

Directions of Innovating Public HDR in the Age of Generative Artificial Intelligence

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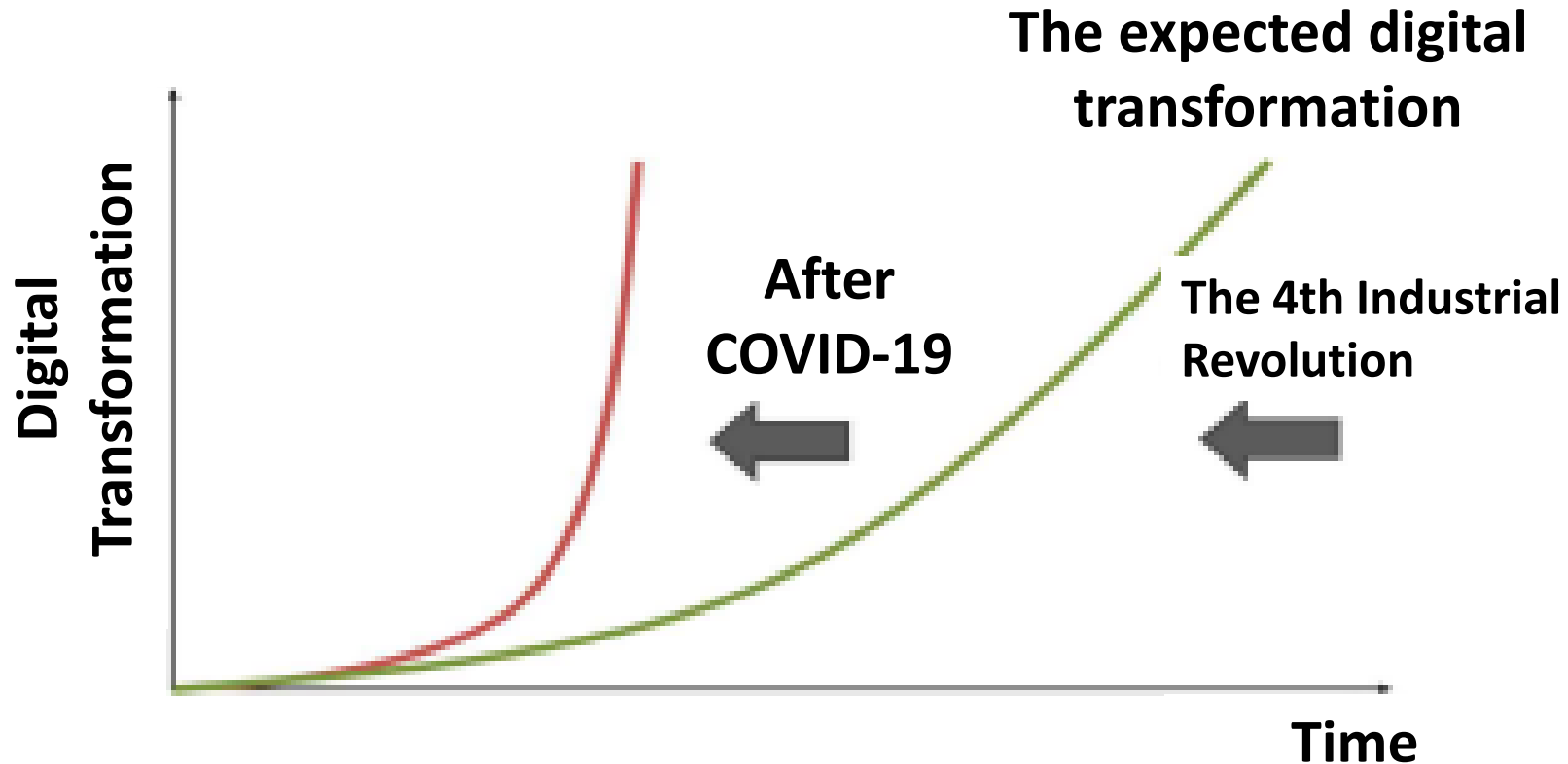
Digital Transformation and the Advent of Generative AI



1. Digital Transformation

Digital Transformation
OECD(2019)

How the proliferation of business models driven by the use of digital technologies leads to productivity gains



After COVID-19 The "Digital Everywhere" phenomenon

1. Digital Transformation

■ Expanding the concept of digital transformation



Digitization

Analog to digital
conversion



Digitalization

Applying digital
technologies



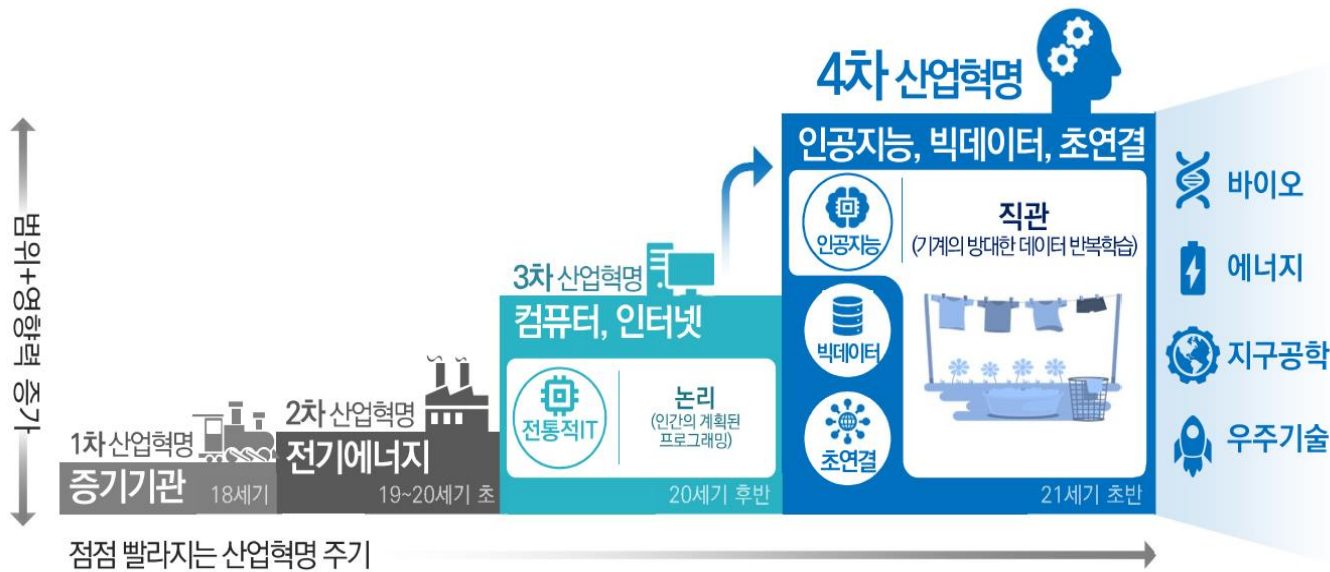
Digital Transformation

Digital thinking

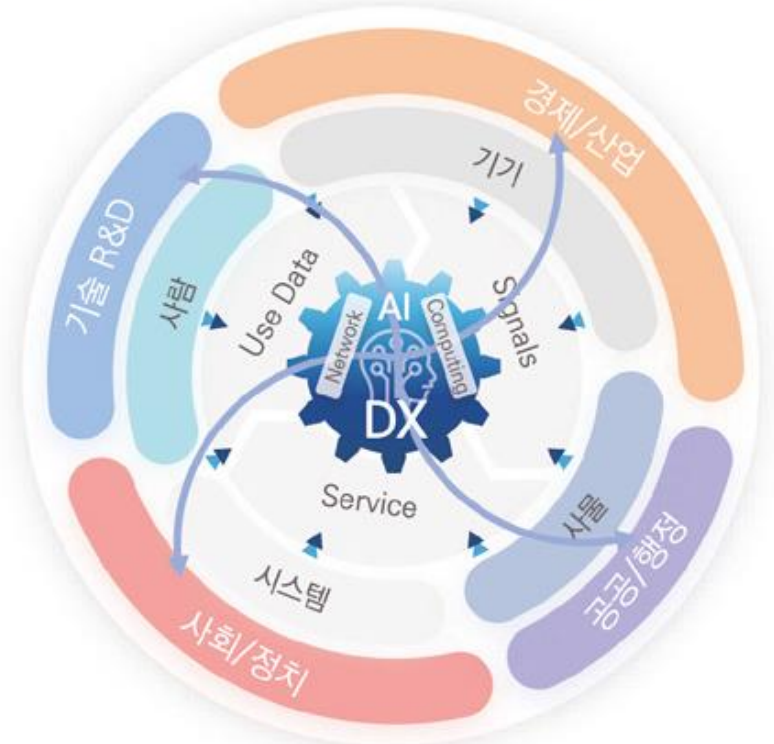
1. Digital Transformation

■ Digital transformation leading to future change

Keywords Leveraging artificial intelligence, big data analytics, hyperconnectivity (real-time networking)



디지털 대전환에 따른 상호 연결성 강화



* 출처: 4차산업혁명위원회

• 출처: <제1회 디지털 대전환 메가트렌드 컨퍼런스 디지털 대전환>자료집,과학기술정보통신부,KISDI(2021)

1. Digital Transformation

IT technology's tools for digital transformation



4차 산업혁명



사물인터넷 (IoT)



인공지능(AI) Artificial Intelligence



자율주행

증강현실과 가상현실 비교

	증강현실(AR)	가상현실(VR)
개념	현실 환경에 가상 정보를 겹쳐서 사물이나 이미지 정보를 더 많이 제공	실재하는 물체나 이미지를 컴퓨터 그래픽/CG로만 만들어 보여줌
용례	축구경기 중계방송에서 푸리치 위치에서 상대까지 거리 표시	관람객이 장면 속으로 들어간 것처럼 체험하게 하는 역할



만물인터넷(IoE)

IoT : Internet of Things
IoE : Internet of Everything

1. Digital Transformation

■ Characteristics of digital transformation

3 Characteristics of digital transformation



Acceleration of digital transformation



Ripple effects and scalability

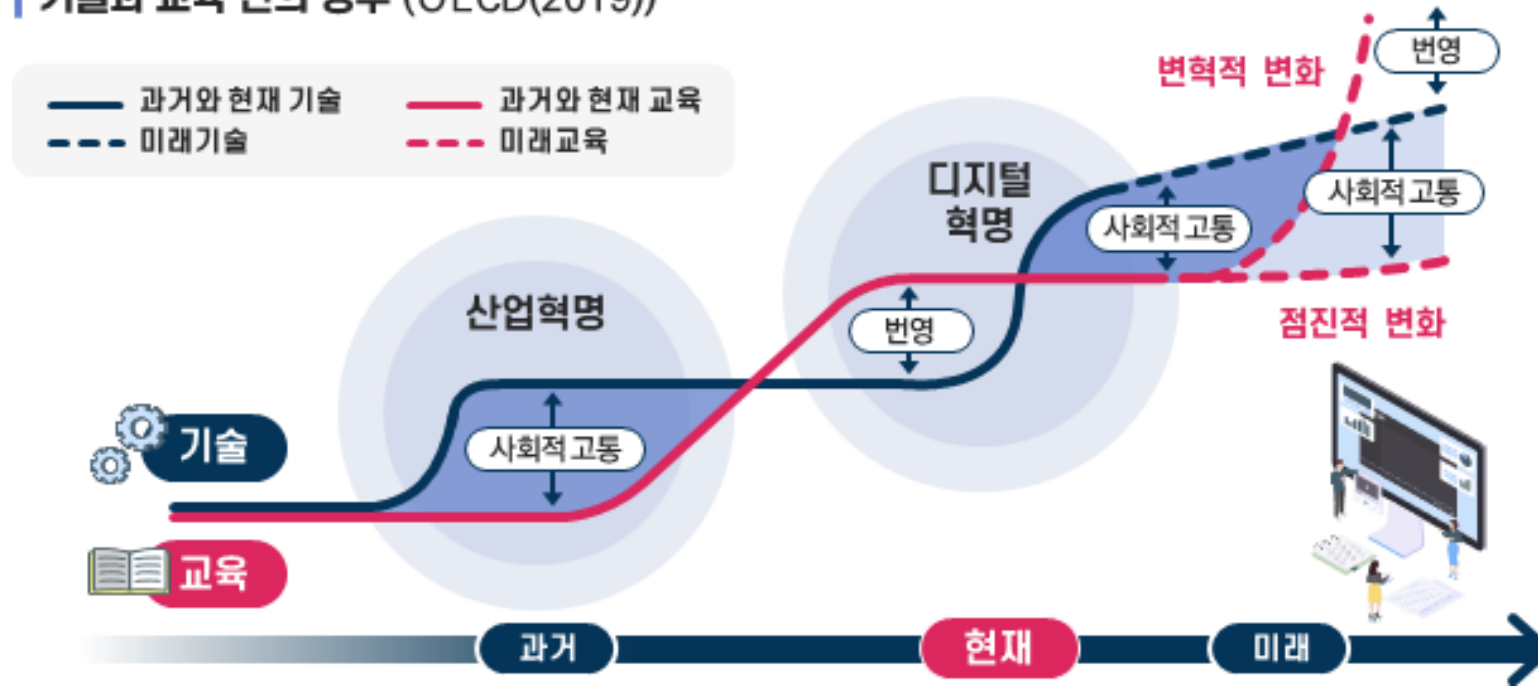


Ambivalence of direction

1. Digital Transformation

■ Digital transformation and education

| 기술과 교육 간의 경주 (OECD(2019))





















Shifting education paradigms and the growing need for education innovation to meet the changing times.

Increasing attempts to adopt and apply AI technologies to personalize education for individual learners

2. Concepts and Features of Generative AI

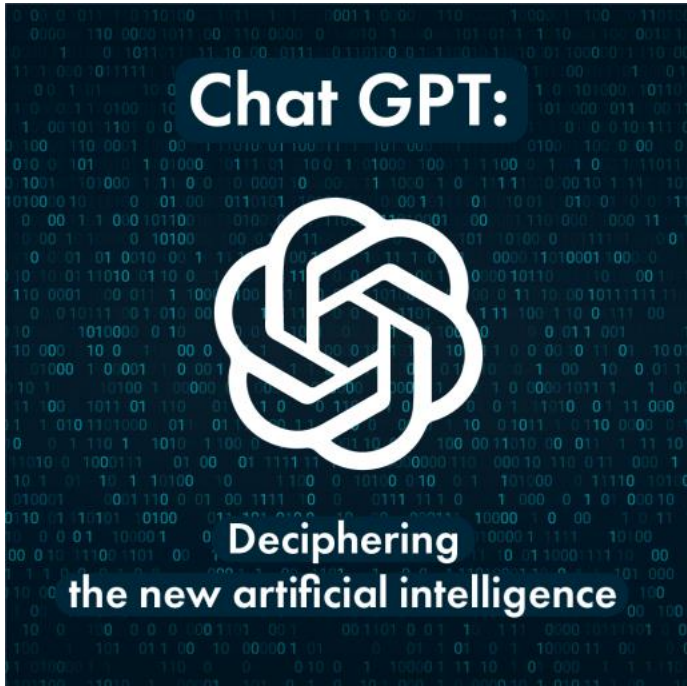
Concept and Types of Gen AI

- Generative AI is a technology for developing AI systems with human-like creativity and inventiveness.
- Generative AI systems generate new information or works based on given data or problems and provide them to users.
- Generative AI uses natural language processing to automatically create documents, images, music, videos, etc.

Text	 ChatGPT OpenAI ChatGPT is fine-tuned from GPT-3.5, a language model trained to produce text. Free	 GPT-4 OpenAI GPT-4 is OpenAI's most advanced system, producing safer and more useful responses. Free	 Notion AI Notion A connected assistant which produces text responses based on user's questions and the current page context. Free
Image	 Stable Diffusion Stability.ai A deep learning, text-to-image model, used to generate detailed images conditioned on text descriptions. Free	 Image Creator Microsoft Bing Image Creator generates AI images based on your text. Free	 Midjourney Midjourney Midjourney is an AI program which generates images from natural language descriptions/prompts.
Video	 Runway Runway A multi-modal AI system that can generate novel videos with text, images, or video clips. Free	 Fliki Fliki Fliki is a text to video and text to speech creator powered by generative AI. Free	 Wonder... Wonder Studio An AI tool that automatically animates, lights and composes CG characters into a live-action scene.
Audio	 JukeBox OpenAI A neural net that generates music, including rudimentary singing, as raw audio in a variety of genres and artist... Free	 MusicLM Google Research MusicLM is an AI model that can generate high-fidelity music from text. Free	 Text to Speech Microsoft Azure AI voice generators to speak naturally using synthesized speech from input text. Free
3D	 Point-E OpenAI A system for generating 3D point clouds from complex prompts. Free	 Magic3D NVIDIA Magic3D is a new text-to-3D content creation tool that creates 3D mesh models with unprecedented quality.	 Imagine 3D Luma AI An early experiment to prototype and create 3D with text.
Coding	 Copilot X Github An AI pair programmer with an early adoption of OpenAI's GPT-4.	 Codex OpenAI An AI AI system that translates natural language to code.	 CodeWhisperer Amazon CodeWhisperer can generate code suggestions ranging from snippets to full functions based on your comments and... Free

2. Concepts and Features of Generative AI

1) ChatGPT의 개념



Generative Pre-trained Transformer

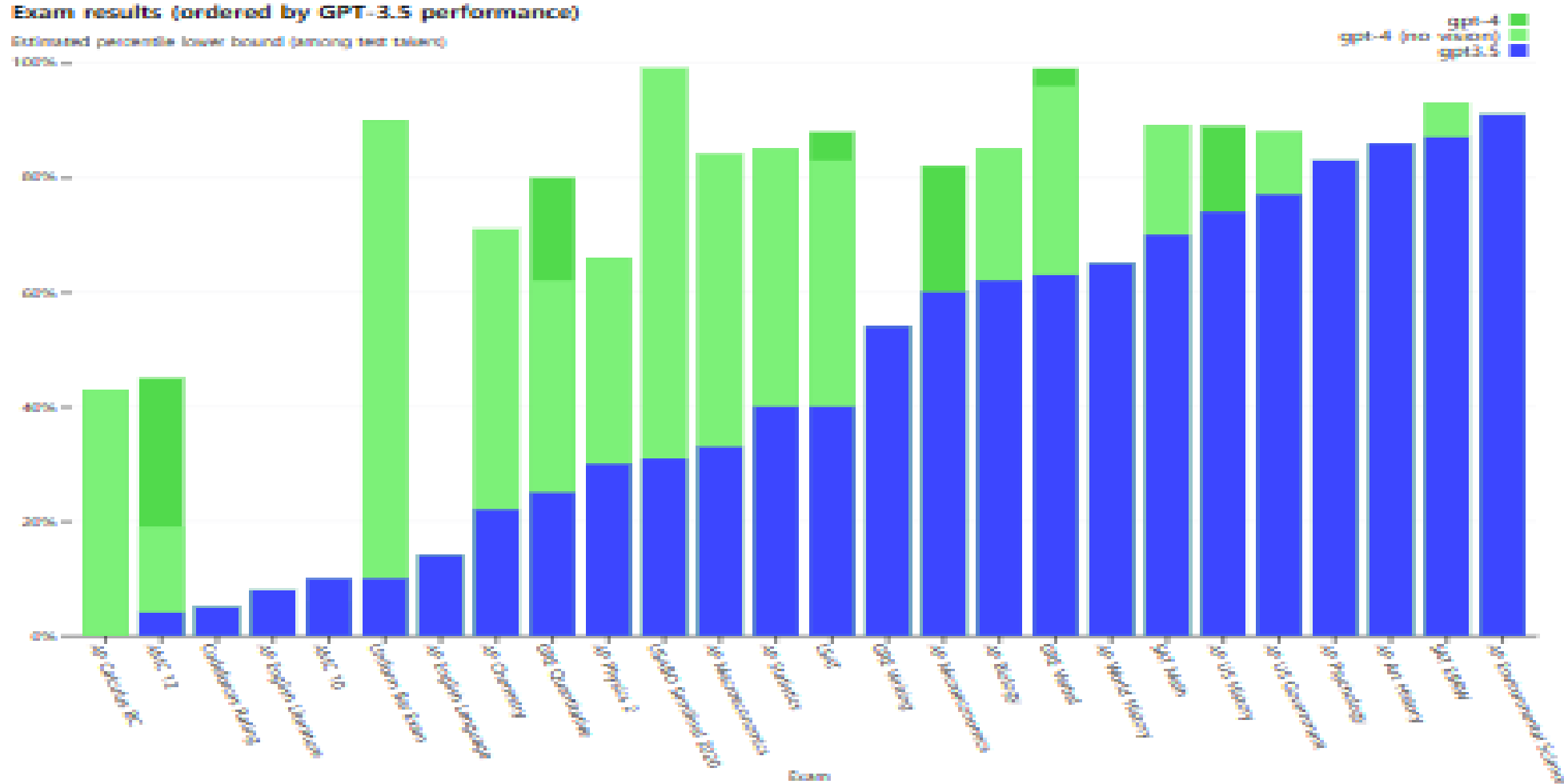
Chat + GPT

대화형 인공지능 생성형 사전학습 트랜스포머

OpenAI에서 개발한 자연어 처리(NLP, Natural Language Processing) 인공지능 언어 모델을 사용한 대화형 인공지능 서비스

2. Concepts and Features of Generative AI

Performance Experiment Results of ChatGPT-4



2. Concepts and Features of Generative AI

Performance Experiment Results of ChatGPT-4

Simulated exams	GPT-4 <small>estimated percentile</small>	GPT-4 (no vision) <small>estimated percentile</small>	GPT-3.5 <small>estimated percentile</small>
Uniform Bar Exam (MBE+MEE+MPT) ¹	298/400 <small>~50th</small>	298/400 <small>~50th</small>	213/400 <small>~10th</small>
LSAT	163 <small>~55th</small>	161 <small>~53rd</small>	149 <small>~40th</small>
SAT Evidence-Based Reading & Writing	710/800 <small>~55rd</small>	710/800 <small>~55rd</small>	670/800 <small>~57th</small>
SAT Math	700/800 <small>~55th</small>	690/800 <small>~55th</small>	590/800 <small>~70th</small>
Graduate Record Examination (GRE) Quantitative	163/170 <small>~50th</small>	157/170 <small>~52nd</small>	147/170 <small>~45th</small>
Graduate Record Examination (GRE) Verbal	169/170 <small>~55th</small>	165/170 <small>~55th</small>	154/170 <small>~55rd</small>
Graduate Record Examination (GRE) Writing	4/6 <small>~54th</small>	4/6 <small>~54th</small>	4/6 <small>~54th</small>
USABO Semifinal Exam 2020	87/150 <small>55th-100th</small>	87/150 <small>55th-100th</small>	43/150 <small>51st-55rd</small>
USNCO Local Section Exam 2022	36/60	38/60	24/60
Medical Knowledge Self-Assessment Program	75%	75%	53%
Codeforces Rating	392 <small>below 5th</small>	392 <small>below 5th</small>	260 <small>below 5th</small>
AP Art History	5 <small>55th-100th</small>	5 <small>55th-100th</small>	5 <small>55th-100th</small>
AP Biology	5 <small>55th-100th</small>	5 <small>55th-100th</small>	4 <small>52nd-55th</small>
AP Calculus BC	4 <small>45rd-55th</small>	4 <small>45rd-55th</small>	1 <small>0th-7th</small>

3. Use cases for generative AI

Use cases for ChatGPT

ChatGPT is widely used in marketing, academic writing, arts and culture, and more.



출처: 라이언 레이놀즈 유튜브(https://youtu.be/_eHjifELI-k)



Performance of ChatGPT on USMLE: Potential for AI-Assisted Medical Education Using Large Language Models

Tiffany H. Kung, Morgan Cheatham, ChatGPT, Arielle Medenilla, Czarina Sillos, Lorie De Leon, Camille Elepaño, Maria Madriaga, Rimel Aggabao, Glezel Diaz-Candido, James Maningo, Victor Tseng
doi: <https://doi.org/10.1101/2022.12.19.22283643>

This article is a preprint and has not been peer-reviewed [what does this mean?]. It reports new medical research that has yet to be evaluated and so should not be used to guide clinical practice.

0 Comments 0 TRIP Peer Reviews 0 Community Reviews 0 Automated



Nurse Education in Practice
Volume 66, January 2023, 103537



Editorial

Open artificial intelligence platforms in nursing education: Tools for academic progress or abuse?

Siobhan O'Connor^a, ChatGPT^b

3. Use cases for generative AI

Use cases for GEN AI

- Copyright issues can arise because AI technology can be used to create, modify, and reproduce works.
- Unclear who owns the copyright when AI creates a work.
- Jason Allen's artwork "Space Opera Theater," created using Midjourney (an AI image generator), won an art competition and sparked a copyright controversy.



3. Use cases for generative AI

Use cases for GEN AI

- The photographer who won the top prize in the world's most prestigious photography competition, the Sony World Photography Awards 2023, suddenly declines to accept the award.
- German photographer Boris Eldaksen said he wanted to make sure AI-generated images were eligible for the competition, and wanted to open up a discussion about the future of photography.

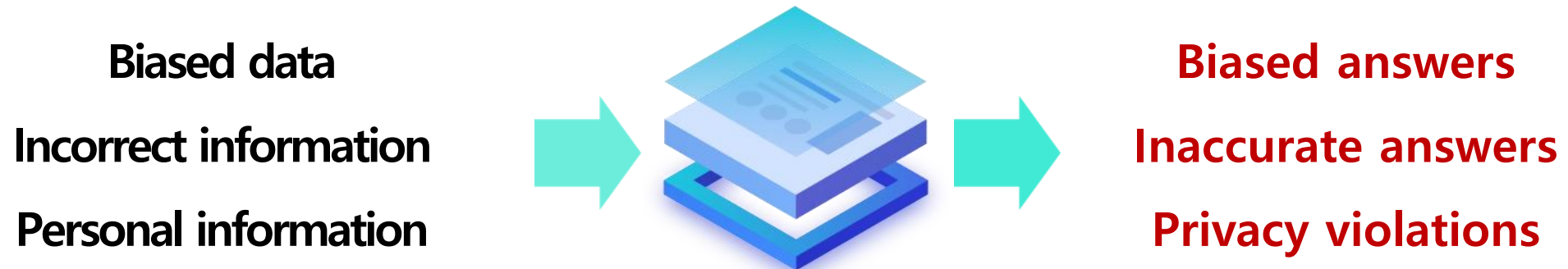


출처: 보리스 엘다크센 <위 기억: 전기기술자>

4. Notes on using ChatGPT

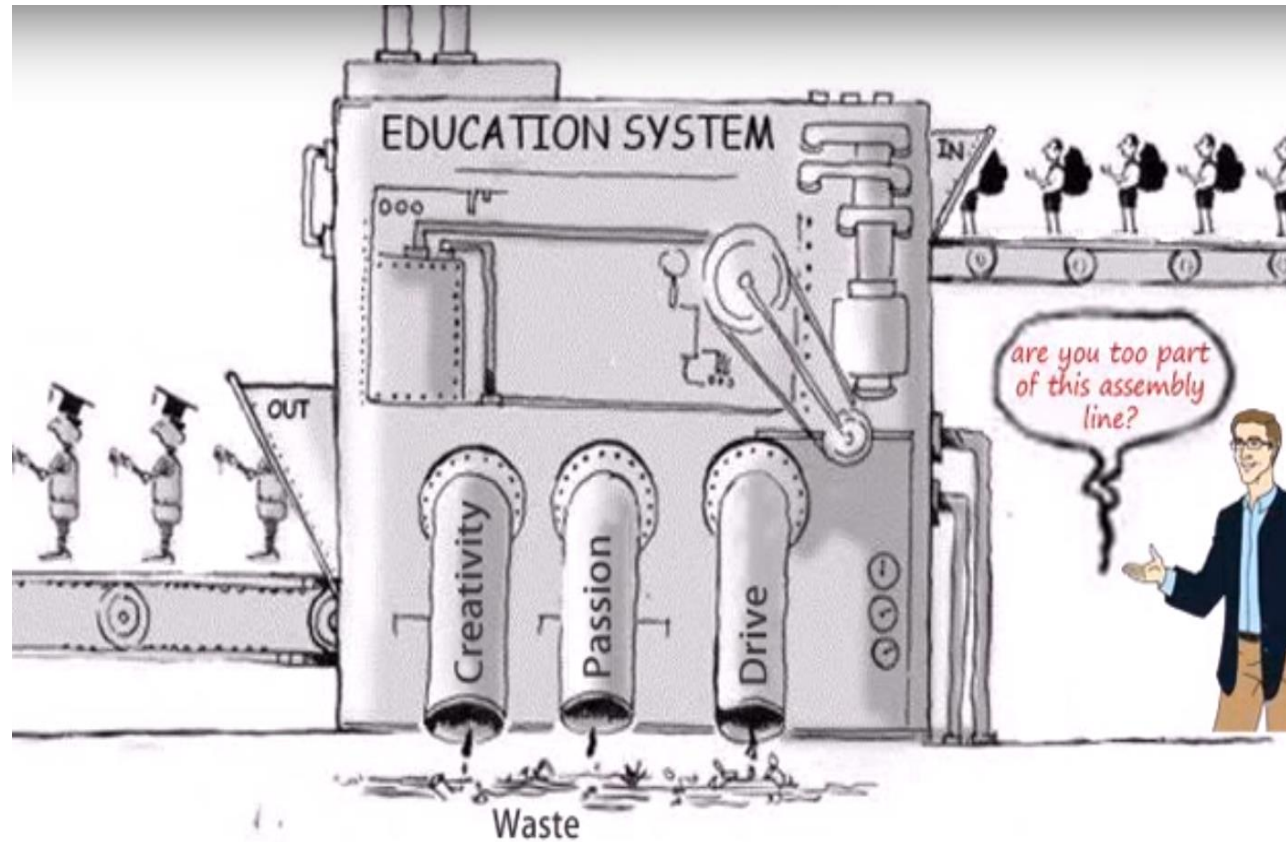
AI and ChatGPT related issues

- If the data in the natural language processing model contains biased data, misinformation, or personal information, the answers may also be biased or inaccurate and may result in a privacy breach.
- Learners must have the knowledge to make judgments about the information provided by ChatGPT.



II Current Status of Public HRD

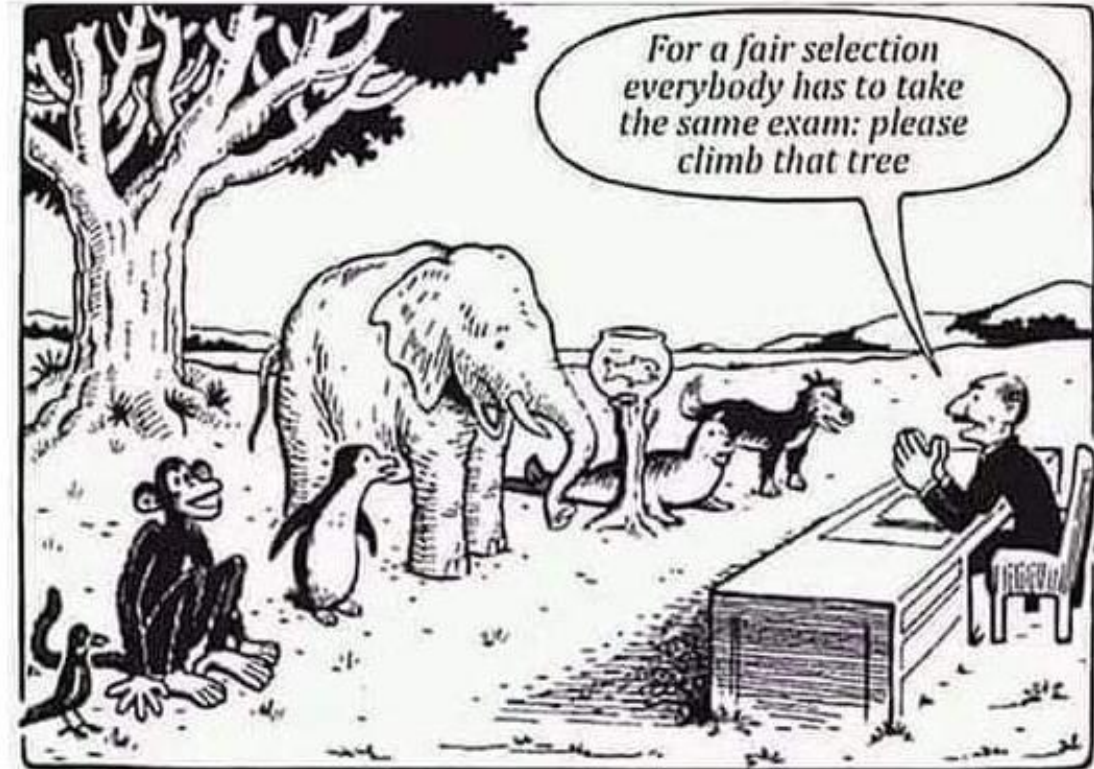
■ Problems of HRD in Industrial Society



Mass Production HRD

■ HRD in the trap of averages

The 1940s fighter pilot crash epidemic in the United States was caused by the trap of averages.



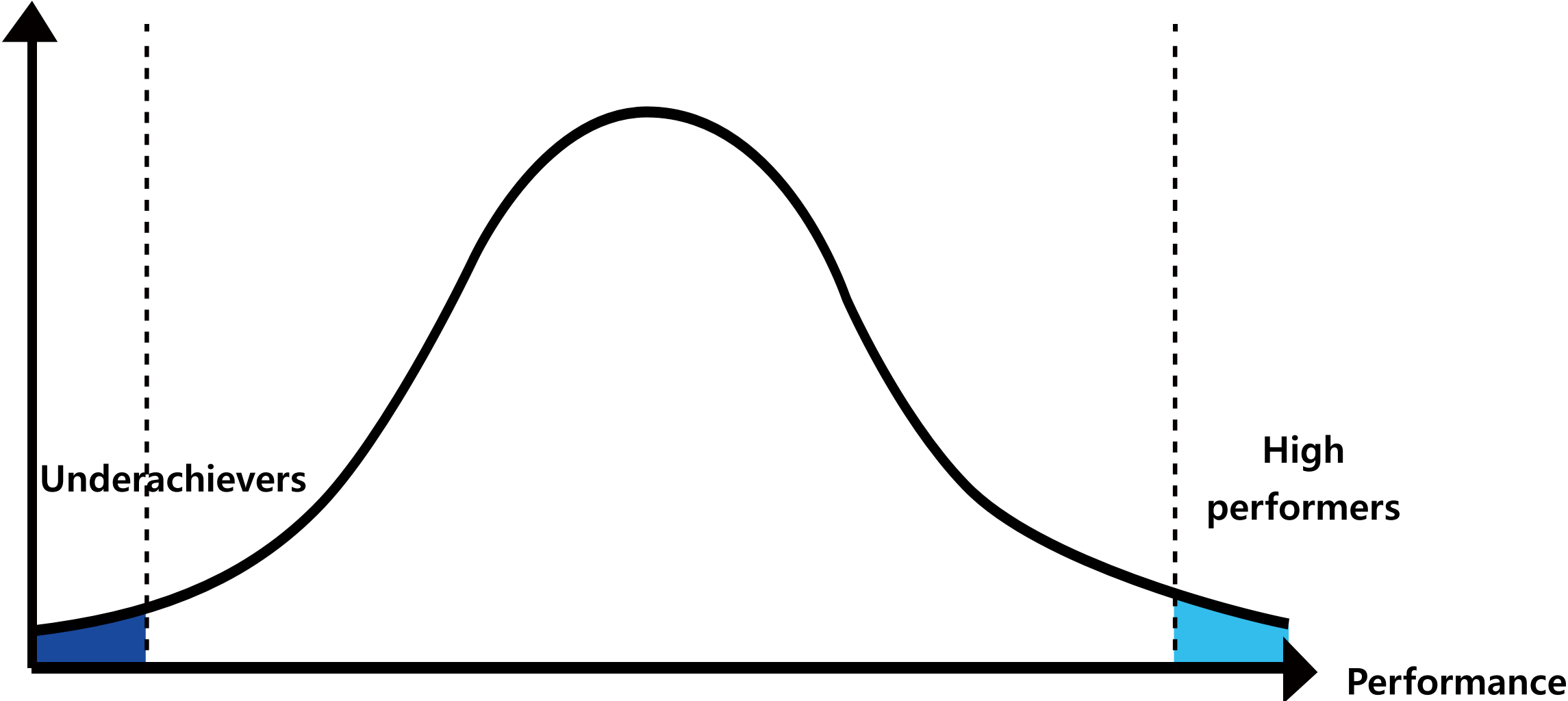
Our Education System

"Everybody is a genius. But if you judge a fish by its ability to climb a tree, it will live its whole life believing that it is stupid."

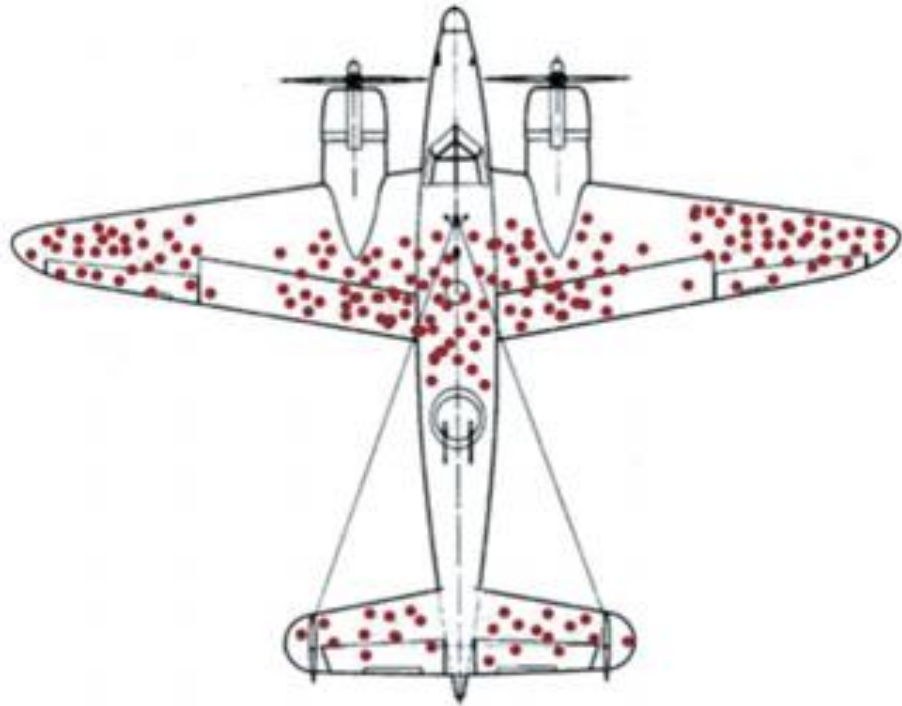
- Albert Einstein

■ Results of Average-Oriented HRD

Learner



■ The problem of survivor bias



Survivor Bias
- Distribution of Shots Fired by Returning Fighters

Survivor bias in HRD

Align training goals and performance management with high performers



Failure to manage training for those who really need it



Direction of Public HRD in the Generative AI Era

■ Is there a time when knowledge is no longer needed?



■ What training do public officials need?

(What) Training required for public officials

**Organizational
needs**

VS.

**Individual
learning needs**

■ Personalized HRD

Enable mastery learning with personalized HRD

**Learning
Outcomes**

Time spent learning

Time required to learn

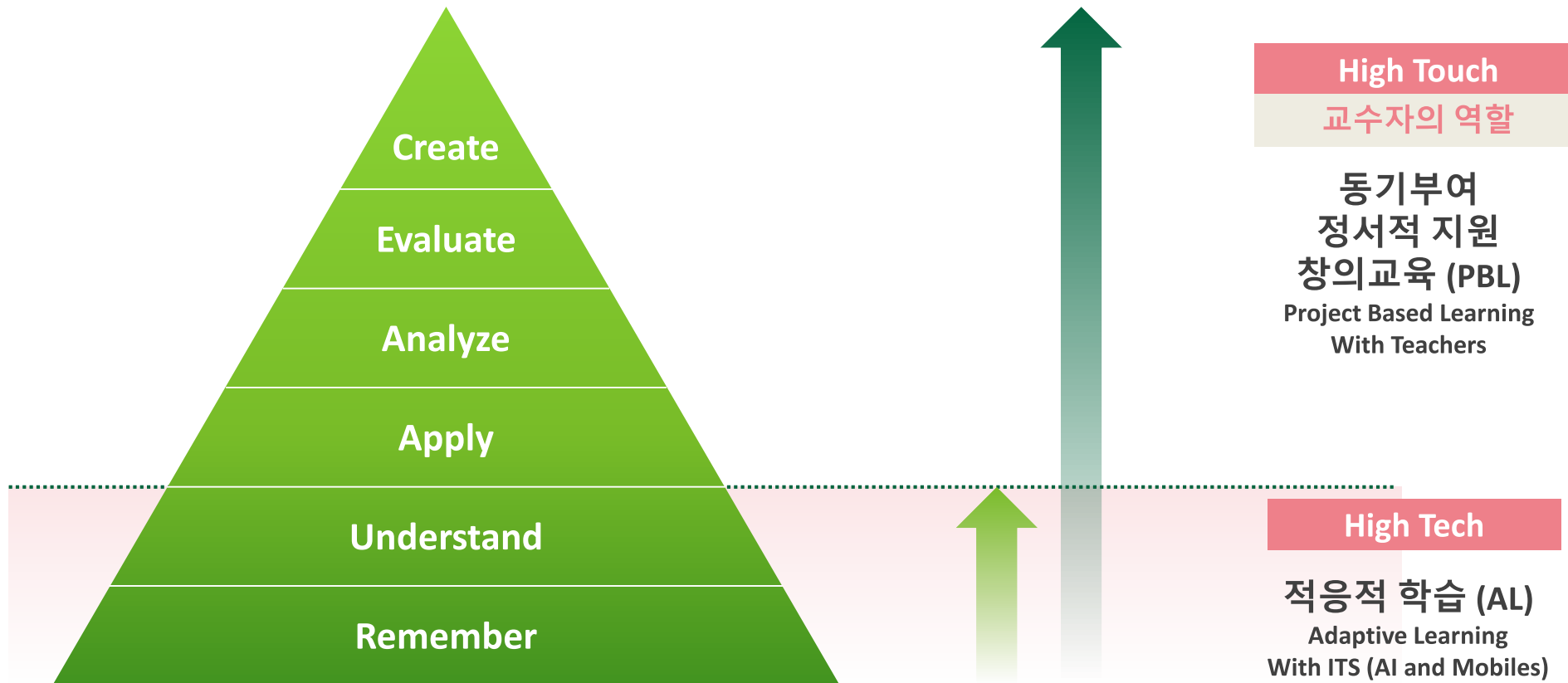
Authentic learning opportunities at students' own pace

Student aptitude, lesson comprehension, and quality of instruction

■ Hybrid HRD

(How) HRD Operational Direction

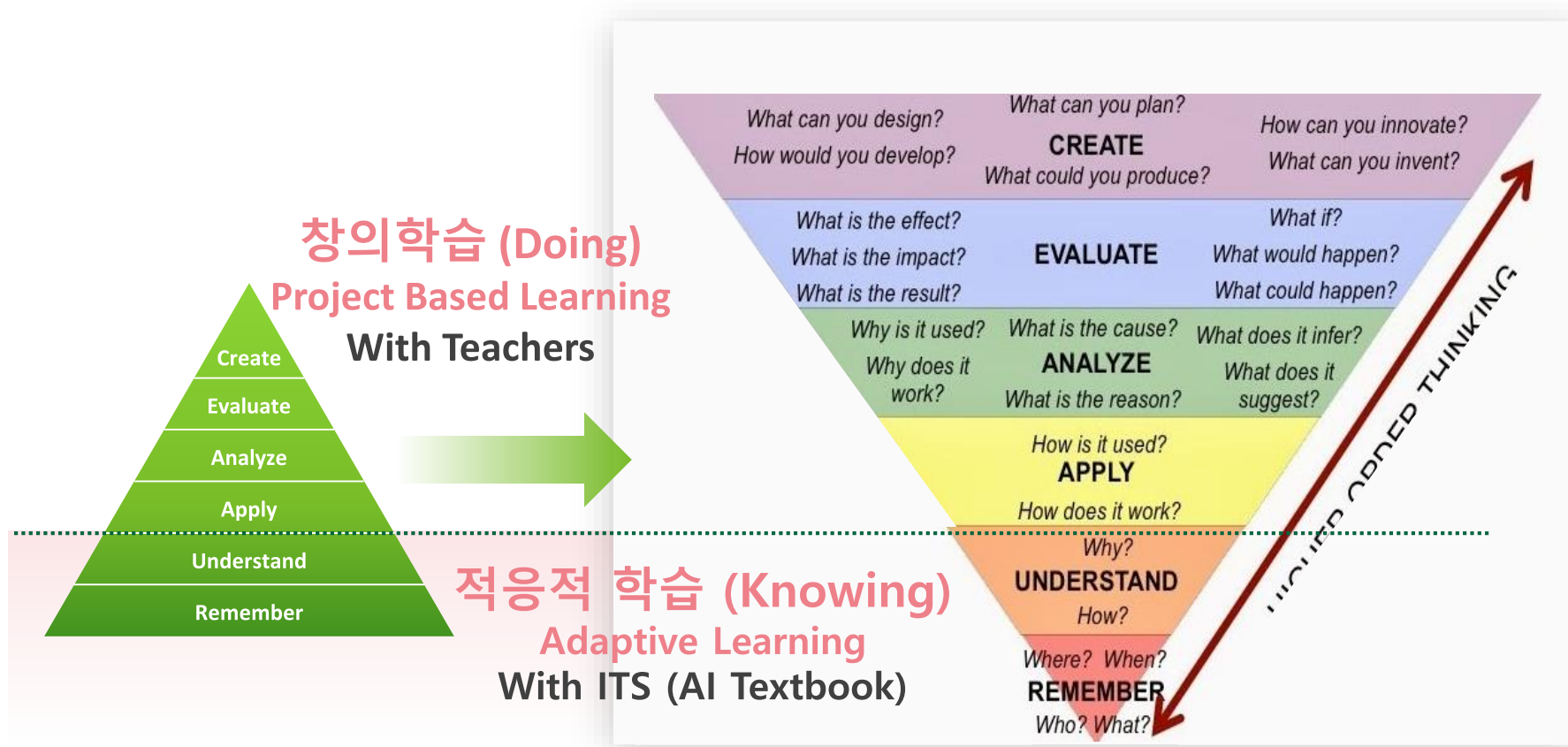
Hybrid HRD (Knowing + Doing)



■ Hybrid HRD

(How) HRD Operational Direction

Transition to Hybrid HRD with AI



■ Educational Use of ChatGPT

UNESCO (2023)

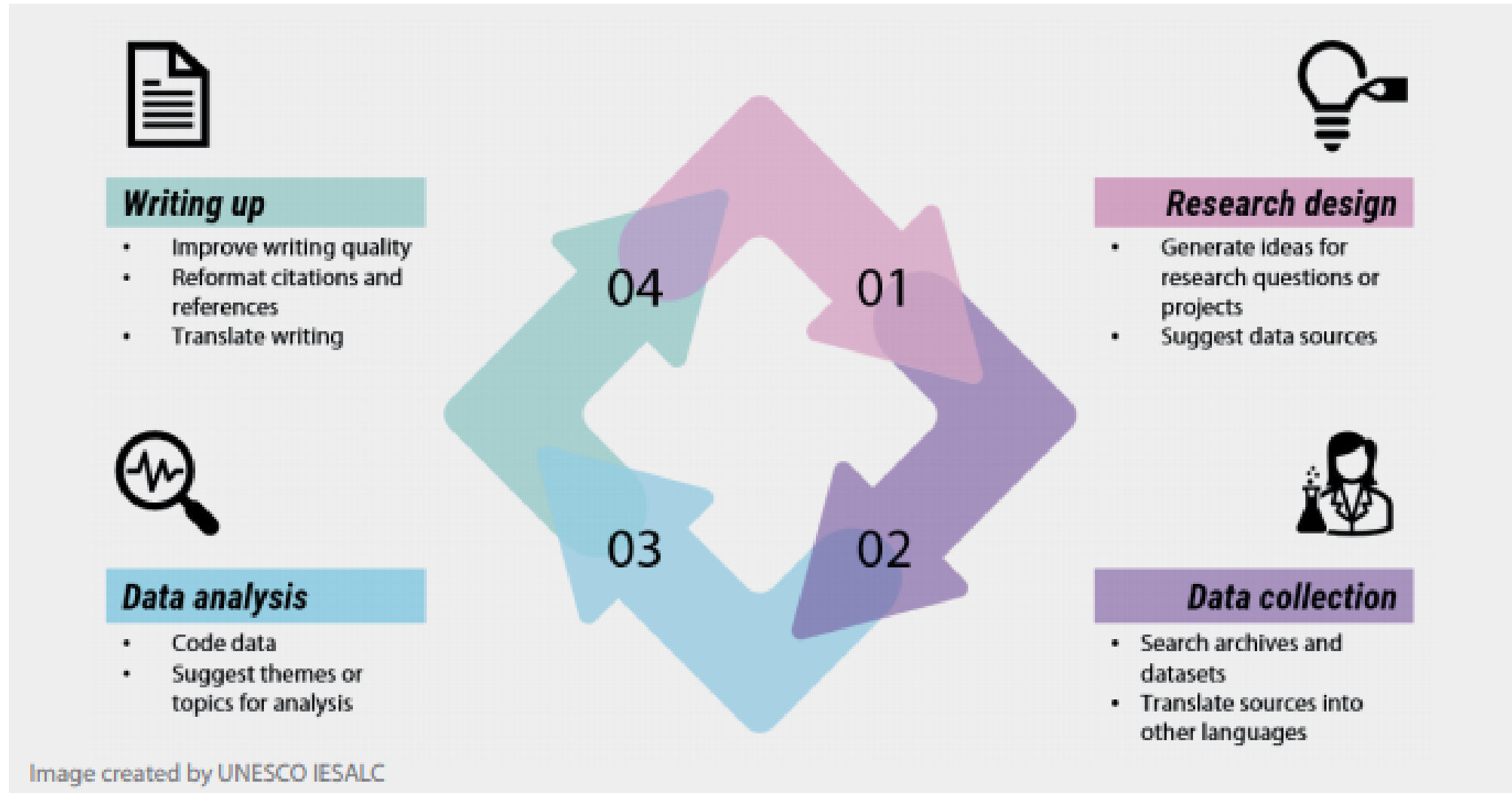
1. Possibility engine (아이디어 도출)
2. Socratic opponent (토론 상대자)
3. Collaboration coach (협력적 코치)
4. Guide on the side (가이드)
5. Personal tutor (개인 튜터)
6. Co-designer (학습 디자이너)
7. Exploratorium (탐색 도우미)
8. Study buddy (학습 동료)
9. Motivator (동기 부여)
10. Dynamic assessor (즉각적 평가)

Role ⁶	Description	Example of implementation
Possibility engine	AI generates alternative ways of expressing an idea	Students write queries in ChatGPT and use the Regenerate response function to examine alternative responses.
Socratic opponent	AI acts as an opponent to develop and argument	Students enter prompts into ChatGPT following the structure of a conversation or debate. Teachers can ask students to use ChatGPT to prepare for discussions.
Collaboration coach	AI helps groups to research and solve problems together	Working in groups, students use ChatGPT to find out information to complete tasks and assignments.
Guide on the side	AI acts as a guide to navigate physical and conceptual spaces	Teachers use ChatGPT to generate content for classes/courses (e.g., discussion questions) and advice on how to support students in learning specific concepts.
Personal tutor	AI tutors each student and gives immediate feedback on progress	ChatGPT provides personalized feedback to students based on information provided by students or teachers (e.g., test scores).
Co-designer	AI assists throughout the design process	Teachers ask ChatGPT for ideas about designing or updating a curriculum (e.g., rubrics for assessment) and/or focus on specific goals (e.g., how to make the curriculum more accessible).
Exploratorium	AI provides tools to play with, explore and interpret data	Teachers provide basic information to students who write different queries in ChatGPT to find out more. ChatGPT can be used to support language learning.
Study buddy	AI helps the student reflect on learning material	Students explain their current level of understanding to ChatGPT and ask for ways to help them study the material. ChatGPT could also be used to help students prepare for other tasks (e.g., job interviews).
Motivator	AI offers games and challenges to extend learning	Teachers or students ask ChatGPT for ideas about how to extend students' learning after providing a summary of the current level of knowledge (e.g., quizzes, exercises).
Dynamic assessor	AI provides educators with a profile of each student's current knowledge	Students interact with ChatGPT in a tutorial-type dialogue and then ask ChatGPT to produce a summary of their current state of knowledge to share with their teacher/for assessment.

출처: UNESCO(2023). ChatGPT and artificial intelligence in higher education: quick start guide.

Public sector problem solving project using ChatGPT

Figure 3: Possible uses of ChatGPT in the research process



The Best Way to Predict the Future is to Invent It.

미래를 예측하는 최선의 방법은 미래를 창조하는 것이다.

Alan Kay

챗GPT
교육혁명

ChatGPT를 활용한 하이러치 하이테크 미래교육
정세영, 조한영, 황재운, 문영현, 김인제 지음

Hello!

Hello! How may I assist you today? ■

AI 교육 혁명은 이미 시작되었다!
인공지능과 함께 살아갈 알파 세대를 위한 미래 교육

- 이영 전 교육부장관 강력 추천
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- 김관숙 스마교육학회장 강력 추천
- 황영식 전주교대 교수 강력 추천
- 김강수 서울교대 교수 강력 추천

대한민국 디지털 교육혁신 원년, 10대 키워드 분석과 2024 전망

디지털 교육
트렌드리포트
2024

이우호, 정재연, 정영식 지음

5대 시드 교육혁신 전략 수립
핵심 키워드 10대 키워드 선정

지금의 교육과 디지털 대전환의 인사이트를 짚어주는 단 한 권의 책
모든 논쟁과 배경지식을 총망라한 국내 유일의 디지털 교육혁신 해설서

무엇을 배우고, 어떻게 가르쳐야 하나?

AI
교육혁명

이우호, 정재연, 정영식 지음

모두가 원하지만, 누구도 바꾸지 못했던
한국 교육, 인공지능이 바꾸다!

서울교대 교수 최영준 강력 추천
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서울교대 교수 최영준 강력 추천

시원 북스

가르침과 배움의 함의
Promises and Implications for Teaching and Learning

인공지능시대의 미래교육
Artificial Intelligence In Education

Wayne Holmes Maya Eliath Charles Fadel 지
정재연 이신재 번역

시원 북스

Thank you so much!

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