM plays an important role for both employers and employees in providing a clear roadmap from jobs to certifications to the relevant courses for workers to achieve necessary skills.

In order to develop DQ GSM codes for AI Literacy, the 'Cognitive Amplifier Loop' process was utilized. The Cognitive Amplifier Loop is a systematic way

of using Gen AI to enhance our human capabilities (Kosslyn, 2023). This process involves starting off by defining clear goals that guide our plans in how we would use Gen AI. Then, after devising relevant prompts, we evaluate the results produced by Gen AI. If the desired results are not obtained, the cycle is repeated until our goals are achieved. In applying the Cognitive Amplifier Loop to developing DQ GSM codes for Foundational Digital Skills for the 21st Century (Table 3), the process started with reviewing surveys of what employers want in this area. Outlines of courses are defined and then GPT-4 was prompted to create several versions of each type of course described. This process was iterated until the best versions are found to create the codes in Table 3. Subsequently, DQ GSM codes for Foundational Skills for Working with AI (Table 4) were developed as the next level up following from the learning objectives covered in the first program (Table 3). For example, after covering 'Digital Essentials: Internet, Communication and Office Productivity', the next learning objective would be 'AI Foundational and Principles', and after covering 'Online Safety, Security and Digital Literacy' the next learning objective would be 'AI Ethics, Fairness and Social Implications'.



Table 3: Sample DQ GSM codes for AI Literacy: Foundational Digital Skills for the 21st Century

Learning Objectives	Sample DQ GSM Codes	Learning Topics
Digital Essentials: Internet, Communication and Office Productivity	Internet Skills	<ul style="list-style-type: none"> Efficiently using search engines Understanding and navigating websites Using cloud storage solutions like Google Drive Understanding the advantages and risks associated with cloud computing
	Communication and Collaboration	<ul style="list-style-type: none"> Setting up and managing an email account Utilizing video conferencing tools like Zoom Using tools like Slack, Trello, and Microsoft Teams
	Office Productivity	<ul style="list-style-type: none"> Creating, editing, and formatting documents. Using spreadsheets for basic data management and calculations. Creating presentations in software like PowerPoint or Google Slides.
Online Safety, Security, and Digital Literacy	Online Safety and Security	<ul style="list-style-type: none"> Creating and managing strong, unique passwords. Recognizing phishing attempts and scams. Keeping personal information safe and secure. Understanding the basics of VPNs and encrypted communication.
	Social Media Literacy	<ul style="list-style-type: none"> Setting up and maintaining social media profiles. Recognizing the implications of oversharing. Evaluating the validity of information found on social platforms.
	Mobile Device Literacy	<ul style="list-style-type: none"> Creating, editing, and formatting documents. Using spreadsheets for basic data management and calculations. Creating presentations in software like PowerPoint or Google Slides.
Digital Etiquette, Rights, and Collaboration	Digital Etiquette	<ul style="list-style-type: none"> Understanding the principles of netiquette. Respectful communication: Interact respectfully and avoid online harassment or trolling. Respect boundaries: Recognize and respect when someone doesn't want to be tagged, mentioned, or photographed.
	Digital Privacy, Health and Wellbeing	<ul style="list-style-type: none"> Understanding cookies, trackers, and digital surveillance. Awareness of rights related to personal data. Engage in balanced digital consumption. Awareness of addiction: Recognize signs of digital addiction and promote healthy usage pattern
	Misinformation and Fake News	<ul style="list-style-type: none"> Critical consumption: Develop skills to critically assess the credibility of online sources and content. Accountability: Avoid sharing unverified information.
Digital Commerce and Advanced Considerations	E-commerce Skills	<ul style="list-style-type: none"> Safely purchasing goods and services online. Understanding online payments, digital wallets, and online banking.
	Problem-solving and Troubleshooting	<ul style="list-style-type: none"> Developing a logical approach to address common tech issues. Using online forums and help guides to solve technical problems.
	Digital Environmental Impact	<ul style="list-style-type: none"> E-waste: Understand the environmental implications of discarding electronic devices. Energy consumption: Be aware of the energy footprint of digital technologies and platforms.

Table 4: Sample DQ GSM codes for AI Literacy: Foundational Skills for Working with AI

Learning Objectives	Sample DQ GSM Codes	Learning Topics
AI Foundations and Principles	Introduction to AI	<ul style="list-style-type: none"> Basic understanding of AI and Machine Learning. Knowing what AI can and can't do. Understanding the difference between AI, Machine Learning, and Deep Learning.
	Data Literacy in AI	<ul style="list-style-type: none"> Recognizing the importance of data in AI applications. Basics of data collection, cleaning, and preprocessing. Recognizing and mitigating biases in data.
	AI in Daily Life	<ul style="list-style-type: none"> Understanding AI's impact on everyday tools: search engines, social media algorithms, and recommendation systems. Being a conscious consumer of AI-driven tech.
AI Ethics, Fairness, and Social Implications	Bias, Fairness, and Transparency in AI	<ul style="list-style-type: none"> Potential for AI to perpetuate or amplify biases. Fairness in AI and algorithm auditing. Value and importance of transparent AI applications.
	Ethical and Social Challenges of AI	<ul style="list-style-type: none"> Ethical challenges in privacy, surveillance, and autonomy. Social dynamics in an AI-powered world.
	Privacy and Personal Data in the Age of AI	<ul style="list-style-type: none"> Implications of AI on personal privacy. Introduction to differential privacy and other protective measures.
Security, Reliability, and Regulatory Aspects of AI	AI and Digital Security	<ul style="list-style-type: none"> AI as both a cybersecurity tool and threat. Recognizing and defending against AI-generated threats like deepfakes and advanced phishing attempts
	Critical Thinking in the Age of AI	<ul style="list-style-type: none"> Questioning AI-driven outputs Recognizing AI's limitations and potential biases
	Regulatory and Legal Aspects of AI	<ul style="list-style-type: none"> Current laws and regulations impacting AI applications Rights and responsibilities in automated decision-making scenarios.
AI in Collaboration, Business, and the Future Workforce	Human-AI Collaboration	<ul style="list-style-type: none"> How AI can be a "cognitive amplifier" for human capabilities. The balance of human oversight and AI autonomy.
	AI Tools and Practical Implementation	<ul style="list-style-type: none"> Introduction to AI platforms and tools like Google's Teachable Machine and ChatGPT. Hands-on experience with AI tools in real-world scenarios.
	AI's Impact on the Future of Work	<ul style="list-style-type: none"> Predictions for how AI will shape job markets. General strategies for upskilling and reskilling in an AI-driven world.

Applying DQ GSM to Search for Talent

Figure 3 illustrates how DQ GSM can be used within a company in searching for talent. In particular, DQ GSM can help companies in hiring new talent and upskilling existing staff. For example, if the company needs an AI Data Scientist, one option would be to hire new talent. DQ GSM can help the company to identify which candidate's skills has the best match with the skills needed for the position (Table 5). As illustrated in the table, DQ GSM can be used to obtain a GSM match score which is based on the match between the candidate's skills compared to the skills needed for the position.

Figure 3: DQ GSM can help meet the talent needs of a company

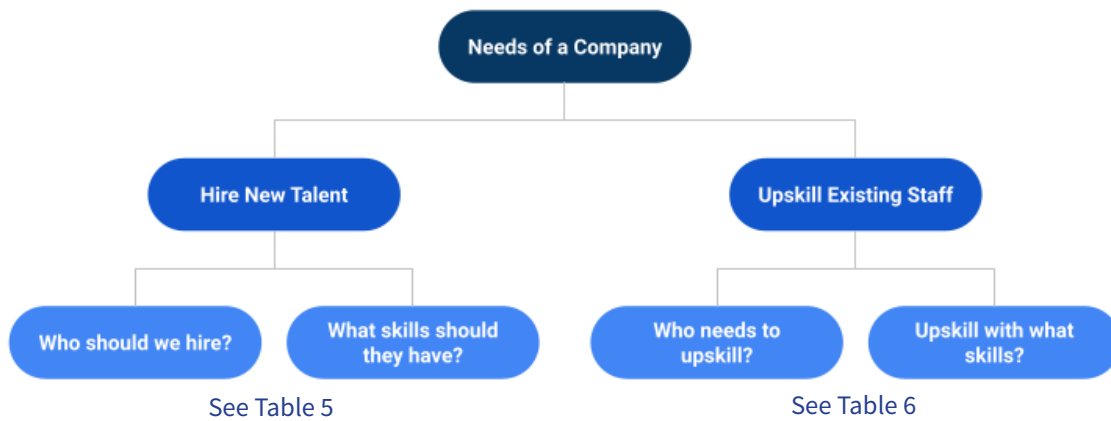


Figure 4: Radar chart comparing candidates from Table 5

Table 5: Hiring New Talent

Applicant	GSM Match Score	Next Best Role	Potential Career Roadmap within the Company	Resume	Radar Chart
Dennis	90%	R2 (80%)	Click to view	Attachment	✓ (Fig 4)
Esther	75%	R3 (75%)	Click to view	Attachment	
Felicia	30%	R4 (85%)	Click to view	Attachment	✓ (Fig 4)

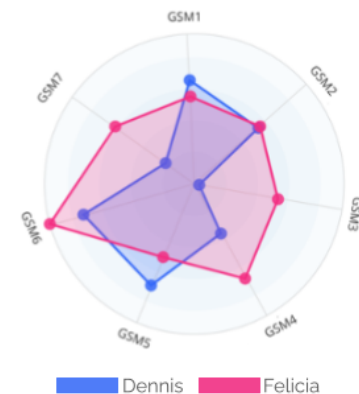


Table 6 illustrates how DQ GSM can be used by companies for upskilling their employees. As seen in Table 6, the skills gap between the skills of the employee compared to the skills required by the position can be measured, and employee can address the skills gap by enrolling in relevant courses for upskilling. The results of Table 5 and Table 6 can also be combined to help companies make the decision of whether to fill a position by hiring new talent or upskilling existing staff.

Table 6: Upskilling Existing Staff

Employee	Department	Current Role	Next Role	GSM Gap Score	Courses Needed
Alice	Marketing	Director	Vice President	20%	<ul style="list-style-type: none"> Course A at EdTech A Course B at EdTech B
Bob	Sales	Data Scientist	AI Data Scientist	10%	<ul style="list-style-type: none"> Course C at University A Course D at EdTech C
Carl	Tech	Junior Engineer	Senior Engineer	30%	<ul style="list-style-type: none"> Course E at University B Course F at Edtech A



Conclusions

In conclusion, the DQ Global Standards Microcredentials (GSM) offer a revolutionary step towards standardizing digital literacy, skills for the integration of AI, and sustainability in various sectors. This paper has articulated the need for a common framework in light of the rapid technological and digital advancements impacting the global labor market. DQGS 2.0 underpins the DQ GSM, providing a structured approach to developing competencies across eight areas of digital life, and ensuring individuals are equipped for digital connectedness, citizenship, creativity, and competitiveness. The interoperability of DQ GSM allows it to be adopted across educational institutions, workplaces, and government entities, thereby facilitating a coherent and comprehensive understanding and assessment of digital skills.

Moreover, the practical applications of DQ GSM in aligning and certifying digital literacy programs, streamlining talent acquisition, and guiding upskilling strategies testify to its pivotal role in addressing the current and future demands of the workforce. DQ GSM's adaptability across various domains, spanning from education to corporate training, illustrates its potential to transform the digital landscape, ensuring that individuals are prepared to navigate and contribute to an increasingly AI-driven and sustainable future.

The DQ Institute's initiative represents a step towards establishing a unified digital standard, that promises to enhance global digital literacy and readiness. This endeavor fosters a workforce that is resilient, adaptable, and proficient in the essential digital competencies for the 21st century.

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Contributors:

Dr Yuhyun Park: Founder and CEO, DQ Institute

Dr Albert Liaw: Education and Research Director, DQ Lab

Professor Stephen Kosslyn: President, Active Learning Sciences Inc.

Dr Katherine Fennedy: Senior Researcher, DQ Lab

The DQ Institute

DQ Institute (DQI) is an international think-tank that is dedicated to setting global standards for digital intelligence education, outreach, and policies. Working together with international agencies and local partners, DQI builds multi-stakeholder coalitions that advance its mission and help people worldwide. DQI's award-winning educational programs include the #DQEveryChild initiative, which seeks to empower one billion children with digital intelligence education.

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