

# Education DX & Utilizing Educational Data

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**文部科学省**

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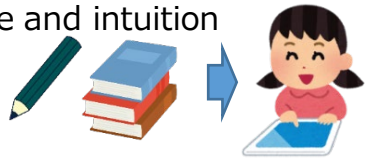
**MINISTRY OF EDUCATION,  
CULTURE, SPORTS,  
SCIENCE AND TECHNOLOGY-JAPAN**

# Education DX

Phase 1  
Digitization

Put into Digital

Standard Model Approach  
"Personal knowledge" based on  
experience and intuition



Efficient and effective via digitalization

(Maintenance of 1 device for 1 student by GIGA School concept)

Phase 2  
Digitalization  
Optimize



Guidance and educational administration improvement and optimization by utilizing ICT & data

(Full utilization of data by effective use of 1 device for 1 student)

Phase 3  
Digital Transformation

New Value

"Individual optimal model" approach  
Utilization of "collective intelligence"



Qualitative changes in the structure of learning models, creating new value

1 device for 1 student  
(GIGA School concept)

Promotion of Digital Textbooks

Promotion of Digitization  
at Universities and other Institutions

Standardization of educational data  
(Rules)

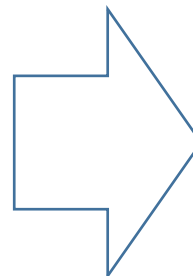
MEXT CBT system (MEXCBT)  
(Tools)

Educational data research, analysis,  
return new knowledge to students and teachers  
(in cooperation with the National Institute for Educational Policy Research)

## Changes Realized by Education DX

Until Now

"Partial and static" understanding  
"Personal knowledge" based on  
experience and intuition  
"Standard model" approach  
"Reactive" approach



In The Future

"Holistic and dynamic" understanding  
Use of "collective intelligence"  
"Individualized optimization" approach  
"Preventative" approach

## 1. Definition of "educational data"

- ✓ In principle, the data of students (learners) in **school education at the elementary and secondary education stage**.
- ✓ (1) **Students** (study logs for learning, life logs for living and health), (2) **teacher** guidance / support (assistance logs), (3) **School and school establishers** (management and administrative data)
- ✓ **Targeting** not only **quantitative data** (test scores, etc.) **but also qualitative data** (deliverables, attitudes toward learning independently, teachers' views, etc.)

## 2. Principles for use of educational data

- (1) **Education and learning should be prioritized over technology**
- (2) Utilize the **latest and most versatile** technology
- (3) Aim for **a simple and effective system**
- (4) Ensure **safety and security**
- (5) **Start small with sequential improvements**

## 3. Reasons for using educational data (concrete future concept)

### (1) Child's perspective

#### Look back over learning

- You can look over own learning and records at a glance and easily grasp strengths and weaknesses

#### Expand & supplement learning

- Develop learning into areas of interest
- Recommendations for overcoming weak areas and revision
- Compensating for areas lacking due to missed attendance or illness

#### Impart learning

- Connect learning at school and at home
- Learning remains even after transferring to another school or proceeding to higher education
- Digital presentation of qualifications and academic history

### (3) Parent's perspective



- Check how child is at school
- Easy contact with school

I can support home study based on learning at school!

### ② Teacher's perspective



You struggled with this in the previous grade. I'll need to explain this carefully.

#### Detailed guidance and support

- Varied data pertaining to each child can be seen at a glance
- Early detection and support for students who might otherwise slip through the cracks
- Understand and support children across the entire school
- Understand a child's situation prior to transferring to school or going up a grade

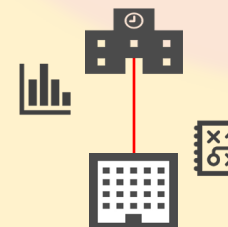
#### Teacher's own growth

- Refer to past experience and knowledge
- Share good practices and use them to improve instruction

He doesn't seem to have much of an appetite lately. I'll ask him if he's worried about anything.

Next time, I'll take a moment to praise this student about this!

### ④ School establisher's perspective



Here's what I think, but this is what the data says. I wonder if I can extract any more hints from this.

- Refer to real-time data for each school
- Hassle-free surveying of each school
- Improve measures when compared to similar local governments

That makes sense. So cities that had reduced truancy have these points in common!

### ⑤ Perspective of research institutes, such as government agencies and universities

- Realize evidence-based policy making (EBPM) by utilizing such data as revisions to the course of study
- Create new teaching and learning methods that were previously unknown
- Use data for further education and training of teachers, improving the quality of the education they provide

# 4. Perspectives on the utilization of educational data

## ① Primary use (practical purposes in the school) and secondary use (policy / research purposes)

- ✓ Primary use: Used according to individual students in specific situations and settings.
- ✓ Secondary use: Understand overall situation and developing trends. Information that can identify specific individuals will in principle not be used.

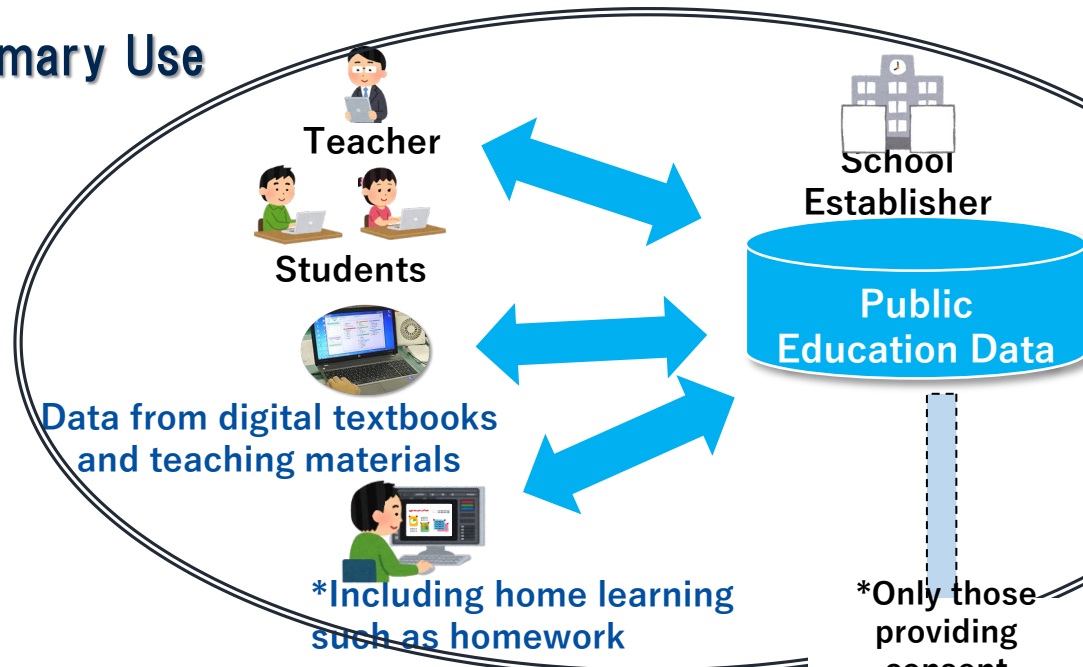
## ② Public education data and data for personal use

- Public education data: Data necessary for conducting public education.
- Data for personal use: Data that is utilized as an individual, including data outside the school. It is necessary to deepen considerations by the whole government, including secondary uses.



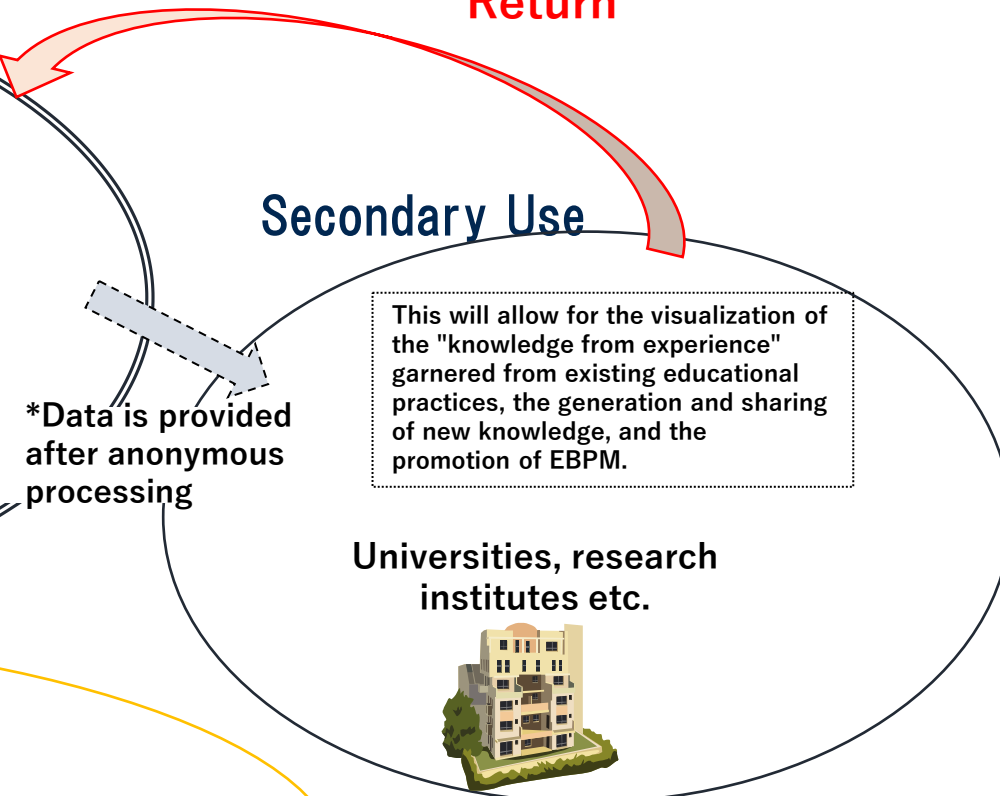
As the GIGA school concept of 1 device for 1 student continues to develop, there is first an urgent need **to improve the environment in which public education data can be used primarily at school sites nationwide**. Consideration and implementation of secondary use will be performed in parallel to such improvements.

### Primary Use



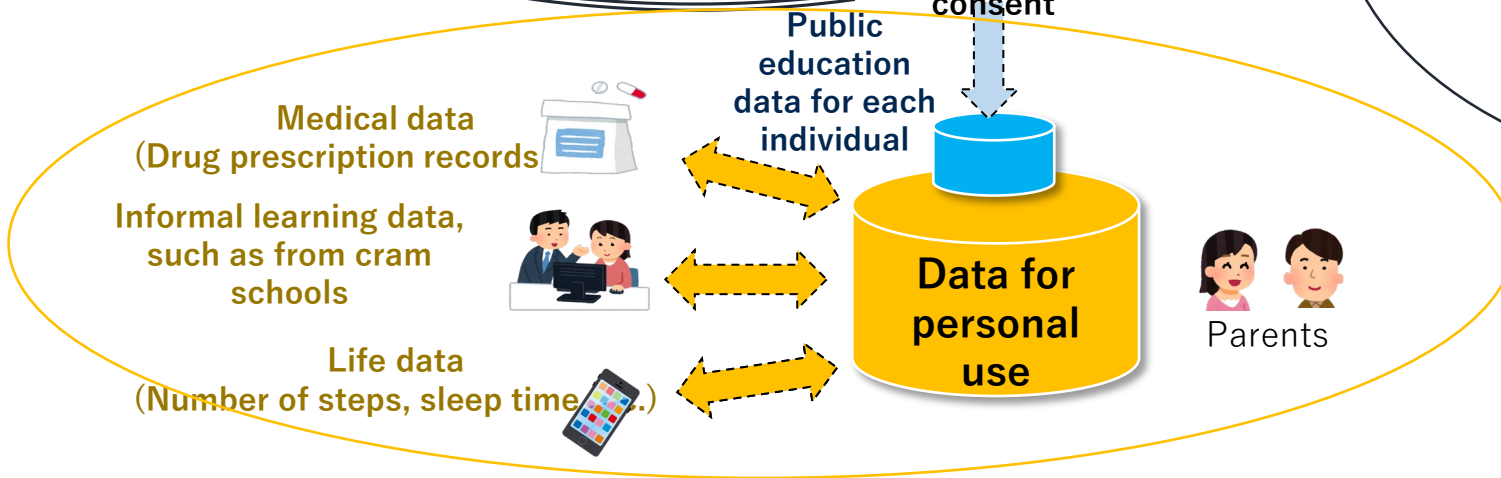
### Return

### Secondary Use



\*Data is provided after anonymous processing

\*Only those providing consent



## 5. Use in schools (primary use of public education data)

- ✓ It is necessary **to build a system that can be conveniently used** at each school.
- ✓ It is important **to be able to use multiple content and systems smoothly** via cross-referencing various educational data.



- ✓ **Multifaceted data is useful** when seeking to make an optimal individual response based on accurate understanding.
- ✓ **Cases of actual use should be collected and knowledge shared** so that schools and local governments can **utilize the data independently**. In addition, it is necessary **to build a support system and create communities** where local governments **can cooperate**.
- ✓ **Digital textbooks and teaching materials should be connected together**, allowing them to be **used in combination with other data**.
- ✓ It is necessary to promote **the spread of the "learning e-portal"**, which is the contact point for learning tools, and to **build a standard model for data aggregation for each school and local government**, taking into account the government cloud concept.

## 6. Use of big data (secondary use of public education data)

- ✓ Improving the level of education means it's necessary **to evaluate and improve based on the analysis of large-scale education data (big data) that contributes to practices in the educational scenes and policy making**. During this process, information that can identify specific individuals is not used.



- ✓ It is necessary **to consider the necessary mechanism based in the situations actually faced** by students and faculty members.
- ✓ It's important **understand what the school needs**, such as visualization and quantification of the techniques of excellent teachers, while **securing a two-way route to convey to researchers those things that have been effective**.
- ✓ **Discussions on policies for data use** should proceed. When doing so, it's necessary that the student themselves **does not handle the data unfavorably in an unintended manner**.

## 7. Lifelong data use (data for personal use)

- ✓ While such data **has merits for continuity and lifelong learning**, there are also **concerns that data will be distributed and used in a way undesirable to the individual**.



- ✓ **Convenience will be enhanced by allowing those who consent** to have not only public education data but also **various other lifestyle data collected for their own personal use freely**.
- ✓ As it is necessary to exchange data safely with businesses in various fields, it is **necessary to deepen considerations of the entire government**.

## 8. Standardization of educational data

- ✓ **Standardization of data content and standards is essential** to ensure interoperability of educational data.
- ✓ MEXT should **accelerate considerations of "educational data standards"**.



- ✓ We should proceed **in a way suited to the actual situation in Japan while also complying with international standards**.
- ✓ We will need to **revise and refine our approach based on the results of actual usage**.
- ✓ From the perspective of promoting the use of data in learning throughout life, including at universities, it is necessary **to work on expanding the scope of standardization**.
- ✓ **The Course of Study Code etc.** should be used for **digital textbooks and varied teaching materials**.
- ✓ It is necessary to consider the ideal form of student ID, based on specific cases going forward while also taking into account the progress of technology.

**Align the meaning of the data collected so that educational data can be exchanged, stored, and analyzed with other data,** rather than having different types and units of data for each service provider or user.

(1) Data content standards

Since the context differs depending on each country, in general each country will need to determine their own independent standards.

(2) Data technical standards

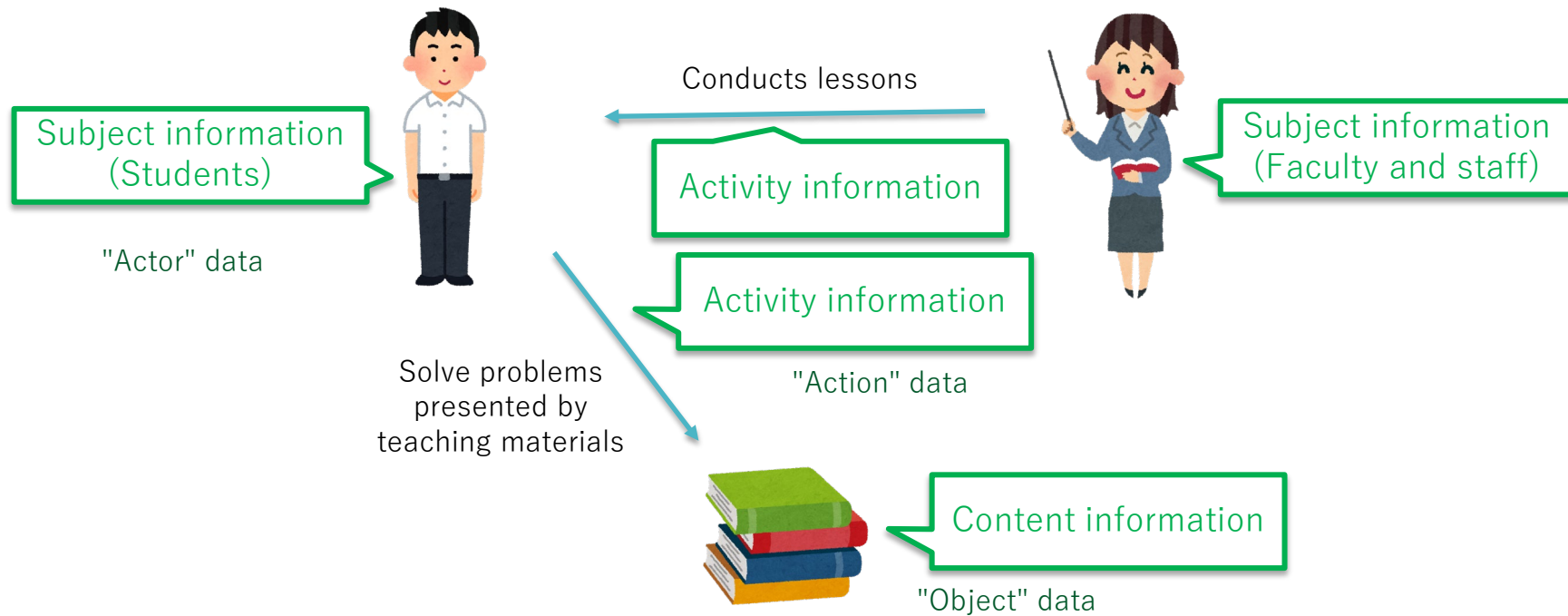
The technical standards for the data will mainly utilize the international standards in circulation.

## Nature of MEXT Educational Data Standards

- The target for standardization is educational data that requires a unified definition across Japan.
  - There's a wide variety of data related to education, with many different types, but data standardization does not need to cover all educational data. The target will be data that requires nationwide standardization from the viewpoint of data interoperability.
  - In actual educational activities, it is assumed that local governments, schools, faculty and staff, and students will use whatever data they think is necessary in addition to standardized data.
- Shared usage is recommended because of the mutual benefits
  - In the future, when developing new systems or renovating existing systems, it is recommended to follow the concept of data standards, as the use of educational data in accordance with such standards will increase the value-added learning opportunities for students. We will not impose legal obligations on the use of "data standards" or force educational institutions to use them.
  - In the future, various measures and subsidized projects related to educational information systems and data implemented by the MEXT will fundamentally be implemented in accordance with MEXT Educational Data Standards.

# MEXT Education Data Standards Framework

- Educational data is divided into (1) subject information, (2) content information, and (3) activity information.
  - (1) Subject information: Basic information, such as the attributes of students, faculty and staff, and schools.
  - (2) Content information: The content of the learning.
  - (3) Activity information: The actions that are actually taken (including not only learning behavior in a narrow sense but also related behavior)
- We will also define standards for systems that ensure the interoperability of educational data.





## MEXT Educational Data Standards Publication Schedule

### **1st Edition (FY2020)**

October: Released the "Course of Study Code," which is one form of content information

December: Released the "School Code," which is one form of subject information

### **2nd Edition (2021)**

December: Released with a focus mainly on subject information

### **3rd Edition (2022) (TBC)**

Fall (TBC): Release with a focus on content information and activity information

\*We plan to updated standards once a year.

# MEXT Educational Data Standards Publication (Course of Study Code)

- ✓ On October 16, 2020, the latest version of the Course of Study for elementary, secondary and upper secondary schools was announced as the "Educational Data Standards" (1st Edition) of MEXT. The other sections will be coded and announced by the end of the year.
- ✓ In response to the acceleration of the GIGA school concept, data is posted on the MEXT website in a format (Excel, csv) that is easy for teaching material providers to use, allowing them to do so as soon as possible.

(MEXT Educational Data Standards (Course of Study Code) Publication Schedule)

October: Elementary, secondary and upper secondary school (latest version of the Course of Study)

November: Elementary, secondary and upper secondary school (previously revised version of the Course of Study)

December: Kindergarten / special needs schools (latest version and last revised version of the Course of Study)

## Code Chart

B Life and Earth	826023320000000
(1) Living Things Around Us Students will be guided to acquire the following skills via activities to investigate living things around them by looking for and growing them, by paying attention to their appearance, surrounding environment, growth process, and body structure, and by comparing them.	826023321000000
A. To understand the following and acquire skills related to observation and experimentation.	826023321100000
(a) Living things differ in appearance, such as color, shape, and size. They also exist in relation to their surrounding environment.	826023321110000
(b) There is a certain order in which insects grow. The adult body consists of the head, thorax, and abdomen.	826023321120000
(c) There is a certain order in which plants grow. The flower's body consists of roots, stems, and leaves.	826023321130000
B. To find and express problems about the relationship between living things around us and the environment, the rules for growth of insects and plants, and the structure of the body, based on differences and similarities and through the investigation of those living things.	826023321200000
(2) The sun and the ground Students will be instructed to learn the following items through activities to investigate the relationship between the sun and the state of the ground, focusing on the state of the sun and the shade, and comparing them.	826023322000000
A. To understand the following and acquire skills related to observation and experimentation.	826023322100000
(a) The shade appears when the rays of the sun are blocked, and the position of the shade changes depending on the change in the position of the sun.	826023322110000
(b) The ground is warmed by the sun, and there is a difference in the warmth and moisture of the ground between the sun and the shade.	826023322120000
B. To find and express problems about the relationship between the sun and the appearance of the ground based on differences and similarities as they investigate the appearance of the sun and shade.	826023322200000

# Image of Application of Course of Study Code

➤ Using the Course of Study as a key, it is possible to link together digital textbooks, teaching material tools, and learning tools from private companies, and the digital archives of museums.

**Course of Study (Grade 6 Social Studies)**  
 3 Handling of Content  
 (2) Regarding content (2), the following shall be dealt with.  
 C. Regarding (a) to (f) of A, the following individuals should be selected and students guided to learn through the actions of said individuals. —— Nobunaga Oda...

Course of Study Code **8220265232000000**

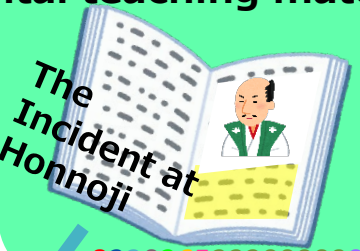
**Automatically linked with the Course of Study Code**

**Company A Digital Textbook**



8220265232000000

**Company B Learning Tools (Digital teaching materials)**




8220265232000000

**Company C Learning Tools (Digital workbook)**



8220265232000000

**Museum Digital archive**



8220265232000000

(1) Click the corresponding page of the digital textbook

(2) Related teaching materials and problems are automatically displayed

(3) Answer problems

(4) Materials related to the answers are displayed



\*There may be multiple guidelines for each item, such as teaching materials, so it is not always one-to-one. (Concept of tagging the Course of Study Code for use with each item)

# Subject Information: School Codes

## (1) Necessity for school codes

### Current situation & issues

- While the promotion of digitalization of society progresses on the whole, there have been no published numbers that can uniquely identify a school in Japan.
- In general surveys, schools are identified only by the name of each school, so it is difficult to link and analyze data across various surveys.

- “School Code” will be set for each school nationwide**, and once set will fundamentally not be changed.
- The school code will be widely disseminated across society, together with the school name and other information, for use not only in basic school surveys but also in various other forms of research. This will enable cross-sectional analysis using varied survey results (data) as the key, and is expected to contribute to the promotion of EBPM for education policy as stipulated in the Third Basic Plan for Education Promotion.

## (2) Basic handling of school codes

- For schools nationwide, MEXT will cooperate with each prefecture to provide each school with a unique school code.
- The school code consists of five elements: (1) the type of the school (school type), (2) the prefecture in which the school is located (prefecture number), (3) the type of school establisher (establishment category), (4) the school number, which is assigned without duplication within the classification based on the first three elements, and (5) the inspection number used to prevent input errors in regard to the other numbers.
- The school code will not be changed once it is set, for any reason, and if a school is closed it’s code will not be assigned to another school.
- The school code will be published on the MEXT website together with the following information regarding school attributes.

School type, prefecture number, establishment category, school name, school location, zip code, attribute information application date, attribute information abolition date, old school survey number, school code after transition

**Example school code: B1-01-1-1000002-9**  
 (The “-” between elements is for convenience)  
**Composition of school code (13 digits in total)**

School type (2 digits)	Prefecture number (2 digits)	Establishment category (1 digit)	School number (7 digits)	Inspection number (1 digit)
A1: Kindergarten *	01: Hokkaido	1: National	1000000	0
A2: Kindergarten with certified childcare center			-	-
B1: Elementary school	-	2: Public	9999999	9
C1: Secondary school	47: Okinawa Prefecture	3: Private	*The first digit cannot be 0	
C2: Compulsory education school				
D1: Upper secondary school				
D2: Secondary school				
E1: Special Needs School				
F1: University				
F2: Junior college				
G1: College of technology				
H1: Vocational school				
H2: Various other schools				

\*Including kindergarten-type certified childcare centers

# MEXT Educational Data Standards , 2nd Edition (2021)

The second edition (2021) focus on the definition of subject information based on the system that has been universally used in schools in the past.

Approx. 340 items

## (1) Subject information

Basic information, such as attributes of students, faculty and staff, and schools.



[Student information]  
Gender, date of birth, belonging school, grade, etc.



[School information]  
**School code**, number of students, number of classes, number of faculty and staff, etc.



[Teacher and staff information]  
License, years of service, etc.



[School establisher information]  
Establishment category, contact information, etc.

## (2) Content information

Define learning content etc.



[Learning content information]  
General information such as titles of textbooks and teaching materials, classification information such as target grades and areas of learning, rights information, and information such as creators  
**Course of Study Code**

## (3) Activity information

Define the actions that were actually taken (Including not only learning behavior in a narrow sense but also related behavior)

A. Lifestyle behavior	Record of lifestyle behavior School attendance, health status, etc.
B. Learning behavior	Record of learning behavior Learning records, records of deliverables, grades & evaluation information
C. Instructional behavior	Records of behavior regarding instruction Records of areas of instruction etc.

# Data Standards Composition for Subject Information

(1) Subject information: Basic information, such as the attributes of students, faculty and staff, and schools.

- “Subject information” consists of the domains of (1) students, (2) faculty and staff, (3) the school, and (4) the establisher of the school.

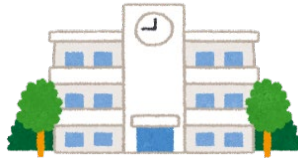
\*It should be noted that (4), the school establisher, will take time to coordinate with related parties, so it will be announced individually as soon as the coordination is completed rather than being the subject of this announcement.

## Domain of subject information



### Students

Attributes (gender, date of birth), school registration (belonging school, grade) etc.



### School

Establishment category, school type, number of students, etc.



### Teachers and staff

Attributes, teaching license etc.



### School Establisher ([xx] city, school corporation etc.)

Establishment category, contact information etc.

## Data Standardization Composition for Subject Information

- Among basic information, such as attributes, information belonging to individuals etc. that has few variable elements shall be the target of standardization.
  - \*Data that has elements that change from moment to moment due to daily activities (attendance, learning records, health status etc.) is referred to as “activity information.”
- From among "subject information", items for which it is appropriate to utilize international standards (ISO etc.) (gender, date of birth, etc.) and items that are standardized in common fields (national local government code etc.) will utilize those definitions, while other items will be newly defined for this data standard.
- Each item of "subject information" defines elements such as name, data type, number of digits, and code.

### Example student domain

Data Item	Data Type	Number of Characters	Code Name	Sample Value	Remarks
Full name	VCHAR	205	—	教科 太郎	Insert a double-byte space between the first and last name
Prefecture code	X	2	National local government code	13	<a href="https://www.jisc.go.jp/app/jis/general/GnrJISNumberNameSearchList?show&amp;jisStdNo=X0401">https://www.jisc.go.jp/app/jis/general/GnrJISNumberNameSearchList?show&amp;jisStdNo=X0401</a>
School code	X	13	Ministry of Education School Code	C1xxxxxxxxxx	<a href="https://www.mext.go.jp/content/20210830-mxtSyoto02-000017735_1-1.pdf">https://www.mext.go.jp/content/20210830-mxtSyoto02-000017735_1-1.pdf</a> P75
School type	X	2	School type *Note: School type code	A1	

\*The data type "X" means "half-width character string (including symbols)", and "VCHAR" is any character such as half-width alphanumerical characters and full-width characters.

\*"ISO" in the code name is an international standard set by the International Organization for Standardization, a non-governmental organization headquartered in Geneva, Switzerland.

\*"MEXT school code" in the code name has already been defined in the Educational Data Standards 1st Edition.

(Remarks)—The target of standardization does not cover all data items for educational data, but prioritizes those that require nationwide unification of definitions from the viewpoint of data interoperability.

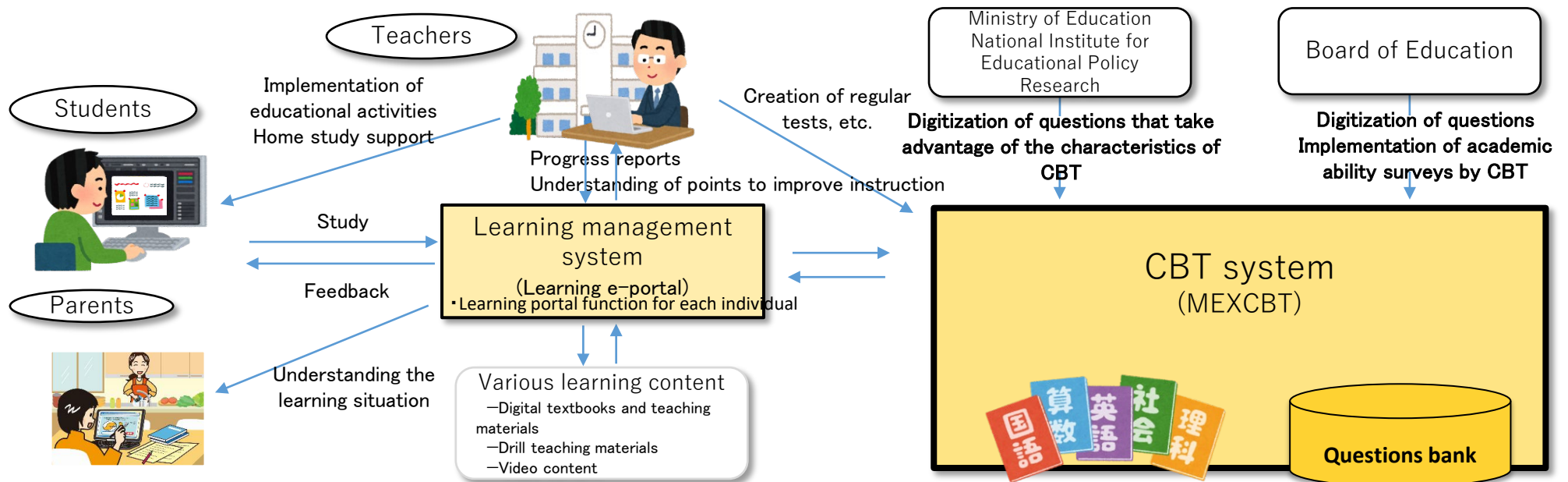
—It is not necessary for every school to collect the information as defined here. (Data etc. stipulated by laws and regulations must comply with said stipulations.)

—In addition to the standard data items, any that data that the school establisher or school thinks necessary can be defined and utilized independently.

# The MEXT CBT System (MEXCBT)

- **MEXCBT system that allows children to study and take assessment at school and at home** from the perspective of guaranteeing children's learning in elementary, secondary and upper secondary schools.
- **Developed by MEXT** (via consignment to a consortium of business associations).
- **It can use questions created by public institutions** such as the national and local governments.
- The GIGA School Concept will realize **digital-exclusive learning via 1 device for 1 student**.

MEXT + CBT  
MEXT Computer Based Testing

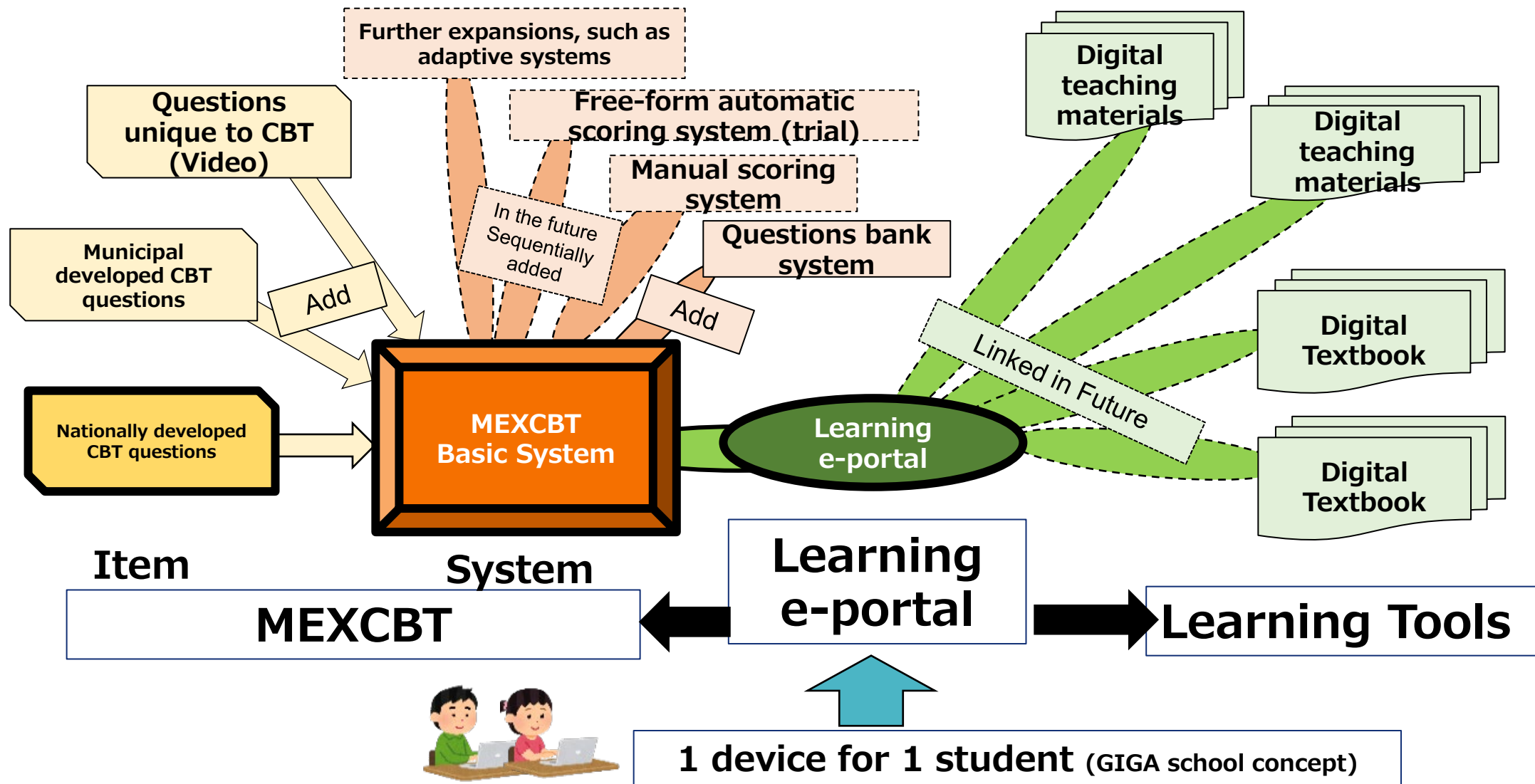


\*CBT: Computer Based Testing



# Fundamental Ideas Behind MEXCBT

- The basic system for digital learning, as public CBT platform.
- General-purpose system that can be mutually accessed by many users and businesses.  
(Introduction of general-purpose systems such as international standards)  
Mutual use of questions, data and knowledge



# Workflow for MEXCBT

## System Overview

### [General Remarks]

- Development of a general-purpose system based on international standards that enables interoperability of problems and data, and that allows students to practice questions online using a learning devices.

### [How to Use]

- The system can be accessed from home or school using the assigned learning devices.

- There are two ways it can be used.

#### (1) One-question-one-answer format

Choose a grade and subject and answer each question with an explanation afterward.

#### (2) Multiple question answer format

Choose a grade etc. and answering a series of questions.



- Automatic scoring for multiple-choice questions and some short-answer free-form questions
- Uses questions created by public institutions, such as the national and local governments.

E.g. National assessment of academi ability

High school graduation certification exam questions

Local government academic ability survey questions

Questions offered in a format only CBT can offer, such as using videos

## Workflow

### (1) Choose a question

**Learning e-portal**

Teachers



### (2) Solve questions and learn

**MEXCBT**

Students



### (3) Check results

Check the learning results in class

Check own learning results

**Learning e-portal**

# Demonstration of MEXCBT Prototype

## Prototype demonstration

- ✓ A prototype of the CBT system was developed in 2020.
- ✓ The prototype is loaded with about 2000 questions by digitizing existing questions created by the government (National assesment of academi ability questions, high school graduation certification exam questions, etc.).
- ✓ 140,000 children (30,000 in 2020 and 110,000 in 2021) used MEXCBT prototype.

## Demonstration

Use in class



Source: Nanao City Asahi Elementary School Homepage

Use in morning studies



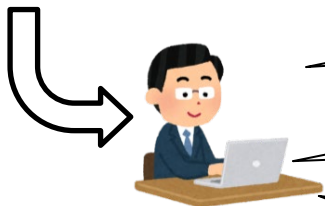
Source: Yusuhara Municipal Yusuhara Gakuen Homepage

Learning



Source: Fukushima University Junior High School Homepage

## Comments from teachers



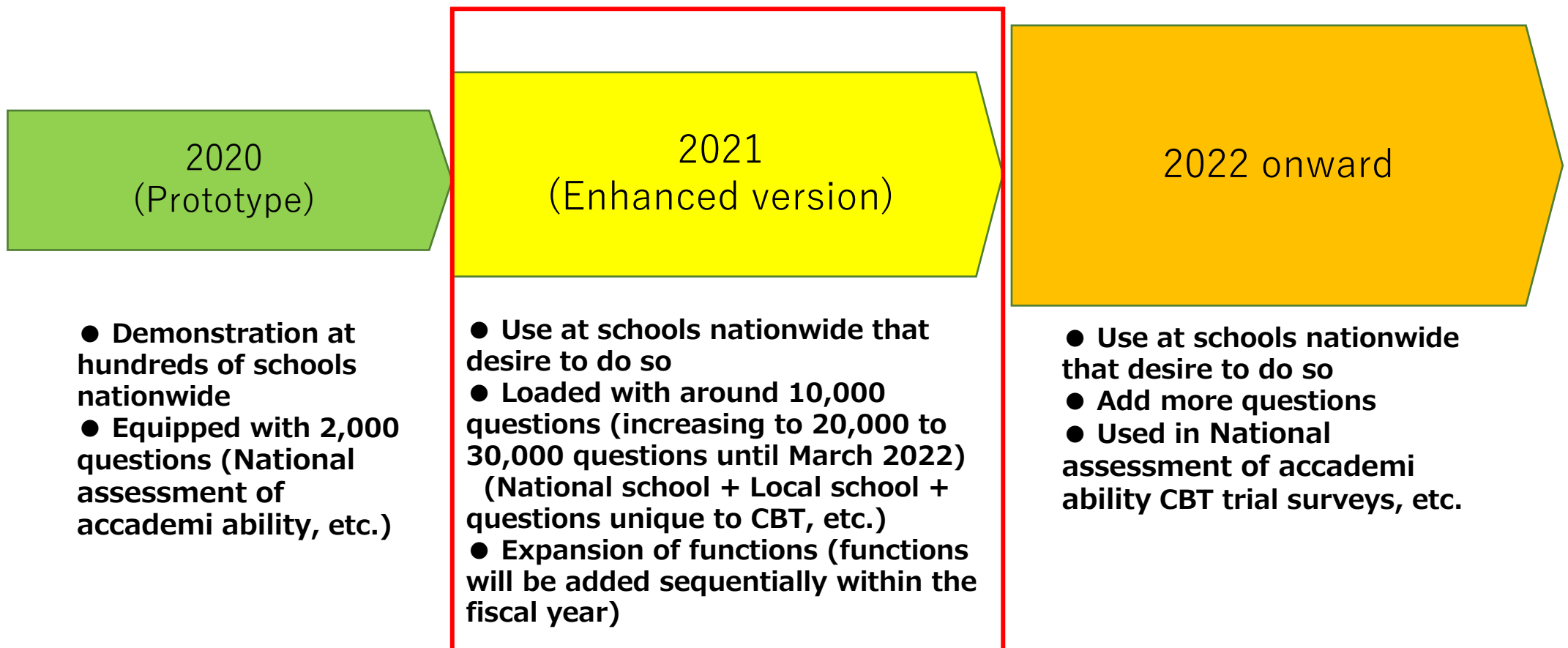
Students used MEXCBT during class, after school, and when studying at home (for homework).

The students enjoyed it because solving the problems showed them their score. I would like to use it again in the future.

Teachers can give a test simply by distributing it, which saves the trouble of printing papers and marking them, which improves work efficiency.

# Overall Schedule for MEXCBT

- Development of a prototype (trial version) started in 2020.
- Gradually expand content and functions as public CBT platform.
- Applications for MEXCBT (enhanced version) is used at elementary and secondary schools nationwide from December 2021.
- Currently, 7200 schools and 2.5 million students are registered.



# About the content added to MEXCBT (enhanced version)

	Prototype Version (FY2020, July-October 2021)	Enhanced Version (Content added sequentially from the beginning of December 2021)
Content	<ul style="list-style-type: none"> <li>• Questions such as <u>National assessment of academi ability developed by the government</u> (Approximately 2000 questions, such as from national academic ability surveys)</li> <li>• <u>Questions created by on-site teachers</u> using the test creation site</li> </ul>	In addition to the left: <ul style="list-style-type: none"> <li>• <b>Questions such as academic ability surveys from local governments</b></li> <li>• <b>Questions unique to CBT</b> that utilize videos etc.</li> <li>• <b>Various formats such as questionnaire surveys</b></li> <li>• <b>Explanation for students</b> of questions such as academic ability surveys developed by the government (sequential addition)</li> </ul>

Content newly added this year (total of about 10,000 questions as of the beginning of December, planned to be expanded to about 20,000 to 30,000 questions by the end of the year )

(Questions such as National assessment of academi ability of local governments)

	Elementary 1	Elementary 2	Elementary 3	Elementary 4	Elementary 5	Elementary 6	Secondary 1	Secondary 2	Secondary 3
Iwate Prefecture's "Survey on the degree of learning retention in Iwate Prefecture" "Survey on English confirmation for first-year junior high school students in Iwate Prefecture"					○ ○		○ ○	○ ○	
Chiba Prefecture's "Chibakko Challenge 100" "Chiba's Motivation Learning Guide"	○ ○	○ ○	○ ○	○ ○	○ ○	○ ○	○ ○	○ ○	○ ○
Saitama City's "Basic Academic Achievement Program"	○ ○	○ ○	○ ○	○ ○	○ ○	○ ○	○ ○	○ ○	○ ○
Satte City's "Power-up sheet and confirmation test"				○ ○	○ ○	○ ○	○ ○	○ ○	
Yamaguchi Prefecture's "Yamaguchi Learning Support Program"					○ ○		○ ○	○ ○	

(Questions unique to CBT using videos etc.)

—PISA (Program for International Student Assessment) questions

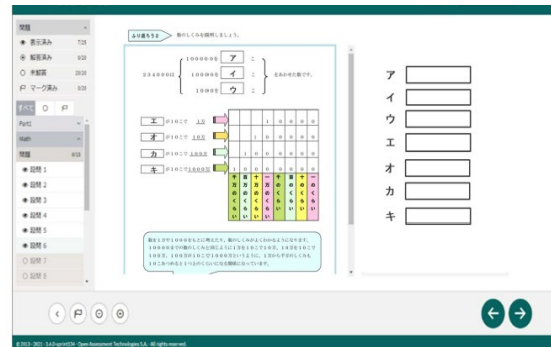
—Questions using video for science

—Content for promoting information moral education, etc.

(Others)

—Public questions such as English tests, math tests, kanji tests, etc.

—Various types of trials such as questionnaire surveys, etc.



Saitama City's "Basic Academic Achievement Program" Public questions from PISA 2015  
\*The format of some questions has been changed in order to work with the system.

# Functions Added to MEXCBT (enhanced version)

	Prototype Version (FY2020, July-October 2021)	Enhanced Version (Functions will be added sequentially from the beginning of December 2021)
Functions	<ul style="list-style-type: none"> <li>• <u>Basic questions handling system</u> (Automatic scoring of multiple-choice questions and short-answer questions)</li> </ul>	<ul style="list-style-type: none"> <li>• <u>Improved usability based on the prototype</u> (Question bank, improvement of convenience of question search / selection, expansion of input tools)</li> <li>• <u>Expansion of freedom in question distribution, etc.</u> (Distributing specific questions to specific municipalities and schools)</li> <li>• <u>Enhancement of scoring system for free-form questions</u> (Allows teachers to manually score. Trial of automatic scoring function)</li> </ul>

## New features to be added

Period for Function Expansion	Expected Functional Improvement and Expansion
Early December 2021	<ul style="list-style-type: none"> <li>— Improved convenience of question search and selection</li> <li>— Test implementation support functions (line marker, etc.)</li> <li>— Connection to learning e-portals other than for demonstrations</li> </ul>
January 2022	<ul style="list-style-type: none"> <li>— Deliver specific questions to specific local governments and schools</li> <li>— Improved visibility of the test execution screen</li> <li>— Implementation of formula input support tools</li> <li>— Multiple simultaneous distribution of questions (*)</li> </ul>
March 2022 (TBC)	<ul style="list-style-type: none"> <li>— Expanded question search methods (selection from question list, etc.)</li> <li>— Manual scoring by teachers for short-form questions (trial implementation)</li> <li>— Register question meta information and apply for disclosure from the system</li> </ul>

(\*) Start periods may differ depending on the learning e-portal used.

## (Question search screen)

問題検索

問題の種類 ※必須	全国学力調査過去問	形式 ※必須	<input checked="" type="radio"/> 複数問題形式 <input type="radio"/> 一問一答形式
学年	小学6年	教科	算数/数学
級			
タイトル	フリーワードで検索 例: 中3 英語		

リセット 検索

問題一覧

No.	タイトル	学年	教科	級	問題情報	解説情報	
1	全国学力調査令和2年度小6算数	小学6年	算数/数学		自	自	選択
2	全国学力調査平成31年度小6算数	小学6年	算数/数学		自	自	選択
3	全国学力調査平成30年度小6算数A	小学6年	算数/数学		自	自	選択
4	全国学力調査平成30年度小6算数B	小学6年	算数/数学		自	自	選択
5	全国学力調査平成29年度小6算数A	小学6年	算数/数学		自	自	選択

# Learning e-portal Overview

Software system with common and necessary learning management functions suitable for elementary and secondary education in Japan.

## (1) Learning portal function

This function enables comprehensive visualization and use of compatible data from various learning resources (such as digital textbooks, teaching materials, and various tools) on the learning e-portal, leading to both individualized optimal learning and collaborative learning.

## (2) Collaborative hub function

It can also function as a hub for collaboration when using learning resources, such as facilitating access through single sign-on.

(In addition to making things more convenient for users, this also saves unnecessary costs by eliminating the need for digital materials providers to link with each software.)

## (3) Access to the MEXT system (MEXCBT)

A function to access the public CBT platform (MEXCBT) operated by MEXT.

Concept of Functions

Areas of Cooperation	In order to ensure mutual compatibility between tools, general-purpose definitions such as international standards are made and implemented for each tool.	<ul style="list-style-type: none"> <li>—Learning tool linkage function</li> <li>—Study log receiving function</li> </ul>
Areas of Competition	Outside of areas of cooperation, each company devises and implements its own functions.	<ul style="list-style-type: none"> <li>—Dashboard function</li> <li>—Timetable, schedule function, etc.</li> </ul>

The learning e-portal was introduced as a portal function (about 140,000 students tried it) in the FY2020 and 21 MEXCBT prototype.

At ICT CONNECT21, business operators and researchers considered standard models and technical standards for learning e-portals, and announced them in March 2021 ( <https://ictconnect21.jp/document/eportal/#standard> ). Based on these findings, each company has implemented functions that comply with learning e-portal standards.

As of January 2022, there are the following four learning e-portals, but it is expected that the number will increase in the future.

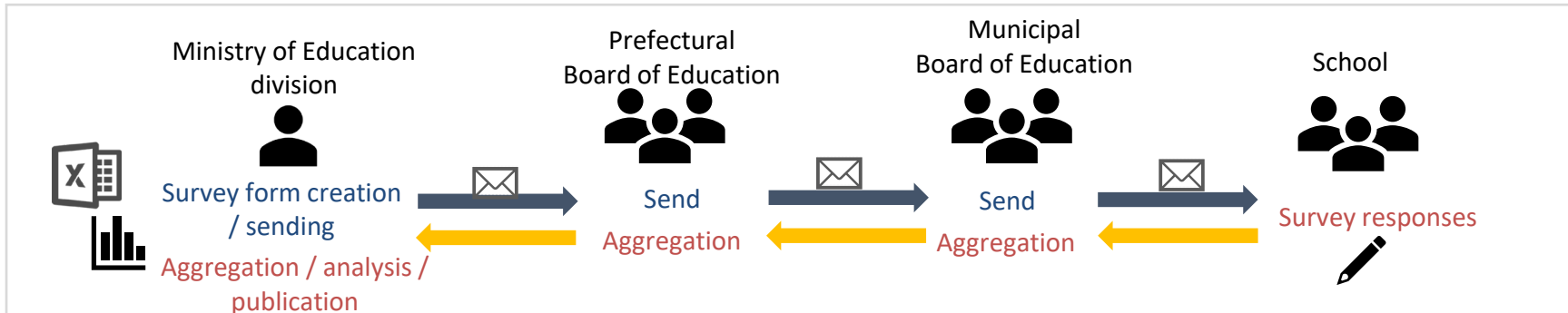
- L-Gate (Uchida Yoko Co., Ltd.)
- Open Platform for Education (OPE) (NEC Corporation)
- Manabi Pocket (NTT Communications Co., Ltd.)
- Studyplus for School (Studyplus Inc.)

\*When using MEXCBT, it is also possible to use the learning e-portal provided by the MEXCBT Consortium.

# MEXT Internet Survey System (Education Field)

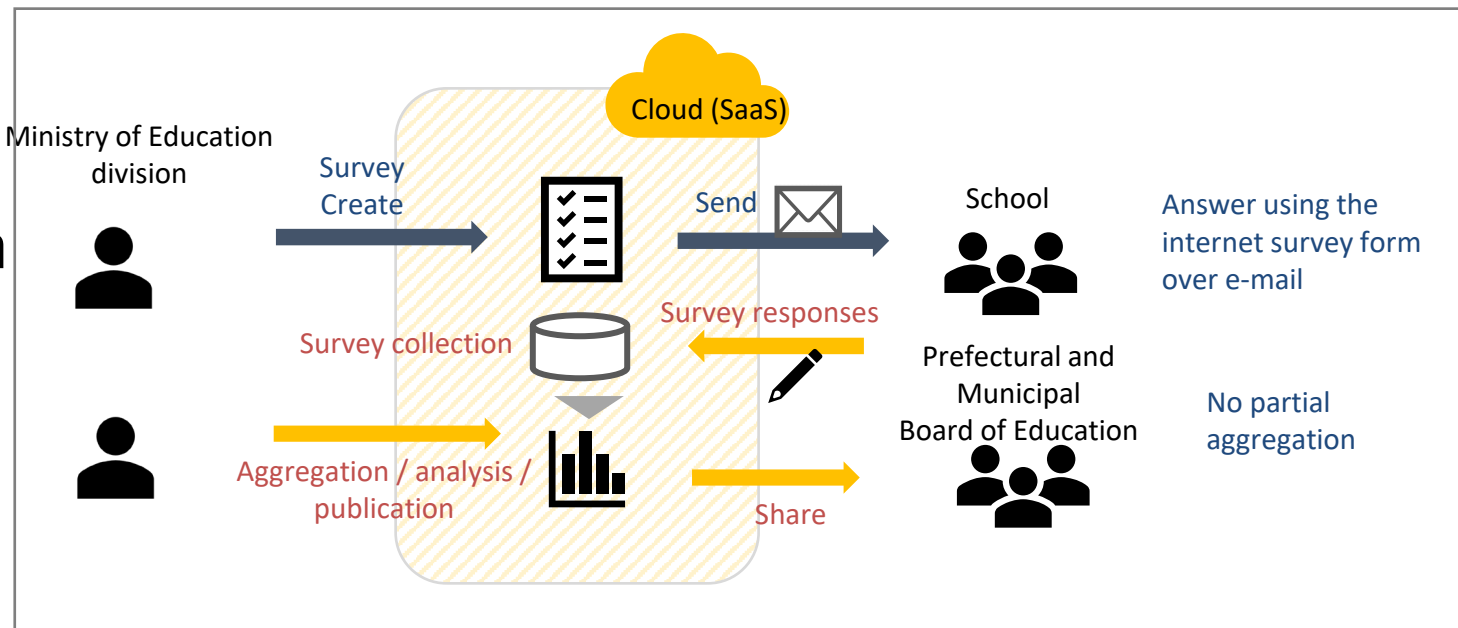
## MEXT internet survey system

- ✓ enables automatic tabulation and graphing by having schools respond directly to the cloud.
- ✓ scheduled to be used from March 2022



## Old System

New System

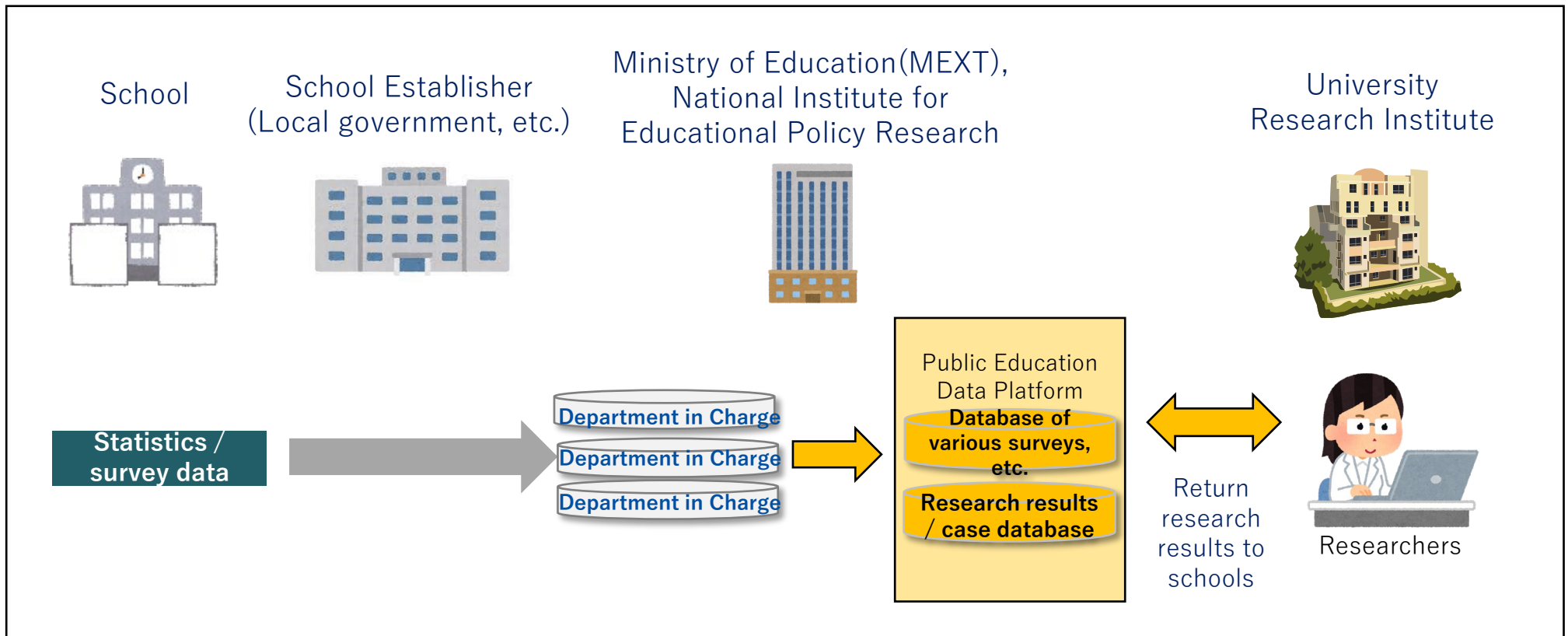




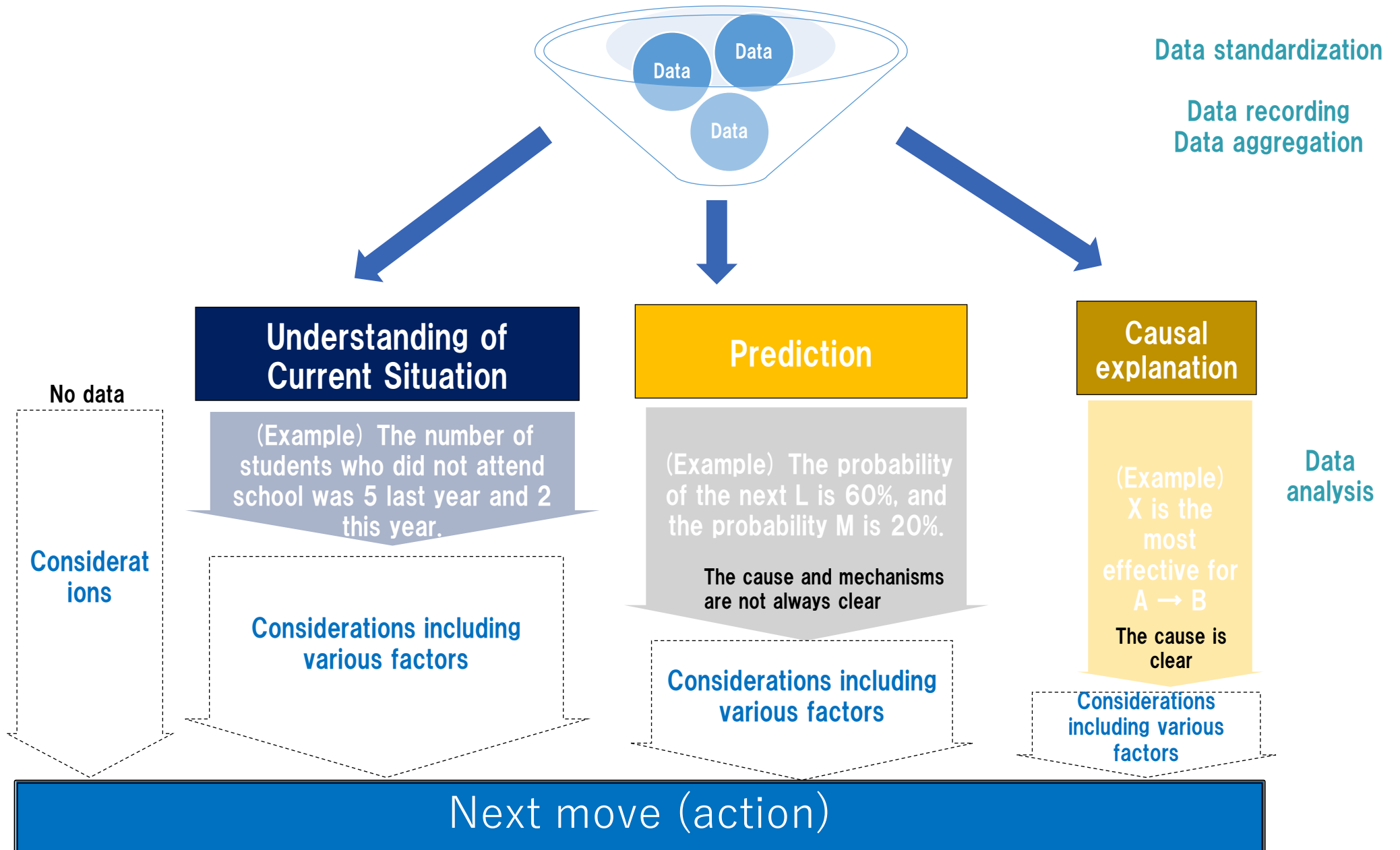
# Building the Public Education Data Platform

## Public education data platform

- ✓ For collecting and disclosing national educational data, research results, and test cases.
- ✓ Trial version system will be established and started operation in FY2022. Official version will be used in FY2023.



# Educational Data : From Analysis to Taking Action



# Analysis and Utilization of Educational Data for Policy Making and teaching, learning at school

Issues in the analysis and use of educational data:

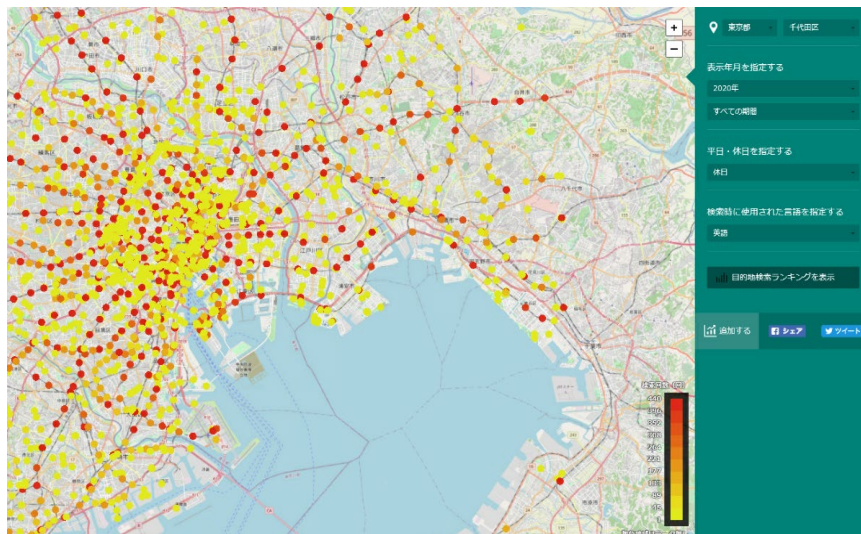
- The results and knowledge that have been carried out so far are scattered and have not reached required officials, teachers and students.
- Each entity is working separately, and is not systematized and ready for immediate use.

We will **advance efforts** to make useful knowledge in the educational scenes available to all necessary schools and installers nationwide.

(1) **Aggregation, organization, systematization, and dissemination of knowledge,** (2) **Create useful knowledge in the field**

\*MEXT plans to publish the "Guidebook for Using Educational Data in Educational scenes (tentative name)" in FY2021.

\*Scheduled to create a "Public Education Platform" at the Educational Data Science Center of the National Institute for Educational Policy Research in FY2022.



<https://resas.go.jp/tourism-foreigners/route>

## Reviewed Research

Charter Schools					
January 2018					
<a href="#">EVIDENCE SNAPSHOT</a> <a href="#">INTERVENTION REPORT (938 KB)</a> <a href="#">REVIEW PROTOCOL</a>					
Outcome domain	Effectiveness rating	Studies meeting standards	Grades examined	Students	Improvement index
English language arts achievement	++	4 studies meet standards	5-12	20,804	8
General Mathematics Achievement	+++	4 studies meet standards	5-12	19,542	12
Science achievement	+	2 studies meet standards	6-12	18,712	11
Social studies achievement	+	2 studies meet standards	6-12	10,363	5
Student progression	0	1 study meets standards	9-12	852	--

<https://ies.ed.gov/ncee/wwc/Intervention/1188>

# **Roadmap for Use of Educational Data**

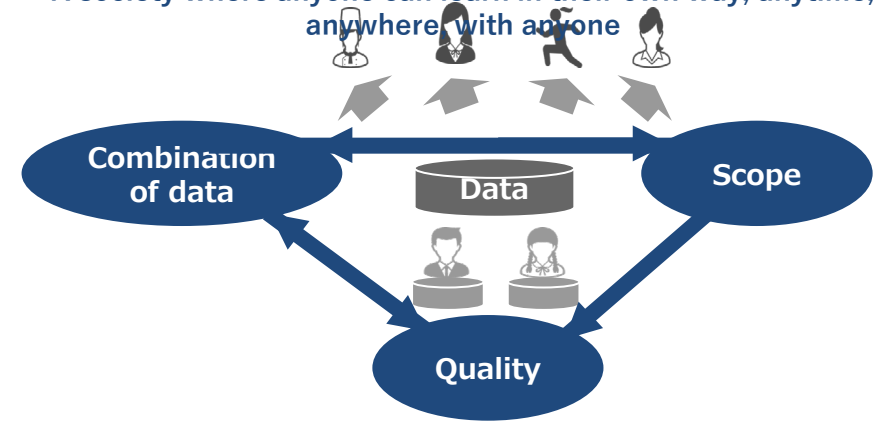
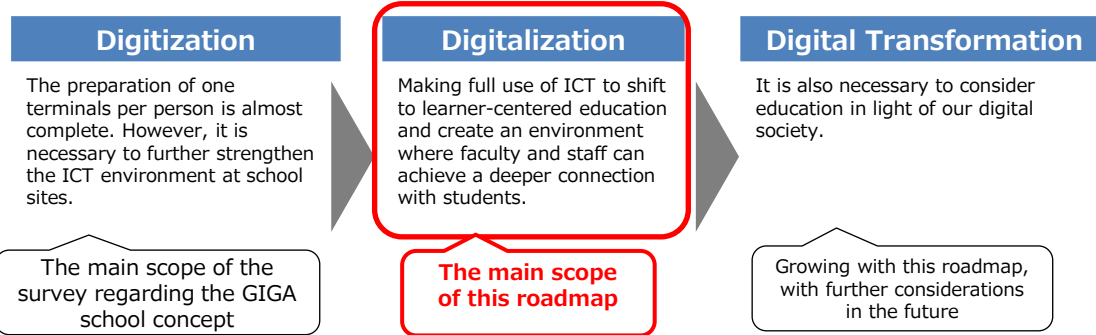
January 7, 2022

Digital Agency  
Ministry of Internal Affairs and Communications  
Ministry of Education  
Ministry of Economy, Trade and Industry

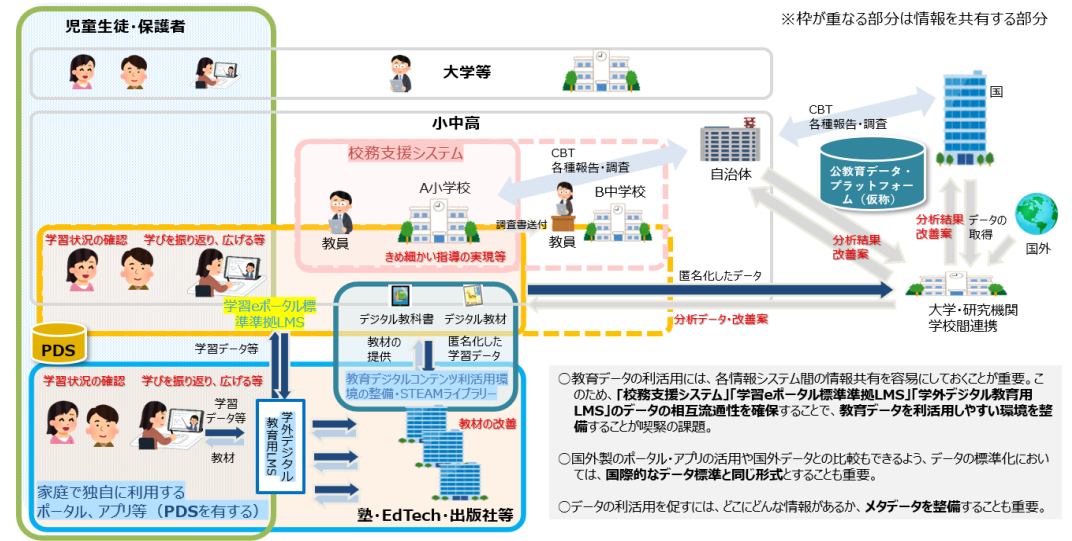
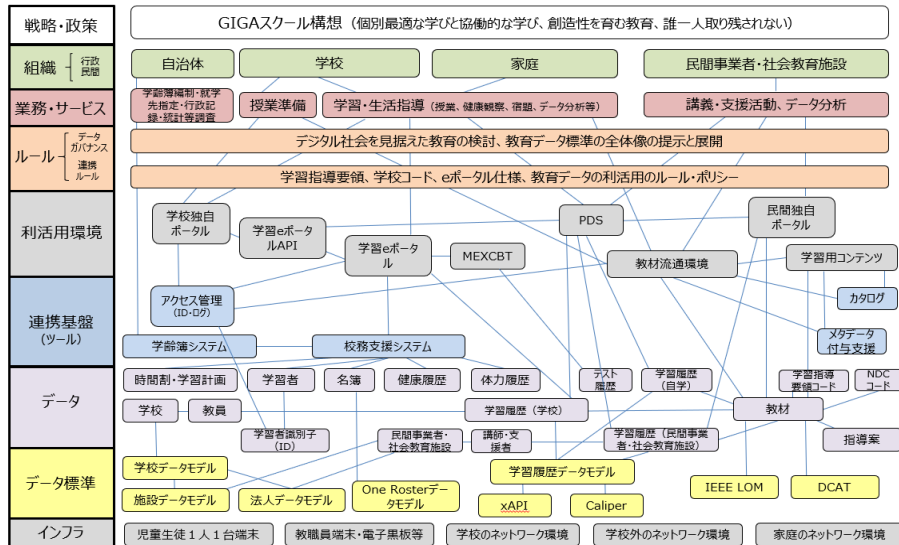
# Key Points for the Roadmap for Use of Educational Data (1) (General)

- Following [the compilation of the survey on the GIGA school concept](#) in September last year, the relevant ministries and agencies have begun to formulate a roadmap for the use of educational data. First of all, the mission of the digitalization of education is to **create a society where anyone can learn in their own way, anytime, anywhere, with anyone**. In order to achieve this, we set **three axes: 1) scope, 2) quality, and 3) combination of data**.

A society where anyone can learn in their own way, anytime, anywhere with anyone



- In order to realize these, **the overall design (architecture (fig)) of the distribution and accumulation of educational data** is presented.



- 教育データの活用には、各情報システム間の情報共有を容易にしておくことが重要。このため、「校務支援システム」「学習eポータル標準化LMS」「学外デジタル教育用LMS」のデータの相互流通性を確保することで、教育データを活用しやすい環境を整備することが喫緊の課題。
- 国外製のポータル・アプリの活用や国外データとの比較もできるよう、データの標準化においては、国際的なデータ標準と同じ形式とすることも重要。
- データの活用を促すには、どこにどんな情報があるか、メタデータを整備することも重要。

## — Key Points for the Roadmap for Use of Educational Data (2) (Details)

- The report **then summarizes the issues related to each structure**, such as "rules," "utilization environment," "collaboration infrastructure (tools)," "data standards," and "infrastructure," and the **necessary measures to**

Issue	Direction for considerations
<b>Overview of educational data</b>	Classify educational data into (1) subject information, (2) content information, and (3) activity information, and organize the overall image based on the architecture.
<b>Standardization of online surveys and educational data</b>	After putting surveys and other data online, we will standardize educational data as needed while considering priorities. While referring to international standards, we will proceed in a way that is appropriate to the actual situation in Japan.
<b>The state of platforms in the education sector</b>	After analyzing the new value and necessary functions of data collaboration, we positioned the Learning e-Portal, the Off-Campus Digital Education Platform, the Public Education Data Platform, and other measures in the overall picture.
<b>Development of data utilization environment for schools, local governments, etc.</b>	To enable schools and local governments to utilize educational data, we will study the use of common infrastructure such as the government cloud, in addition to the school network environment, digitization of school work, teacher terminals, and student terminals.
<b>Rules and policies for using educational data</b>	The principles for the use of educational data, the direction of guidelines for the safe and secure use of one-per-person terminals, guidelines for educational information security policies, and aspects of data handling that may be problematic—such as personal data—are all to be summarized.
<b>Creating a lifelong learning environment</b>	In order to enable people to continue learning throughout their lives, we will discuss how to provide opportunities to acquire literacy according to life stages and situations, how to visualize the results of learning, and how to utilize identifiers (IDs), personal data stores (PDSs), and information banks.
<b>Realization of support for children who require it through data linkage</b>	Each local government will establish a system and structure to link data from such areas as education, childcare, welfare, and medical care as necessary, and will support verification projects to identify children who need support and then use this data for push-type initiatives that meet their needs.
<b>Education for a digital society</b>	In order to truly realize optimal individualized learning and collaborative learning, relevant ministries and agencies will work as one-team to examine whether there are any points that need to be improved in terms of systems etc., based on the shared mission and vision.

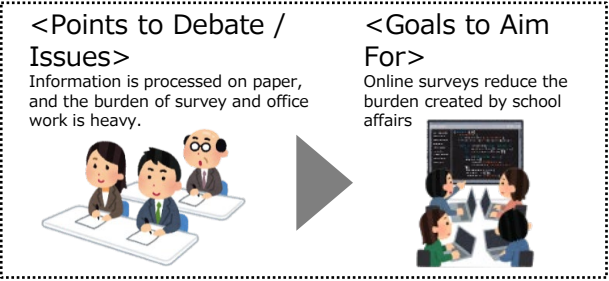
- Using the Digital Agency Idea Box, we **solicited opinions from a wide range of people on this roadmap from October 25 to November 26 last year**. Then, based on the opinions received and the exchange of opinions with experts (see attached sheet), the necessary measures were further discussed in depth **and the roadmap compiled**. In the future, in conjunction with the "**Priority Plan for the Realization of a Digital Society**" as decided by the Cabinet on December 24 based in the Basic Act for the Formation of a Digital Society, **the measures will be steadily promoted in cooperation with various stakeholders and will be flexibly reviewed in light of changes in the situation**.

# Key Points for the Roadmap for Use of Educational Data (3) (Short-term, Medium-term, and Long-term Goals)

- Divided into three major phases (short-term, medium-term, and long-term), each phase aims to achieve the following. In the future, along with clarifying and indexing the qualities and abilities that we aim to develop, we will promote measures based on the [process chart \(described later\)](#) while gathering practical cases from the demonstration project.

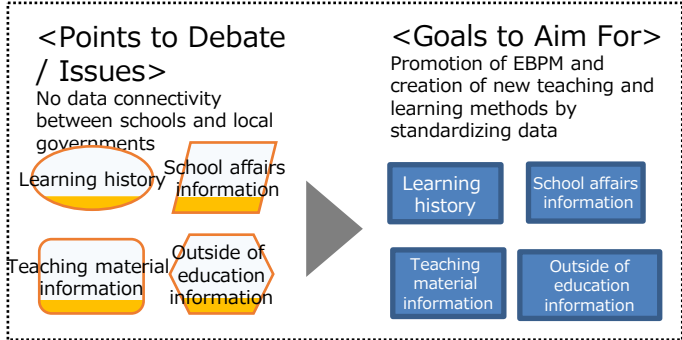
## Short term (around 2022)

- In principle, surveys and procedures targeting educational sites are online.
- Reduce the burden on schools by promoting the digitization of school affairs, such as digitization—in principle—of office work.
- Elimination of infrastructure obstacles (e.g. network environment).
- Standardization of basic items of educational data (e.g. subject information normally obtained nationwide by laws and surveys).



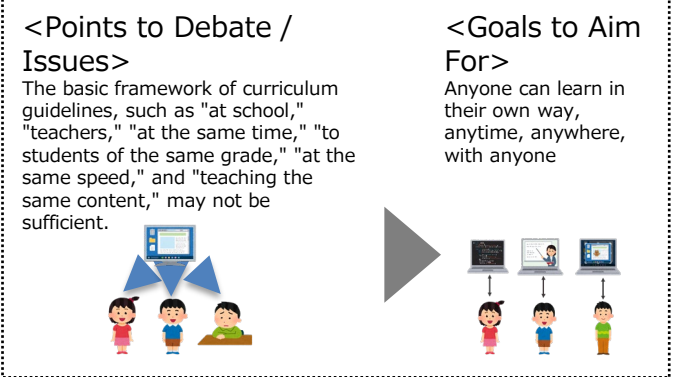
## Mid-term (around 2025)

- Learners will use the terminal on a daily basis; it will be possible to collect logs for the use of educational data.
- Contents and activity information are standardized at a certain level of granularity, and data linkage between schools and local governments is realized.
- Partial support based on each learning situation between school, home, and private education.



## Long term (around 2030)

- Learners can use PDS to accumulate and use their own data for a lifetime.
- Realization of standardization of content and activity information at a more granular level.
- Realization of push-type support for children who require it.
- Realization of true "individual optimal learning" and "collaborative learning."



## KPI concept to achieve realization

- Progress of online surveys and procedures
- Progress of digitization of school affairs
- Infrastructure indicators (terminals, networks, etc.)
- Daily use of terminals

\*It is important to measure from multiple angles

- Realization status of individual optimal learning and collaborative learning using ICT
- Improvement of information use ability (2022 information usability survey)
- Data use status
- Improvement of ICT use guidance abilities of teachers and staff
- Reduction of duties placed on teachers and staff (2022 survey of teachers and staff work)

- Improvement of academic ability (national academic ability / learning situation survey, etc.)
- Improvement of so-called non-cognitive abilities (National assesment of academi ability, etc.)
- Reduction of duties placed on teachers and staff (2022 survey of teachers and staff work)