Education Digital Transformation (DX) Roadmap

June 13, 2025

Digital Agency
Ministry of Internal Affairs and Communications
Ministry of Education, Culture, Sports, Science and Technology
Ministry of Economy, Trade and Industry

**This is the digest version in English. The original text is at the following URL in Japanese.*

Full) https://www.digital.go.jp/assets/contents/node/information/field ref resources/511df327-5ba3-456e-a5cd-2ebeddd8c960/29c4e154/20250613 edu-dx-full.pdf

Outline) *https://www.digital.go.jp/assets/contents/node/information/field ref resources/511df327-5ba3-456e-a5cd-2ebeddd8c960/b166fe28/20250613 edu-dx-summary.pdf*

Mission and Vision

Basic Plan for the Promotion of Education

Fostering creators for sustainable society towards post-2040

Improving the Japanese way of well-being rooted in Japanese culture

A society that aims to use digital technology

Creating a society in which diverse happiness can be realized by using digital technology

Human-friendly digitalization: No one left behind

Mission

A Society Where Anybody, at Any time and Place, Can Learn with Anybody in His/her Own Way

Vision

All Resources for Every Learner

Background Surrounding Children and Benefits of Digitalization ①

Realizing learning tailored to each child for all children, regardless of their environment or innate characteristics, through utilizing diverse digital tools.

Emerging Diversity of Children

In elementary school classes of 35 students

Children with disabilities and complex difficulties	Children with unique talents	Children who don't speak much Japanese at home
3.6	0.8	1.0

Children who tend to have lower academic achievement and fewer books at home	Children with absenteeism tendencies	Children with chronic absenteeism
12.5	4.1	0.7

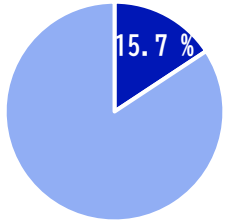
Ref. "Considerations on Curriculum Standards in Elementary and Secondary Education (requests) reference materials (Central Council for Education)" (December 25, 2024), updated based in the "Policy Package on Education and Human Resource Development for Society 5.0 (Cabinet Office)"

Challenges in Achieving Personalized Learning

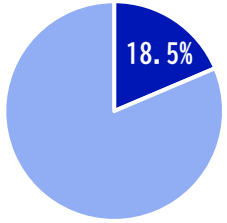
Class is not suited to me

Percentage of students (6th grade elementary and 3rd grade junior high school) who responded "No" or "Not really" to the question "The classes I took up until the previous academic year had teaching methods, materials, and learning time that suited me"

Elementary School



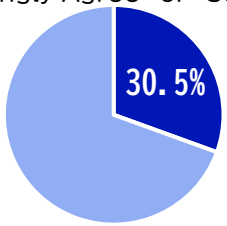
Junior High School

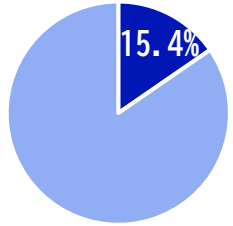


Class is too difficult for me

Class is too easy for me

Percentage of students (4th grade elementary to 3rd grade junior high school) who responded "Strongly Agree" or "Somewhat Agree" to each of the above questions





Ref. top: "Results of the 2024 National Assessment of Academic Ability (Summary) (MEXT and National Institute for Educational Policy Research)"
bottom: "Survey on Awareness Regarding Compulsory Education (MEXT)"

Examples of Diverse Learning made possible or easier through Digitalization

Personalized Learning Tools

- ✓ Address the problems identified and their difficulty levels according to children's interests and responses
- ✓ Repeatedly learn difficult content through videos

Diverse Interfaces

- ✓ Enable input through typing, handwriting and voice
- ✓ Easy to support multiple languages, black-and-white inversion, magnification, etc.

Flexible combination

- ✓ Thoroughly learn weak areas while referring to videos
- ✓ When mistakes are made in drill tools, transition to the textbook and review by returning to related pages

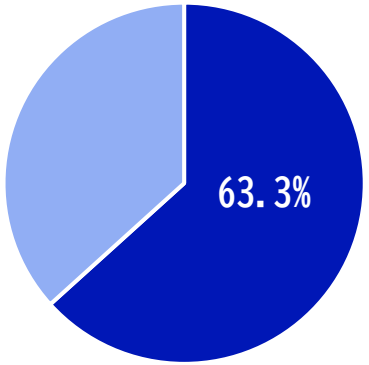
Background Surrounding Children and Benefits of Digitalization ②

When supporting personalized learning using digital technology, it is important not to rely solely on algorithmic optimization such as providing problems based on proficiency levels, but also to support learners in regulating their own learning so that it becomes optimal as they learn proactively, utilizing data, generative AI, and other tools.

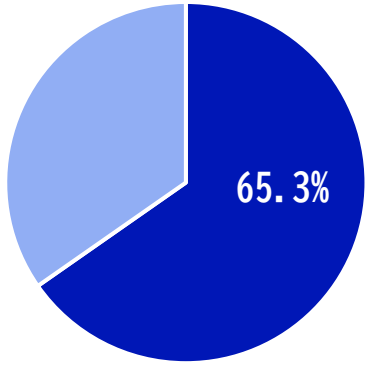
I don't have confidence in planning when to do school work on my own

I don't have confidence in assessing my progress with learning

Percentage of students (15-year-old students) who responded "Not very confident" or "Not at all confident" to the question "Are you confident in your ability to self-study if school is closed again?"



Challenges in Self-regulated Learning



Ref. "Key Features of OECD Programme for International Students Assessment 2022 (PISA2022) (MEXT and National Institute for Educational Policy Research)"

Examples of Diverse Learning made possible or easier through Digitalization

Support for Proactive Learning

- ✓ Create plans and reflections based on one's own learning data
- ✓ Identify missing perspectives and deepen thinking through brainstorming with generative AI(*)

*When utilizing generative AI, it is necessary to pay attention to age restrictions and other considerations

Easy accumulation and storage of process data

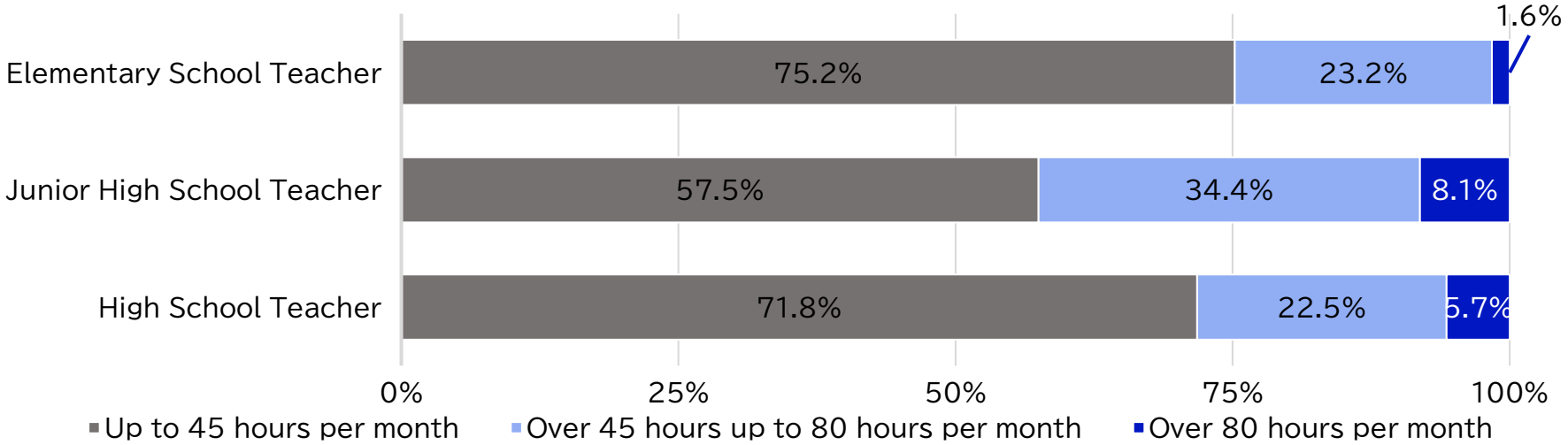
- ✓ Reference one 's own progress and strengths/ weaknesses based on logs
- ✓ Diverse assessments including performance evaluation and portfolio assessment based on automatically recorded outputs and learning processes

Background Surrounding Teachers and Benefits of Digitalization

While teachers' time at school has shown improvement in recent years, challenging working conditions still remain. To realize "Personalized Learning" for each child, we will first streamline teachers' tasks through School Work DX, and improve the quality of work by utilizing diverse digital tools and data

Percentage of Teachers' Overtime Hours at School (April 2023 - March 2024)

The percentage of overtime work at school exceeding "45 hours per month" is approximately 25% at elementary schools, approximately 43% at junior high schools, and approximately 28% at high schools.



Time obtained by subtracting total scheduled working hours from total time at school, etc. (Time that can be objectively identified as the time when educational staff are performing duties related to school educational activities)
The upper limit for overtime hours at school, etc. per month is basically within 45 hours (Guidelines on appropriate management of workload for educational staff at public schools and other measures that boards of education supervising the service of educational staff should take to ensure the health and welfare of educational staff)
Ref. Survey on the Status of Initiatives for Work Style Reform in Schools by Boards of Education in 2024

Examples of Teachers Tasks made possible or easier through Digitalization

Efficiency in School Work

- ✓ Eliminating the need for paper materials and printing
- ✓ Creating documents and printouts efficiently using generative AI
- ✓ Easy grading of tests and compilation of surveys
- ✓ Once inputted, information is linked so re-entry is unnecessary

Enhancing Teachers' Assessment

- ✓ Making it possible to instantly grasp the situation of all students in a class, which was difficult with traditional classroom monitoring alone
- ✓ By utilizing data to understand the learning process and other aspects, more comprehensive assessments for each individual student become possible than before

Related Measures and Key Issues

Reducing Teachers' Burden through Digitalization

Realization of environments where teachers can spend more time with students

- Promoting School Work DX
- Online Surveys
- Digitalization of High School Entrance Exam
- List of Tasks to Quit for Work Style Reform of School

Developing Learning Environments for Diverse Learning

Realizing environments that enable personalized and self-regulated learning through diverse learning tools, including generative AI

- Promoting Learning with One Device per Student
- Network Environments
- Diverse Learning Tools

All Resources for Every Learner

Integrated Enhancement of Personalized and Self-Regulated Learning and Collaborative Learning Through Digital Technology

Enhancing Students Self-Understanding and Teachers Assessment Through Data

Supporting students' self-understanding and teachers' assessment through data across systems and tools

- Interconnection of Educational Services
- Standardization of Educational Data
- Utilization of Educational Data

Developing Environments to Utilize Learning Data Throughout Life

Establishment of infrastructure for data connection from individual and organizational perspectives

- User and Data Authentication

Utilization of Educational Data for Research that Contributes to Policy and Practice

I Reducing Teachers Burden through Digitalization
(Development and deployment of hardware and environment)

【Goals】

All necessary tasks are completed digitally through School Work DX, and data input is performed once only through interconnection of educational services. Furthermore, by actively using generative AI, school administrative affairs tasks are significantly reduced and environments where teachers can spend more time with students are realized.

Student Information Systems (SISs) are still operated on-premise

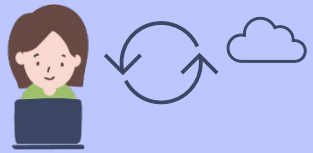
Many paper documents still remain

Teachers often use two computers

Many documents must still be exchanged via paper or postal mail in high school entrance exam

Burden of manual data input, printing and bringing documents

Transition to School Work DX environment based on public cloud



Realizing end-to-end digital processes and once-only data input enabled by cross-school and cross-system data integration

List of Tasks to Quit for Work Style Reform of School

- Communication between schools and parents via telephone or paper
- Paper-based sharing of meeting documents
- Schedule coordination with parents by telephone or paper
- Unnecessary manual input of new student roster information into administrative systems

etc.

Measures

Building Environments for School Work DX
Promoting School Work DX, Online Surveys, Digitalization of High School Entrance Exam

List of Tasks to Quit for Work Style Reform of School
Utilizing General-Purpose Cloud Tools, Realizing Data Integration of Student Roster Information

List of Tasks to Quit for Work Style Reform of School

～Creating an environment where teachers can spend more time with students～

By **thoroughly implementing end-to-end digital processes and once-only data input, the first step to significantly reduce teachers' burden and create an environment where teachers can engage more with students**, enabling them to experience the benefits of digitalization. To this end, the **List of Tasks to Quit for Work Style Reform of School (shifting to digital processes)** has been created. Boards of education and schools are expected to actively promote digitalization. The government is also advancing initiatives toward building environments for School Work DX with the use of tools such as the **Dashboard of School Work DX**

☐	① Receiving notifications of student absences via telephone
☐	② Paper-based questionnaires for parents
☐	③ Distribution and collection of paper-based surveys between schools and parents
☐	④ Paper-based questionnaires for teachers
☐	⑤ Unnecessary manual input of new student roster information into administrative systems
☐	⑥ Schedule coordination with parents by telephone or paper
☐	⑦ Paper-based sharing of meeting documents
☐	⑧ Paper-based questionnaires for students
☐	⑨ Distribution of paper-based letters to parents
☐	⑩ Individual storage of teaching materials created by teachers
☐	⑪ Collection of school fees in cash
☐	⑫ Paper-based management of school event schedules and reservations for special classrooms

It is important to proceed with flexible measures, taking into account the actual circumstances of each region and school, such as addressing households without digital devices.

Ⅱ Developing Learning Environments for Diverse Learning
(Development and deployment of software and tools)

【Goals】

An environment is established where learners - each with different interests, characteristics, and career directions can access diverse learning resources from their individual device, and where they can learn anytime, anywhere, and with anyone.

GIGA School Program Device

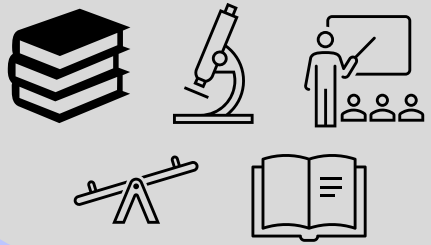
Significant differences in the utilization rate of devices among schools

Network

Only about 20% of schools meet the recommended network performance levels

Information asymmetry exists in the procurement of diverse tools

Learning with optimal materials for each learner



In addition to conventional learning environments, GIGA School Program devices enable students to access diverse tools and engage in learning that meets their needs.

Digital Textbooks

Lesson-Support Tools

MEXCBT

CBT

Generative AI

AI-based Drill Materials, Video Materials

Web Conference Tools

Learning Management System

※Tools shown above are examples.

Measures

Developing Devices and Network
Procurement Support for GIGA 2nd, Development Network Environments

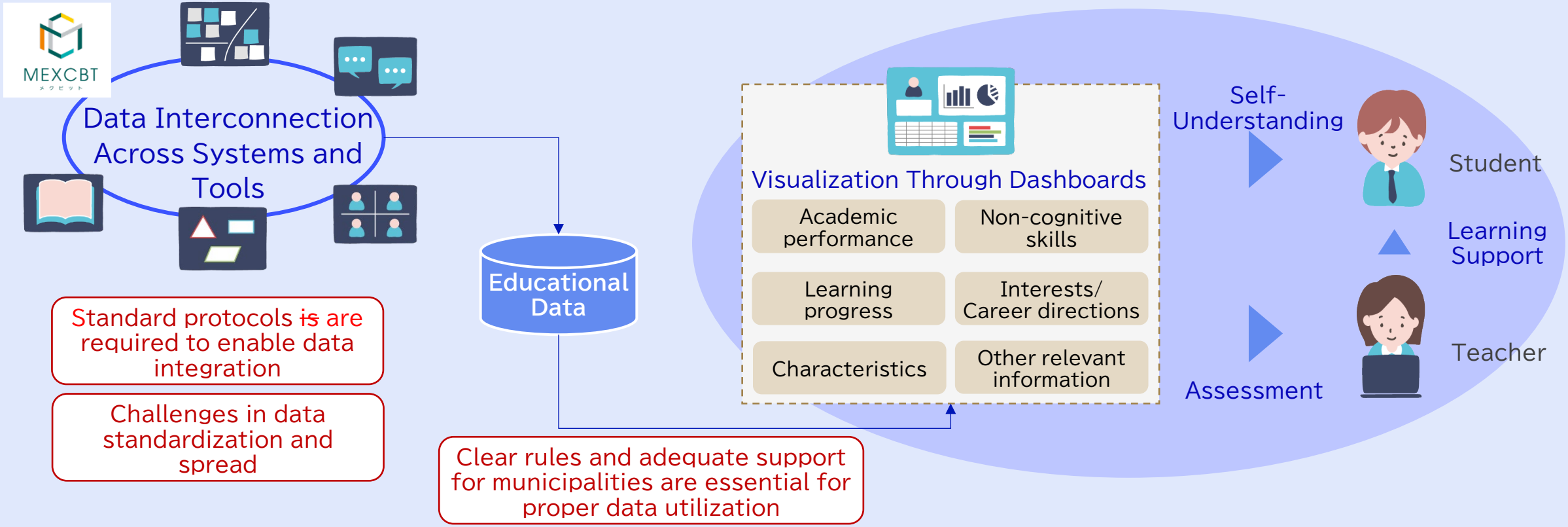
Learning with One Device per Student
Promoting Learning with Devices, MEXCBT, Spread of Digital Textbooks

Diverse Learning Tools
Procurement Support for Diverse Learning Tools, Utilizing Generative AI in Learning

Ⅲ Enhancing Students Self-Understanding and Teachers Assessment Through Data (Development and deployment of data utilization environments)

【Goals】

Secure data utilization across different tools becomes possible, enabling support for learners' self-understanding and teachers' assessment by interconnecting systems and tools through standard protocols and standardizing educational data.



Measures

Interconnection of Educational Services
Interoperability Standard Model, Promoting Standard Protocols

Standardization of Educational Data
Promoting Standardization, Implementation and Utilization

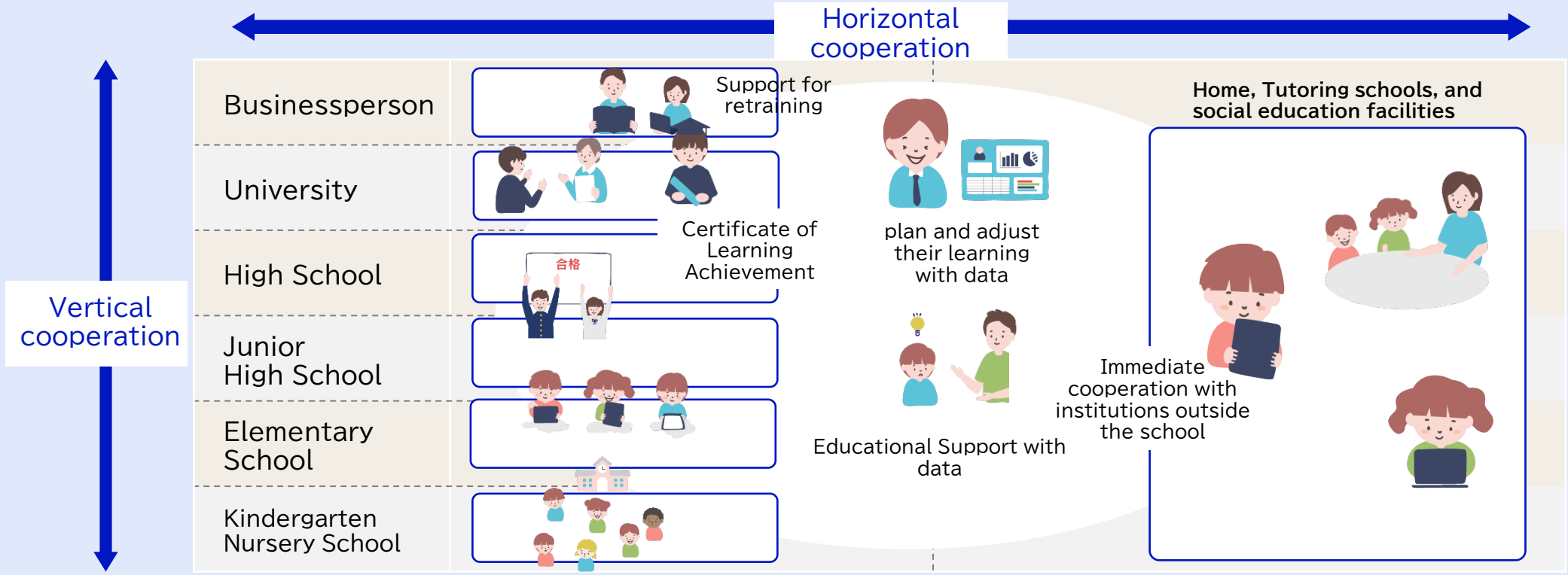
Utilization of Educational Data
Organizing Considerations from a Personal Information Protection Perspective, Creating Use Cases, Support for Municipalities

Ⅳ Developing Environments to Utilize Learning Data Throughout Life
(Empirical Research Inter-Organizational Educational Data Connection)

【Goals】

When transferring to another school or advancing to higher education, proper data management ensures continuity and data authenticity, enabling learners to provide proof of their learning history and use it for self-realization and necessary support. While pursuing this direction, preschool and higher education institutions should prioritize thorough digitalization to reduce staff burden and improve convenience for students and users.

Through the use of digital technology, we will establish an environment that enables: (1) inter-agency cooperation (vertical cooperation) to maintain data continuity regardless of transfer, advancement, or graduation, and (2) cooperation (horizontal cooperation) with various institutions and organizations, such as public education, tutoring schools, and social education facilities.



Measures

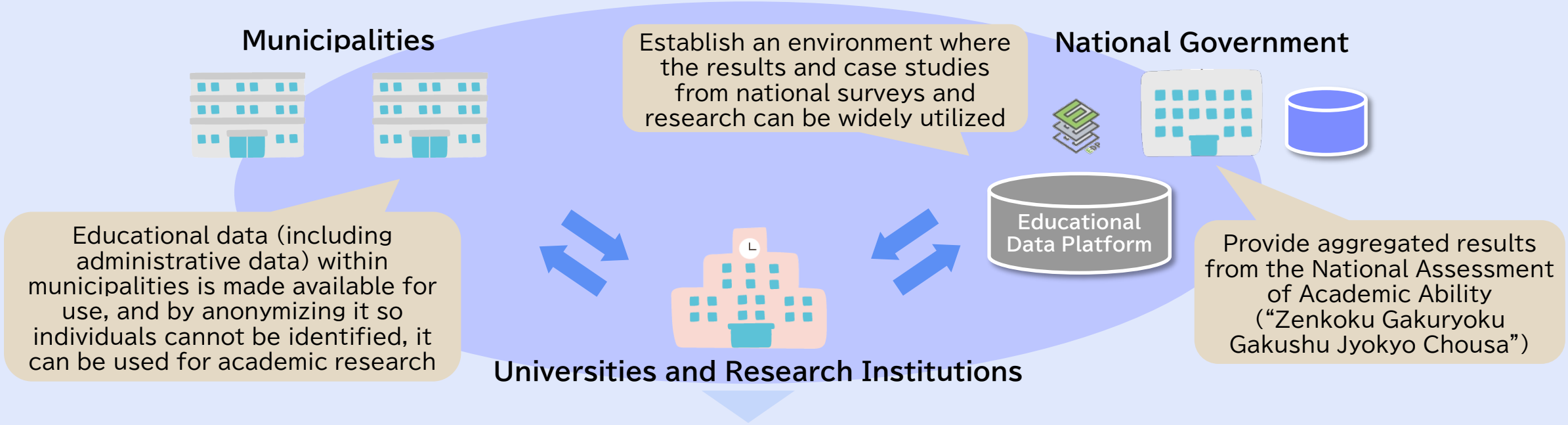
Digitalization of Processes across Institutions
Digitalization of Processes, Digitalization of Academic Credentials

Inter-Organizational Educational Data Connection
Data Connection across Municipalities, Institutions, and Other Sectors, Identification/Verification Infrastructures

V Utilization of Educational Data for Research that Contributes to Policy and Practice

【Goals】

Developing an environment that enables research institutions to access anonymized educational data as a foundation for supporting research that leads to improvements in educational policies such as EBPM and provides insights for daily educational practice.



Utilized for policy improvements by the national government and municipalities, and instructional improvements at schools, in response to the “Formation of foundation to implement policies focused on objective evidence” set forth in the Basic Plan for the Promotion of Education, and the promotion of effective measures based on evidence as indicated in the “Meeting on Digital Administrative and Fiscal Reform Compilation 2024”

Goals of Related Measures

	As Is	2028~2029 Advancing Diverse Learning Enabled by School DX and Digital Technology	To Be Realizing Personalized Learning through DX
Reducing Teachers' Burden through Digitalization	✓ SIS are constructed on on-premise, and teachers use two computers ✓ Paper-based operations remain mainstream	✓ Nationwide implementation of Next-Generation School Work DX environment ✓ Information required for account management can be linked between systems on a once-only basis	✓ Seamless digital integration of all administrative affairs tasks and fully online access to information →Realizing environment where **teachers** can spend more time with students
Developing Learning Environments for Diverse Learning	✓ One device per has been deployed, but network connectivity is insufficient ✓ Disparity in device utilization	✓ Devices have been procured at the prefectural level, enabling effective use daily ✓ Necessary network environments have been established ✓ Supporting local governments in procuring diverse tools and establishing environments where students learn with tools suited to them	✓ Learning environments, including devices and networks, are fully developed ✓ Diverse tools can be flexibly combined, enabling learners to pursue personalized learning →Realizing environment in which everyone can learn with diverse **tools**
Enhancing Students Self-Understanding and Teachers Assessment Through Data	✓ While standardization demonstrations are progressing, challenges remain in social implementation ✓ Advanced data utilization cases exist, but implementation varies across local governments	✓ Widespread use of standard specifications and implementation of data standards enables data connection across systems ✓ Data visualization through dashboards and other means has been realized while minimizing manual tasks such as name matching	✓ Teachers and learners can use diverse data to understand student status accurately and from multiple perspectives →Supporting learning through **data**
Developing Environments to Utilize Learning Data Throughout Life	✓ Data connection efforts and considerations are mainly limited to coordination within local governments	✓ Digital completion of data transfer between schools begins with leading local governments ✓ Social implementation of personal data utilization, including promotion of common infrastructure usage, begins in phases	✓ Learners can independently carry their learning history, prove their academic achievements anywhere, enabling self-realization and accessing necessary support →Enabling people to learn with **diverse resources** throughout life

Major Milestones KPI

Transition to Next-Generation School Work DX environment (2026-2029)

GIGA School Program Phase 2 (2024-2028) → GIGA School Program Phase 3 (2029-)

- Schools with necessary network 100% (-2025)
- Schools that practically utilize digital textbooks 100%(2028)

Sequential implementation of CBT for the National Assessment of Academic Ability(2025-)