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Digital Skills Assessment Framework for Life-Long Learning

Yuhyun Park PhD, DQ Institute
In collaboration with World Bank

What shall we do today to make a 5th grade girl in the Global South get a job at Silicon Valley in 10 years?



MIT News
ON CAMPUS AND AROUND THE WORLD [SUBSCRIBE](#)

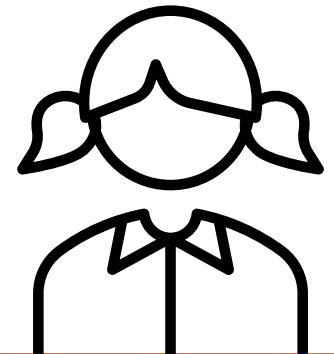
Toward artificial intelligence that learns to write code

Researchers combine deep learning and symbolic reasoning for a more flexible way of teaching computers to program.

“Every child must learn *digital life skills* that go beyond technical skills to achieve their security and well-being.” – World Economic Forum

“Everybody should learn to *program a computer*, because it teaches you *how to think*.”
- Steve Jobs, Apple

“*Soft skills* like **sharing** and **negotiating** will be crucial. The modern workplace, where people move between different roles and projects, where we learn social skills such as **empathy** and **cooperation**.” - David Deming, Harvard University

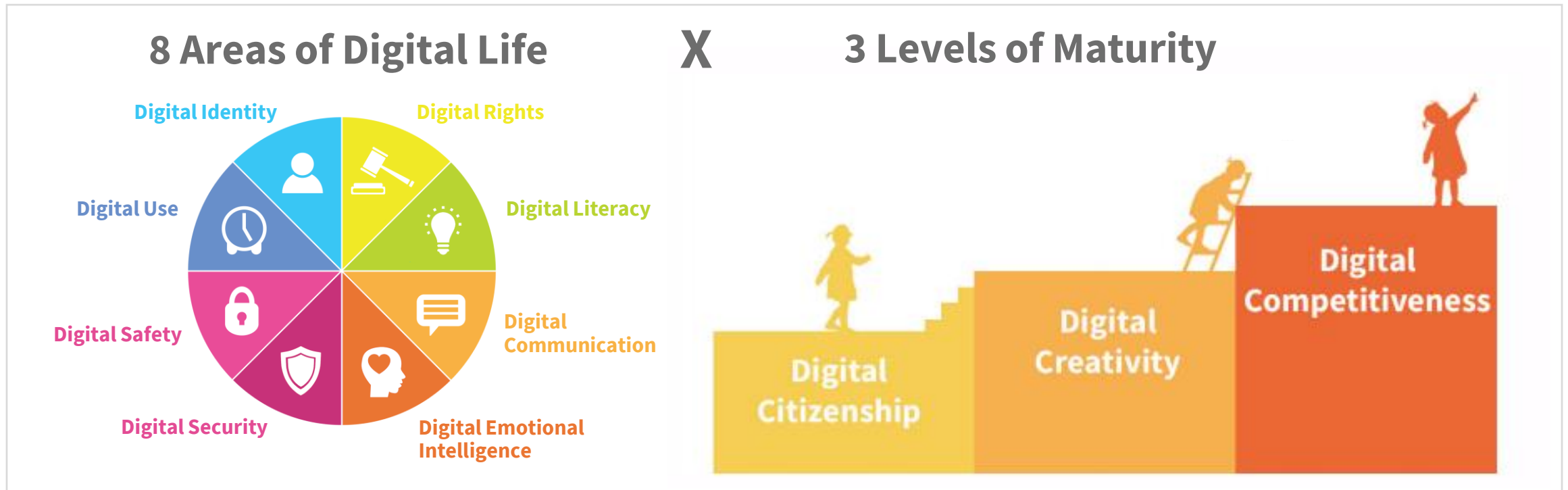


She needs comprehensive digital skills!

What is “Digital Skills”?

Using Global Standard on Digital Literacy, Digital Skills, and Digital Readiness (IEEE™ 3527.1)

DQ (Digital Intelligence) is “a comprehensive set of technical, cognitive, meta-cognitive, and socio-emotional competencies that are grounded in universal moral values and that enable individuals to face the challenges and harness the opportunities of digital life.”

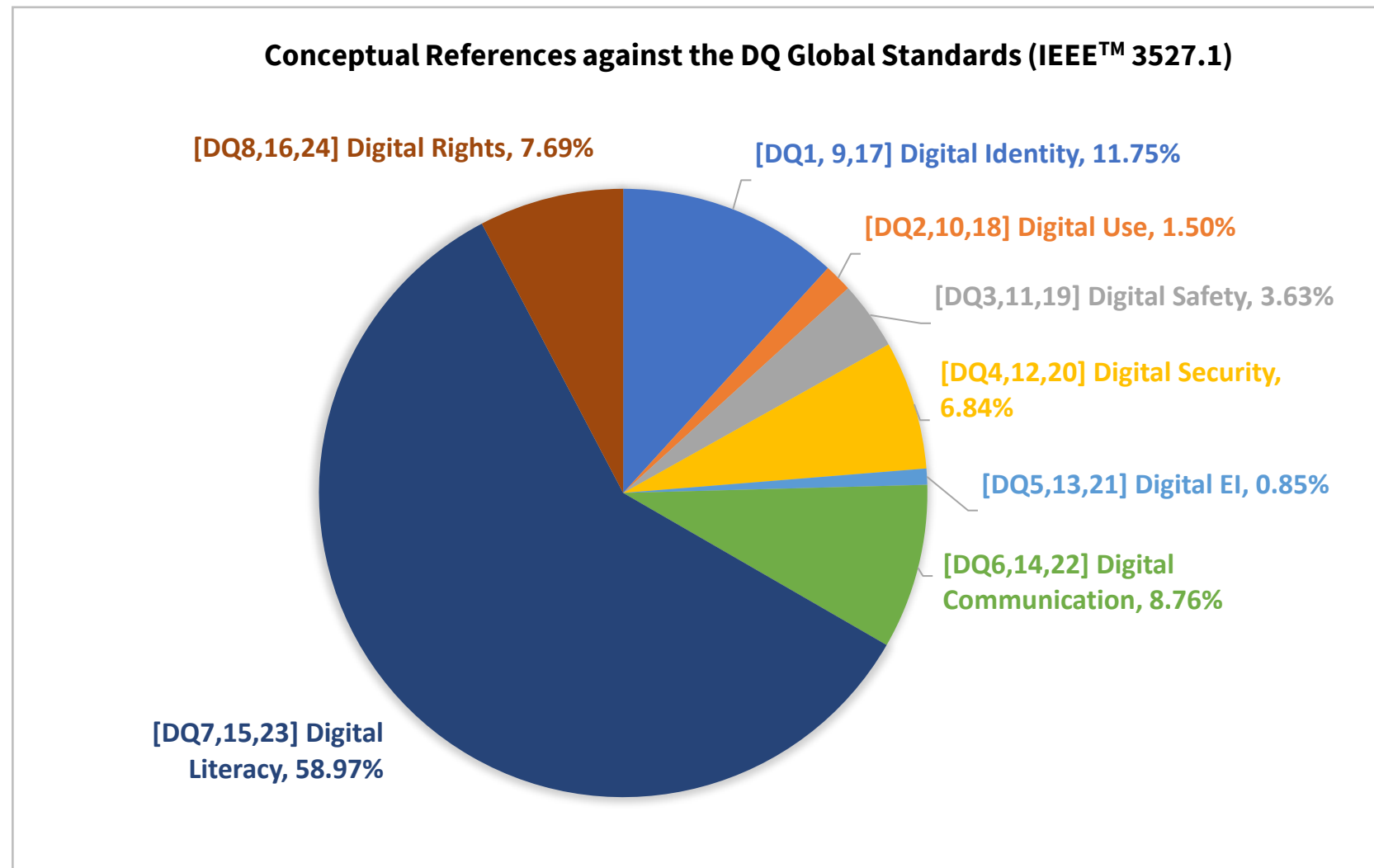


Three areas (80%) are heavily covered by the reference frameworks

1. Digital Literacy (59%)
2. Digital Identity (12%)
3. Digital Communication (9%)

Three areas (7%) are least covered by the reference frameworks

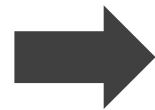
1. Digital Emotional Intelligence (1%)
2. Digital Use (2%)
3. Digital Safety (4%)



Support the National Digital Skills Roadmap Aligned with Your National Digital Agenda

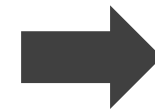
Identify Gaps

Current National Framework and Education / Assessment tools Against International Frameworks Using DQ Global Standards (IEEE™ 3527.1)



Design Roadmap

National Digital Skills Roadmap Aligned with Global Standards Based on Your Digital Transformation Agenda



Monitor Progress

Digital Skills Improvement Based on a common assessment tool that is aligned with **SDG4**.
Track the Improvement of Digital Skills, Well-being, and Employability

Example: National Digital Readiness Blueprint of Singapore



#1: Expand and Enhance Digital Access for Inclusivity



#2: Infuse Digital Literacy into National Consciousness



#3: Empower Community and Businesses to Drive Widespread Adoption of Technology



#4: Promote Digital Inclusion by Design



Ministry of Education
SINGAPORE

**Digital
Citizenship**

**Digital
Creativity**

**Digital
Competitiveness**



PRIMARY LEVEL

Enhancing cyber wellness education

- Greater emphasis on cyber wellness education as part of CCE 2021.

Expanding 'Code for Fun' programme

- Students will learn computational thinking and coding through visual programming-based lessons.
- From 2020, it will be offered to all primary schools as a 10-hour enrichment programme at upper primary.

SECONDARY AND JC LEVELS

Enhancing computational thinking skills








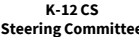
- Mathematics curriculum to help develop and deepen computational thinking skills at secondary levels.

HIGHER EDUCATION LEVEL

Enhancing baseline digital competencies, with deeper competencies for certain sectors

Identify Gaps 1: Coverage

Illustration: National Digital Skills Framework of the Country A has heavy focus on Technical Skills

Sum of Count	Digital Citizenship								Digital Creativity								Digital Competitiveness								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
DQ#	Digital Citizen Identity	Balanced Use of Tech	Behavioural Cyber Risk Mgt	Personal Cyber Security Mgt	Digital Empathy	Digital Footprint Mgt	Media and info Literacy	Privacy Mgt	Digital Co-creator identity	Healthy Use of Tech	Content Cyber-Risk Mgt	Network Security Mgt	Self-Awareness and Mgt	Online Communication and Collaboration	Content Creation & Computational Literacy	Intellectual Property Rights Mgt	Digital Changemaker Identity	Civic Use of Technology	Commercial and Community Cyber Risk Mgt	Organizational Cyber Security Mgt	Relationship Mgt	Public and Mass Communication	Data and AI Literacy	Participatory Rights Mgt	
 Microsoft Covid-19 Global Skills Initiative		6%	13%		3%		45%	3%						29%										100%	
 Computer Science Teachers Association Framework				2%			3%	4%	2%				1%	3%	44%	5%	9%		9%				17%	100%	
 DigComp 2.1 The Digital Competence Framework for Citizens	13%		4%	4%	2%	6%	19%	10%	4%	2%	2%		4%	13%	4%	4%	2%	2%					4%	100%	
 Digital Literacy Global Framework(DLGF)	12%		4%	4%	2%	6%	24%	10%	4%	2%	2%		4%	12%	4%	4%	2%	2%					4%	100%	
 Grow with Google: Applied Digital Skills							24%		6%					12%	6%		18%		6%			18%	6%	6%	100%
 International Society for Technology in Education (ISTE): Standards for Students									6%						53%								35%	6%	100%
 ITU: Digital Skills Toolkit							17%	6%							28%		6%				22%	22%		100%	
 K12CS	1%		2%	1%	1%	1%	1%	1%	3%		7%		9%	43%	1%	9%						19%	1%	100%	
National Digital Skills Framework for Country A				5%			35%							49%	3%								7%	100%	

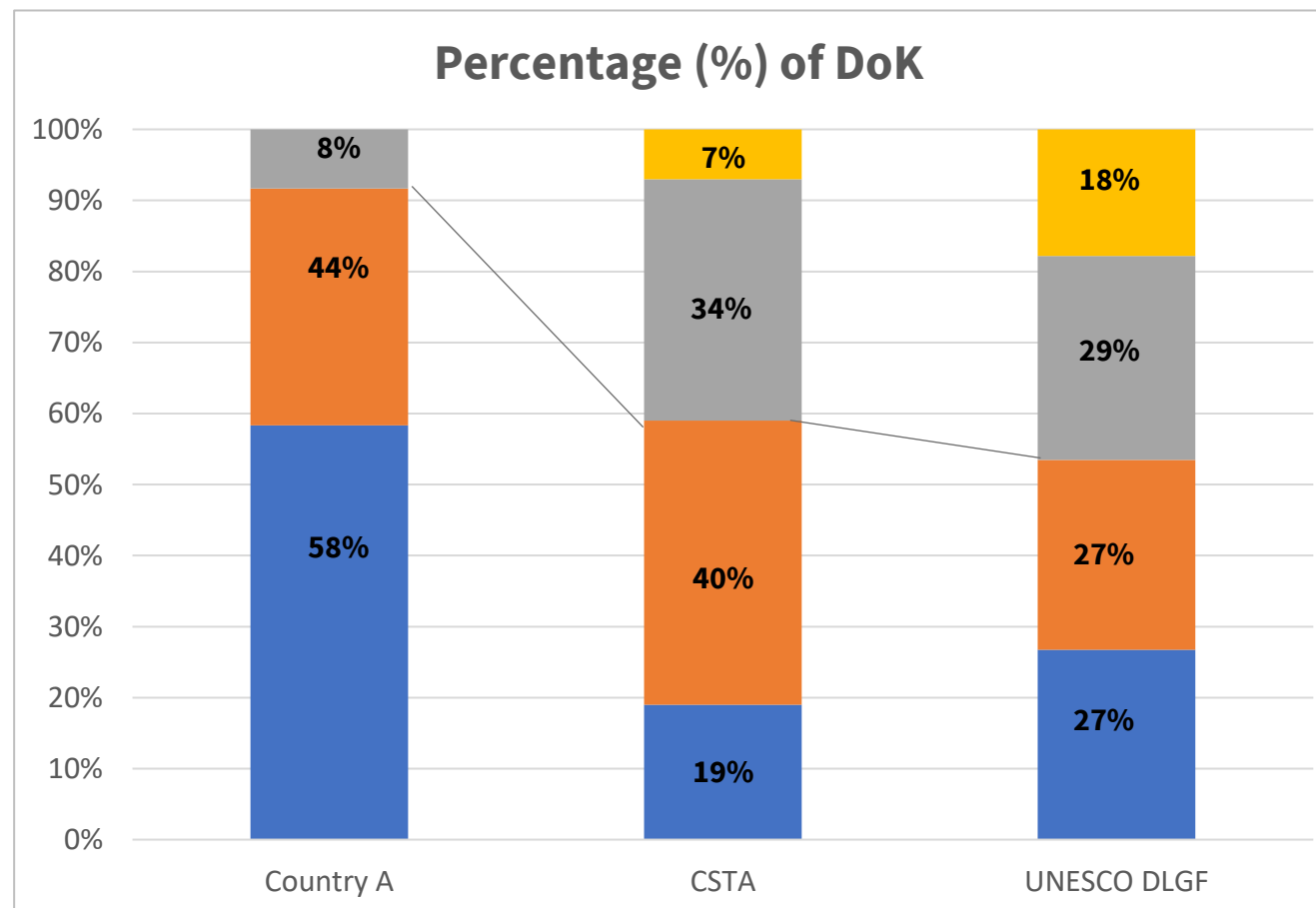
The numbers indicate the learning objectives aligned with each of the DQ24 competencies (IEEE™ 3527.1)

Identify Gaps 2: Depth of Knowledge (DoK)

Illustration: National Digital Skills Framework of the Country A Can Enhance “Thinking Skills”

4 Levels of Depth of Knowledge

- LEVEL 4**
(Extended Thinking)
- LEVEL 3**
(Strategic Thinking)
- LEVEL 2**
(Problem Solving)
- LEVEL 1**
(Concept / Procedure)



*“Everybody should learn to program a computer, because it teaches you **how to think.**”*

- Steve Jobs, Apple



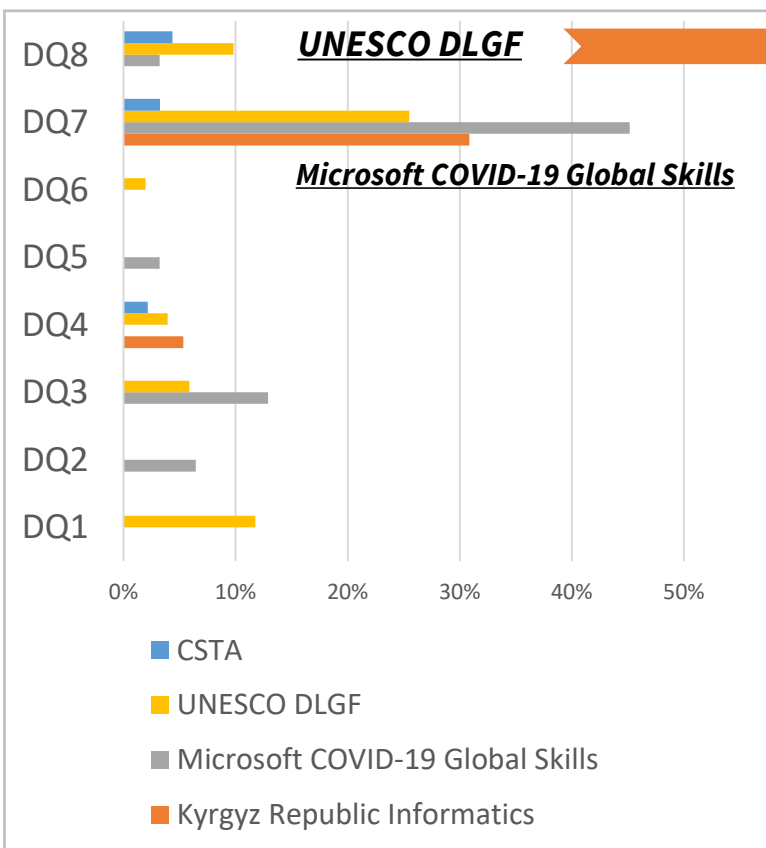
<https://www.forbes.com/profile/steve-jobs/?sh=342678722808>

Design 1: Plan for Enhancing the Digital Skills Framework

Pick and Choose the Best Frameworks or Programs to Benchmark

Demonstration: Primary School – Digital Citizenship Curriculum

1. Choose a benchmarking framework



2. Benchmark how the reference framework addresses the learning objectives

DQ Microbadge	UNESCO DLGF Description	DoK
DQ8.1 Understanding Personal Information	<ul style="list-style-type: none"> To understand how to use and share personally identifiable information while being able to protect oneself and others from damages To understand that digital services use a “Privacy policy” to inform how personal data is used 	<ul style="list-style-type: none"> Level 1, 2 Level 1, 2
DQ8.2 Keeping Information Private Online	<ul style="list-style-type: none"> To protect personal data and privacy in digital environments. To protect devices, content, personal data and privacy in digital environments 	<ul style="list-style-type: none"> Level 1, 2, 3
DQ8.3 Attitudes about Privacy Online	<ul style="list-style-type: none"> To have due regard to reliability and privacy 	<ul style="list-style-type: none"> Level 3, 4
DQ8.4 Health Check-Protection of One’s and Others Privacy Online		
DQ 8.5 Protecting company-related confidential information		
DQ 8.6 Privacy and Ethics Online	<ul style="list-style-type: none"> To participate in society through the use of public and private digital services 	<ul style="list-style-type: none"> Level 3, 4

Monitor 1: Develop Customized Digital Skills Assessment Tool

By Utilizing International Tools

Demonstration Purpose Only

The DQ App interface displays a score of 127.1 with a +1.64 increase. Below the score is a 'VIEW SCORE' button. A list of digital skills categories is shown on the left, including 'BASIC DIGITAL FOOTPRINTS', 'CONTROLLING DIGITAL FOOTPRINTS', 'MINIMIZING SOCIAL MEDIA CRISIS', 'CARE FOR DIGITAL PRESENCE', and 'MANAGING COMPANY DIGITAL FOOTPRINTS'. The main content area shows a question: 'Which of the following are likely to be harmful to your digital footprint?' with five options related to social media behavior.

DQ App

The ICL interface shows 'Task 3 of 13' with a timer at 01:49:18. It includes an 'Instructions' section and a 'Web browser' window displaying a webpage titled 'PLANETS & SPACE'. The webpage content includes 'Full planets' profiles', 'See picture of the Solar System', and 'List of planets by their characteristics'. The task requires selecting planet names from a drop-down list based on specific criteria.

ICL

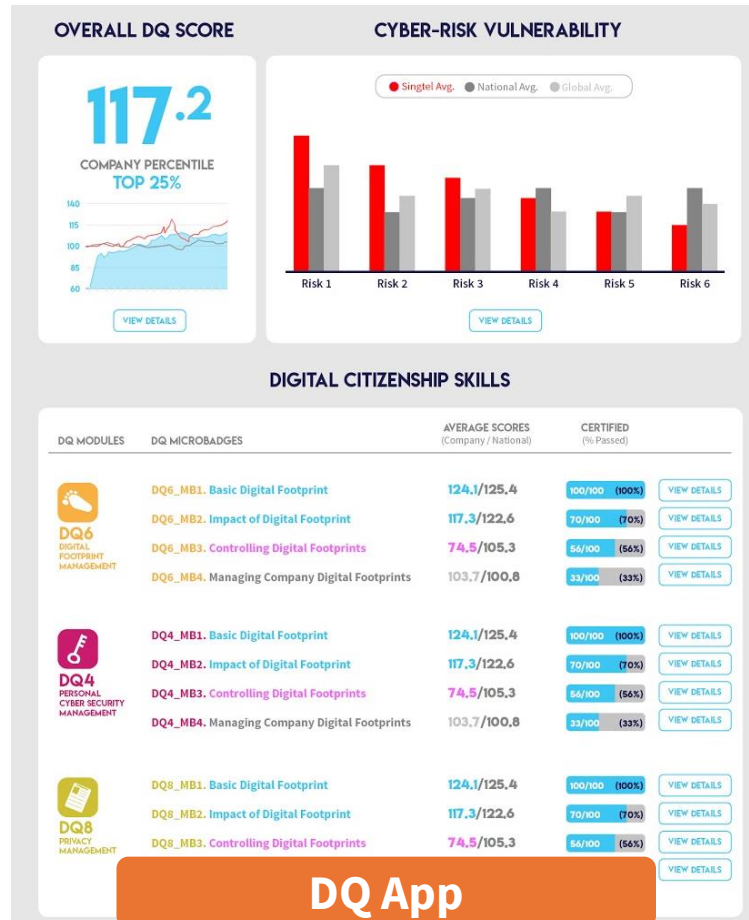
The OECD Karel environment displays a 'Challenge: Use a while loop to pick up the stone piles in both worlds.' Below the challenge are two worlds, 'World 1' and 'World 2', each containing a Karel character and several stone piles. A 'Run' button is visible. On the right, a code editor shows a 'while front is clear' loop. The 'World 1' and 'World 2' labels are circled in red.

OECD Karel

Monitor 2: Addressing Needs of Schools and Students

By Identifying Gaps and Recommendations for Improvement

Demonstration Purpose Only



Test results

Congratulations! You have outstanding results!

You should focus on improving

- creating information independently following supplied instructions;
- evaluating the accuracy and quality of different sources of information.

Thank you!

Test results

Your results are around the average for other students of your age.

You should focus on improving

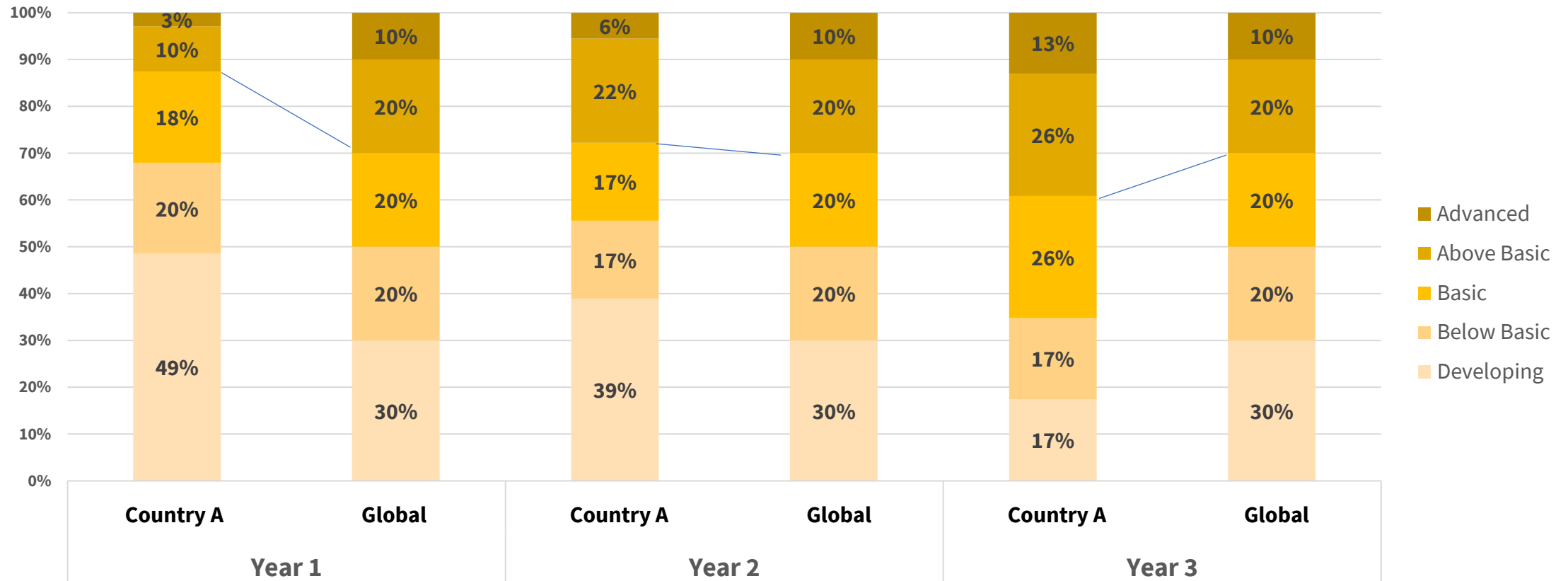
- searching for, collecting and saving information;
- sorting information and managing files;
- presenting information clearly to different people;
- identifying where you need more information and knowing how to find it;
- summarizing and interpreting information.

Thank you!

ICL

Monitor 3: Monitoring the Progress of the National Digital Skills Compared to National & Global Benchmark

Demonstration Purpose Only



Thank you

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