Japan’s Educational Policy Aimed at 2030

July 28, 2018

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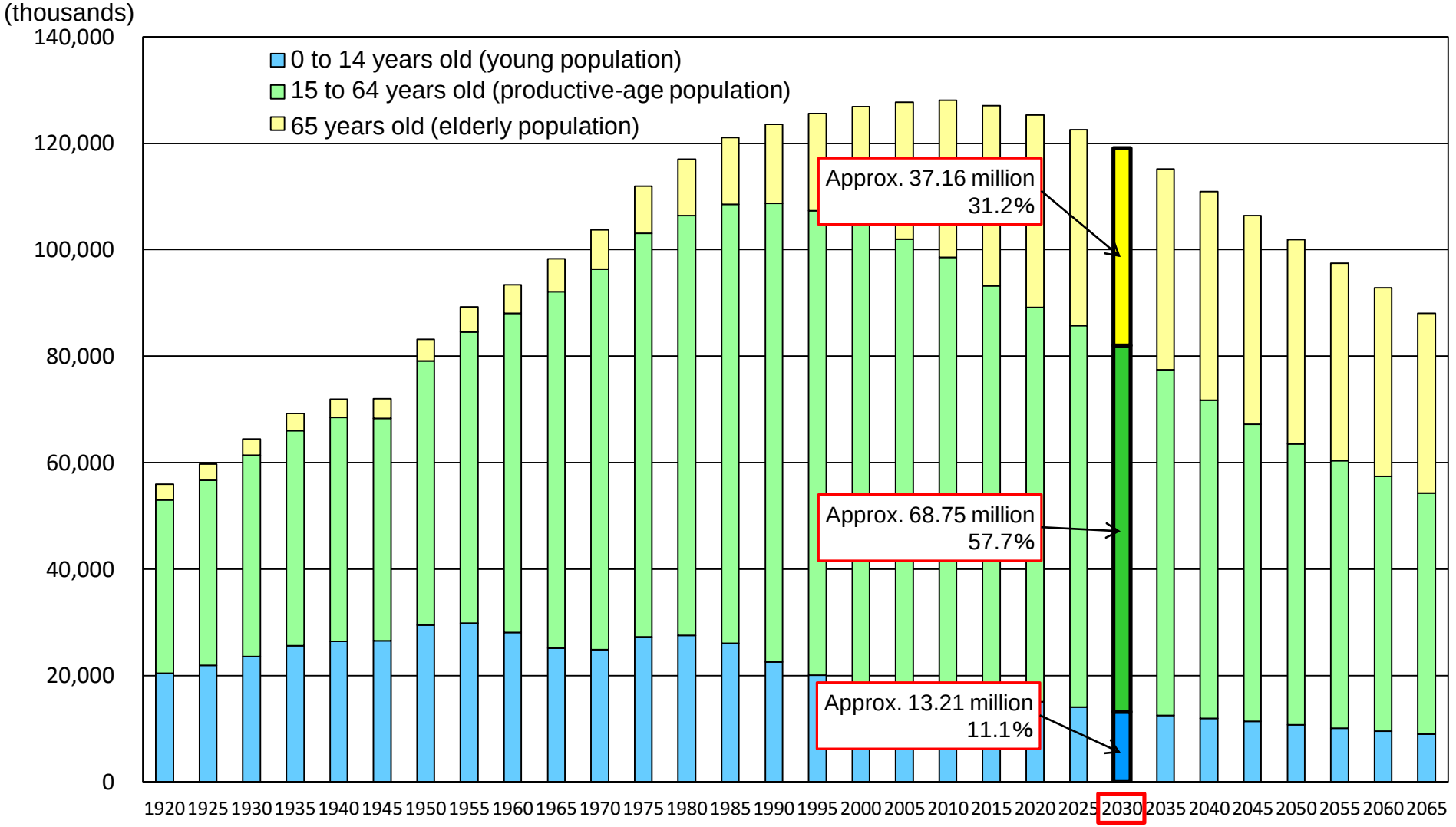
1. Image of Society after 2030

Advancement of the Decrease in Population / the Low Birthrate and Aging of Society

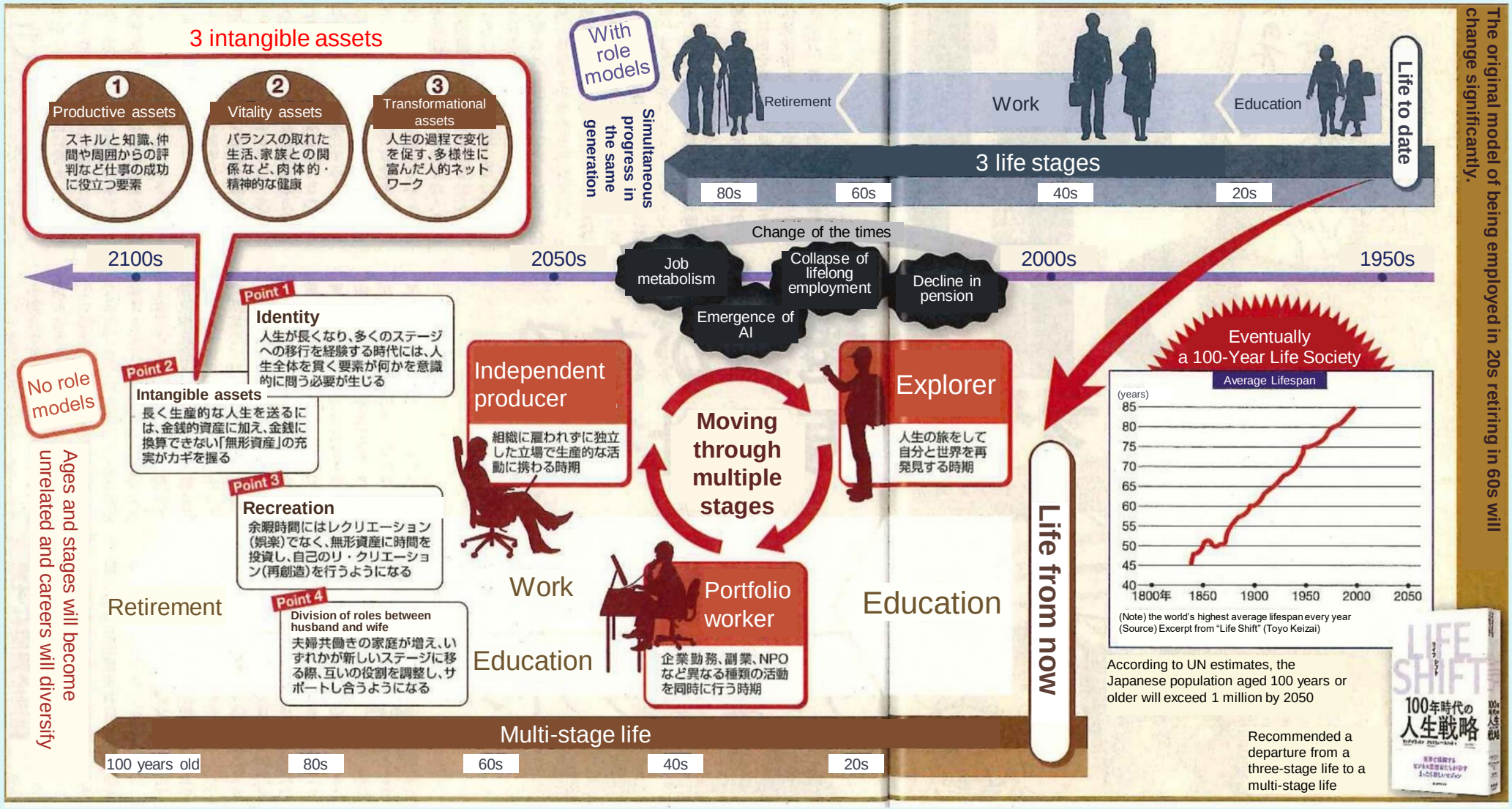
According to the forecast of National Institute of Population and Social Security Research, the young population will be 13.21 million and the productive-age population will decrease to 68.75 million in 2030 due to the decline in birthrate and aging of society. The population aged 65 or higher will exceed 30% of the total population of Japan.



* The estimated values are based on the median birthrate (median death rate). Actual values for 1945 to 1970 do not include Okinawa.
The values for 1945 use the age of 1 to 15 years for the young population, the age of 16 to 65 years for the productive-age population and the age of 66 years or older for the elderly population.

(Data) 1920 to 2015: "Population Estimates" (Ministry of Internal Affairs and Communications), 2020 to 2065: "Population Projections for Japan" (2017 estimate) (National Institute of Population and Social Security Research)

LIFE SHIFT Expanding in Japan

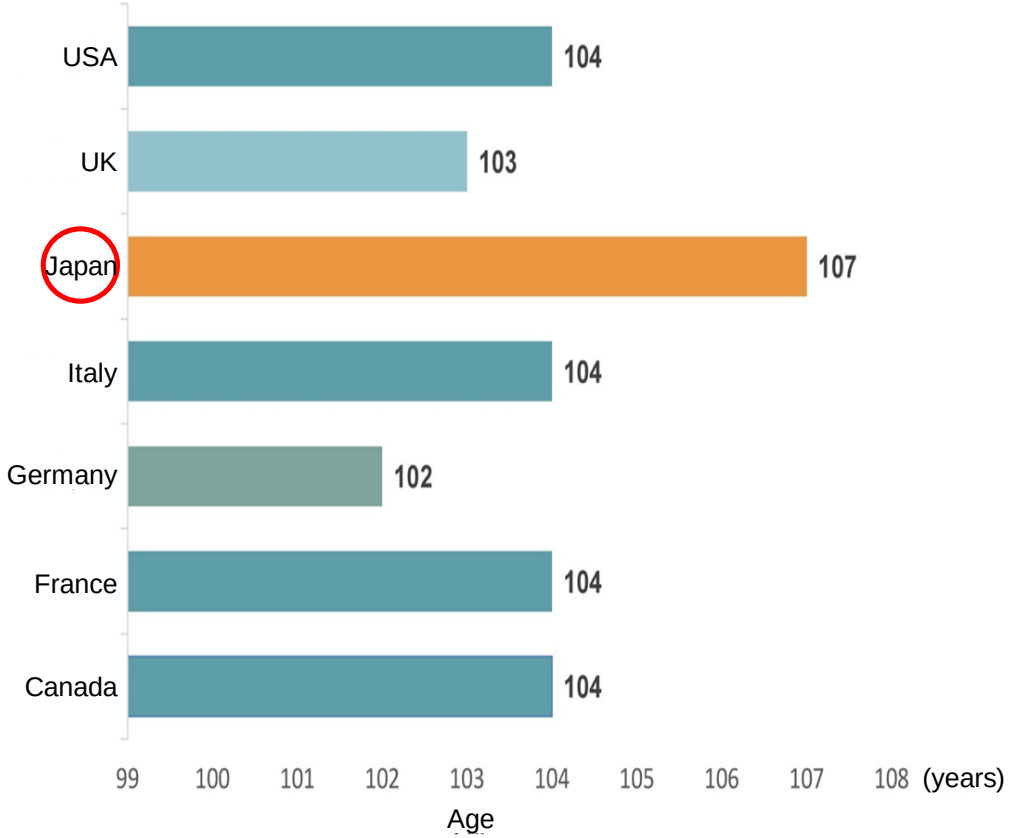


[Source] Weekly Toyo Keizai, July 22, 2017

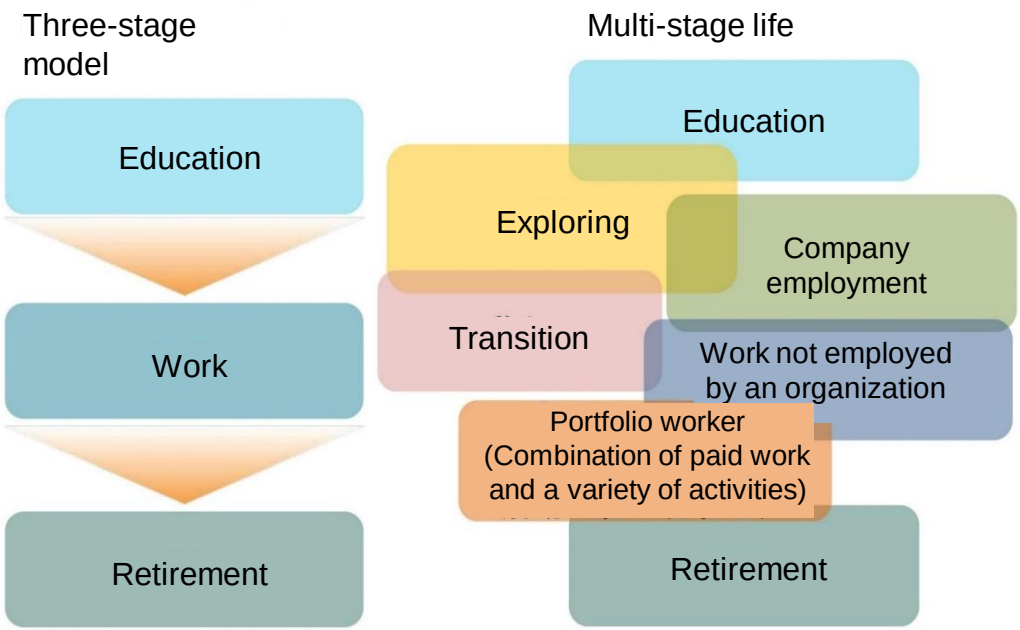
Advent of the “100-Year Life Society”

- Japan has become a longevity society with the world’s longest healthy lifespan, and it is said that children born in Japan in 2007 have a 50% probability of living to 107 years old.
- In the 100-Year Life Society, there will be a shift from the traditional three-stage life model of education, employment and retirement to a multi-stage model.

Age 50% of children born in 2007 are expected to reach



Multi-stage life rather than a three-stage life

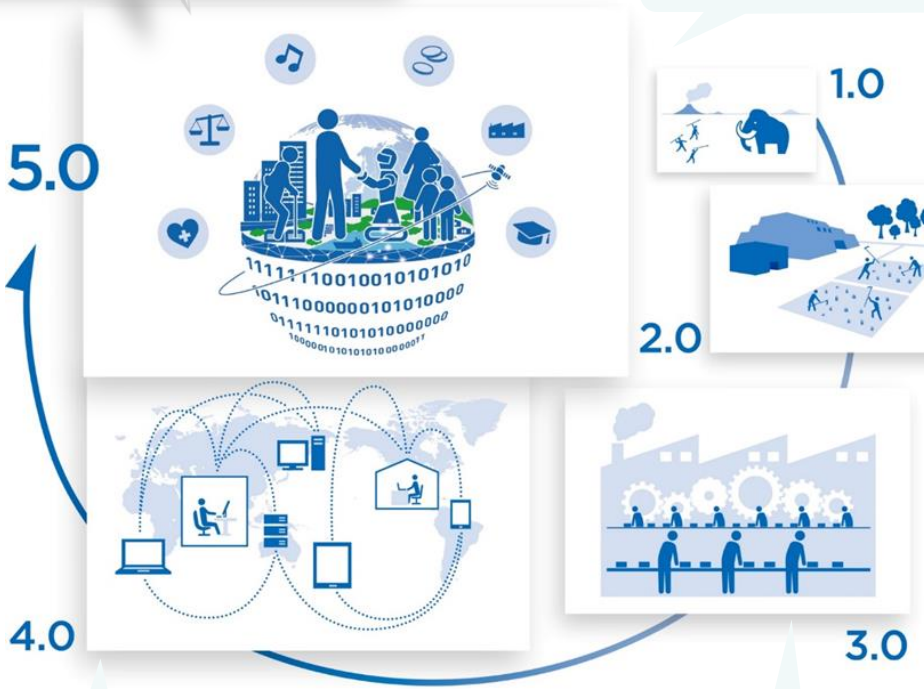


[Source] Materials submitted by Lynda Gratton to the 1st Meeting of the Council for Designing 100-Year Life Society held on September 11, 2017 (Japanese translation by the council secretariat)

Advent of Society 5.0

- In around 2030, technological innovation such as IoT, big data and AI referred to as the fourth industrial revolution will make further advancements. This is expected to be the advent of Society 5.0, which is the 5th new society for mankind following hunting society, agricultural society, industrial society, and information society.

New society
"Society 5.0"



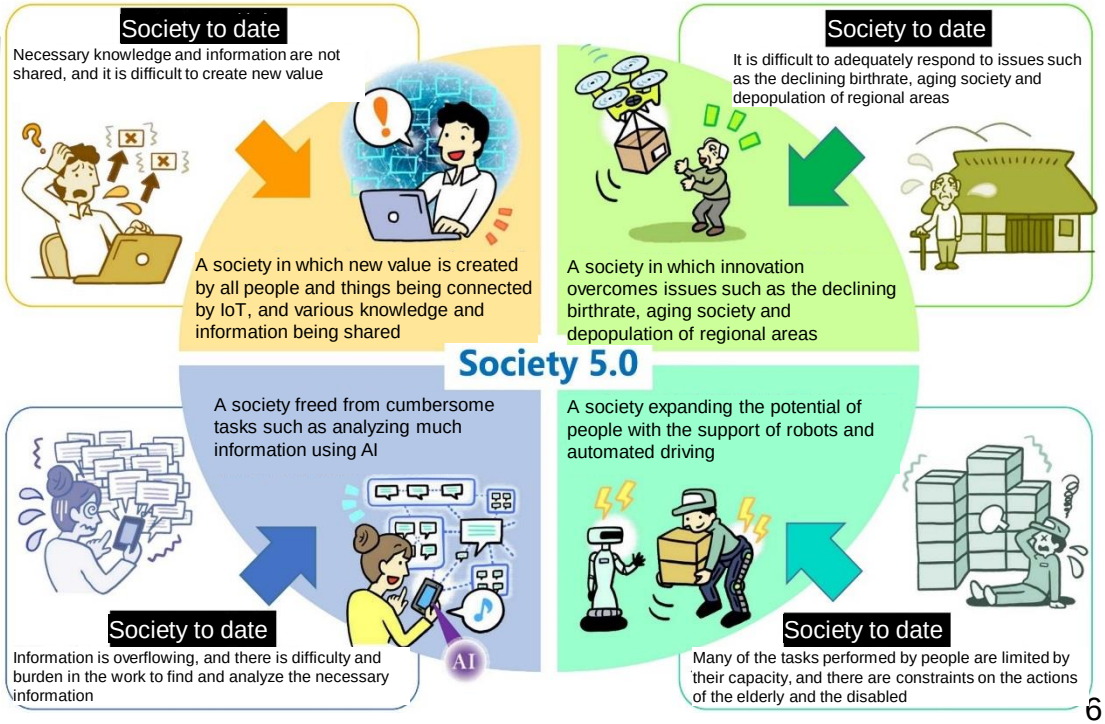
Society 1.0 Hunting

Society 2.0
Agriculture

Society 3.0
Industry

Society 4.0
Information

Human-centric society balancing economic development with the resolution of social problems using a system with **advanced merging of cyberspace and physical (real) space**

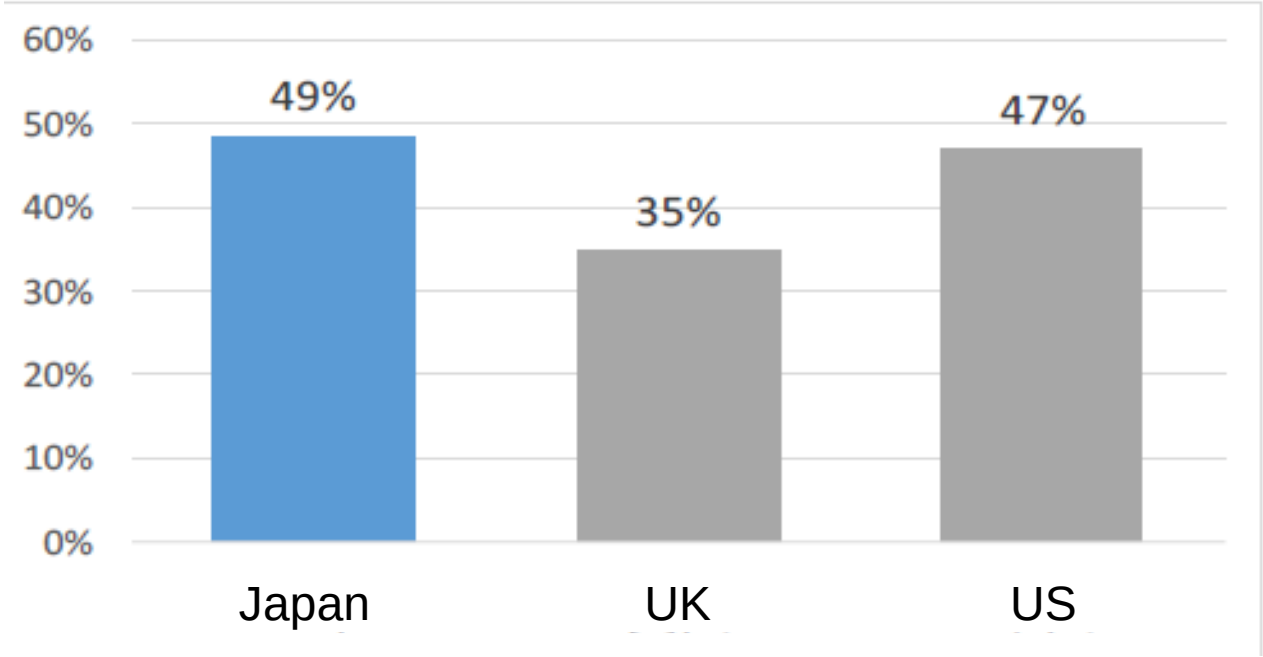


[Source] Created based on the website of the Cabinet Office Council for Science, Technology and Innovation

Proportion of the working population likely to be replaced by AI or robots, etc.

- It has been estimated that around 49% of the working population in Japan could be replaced by AI or robots in 10 to 20 years.

Proportion of the working population likely to be replaced by AI or robots, etc. (comparison of Japan, UK and US)



* Data on Japan estimates the probability of 601 types of job in Japan being replaced by AI or robots.

* Data on Japan is from Nomura Research Institute and joint research by Associate Professor Michael A. Osborne of Oxford University and Dr. Carl Benedikt Frey (2015)
  Data on the US is from "The Future of Employment" (2013) coauthored by Associate Professor Osborne and Dr. Frey
  Data on the UK is from the report results (2014) by Associate Professor Osborne, Dr. Frey and Deloitte Tohmatsu Consulting.

(Source) News release by Nomura Research Institute dated December 2, 2015

Jobs that will Disappear/Remain in 10-20 Years Due to the Advancement of Artificial Intelligence (AI)

- It is likely that the structure of employment will become polarized in the future due to the advancement of artificial intelligence (AI) and it will also be necessary to transform the content of labor in the business community in Japan

Work that will disappear/ low-income work
= Formulaic work and work requiring the accumulation of large volume of knowledge

- Telemarketer, salesperson, restaurant/lounge/coffee shop worker, cashier
- Insurance underwriter, insurance claims examiner, automobile insurance appraiser credit analyst, worker performing credit card approval and review, worker performing survey, person reviewing/investigating on real estate registration, agent for reporting taxes, real estate broker
- Bank teller, finance officer, securities company general worker, person in charge of bookkeeping/accounting/auditing
- Person responsible for collection/processing/analysis of data using computers, data entry person and document organizer
- Order handler, procurement handler, freight forwarding/receiving/logistics management handler, freight handler, telephone operator, delivery person using vehicles
- Library assistants, sports referees, models
- Tailor, watch repairer, film developer, photographer, etc.

Work that will remain
= Planning and interpersonal work

- Mechanical/facility/repair site supervisor, risk management supervisor
- Physician/surgeon, nurse, dental technician
- Mental health/medical social worker, clinical psychotherapist, counselor, auditory trainer, work therapist, cleric
- Fire fighting/disaster prevention site supervisor, police/detective site supervisor
- Lodging facility manager, sales engineer
- Psychologist, teacher, daycare worker, nutritionist, education coordinator, job counselor
- Clothing pattern maker, makeup artist
- Personnel manager, computer systems analyst
- Museum/art gallery curator, athletic coach, forest manager, etc.

(Source) Paper on “The Future of Employment” (Associate Professor Osborne of Oxford University, etc.)

2. Response to the 100-Year Life Society (Human Development Revolution)

Efforts Aimed at Free and Reduced-cost Education

"New Economic Policy Package" (Cabinet Decision of December 8, 2017) and "2018 Basic Policies for the Economic and Fiscal Management and Reform" (Cabinet Decision of June 15, 2018) * Excerpt from Ministry of Education, Culture, Sports, Science and Technology part

Free early childhood education ⇒ **Aiming for full implementation from October 2019** * Utilization of revenue sources by raising consumption tax

■ **Free early childhood education in kindergartens, nursery centers and centers for early childhood education and care including day care services at kindergartens for all children aged 3 to 5 years old.**

Free higher education ⇒ **implementation from April 2020** * Utilization of revenue sources by raising consumption tax

■ **Realization of free education in university, junior college, technical college and vocational school (university, etc.) only for children from low-income households**

1. Households not paying residential tax (households with income of less than 2.7 million yen)

(1) **Exemption from tuition**:
National universities: Exemption from tuition Public universities: Support up to the tuition of national universities
Private universities: In addition to national university tuition, additional support for half of the difference between the average tuition for private universities and national university tuition

(Exemption of enrollment fee established in the same manner
(Private universities: up to the average enrollment fee for private universities))

(2) **Scholarships**: Steps to provide the living expenses required for leading a student life that is appropriate under social norms based on the perspective of fairness with other students

2. In order to prevent disparity in support, also for households deemed equivalent to households not paying residential tax, 2/3 of the amount for untaxed households is provided to households with annual income of less than 3 million yen and 1/3 of the amount is provided to households with annual income of 3 to 3.8 million yen

■ **Establishment of requirements for support**

(1) **Recipients**:
- Rather than making a negative determination based solely on grades during high school, confirm students' motivation to learn based on the submission of reports and interviews
- Confirm the state of learning every year after advancing to university, and provide a warning from the university, etc. if the student only obtained 60% or less of the credits required to be obtained in a single year, or if grades are in the bottom 1/4 based on objective indicators such as using GPA. Cease payment if warnings are received in succession or if subject to expulsion or suspension, etc.

* Exceptions in cases where there are mitigating or unavoidable circumstances are also being considered.

(2) **Universities, etc. covered**:
- This covers universities with a balance of academic research and practical education based on their respective characteristics and strengths, the needs of society and the needs of the business community
- Teachers with practical experience responsible for subjects accounting for 10% or more of the credits required for graduation, appointment of multiple external personnel such as from the business community as directors, implementation and publication of appropriate grade management, disclosure of management information

* Continuous consideration of equal opportunities to access to university, etc. for the middle class

Effectively free tuition for private high schools ⇒ **Securing stable financial resources for the government as a whole by FY2020 to provide education for free** * It is necessary to separately secure stable financial resources because the increase in consumption taxes will not be allocated

■ **Effectively free tuition for private high school for household with annual income of less than 5.9 million yen**

University reform

■ **University reform in a way that matches the times as one of the key aspects driving the Human Development Revolution**
- Clarification of the roles and functions of universities - Improvement of the quality of university education - Visualization of the skills and added value gained by students
- Strengthening of management capability - Coordination and integration of universities, etc.
- Promotion of practical job education in technical colleges and vocational schools, etc.

Recurrent education

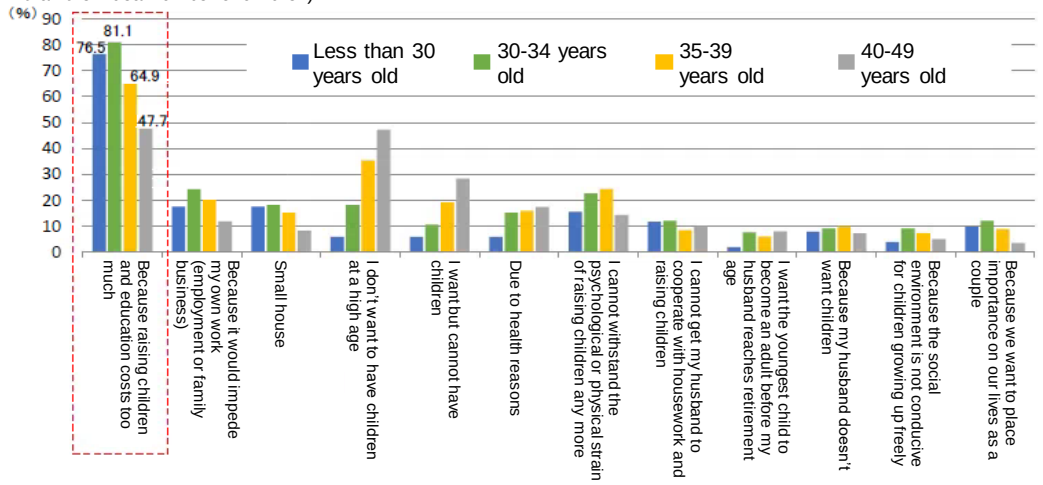
■ **Building a society leading to career advancement and career changes through recurrent education**
- Expansion of educational training benefits - Recurrent education by industry-academia collaboration , etc.

Free early childhood education

[Awareness of current state]

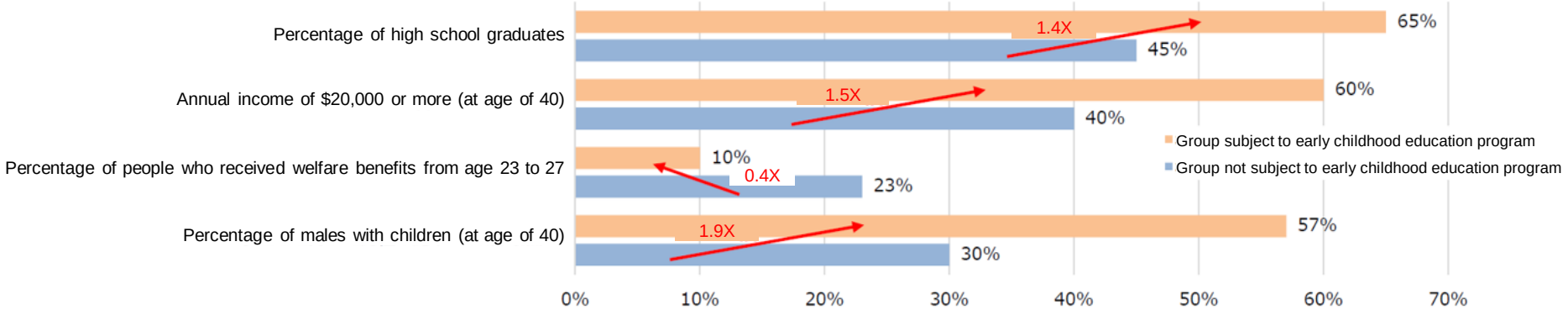
- ✓ Education in early childhood forms the foundation of personality spanning a lifetime, and ensuring all children have the opportunity to receive high-quality early childhood education is extremely important.
- ✓ Promotion of free early childhood education is significant for effectively guaranteeing that all children have opportunity to receive high-quality early childhood education by society as a whole bearing the cost of early childhood education.
- ✓ The reduction of the economic burden of expenses for education during early childhood when it is felt that there is a large economic burden is also meaningful in addressing the declining birthrate.

Reasons for not having ideal number of children based on age of wife (couples whose planned number of children is less than their ideal number of children)



(Note) Question for couples in their first marriage where the wife is aged under 50 years old and the planned number of children is less than the ideal number (approx. 30%) (response by wife).
Source: National Institute of Population and Social Security Research "15th Annual Population and Social Security Surveys (Couples Survey)" (2015)

Main Results of the Perry Preschool Study



Source: Lawrence J. et al.(2005) "The High/Scope Perry Preschool Study Through Age 40:Summary, Conclusions, and Frequently Asked Questions" High/Scope Press

[Government Policy] ■ **Free early childhood education in kindergartens, nursery centers and centers for early childhood education and care including day care services at kindergartens for all children aged 3 to 5 years old.**

Securing opportunities for access to higher education

[Awareness of current state]

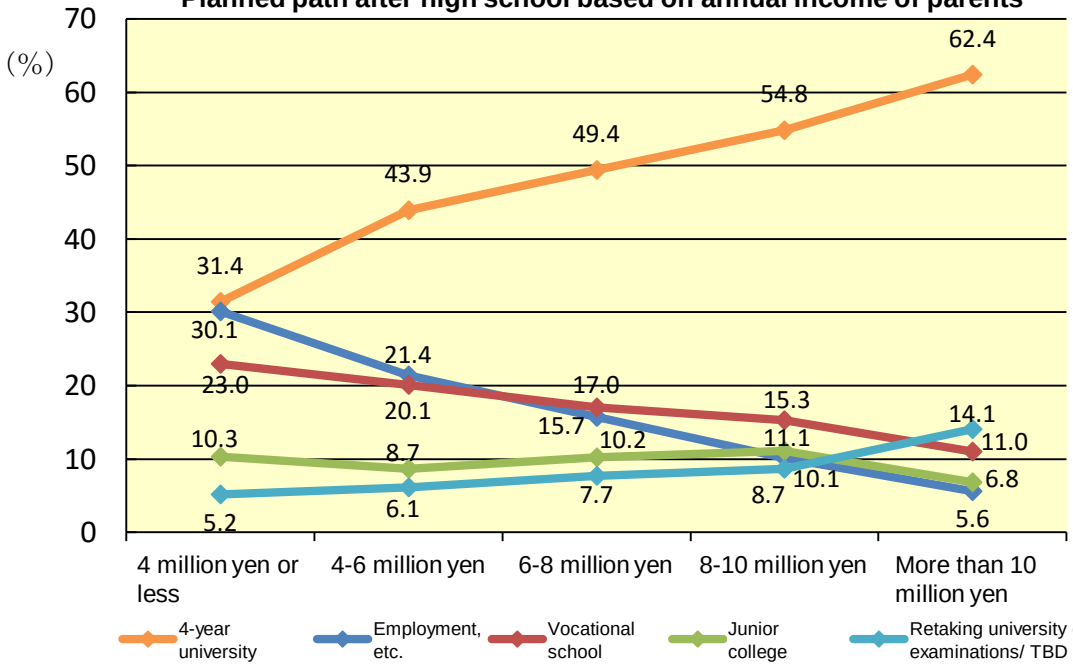
- ✓ The rate of advancement to university, etc. is lower in households with difficult economic conditions.
- ✓ There is a clear gap in average wages based on educational background.
- ✓ Education expenses in Japan account for a high proportion of household expenses when compared internationally.

(The burden of education on the household is high)

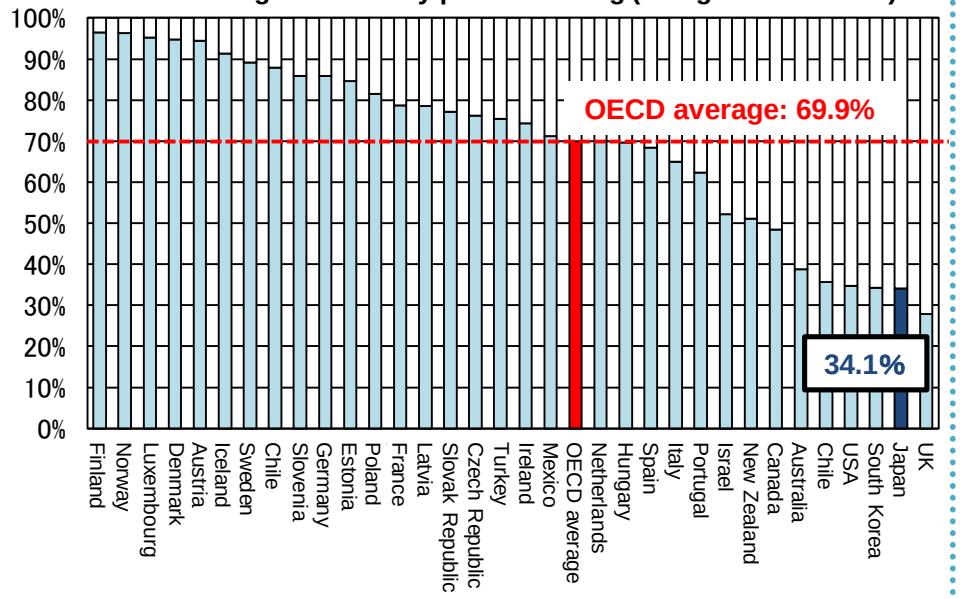
→ Cycle of poverty May cause entrenchment of disparity

→ A cause of declining birthrate

Planned path after high school based on annual income of parents



Percentage covered by public funding (in higher education)



Note 1) Survey of 4,000 third-year high school students and 4,000 guardians thereof chosen at random from throughout Japan.
Note 2) The parents' annual income is the sum of the median of the tax-inclusive income of the father and the mother (e.g. 6 million yen in the case of "5-7 million yen")
Note 3) Excluding non-responses. "Employment, etc." includes education advancement for employment, part-time work, overseas university and school, domestic help, domestic help/housework, and others. Vocational school includes various types of schools.
(Data) Department of University Management and Policy Studies, Graduate School of Education, The University of Tokyo
First Report on Follow-up Survey of High School Students (September 2007)

(Data) "Education at a Glance 2017 OECD Indicators (2017)"

[Government Policy] Realization of free higher education only for children who truly need it in low-income households (To be implemented from April 2020)

Overview of University Reform

[Awareness of current state]

- ✓ Education research innovation responding to major changes in industry structure and social structure as a whole referred to as the 4th Industrial Revolution and Society 5.0 are required.
- ✓ As the rate of advancement to university continues to rise, society does not understand the level of university education.
- ✓ The number of universities continues to increase despite the expectation that the 18-year-old population will decline significantly, and the number of universities failing to meet admission quotas is increasing.

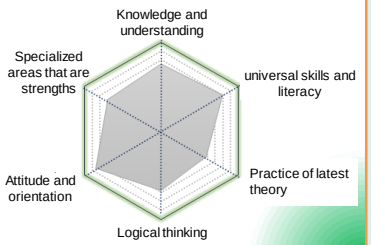
[Direction of consideration]

University education reform supporting Society5.0

- Reform of selection of university enrollees
  - Consideration of addition of subjects corresponding to the new learning guidelines for "Information I", etc. in the Common University Entrance Examinations (from FY2024)
- Education according to new literacy not constrained by division into humanities and sciences
- Reform of engineering education
  - Review of vertical structuring of departments and majors
  - Promotion of the introduction of major/minor systems by creating education programs linking undergraduate and graduate schools
- Establishment of professional universities, etc.

Guarantee of the quality of education

- Transformation into the state as a students-oriented higher education institution
- Improvement of education content and education methods, etc.
  - Formulation of guidelines on education management
- Visualization of skills and added value obtained by students
  - Transparency and disclosure of results of learning



Strengthening of foundations, coordination and integration of universities

- Utilization of diverse human resources
  - Employment of practitioners and diverse teachers such as those who are young, women or foreign nationals
  - Promotion of the employment of external directors
- Strengthening of management capacity of national universities
  - Personnel and wage management reform
  - Governance reforms such as the introduction of a system for a single corporation operating multiple universities and the formulation of a University Governance Code
  - Strengthening of financial base such as donations to universities and effective utilization of assets
- Private university reform
  - Improvement and strengthening of autonomous governance of incorporated schools such as the promotion of the formulation of a "University Governance Code"
  - Strengthening of management guidance by establishing new financial indicator
  - Promotion of information such as the transition from disclosure by viewing to general publication
  - Clarification of procedures for handling bankruptcy
  - Facilitation of business transfer
- Creation of "Platform for Regional Cooperation (tentative name)" and establishment of guidelines

Consideration of establishment of a system for the "Corporation for the Promotion of Cooperation Between Universities, etc. (tentative name)" enabling cooperation across the boundaries of national, public and private universities

Expansion of recurrent education

- Promotion of development of recurrent education programs
- Expansion of opportunities to receive recurrent education
- Promotion of development of practical teacher

Securing opportunities for access

- Significant expansion of the recipients and amount of support provided through tuition exemption and scholarships

Future Direction of the Expansion of Recurrent Education in Universities, etc.

1. Expansion of Supply of Recurrent Education Programs

Development and implementation of diverse education programs | Diversification of learning methods

[Awareness of current state]

- The total number of programs is low.
- Many programs are held in major cities, and there is a regional bias.
- Few have practical content.

[Direction of consideration]

○ **Nationwide deployment** through the fundamental increase in the creation and implementation of **educational programs through collaboration between industry and academia**.

○ **Improvement of systems** for the promotion of development of short-term and appealing programs
(1) **Quality assurance and expansion of scope** of practical short-term programs, etc.
<**Quality assurance** such as promotion of participation of the business community in creation of programs and **inclusion of short-term programs**, etc. >
(2) Review of **enrollment certification systems**, promotion of the use of **credit accumulation systems**, etc.

○ **Significant expansion of practical online courses** in The Open University of Japan and MOOCs, etc.

2. Securing Human Resources Able to Provide Practical Education

Development and implementation of diverse education programs

[Awareness of current state]

- Securing teachers able to plan and implement programs is an issue.
- “Practitioner teachers” have little experience in teaching students.
- It is difficult for current practitioners to find time.
- It is difficult to secure “practitioner teachers” in individual universities.

[Direction of consideration]

○ Improvement of the teaching ability of practitioner teachers by mandating training for those without experience in teaching in universities, etc. (**quality assurance**). <**Development of training programs and promotion of taking programs**>

○ Establishment of mechanisms enabling the practitioner teachers required for implementing programs to be secured smoothly and easily (**quantity assurance**). <**Creation of platform for sharing human resources**>

○ Establishment of an environment facilitating teaching by practitioners working on the front line.

3. Establishment of an environment where it is easy to take courses

Visualization of education effect

[Awareness of current state]

- Low recognition and a sense of urgency for recurrent education.
- It is difficult to find time and money to participate in in recurrent education.
- The results of learning are difficult to see and are not recognized by companies, etc.

[Direction of consideration]

○ **Visualization of the effect** of learning. <**Clarification of requirements for quality assurance** such as knowledge and skills that can be learned>

○ Expansion of opportunities to come in contact with information related to recurrent education.

○ Reduction of economic cost. <**Coordination with employment insurance systems and tax systems, etc.**>

+ 4. Fostering of momentum supporting these

(1) **Participation in the development and implementation of programs in the business community**
(2) **Active support and evaluation of learning by adults**
(3) **Fostering of awareness of career building among women who have left the workplace**

3. Human Resource Development for “Society 5.0”

Result of Programme for International Student Assessment (PISA)

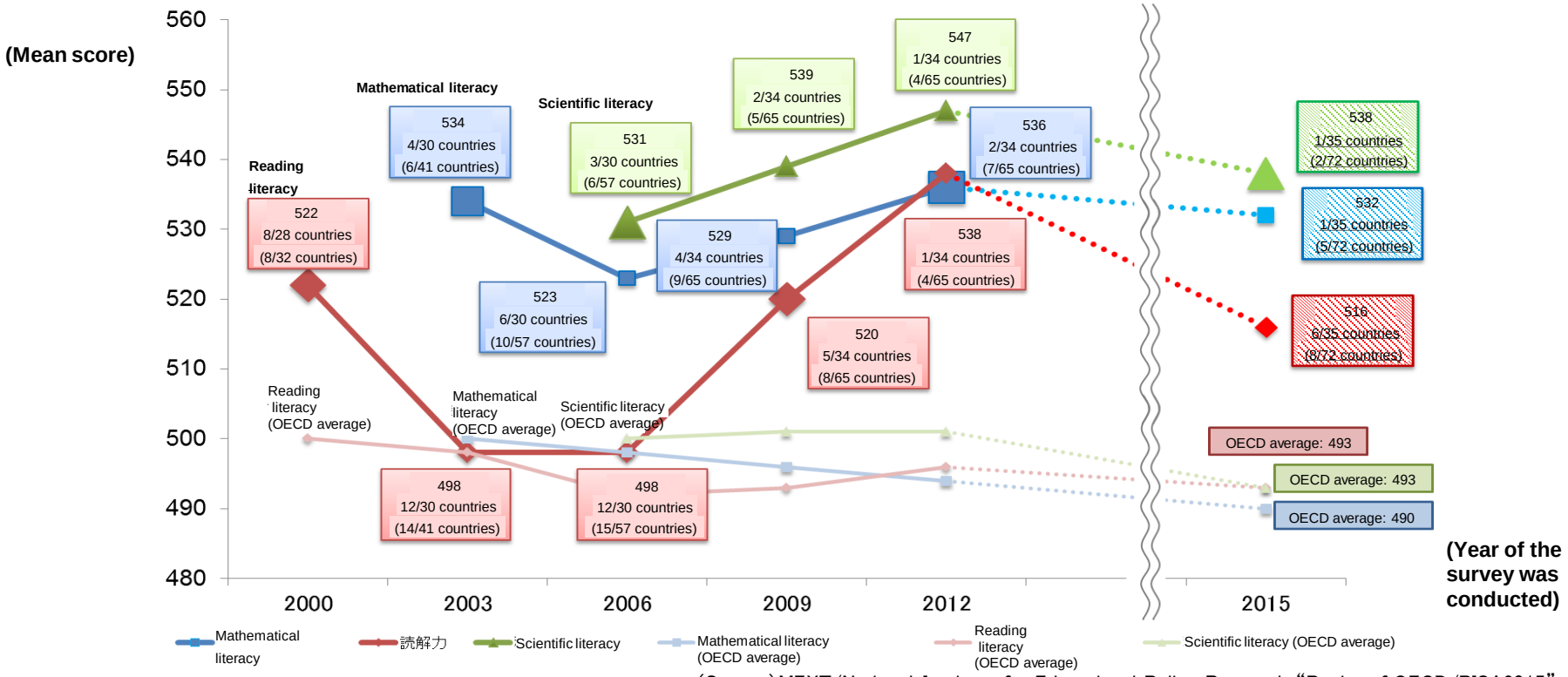
- In all the domains of scientific literacy, reading literacy, and mathematical literacy, **Japan continues to place in the top performing group with high mean score from an international viewpoint**. On the other hand, compared to the previous survey, **Japan's average score for reading literacy has fallen significantly**, possibly as a result of the transition to a computer-based survey.
- The average score for scientific literacy, which is the major domain for the current survey, puts Japan in the top performing group with high mean score from an international view point in each of three scientific competencies.
- With respect to students' attitudes toward science, percentage of those who answered positively on the survey remain low relative to the OECD average, but there were **signs of improvement**, such as **the percentage of students who feel that science study will be useful in the future increasing** compared to 2006.

Changes in mean score and ranking

*OECD implements PISA to 15-year-old students. (In Japan, freshman in high school)

・*The scores are estimated based on OECD average of 500 points when each domain first became the major domain (reading literacy: 2000, mathematical literacy: 2003, scientific literacy: 2006). The results since the survey in which mean scores can be compared over the year for mathematical and scientific literacy. The marks for the years where the literacy became the major domain are larger.

・*Wave line is drawn between 2012 and 2015, due to the shift from PBA to CBA and the changes in way of scaling and scoring.



(Source) MEXT/National Institute for Educational Policy Research "Ponits of OECD/PISA2015"

OECD PISA 2015 Math

country	below level 1	level 2	level 3	level 4	level 5	level 6	above level 6
Japan	2.9	7.8	17.2	25.8	25.9	15.0	5.3
Australia	7.6	14.4	22.6	25.4	18.7	8.6	2.7
Canada	3.8	10.5	20.4	27.1	23.0	11.4	3.7
Estonia	2.2	9.0	21.5	28.9	24.2	11.3	2.9
Finland	3.6	10.0	21.8	29.3	23.7	9.5	2.2
France	8.8	14.7	20.7	23.8	20.6	9.5	1.9
Germany	5.1	12.1	21.8	26.8	21.2	10.1	2.9
Ireland	3.5	11.5	24.1	30.0	21.2	8.3	1.5
Italy	8.3	14.9	23.3	24.7	18.3	8.1	2.4
Korea	5.4	10.0	17.2	23.7	22.7	14.3	6.6
Netherlands	5.2	11.5	19.8	24.9	23.0	12.3	3.2
New Zealand	7.1	14.6	22.6	25.3	19.0	8.6	2.8
United Kingdom	7.7	14.1	22.7	26.0	18.8	8.3	2.3
United States	10.6	18.8	26.2	23.8	14.7	5.0	0.9
Average of OECD	8.5	14.9	22.5	24.8	18.6	8.4	2.3
Beijing/Shanghai/Jiangsu/Guangdong	5.8	10.0	16.3	20.5	21.8	16.6	9.0
Hong Kong	2.5	6.4	13.6	23.4	27.4	18.8	7.7
Chinese Taipei	4.4	8.3	14.6	21.2	23.3	18.0	10.1
Singapore	2.0	5.5	12.4	20.0	25.1	21.7	13.1

OECD PISA 2015　Science

Table 1 Percentage distribution of 15-year-old students on the PISA science literacy scale, by proficiency level (%)

country	below level 1b	level 1b	level 1a	level 2	level 3	level 4	level 5	above level 6
Japan	0.2	1.7	7.7	18.1	28.2	28.8	12.9	2.4
Australia	0.6	4.3	12.8	21.6	27.3	22.3	9.2	2.0
Canada	0.1	1.8	9.1	20.2	30.3	26.1	10.4	2.0
Estonia	0.0	1.2	7.5	20.1	30.7	26.9	11.6	1.9
Finland	0.3	2.3	8.9	19.1	29.2	26.0	11.9	2.4
France	0.9	5.8	15.3	22.0	26.5	21.4	7.2	0.8
Germany	0.4	3.8	12.8	22.7	27.7	22.0	8.8	1.8
Ireland	0.3	2.7	12.4	26.4	31.1	20.1	6.3	0.8
Italy	0.6	5.4	17.2	27.1	28.6	17.0	3.8	0.2
Korea	0.4	2.9	11.1	21.7	29.2	24.0	9.2	1.4
Netherlands	0.3	4.0	14.3	21.8	26.1	22.4	9.5	1.6
New Zealand	0.4	4.0	13.0	21.6	26.3	21.8	10.1	2.7
United Kingdom	0.4	3.4	13.6	22.6	27.5	21.6	9.1	1.8
United States	0.5	4.3	15.5	25.5	26.6	19.1	7.3	1.2
Average of OECD	0.6	4.9	15.7	24.8	27.2	19.0	6.7	1.1
Beijing/Shanghai/Jiangsu/Guangdong	0.6	3.8	11.8	20.7	25.8	23.8	11.5	2.1
Hong Kong	0.1	1.6	7.8	19.7	36.1	27.4	6.9	0.4
Chinese Taipei	0.3	2.7	9.4	18.1	27.0	27.1	12.7	2.7
Singapore	0.2	2.0	7.5	15.1	23.4	27.7	18.6	5.6

○Notably, Japan's average scores in Literacy and Numeracy put it in first place among participating countries in those two areas.
○Japan's ranking for Problem solving in technology rich-environment was average for OECD countries in terms of percentage of participants at Level 2 and 3, whose parameters included persons not taking the computer survey.
○On the other hand, Japan's average score for persons taking the computer survey put it in first place among participating countries.

Table 1. National Comparison of PIACC Results by Area

The number in parentheses indicates ranking

Country	Literacy	Numeracy	Problem solving in technology rich-environments	
	Average score	Average score	Percentage of Level 2 & 3 adults	Average score
OECD average	273	269	34%	283
Australia	280(4)	268(13)	38%(6)	289(3)
Austria	269(17)	275(10)	32%(13)	284(7)
Canada	273(11)	265(14)	37%(7)	282(12)
Czech Republic	274(9)	276(9)	33%(12)	283(9)
Denmark	271(14)	278(7)	39%(5)	283(8)
Estonia	276(7)	273(11)	28%(16)	278(16)
Finland	288(2)	282(2)	42%(2)	289(2)
France	262(21)	254(20)	m	m
Germany	270(15)	272(12)	36%(8)	283(11)
Ireland	267(20)	256(19)	25%(18)	277(18)
Italy	250(23)	247(22)	m	m
Japan	296(1)	288(1)	35%(10)	294(1)
Korea	273(12)	263(16)	30%(15)	283(10)
Netherlands	284(3)	280(4)	42%(3)	286(6)
Norway	278(6)	278(6)	41%(4)	286(5)
Poland	267(19)	260(18)	19%(19)	275(19)
Slovak Republic	274(10)	276(8)	26%(17)	281(13)
Spain	252(22)	246(23)	m	m
Sweden	279(5)	279(5)	44%(1)	288(4)
United States	270(16)	253(21)	31%(14)	277(17)
Belgium	275(8)	280(3)	35%(11)	281(14)
UK	272(13)	262(17)	35%(9)	280(15)
Cyprus	269(18)	265(15)	m	m

Countries with significantly higher scores statistically than the OECD average
Countries without significantly different scores statistically than the OECD average
Countries with significantly lower scores statistically than the OECD average

Note: The average score for problem solving in technology rich-environment was calculated by the Japanese National Institute for Educational Policy Research using computer survey respondents as a parameter based on the PIAAC data.
Cyprus, France, Italy and Spain did not participate in the survey on problem solving in technology rich-environments (m = no data obtained).
The difference in rankings between countries with the same score in the table reflects fractional differences between them.
Note also that this table does not include data for Russia.

(Source: Summary of Survey Results of OECD/PIAAC (Ministry of Education, Culture, Sports, Science and Technology))

Turbulent Age: Inconceivable Risks and Unimaginable Opportunities

- ➢ Age of VUCA* *Volatility, Uncertainty, Complexity, Ambiguity
- ➢ Scientific and technological advancements (AI, IoE, robotics, regenerative medicine, etc.) increase benefits and risks to society
- ➢ Increasing globalization, complexity, diversification, unexpectedness
- ➢ Increasingly numerous and intractable dilemmas, conflicts, and trade-offs

- ○ Human resources capable of confronting and overcoming the “unexpected” and “between conflicting demands”
- ○ Human resources that utilize AI effectively; and human resources capable on confronting the issues, topics, and difficulties that AI cannot resolve
- ○ Human resources capable of imagining and executing creative, collaborative projects
- ○ Communication → Collaboration → Creation → Culture

- ○ Active learners
- ○ Active learning
- ○ Project/problem-based learning
- ○ Enhancement of liberal arts education (stories of predecessors and sages who grappled with conflicting demands) + ELSI※

※Ethical, Legal and Social Issues

Cf. Prof. Toshitaka Katada, Gunma University (disaster prevention education)
Ability to survive in unexpectedness

- Do not over-rely on simulations and manuals
- Never fear mistakes, always do your best
- Do not await instructions, become a leader

Promoting Human Resource Development for Society 5.0

- Considered how to develop human resources that lead a new society while leveraging AI and data capabilities, as well as the skills that will be needed by anyone, regardless of whether in humanities or sciences.
- Near-term initiatives include developing **human resources specialized in IT and other fields**, as well as the **radical enhancement of Learning for working adults** and the **development of information competency** in primary and secondary education.

Industry

Learning for working adults

Career advancement

Career change

- **Increasing productivity**
- **Producing outstanding human resources**

Development of top-level human resources

- Supports employee learning

Strengthen mathematics and information-related undergraduate and graduate schools

Strengthen mathematics and data science education as a whole university

Higher education

Primary and secondary education

- Presents required skills and abilities
- Develops education programs by industry-academia collaboration
- Provides lecturers and instructional materials

Programming education

Statistics education

Strengthening the function of universities and specialized training colleages engaged in the enhancement of Learning for working adults

- **Developing practical educational programs** through industry-academia collaborations
- **Creating learner-friendly environments** (e.g. enhancing advice and job-seeking support functions for adults, including women)
- **Reducing time cost**
  (e.g. promoting the development of short-term programs and online courses provided by Open University of Japan and others)
- **Reduce financial cost** (coordinate with employment insurance system, tax credits for salary growth, etc.)

Development of specialized human resources to support Society 5.0

- Human resource development, **from basic education to advanced specializations**
  (e.g. start discussion on adding "Information I," which becomes compulsory under the new National Curriculum Standardfor high schools, as a subject on the Common Test for University Admissions, develop human resources in advanced specializations through university education, etc.)
- **Support for activities by human resources that will lead a new society**
  (e.g. support for study abroad, support for outstanding performers in the Science Olympiads, support for young researchers in information science and technology fields, etc.)
- **Create "degree programs"** that provide cross-disciplinary education

Strengthen programming and statistics education

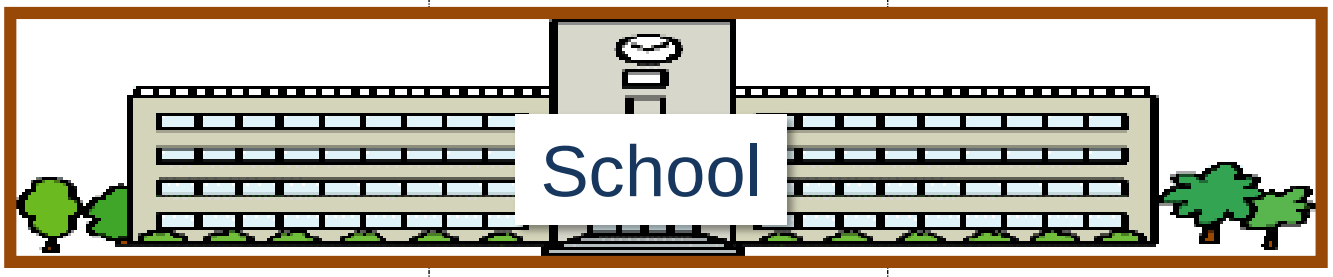
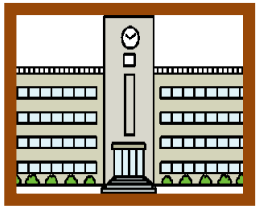
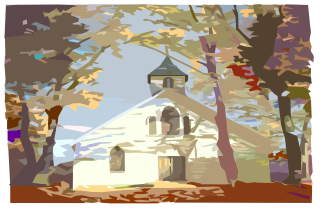
- **Strengthen programming education**
  - **Develop information literacy** fundamental to all learning
    Under the new National Curriculum Standards, **programming education becomes compulsory in elementary school** (from AY2020), and **"Information I" will be created for high schools as a common required subject that includes programming** (from AY2022)
  - Promote the development of instructional materials to meet the needs of schools through private corporations and organizations under the "Mirai no Manabi Consortium," a public-private sector collaboration, and so on
- **Strengthen statistics education**
  - Under the new National Curriculum Standards, **statistics education is strengthened across elementary, lower and upper secondary school**, for instance, by **creating a new "data utilization" area** (for elementary arithmetic)(transition preparations from AY2018, implementation from AY2020 in sequence)
  - Toward implementation of the new National Curriculum Standards, **supplemental instructional materials will be distributed and guidelines for organizing instructional materials will be reviewed** and so on

International Comparison of the State of “Schools” (1)

The state of “school” in Japan and “school” in foreign countries differs considerably.

→ In contrast to the work of teachers in foreign countries which is specialized mainly in lessons, the main work of teachers in Japan is integrally conducting subject teaching, student guidance and coaching of club activities.

→ Japanese schools are the core of local society and vital for the stimulation of the local community.

	Intellectual education [Subjects, etc.]	Moral education [Morals, special activities, etc.]	Physical education [Club activities, etc.]
Japan	 School		
Foreign countries	 School	 Church, home, etc.	 Community (Sport clubs, etc.)

* Physical education: While Club activities are mainly conducted in school in Japan, China and South Korea, they are conducted in school and the community in the USA and UK, and mainly in the community in Germany, Italy and Scandinavia.

Curriculum Philosophy Moving Forward

Realization of a "Curriculum Open to Society"

(1) **Broadly incorporate conditions in society and the world into perspectives,** have the goal of creating a better society through better school education, and **share that goal with society through the curriculum**.

(2) **Use the curriculum to clarify and develop the qualities and skill required for** the children who will build society of the future **to face and be involved in society and the world, and to open the way for their own lives**.

(3) When implementing the curriculum, **utilize the personal and physical resources in the region, coordinate with social education** utilizing time after school and Saturdays, etc., and **share and coordinate aims with society without closing off school education within schools**.

New National Curriculum Standards

Fostering competencies necessary for the new era and enhancing learning evaluations

Cultivation of **motivation to learn, and humanity** so that one strives to apply learning to life and society

Acquisition of the **knowledge and skills** that can be utilized in real life context

Developing the **abilities to think, make judgement, and express oneself** to be able to respond to unprecedented situations

What can be achieved

By sharing the goal of bringing about a better society through improved school education, we will realize "**curriculum that are open to society**," that develop the competencies of students to become creators of the future in conjunction with society

Realization of "**curriculum management**" at each school

What to learn

Introducing new subjects and subject subdivisions, and reviewing objectives and content based on the qualities and abilities necessary for the new era

Adopt foreign language education as a subject at elementary schools and introduce a new subject "Public (tentative translation)" at high schools

Clarify the qualities and abilities to be developed in each subject and show the goals and content in a structured manner

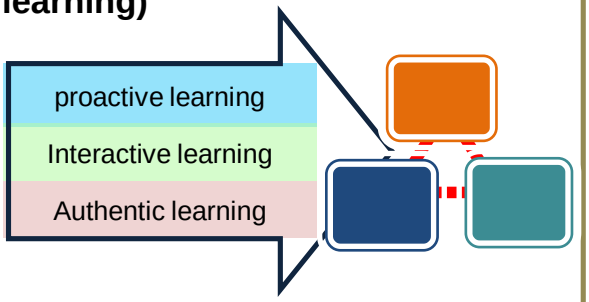
The learning content will not be reduced*

How to learn

Improving the learning process from the perspective of proactive, interactive, and authentic learning (active learning)

Develop the qualities and abilities needed for the new era, including acquisition of the knowledge and skills necessary to live and work

Improve the quality of the learning process to achieve quality understanding without reducing the amount of knowledge



*With regard to high school education, comprehensive reforms to build connections between high schools and universities will be carried out in order to overcome the current system for selecting university entrants, which involves the simple memorizing of trivial knowledge.

Relationships in School-Community Partnerships

Efforts to support the growth of the children who bear the future by sharing the image of children the community and school want to develop and the vision of the ideal education with parents and the community, coordinating and cooperating with each other as partners to achieve these goals.

School

Teachers

Principal

School staff in charge of regional collaboration

School Management Council

Sharing the image of children to develop and the vision of ideal education

Members: Parents, Community Coordinators, community residents, etc.

Discussion on school operation and support required for such operation, etc. (Article 47-6 of the Act on the Organization and Operation of Local Educational Administration)

Community Cooperation Activities for Learning and Education

○ **Community Cooperation Activities**
Fostering local HR, learning local area, joint disaster prevention training, study/club activities support, landscape maintenance, watching over school routes, etc.

○**Extracurricular activities**
Learning, sports activities, etc. on Saturdays, holidays

○**Experiential activities**
Community service, nature experience, workplace experience, etc.

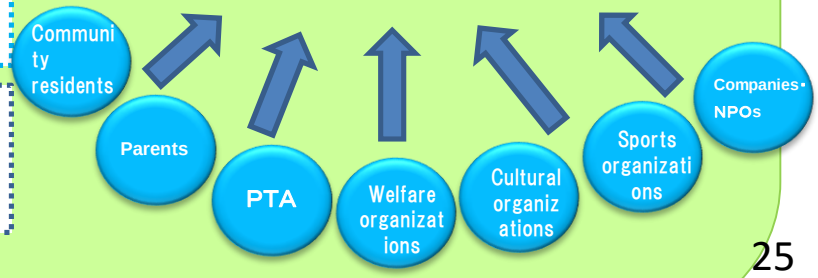
Community

Community Cooperation Networks for Learning and Education

Community Coordinators

Role of CC linking community and school

- **Sharing information between local residents and school**
- **Advice to local residents, etc.**



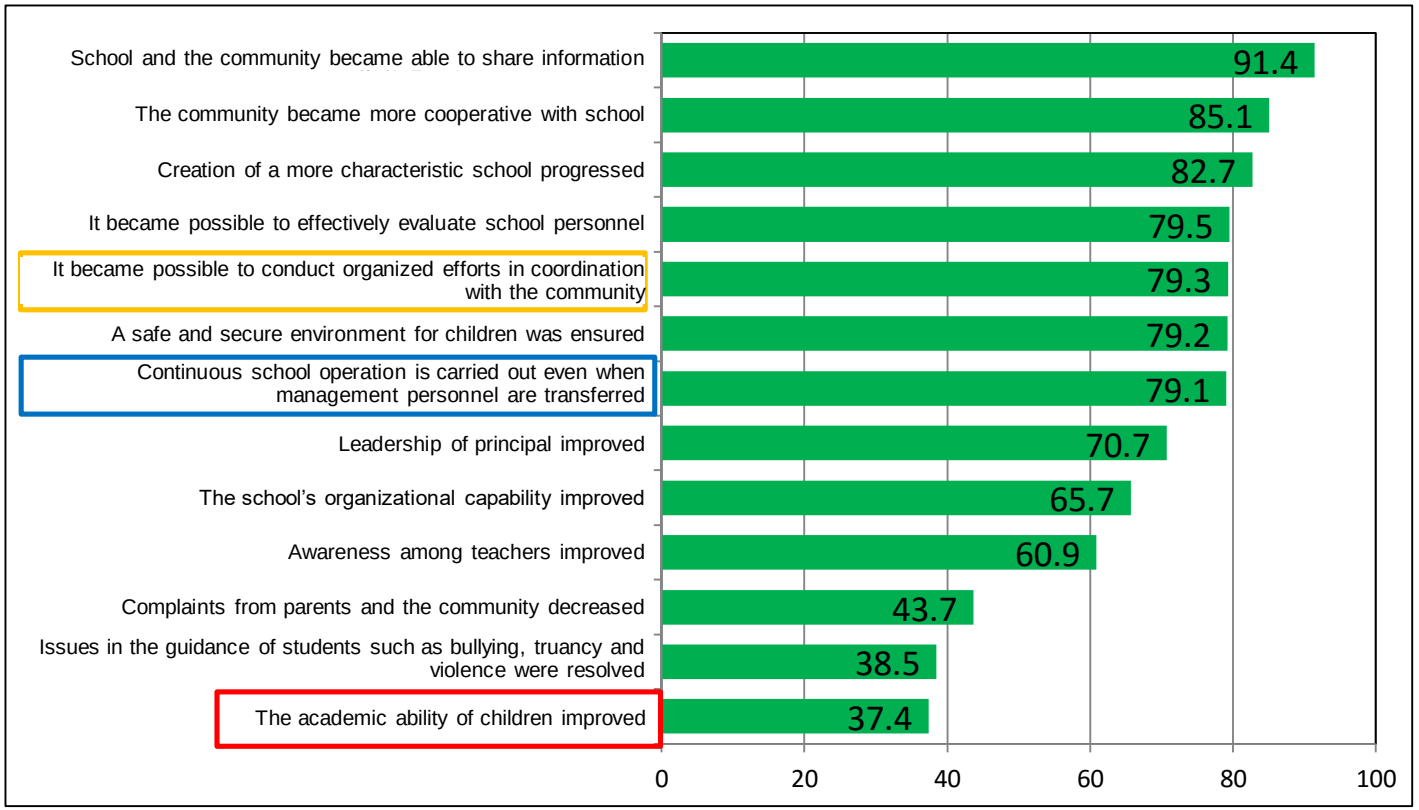
Effects of Efforts in School-Community Partnerships — Based on Principal's Awareness of Results—

Working as one by school, home and the community with **sharing "goals" and "vision"** of how to raise children in the community and what to achieve through the implementation of School Management Council and discussion shows various effects related to school operation such as **improvement of children's academic ability**, **solving issues in student guidance** and **changing awareness of teachers and making improvements in operations**.

Effect on children

Effect on school (teachers)

Effect on the community (residents)

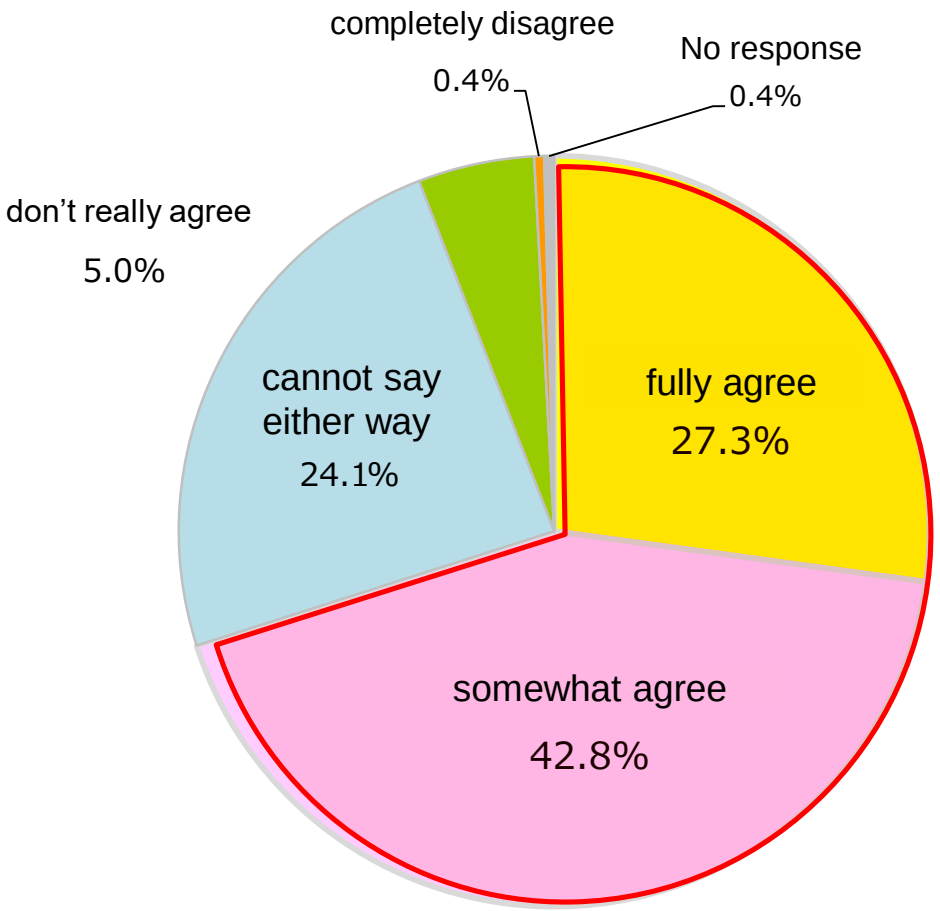


* Responses by principals of community schools
* Sum of "Very good match" and "Somewhat good match"

Source: "Investigative Research Report on the Status of Community Schools Aimed at Strengthening Comprehensive Management Capabilities" (FY2015 Ministry of Education, Culture, Sports, Science and Technology Commissioned Research)

Effect of School-Community Partnerships (Effect on School (Teachers))

Teachers could give more attention to lessons and student guidance due to local residents supporting school



Approx. 70%

("FY2015 Survey on the State of Implementation of Community Cooperation Activities for Learning and Education" National Institute for Educational Policy Research, Ministry of Education, Culture, Sports, Science and Technology. The results of the survey of schools is shown above.)

Introduction of Community Schools (School Management Council System)

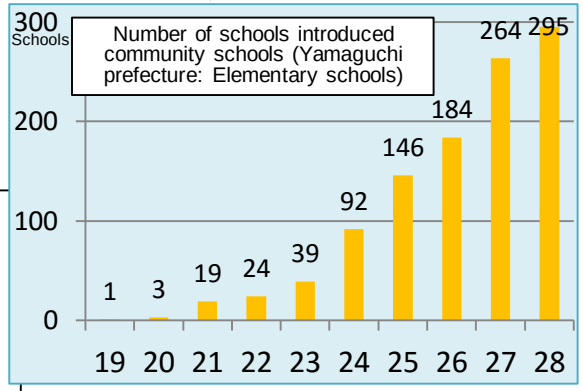
(Implemented in all public elementary and junior high schools in Yamaguchi prefecture by April 1, 2016)

(1) Enabled **participation in school management** by parents and local residents

Unit-based training (lesson research)

7-8 people (a unit) including School Management Council members observed lessons by young teachers. This method enabled teachers and parents/local residents to seriously discuss lesson improvements, leading to mutual understanding transcending viewpoints, improvement of teachers lesson capabilities, and improvement of the academic ability of children and students.

In lesson workshops after school, a School Management Council member also provides opinions as a member of the unit



(3) **Efforts through coordination and cooperation** by schools and the community improved, and the potential of educational activities expanded significantly

(Case study) Ojison-juku (Shimonoseki City Oji Elementary)

Workshops are held for those who wish to attend within the school after class every Wednesday. Children are taught one-on-one about problems they have trouble with by community volunteers.

Many grade 3-6 students participate every time

(2) **The number of visitors to the school increased** significantly (Parents, local residents, etc.)

Changes in children

Heightened sense of self-esteem

- ○ Increase in opportunities to **give presentations in front of people**
- ○ Increase in opportunities to **actively and cooperatively** engage in efforts with people in a variety of positions
- ○ Increase in opportunities to enjoy a **sense of achievement**

Improvement of academic ability

- ○ Learning in a **relaxed environment**
- ○ **Establishment of learning habits** through collaboration between homes and after-school classes for children

Children's impressions

- ○ I began to think studying is fun because I participated in Ojison-juku and was taught by people in the community.
- ○ I am happy my knowledge has increased because I have heard a variety of things talking with people in the community.

Changes in school/teachers

- ➢ Increase in the number of lesson observers such as parents and local residents
- ➢ Enables effective lessons to be conducted by utilizing local characteristics and personal and physical resources
- ➢ Increase momentum toward lesson improvements throughout the entire school (as a team)

Improvement of teachers' ability to conduct lessons

Awareness among teaching staff improved

61.3%

Nationwide survey of academic ability and the state of learning

The average correct response rate for **"Japanese Language B"** improved significantly

Japanese Language B

Content related to **the ability to utilize** knowledge and skills, etc. **in a variety of situations in the actual life and** the **ability to evaluate and improve** by formulating and implementing concepts for solving a variety of problems

Example of School-Community Partnerships Contributing to Curriculum Management (Masuda City Toyokawa Elementary School, Shimane Prefecture)

○ The direction of raising children is shared as a whole community through School-Community Partnerships centered on the Community Coordinator. Activities are coordinated and also contribute to curriculum management.

○ The community's education capability increases toward the realization of an "curriculum open to society" providing a "Circulation of learning" where adults and children learn from each other

(1) Cooperation and coordination in School Operation Council and Community Council

School Management Council
Members: Principal, teaching staff, **Community Coordinator**, public halls, day care centers, PTA, residents' association representatives, etc.

People recommended by the Community Council are appointed as members of the School Management Council

The school's education goals, research efforts within school and the state of children are shared

Community Council
Members: Public halls, combined residents' association, social welfare council, child welfare volunteers, day care centers, elementary schools, junior high schools, PTAs, **Community Coordinators**, etc.

(2) Implementation of lessons

Some lessons conducted based on local characteristics and circumstances are implemented in coordination with local residents. Teaching plans and objectives are shared with local residents in advance, and local residents also participate in lessons. Local residents also ask children questions based on the teaching plan.

(3) Reflection

After lessons are conducted, local residents centered on members of the school management council also participate in research discussion on lessons.

<Role of Community Coordinators>
- **Connecting children's school lives with real life in the community** → Children's participation in the community → Development of citizens
- **Contribution to school's curriculum management**

<Example of Curriculum Management>

(1) In a unit where children grow crops in class, the process from growing soybeans to making tofu that is difficult for a teacher to handle alone is carried out with the cooperation of local residents.

(2) After the lesson, tofu-making activities were also continued in years after the goal was achieved, but this was continued by switching to activities in the public hall based on discussion between the school, the **Community Coordinator** and the public hall. The **Community Coordinator** coordinated the activity, enabling the switch to a method that is beneficial for both the school and the community, leading to improvement of children's learning.

Discussion on the Division of Roles of School and Teachers

✓ Discussion of the clarification and adjustment of tasks performed by school teachers in the national government's council to realize student well-being and reduce teacher workload

◆ Approach to the state of typical tasks handled by schools and teachers until now (interim report by the Central Council for Education in December 2017)

Tasks that parties other than school should basically handle	School tasks but tasks that don't necessarily need to be handled by teachers	Tasks that are teachers' tasks but of which workload can be reduced
(1) Responses related to traveling to and from school (2) Patrols after school and at night, responses when students are taken into custody by the police (3) Collection and management of school related fees (4) Liaison and Coordination with community volunteers	(5) Responses to surveys and statistics, etc. (Administrative staff, etc.) (6) Responses during children and students' break times (Rotation, community volunteers, etc.) (7) School cleaning (Rotation, community volunteers, etc.) (8) Club activities (club activity coaches, etc.)	(9) Handling of school lunches (Coordination with homeroom teachers and nutrition teachers, etc.) (10) Lesson preparation (Participation of support staff in auxiliary tasks) (11) Learning evaluation and grading (Participation of support staff in auxiliary tasks) (12) Preparation and operation of school events (Coordination with administrative staff, partial outsourcing, etc.) (13) Career guidance (Coordination and cooperation, etc. with administrative staff and outside personnel) (14) Responses to children, students and households requiring support (Coordination and cooperation, etc. with specialized staff)

Structure of Subjects and Subject Subdivisions at High Schools

… Compulsory subjects

…Compulsory elective subjects

※Subject names are tentative translations.

* Existing subject subdivisions are indicated by a gray text box

Japanese Language

- Japanese Language (Logic)
- Japanese Language (Literature)
- Japanese Language Expression
- Inquiry-based Japanese Classics
- Contemporary Japanese Language
- Language and Culture

Foreign Languages

- English Communication II/III (Integration of "listening," "reading," "speaking," and "writing")
- Logic and Expression I/II/III (Speeches, presentations, debates, and discussions)
- English Communication I (Integration of "listening," "reading," "speaking," and "writing")

* To be considered based on the results of English skills surveys, CEFR levels, and in response to the diverse range of learning needs of high school students.

Geography and History

- Inquiry-based Geography
- Inquiry-based Japanese History
- Inquiry-based World History
- Geography
- Modern and Contemporary History

Civics

- Ethics
- Politics and Economy
- Public

Home Economics

- Basic Home Economics
- Home Economics

Information

- Information II
- Information I

Inquiry-based Integrated Study of Science and Mathematics

- Inquiry-based Integrated Study of Science and Mathematics
- Basic Inquiry-based Integrated Study of Science and Mathematics

Period for Inquiry-based Cross-disciplinary Study

- Period for Inquiry-based Cross-disciplinary Study

* The principle of the Period for Integrated Research will be clarified: to develop the research ability of students through the practice of researching challenges that the students themselves have discovered in the real world and everyday life while making connections to their own career formation.

Mathematics

- Mathematics III
- Mathematics II
- Mathematics I
- Mathematics C
- Mathematics B
- Mathematics A

Science

	Physics	Chemistry	Biology	Earth Science
Science and Our Daily Life	Basic Physics	Basic Chemistry	Basic Biology	Basic Earth Science

Necessity of Articulation Reforms of High Schools and Universities

- Rapid internationalization, informatization → Rapid and drastic change in social structure
- Necessity of fostering capability to create new values in knowledge-based society
- Necessity of balanced development of "3 elements of academic abilities" necessary for acting independently in society

"3 academic abilities":

1) Solid acquisition of knowledge, skills
2) Power of critical thinking, judgement, self-expression, based on (1)
3) Independent willingness to work with, learn from, diverse range of people

Multi-faceted evaluation of "3 elements"
Selection of university entrants

Integrated reform of high school and university education and selection of university applicants (articulation reforms of high schools/universities)

Fostering of 3 elements of academic abilities
High school education

Further strengthening of capabilities developed in high school and preparation for entry into society
University education

Reform of University Admissions System

Outline of reform

◆ Switch to entrance exams that evaluate the *three elements of academic abilities (below)* of students' with multilateral and comprehensive assessments: 1) Solid acquisition of knowledge, skills; 2) Power of critical thinking, judgement, self-expression; 3) Willingness to learn from cooperation with diverse range of people, with self-direction

◆ Promote reforms of selection of university applicants

◆ AY 2020 Introduce Common Test for University Admissions *With essay questions and assessment of four English skills
AY 2024 Implement further changes based on the New National Curriculum Standards

Current System		System after academic year 2020
Common exam (currently the National Center Test)		
Multiple choice questions only	Introduce essay questions	-National Center for University Entrance Examination will create and decide the test questions. The Scoring will also be done by the Center, and the center may utilize the private sector to facilitate scoring processes. -Japanese: about three questions including a question of 80 to 120 characters Mathematics: about three questions including formulae and problem solving -Should introduce in academic year 2024 essay questions in geography, history, civics and even in science
English test: *reading* and *listening* only	Switch to assessment of four skills	-Assess four skills of English – reading, listening, speaking, and writing, using private-sector English assessment tests. -The Center will certify tests appropriate for university admissions after evaluating the content of the tests and the system for implementation. Universities will decide which tests to use for admission. (up to twice for high school seniors). -The English section of the National Center Test will continue to be implemented through academic year 2023. -MEXT will request that testing agencies to reduce testing fees, and that each university use as many certified tests as possible in consideration of the applicants' financial costs.
Individual admissions by Institutions		
Three elements of academic abilities not properly assessed High school students' motivation to learn discouraged by early passing of the entrance exams	Set new rules	- For admissions office and recommendation-based entrance exams, make either essays, presentations, course/subject tests, or the Common Test for University Admissions mandatory. -Improve the content of student credentials -Change the start of the application period for admissions office exams from August to September -Set new rules so that application results for admissions office exams will be published no earlier than November, and for recommendation-based entrance exams no earlier than December.

Discussion on Human Resource Development in Society 5.0

Created in November 2017 under the auspices of the Minister of Culture, Sports, Science and Technology, the "Minister's Meeting on Human Resource Development for Society 5.0" and the "Task Force on Developing Skills to Live Prosperously in the New Age" held numerous discussions, the results of which were summarized in June 2018 under the title "Human Resource Development for Society 5.0: Changes to Society, Changes to Learning."

Minister's Meeting on Human Resource Development for Society 5.0

○ Meetings were held nine times with experts from a variety of fields to sketch a vision of society and engage in free and wide-ranging discussion. To provide educators and industry with materials for thinking together about the future of education policy through society as whole, the meeting outlined a vision of society for Society 5.0 and the kinds of human resources and forms of learning needed.

(Members) ◎ Chair ○ Deputy Chair

◎ Yoshimasa Hayashi,	Minister of Education, Culture, Sports, Science and Technology
○ Hiroshi Suzuki,	Special Advisor to Minister of Education, Culture, Sports, Science and Technology
Noboru Ota,	Mayor, Maniwa City, Okayama
Hiroshi Ohashi,	Professor, Graduate School of Economics, The University of Tokyo
Hiroaki Kitano,	President and CEO, Sony Computer Science Laboratories
Sisyu,	Japanese Calligrapher/Artist
Hideaki Shiroyama,	Graduate Schools for Law and Politics / Vice Director, Policy Alternatives Research Institute, The University of Tokyo
Masashi Sugiyama,	Director, RIKEN Center for Advanced Intelligence Project / Professor, The Department of Complexity Science and Engineering, Graduate School of Frontier Sciences, The University of Tokyo
Hinae Niori,	President, manma inc. / Master's Course, Graduate School of System Design and Management, Keio University
Yohei Harada,	Leader, Youth Life Lab, Hakuhodo Brand Design
Masaaki Mizuno,	Presidential Advisor, Nagoya University / Vice Director, Center for Advanced Medicine and Clinical Research, Nagoya University Hospital

Task Force on Developing Skills to Live Prosperously in the New Age

○ Building on discussions in the Minister's Meeting, the Task Force pursued discussion of policy measures that should be undertaken as part of Japan's education policy and outlined not only items related to the direction of policy measures to pursue specific to Society 5.0 but also short and mid-term initiatives based upon them.

(Members) ※ As of January 2018 ◎ Chair

Yoshimasa Hayashi,	Minister of Education, Culture, Sports, Science and Technology
Noriko Miyagawa,	Parliamentary Vice-Minister of Education, Culture, Sports, Science and Technology
Naoko Okamura,	Director, Policy Division, Minister's Secretariat
◎Atsuyuki Asano,	Director, Local Facilities Aid Division, Department of Facilities Planning and Administration, Minister's Secretariat
Naoki Himiya,	Director, Policy Planning and Coordination Division, Lifelong Learning Policy Bureau
Ken Umemura,	Director, Education Media and Information Policy Division, Lifelong Learning Policy Bureau
Takayuki Mori,	Director, Elementary and Secondary Education Planning Division, Elementary and Secondary Education Bureau
Tetsuo Goda,	Director, Financial Affairs Division, Elementary and Secondary Education Bureau
Takashi Fuchigami,	Director, School Curriculum Division, Elementary and Secondary Education Bureau
Tomohiro Tsubota,	Director, Student Affairs Division, Elementary and Secondary Education Bureau
Takuho Senzaki,	Director, Early Childhood Education Division, Elementary and Secondary Education Bureau
Yasushi Takinami,	High-School Education Reform Project Team Leader, Elementary and Secondary Education Bureau
Yoshiyuki Ebina,	Director, Higher Education Policy Planning Division, Higher Education Bureau
Mutsuko Inoue,	Director, Private Education Institution Management Division, Higher Education Bureau
Masaharu Shiozaki,	Knowledge Infrastructure Policy Division, Science and Technology Policy Bureau
Katsuhiko Hara,	Director, Information Division, Research Promotion Bureau
Keiko Momii,	Director, Competitive Sports Division, Japan Sports Agency
Yumi Enyu,	Director, Fine Arts Division, Cultural Properties Department, Agency for Cultural Affairs

*1 : untill March 2018 *2: from April 2018 *3: untill January 2018 *4: from January 2018

※Adding to the members listed above, a large number of young members including deputy directors and unit chiefs of MEXT have discussed what should be undertaken as part of Japan's education policy.

School Ver. 3.0 for Society 5.0 (Part 1)

Society 3.0 (Industrial Society)

Society 4.0 (Information Society)

School Ver. 1.0 (Age of "Studying")

- Schools monopolize educational resources (teachers, materials, locations) and offer classes that everyone takes together at a pre-determined time, with outcomes measured using paper exams focused on the reproduction of knowledge.
- Curriculum is a body of knowledge (typical example would be the table of grade-specific kanji characters in the Japanese class).
- Priority given to accurate memorization of knowledge as a basic academic ability, diligence and perseverance, and accuracy in steadily executing a pre-determined plan.
- Relies on experience of self-motivated teachers who use and improve educational techniques through classroom research.

School Ver. 2.0 (Age of "Studying / Learning")

- Combines Japanese schools' experience in education with active, dialogic deeper learning to produce active learners.
- Reforms high school-to-university articulation by shifting away from university entrance exams that favor 5 alternative questions to exams that require evidence of thinking through written responses.
- Curriculum shifts toward a system that prioritizes ability (Prioritizes cognitive ability and an underlying desire to learn and willingness to collaborate—e.g. using vocabulary to express oneself, thinking scientifically, using math in everyday life).
- Priority given to the ability to compile information within one's own context and create new value and "consensus" through collaboration and dialog.

School Ver. 3.0 Schools (Age of "Learning")

School Ver. 3.0 for Society 5.0 (Part 2)

Society 5.0
Super-Smart Society

- Strengths as human strengths (the ability to understand the real world and assign circumstance-specific meanings,morality and the ability to face conflicting demands and the unexpected, the ability to act responsibly, etc.)
- Commonly needed skills include the ability to accurately interpret and respond to writing and information; the ability to think scientifically/examine and apply; the sensitivity and ability to discover and create value; and curiosity and inquisitiveness

School Ver. 3.0 (Age of "Learning")

21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 K

From "K-12 Education" to "K-16 Programs"

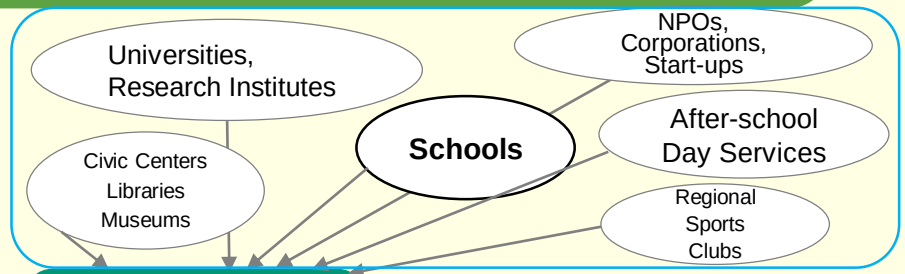
- Shifts to individually optimized "learning" through educational programs in next-generation schools
- K-16 grade levels reflect level of ability, not school year. Shifts to a system of education predicated on recurrent education for the generation of 100-year lives
- K-16 programs centered on next-generation schools are provided by universities, NPOs, corporations, and various other entities utilizing their respective strengths

Learning (with experiential focus) that creates value through collaboration with others in STEAM-oriented programs

Learning (with practical experiential focus) to become professionals that utilizes human strengths

- Deepening of perspectives and thought to produce more analytical, more critical thinking
- Learning unfolds around self-awareness of one's individual roles and responsibilities in society
- Responsiveness and confidence in collaborations with others and society through hands-on experiences

- Basics of academic ability, including vocabulary, reading ability, and numerical sense
- Realization of living together with others through hands-on experiences
- Curiosity to undertake the challenge of unknown worlds
- Ability to create things through hard work



Region, family, and information networks (Multi-layered connections to actual society)

"Active Learner"

Learning organizer for individually optimized learning
Design and production of individual child learning and collaborative classroom learning (new function for public education)

Individually optimized learning and learning portfolios

- An important function of public education is to observe the condition of children's learning and support learning that is successfully tailored to each child
- Ubiquitous learning centered on next-generation schools allows students to select and learn from various programs offered by universities, NPOs, corporations, and others
- Schools serve the important function of providing fair opportunities for various learning activities, including hands-on experiences and dialog/collaboration with others
- Individual student outcomes (essays, works, reports, presentations, etc.) are digitized and preserved in the form of learning portfolios

Support tailored to an individual's cognitive and dispositional traits
(use of cognitive science and educational Big Data)
*Risks and limitations of Big Data must also be considered

Gathering and analyzing educational Big Data (comprehensive evidence)

Study logs

Coordination between local municipalities and with the state

Coordination with research institutes and corporations

Human Resource Development for Society 5.0: Changes to Society, Changes to Learning (Summary)

1. Vision of society for Society 5.0, and the kinds of human resources and forms of learning needed

(Building upon discussions in Minister's Meeting on Human Resource Development for Society 5.0)

Vision of society for Society 5.0

Development of AI technology ⇛ AI technology can provide alternatives for routinized work and work that can be expressed numerically
⇛ Changes to industry, changes to ways of working

Issues for Japan
Lack of human resources engaged in AI research and development; declining birthrate and societal aging; weakening of bonds; decreasing opportunities to experience nature

Strengths as human beings
Sensitivity and ethics to understand and give meaning to the real world; ability to confront and adapt to conflicting demands and the unexpected; ability to take responsible action

Forms of learning in Society 5.0 and the kinds of human resources needed in Society 5.0

How AI and other advanced technologies will affect education ⇛ Transformation of forms of learning
(Ex.)
- Offering study plans and study content based on an understanding and analysis of study logs, etc.
- Supporting study in more sophisticated ways based on study log records (provision of content tailored to study conditions, matching of study environments, etc.)

Changes to schools / Changes to learning ⇛ Society 5.0 schools (age of "learning")
- Schools with one-size-fits-all classes → Sites of learning where individuals learn according to their own pace, ability and interests, while steadily attaining fundamental academic abilities such as reading comprehension
- Studying in groups based on school-year grade-level → Expansion of learning beyond grade levels to include more collaborative learning in mixed-age, mixed-grade groups based on level of attainment, subject matter, etc.
- Studying in school classrooms → Diverse learning programs that also utilize universities, research institutes, corporations, NPOs, education/culture/sports facilities, and so on

Skills commonly needed: Ability to accurately interpret and respond to writing and information
Ability to engage in and apply scientific thinking and inquiry
Sensitivity and ability to discover and create value; curiosity and the inquisitiveness

Human resources to lead a new society: Human resources who discover and create leaps in knowledge that are the sources of technological innovation and creation of value
Human resources that create platforms that connect technological innovations to societal issues and create platforms
Human resources that can leverage and extend AI and data in various fields

2. Direction of policy measures to pursue specific to Society 5.0

(Outline of discussions within the Task Force on Developing Skills to Live Prosperously in the New Age)

< Kinds of human resources and forms of learning needed >

Transformation of forms of learning

Development of commonly needed skills

Development of human resources to lead a new society

< Current conditions, issues, etc. >

[At all stages of learning]

- Lack of self-guided, independent learning in collaboration with others while steadily mastering fundamental academic abilities

[Elementary and lower secondary school]

- High level of achievement on OECD/PISA
- On the other hand, amid changes in home and information environments, there are issues in reading comprehension—the ability to understand and think about what writing and information mean
- The chain of poverty must be broken and steady progress made toward attaining fundamental skills needed by all children in Society 5.0

[Upper secondary school]

- General courses are 70% (800k persons), specialized courses are 30% (300k persons)
- Humanities make up 70% of general courses (500k persons) and many students split into either the humanities or sciences in their second year. As a result, students tend not to learn enough on specific subjects.
  ※ For instance, only 20% (140k persons) of all general course students take "physics."
- Potential of various kinds of learning regardless of grade level (collaboration with institutions of higher learning, industry, etc.)

[From high school graduation to working member of society]

- Four-year universities are 50% humanities and social sciences (300k persons), 20% science and engineering (120k persons), 10% health, and 20% education, arts, etc.
  ※ Other countries: Science and engineering make up nearly 40% in Germany and nearly 30% in Finland and Korea
- STEAM and Design Thinking are needed in education
  ※STEAM＝Science, Technology, Engineering, Art, Mathematics

< Direction of policy measures to pursue >

I. Provide a variety of learning opportunities and spaces to achieve **"fair, individually optimized learning"**

II. Ensure that all children and students acquire fundamental academic abilities—e.g. **basic reading comprehension, mathematical thinking**, etc.—and **information competency**

III. Transcend the humanities/sciences divide

I. Provide a variety of learning opportunities and spaces to achieve "fair, individually optimized learning"

○ Development of a pilot project for a variety of collaborative kinds of learning, including individually optimized and mixed-age/mixed-grade learning

※ Elementary, middle and high schools nationwide will participate (Number of schools to be determined in the future)

- To achieve individually optimized learning tailored to the abilities and aptitudes of each individual child or student, practical research and development will be conducted based on individual learning tendencies and current activities (including sports, culture, special activities, club activities, volunteering, etc.), as well as the characteristics of each subject/unit, using learning portfolios (see below) that track study logs, etc. (e.g. individually optimized learning to ensure steady attainment of basic literacy and mathematical thinking)
- Practical research and development will also be conducted on collaborative learning in mixed-age/mixed-grade groups (e.g. mixed-age/mixed-grade collaborative learning based on English-language ability)
- The project collaborates with regional human resources and others to advance a "team school" and provide a varied learning program that includes hands-on activities
- The use of practices such as Advanced Placement, early matriculation, and early graduation will be encouraged to ensure that child/student learning environments are more individually optimized. To engender a desire for varied learning in students, the use of gap years at universities and leaves-of-absence to engage in diverse learning outside of school will also be encouraged with a view to advancing individually optimized learning.

○ Use of learning portfolios to track study logs, etc.

- Using EdTech, study logs that record individual learning will be digitized and tracked as learning portfolios, which will not only accelerate the integration of instruction and assessment but also enable their use by children and students themselves. For this reason, improved surveys of nationwide academic ability and learning conditions and a smooth introduction of basic diagnostics of learning, including the introduction of CBT, will create a cycle of assessment and improvement by enabling an ongoing awareness of individual child/student attainment in fundamental academic abilities and information competency, as well as the ability to provide rapid feedback.

○ Improved educational quality and more enriched learning environments through the use of EdTech and Big Data

- To promote the use of EdTech and big data, discussions will be held on drafting necessary guidelines and on building a platform to collect, share and use data.
- Preparation of ICT environments and development/hiring of ICT human resources will also be accelerated to keep pace with digital textbooks, digital instructional materials, CBT adoption, and so forth.

II. Ensure that all children and students acquire fundamental academic abilities—e.g. basic reading comprehension, mathematical thinking, etc.—and information competency

○ Steady attainment under new National Curriculum Standards

- Steady attainment under the new National Curriculum Standards stresses mastery of fundamental academic abilities, including vocabulary knowledge, structural awareness of sentences, literacy, arithmetic and mathematical thinking. (Surveys of nationwide academic ability and learning conditions, Common Test for University Admissions, basic diagnostics of learning likewise stress these abilities.) For this reason, support for learning will be strengthened by accelerating the preparation of instructional materials, ICT environments, and EdTech that improve instructional methods, such as individually optimized review, and support more effective instruction.
- Mastery of academic abilities will be promoted through the use of learning portfolios that track study logs, etc. (see I.).

○ Attainment of information competency

- Discussions will be initiated regarding the addition of “information” as a subject to be tested on the Common Test for University Admissions (from 2024).
- Data science and statistics education will be strengthened across elementary, lower and upper secondary school.

○ Instructional procedures will be established at schools and the teaching certification system will be improved to ensure that fundamental academic abilities are steadily mastered.

- Establish instructional procedures as schools such as assigning single-subject teachers to upper elementary grade levels
- Given that the elementary school teacher employment exam has become less competitive than the lower and upper secondary school teacher employment exams and that relatively few teachers have certificates for specific subjects such as technology and information at the lower and upper secondary school levels, the teaching certification system will be updated in order to enhance and strengthen instructional procedures, both qualitatively and quantitatively (e.g. flexibility in obtaining teaching certificates for multiple types of school or subjects and enabling candidates to obtain certificates for specific subjects more flexibly based on years of experience and area of specialization).

III. Transcend the humanities/sciences divide

○ Reforming high school-to-university articulation to enable study of both the humanities and sciences

- Human resources with understandind of both the humanities and sciences will be developed not only by ensuring steady attainment of the new National Curriculum Standards, which requires the basic skills— probability, statistics, and basic programming, as well as science and social science—that are needed in a variety of academic disciplines, but also by having in place conditions to serve students who wish to pursue more advanced topics, such as differential equations, linear algebra, Bayesian statistics, and data mining.

→ Creation of a Consortium for World-Wide Learning (WWL)

- Consortiums for WWL will be created to offer study programs/courses in advanced and varied subjects, including AP (Advanced Placement), that individuals can take based on their interests, traits, etc. (approximately one location per 60,000 upper secondary school students will be created, with each center to be housed in national / public / private upper secondary school and/or technical college campuses in each prefectures around the country).
- Short / long-term study abroad at foreign partner schools will be mandatory, high-level human resources accepted from abroad and classes and research conducted in English with exchange students

- Given the need to reform the dividing situation between the humanities and sciences in upper secondary schools, the needs of society, and international trends, universities will be encouraged to review their educational programs to provide the kind of education that many students will need in the future (e.g. STEAM, Design Thinking, etc.).
  Transition to a framework that can provide across departments liberal arts that are studied in common by all students and specialized fields (e.g. human and social sciences, STEAM, healthcare, etc.) that are selected by students.
- In addition to the development of leader and expert AI human resources majoring in STEAM, human resources majoring in the human and social sciences will also be developed to acquire needed AI-related knowledge through studying both the humanities and sciences. Expert human resources in AI will also be developed at colleges of technology and specialized training college, not only universities.

→ Development of advanced expert human resources in areas like AI

- Expansion and strengthening of cross-curricular mathematics and data science education (e.g. centers created, standardized curriculum, etc.) etc.

→ Offering practical education and developing expert human resources through industry-academia collaboration

- Development and delivery of practical educational programs through industry-academia collaboration; incentives to attract investment from industry etc.

○ Developing human resources that study the merits of local regions and support communities

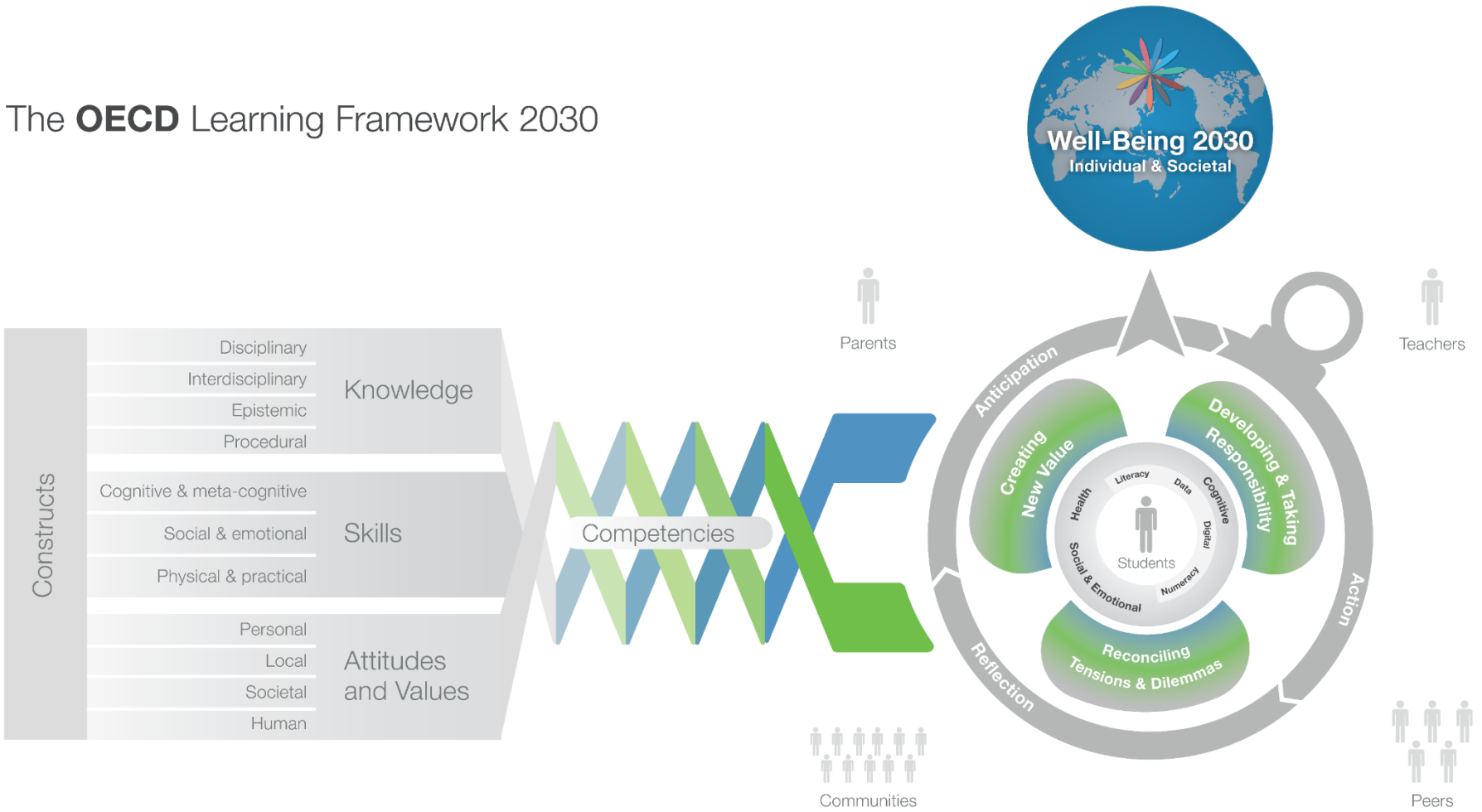
- Collaborative courses involving upper secondfary schools, local municipalities, institutions of higher education, and industry will promote the development of local human resources by creating environments in which students can study various fields such as welfare, the agricultural, forestry and fishery industries, and tourism.

→ Creation of Region^3 High Schools※ (Region-Cubic High Schools) ※Upper secondary schools of the region, by the region, for the region

- By building a consortium between high schools, local governments, institutions of higher education, corporations, medical and caregiving facilities, the agricultural, forestry, and fishing industries, and so on and requiring students to take distinctive subjects specific to the industries and culture of their region (e.g. tourism studies) through discovery-oriented learning, etc., educational institutions will be transformed into places where students can discover “what they want to do.”
- To promote collaboration between prefectures and municipalities, efforts will be required to include local mayors and/or superintendents as members of the school board at prefectural upper secondary schools that are community schools

4. International Trends

Consideration of competencies required in the new era by the OECD (1)



(From OECD)

OECD Education 2030 Learning Framework

2030 Well-Being

Individual ・ Societal

Constructs		
	Disciplinary	**Knowledge**
	Interdisciplinary	
	Epistemic	
	Procedural	
	Cognitive & meta-cognitive	**Skills**
	Social & emotional	
	Physical & practical	
	Personal	**Attitudes and Values**
	Local	
	Societal	
	Human	

Parents　　Teachers

Anticipation ・ Action ・ Reflection

- Creating New Value
- Developing & Taking Responsibility
- Reconciling Tensions & Dilemmas

Health　　Cognitive

Students

Literacy
Digital
Data
Numeracy

Social & Emotional

Communities　　Peers

(From OECD)

Japan OECD Joint initiative Project (2015-2017)

[Background]

Based on the results obtained in the OECD Tohoku School Project(*) including the effectiveness of Problem-Based Learning, Secretary-General of the OECD, Angel Gurría and the then Minister of Education, Hakubun Shimomura agreed on the joint research with a bilateral framework between Japan and the OECD in April 2014 .

[Objectives]

To conduct a project in which Japan and the OECD jointly develops a new education model for developing the competencies of children required for them to open the way for a new era by overcoming the issues such as globalization, the falling birthrate and the aging population, and to share these issues not only in Japan but with other countries to contribute to innovation, etc. in school education in each country.

* OECD Tohoku School Project (2011-2014)

The education program implemented by Fukushima University in coordination with the OECD and the local governments of disaster-affected areas in Tohoku for the purpose of children's participation in revitalization and development of global human resources to support the revitalization of Tohoku area by utilizing the knowledge of the OECD. Around 100 junior high and high school students from three prefectures in Tohoku participated in the event in Paris in August 2014, and appealed the revitalization of Tohoku through their originally designed event.

[Source] "OECD Tohoku School Report"

Japan / OECD Joint initiative Project (2015-2017)

Projects Implemented

(1) Policy Dialogue

Policy dialogue was implemented to enable high-level staff of the Ministry of Education, Culture, Sports, Science and Technology and the OECD to exchange opinions on the state of curricula and classes befitting the new era, learning and teaching methods such as active learning, and the state of evaluation of academic ability.

(2) Joint research

On the Japanese side, Tokyo Gakugei University was the main entity involved as Japan and the OECD jointly conducted investigative research on teaching methods and various knowhow and data held by the OECD with the aim of creating results contributing to educational innovation in schools by developing educational models and researching evaluation methods to determine how to develop the competencies required in 2030 in elementary and junior high schools.
(analysis of the correlation between competencies, development of “21CoDOMoS” video-based lesson explanation system, etc.)

(3) Regional Revitalization Innovation School 2030

Based on the results of the OECD Tohoku School Project, six regional clusters were organized by schools agreeing to the aims of the project to practically examine the spread of learning content and methods to help students to acquire Problem-Based Learning skills and international mind at schools, and each cluster from the six regions implemented project based learning in cooperation with partner schools overseas.
(Tohoku x Germany, Fukui x Singapore, Oki-Dozen x Estonia, etc.)

* In addition, the OECD conducted a review analyzing the “strengths” and “challenges” in Japanese education from an international perspective as part of the joint project.

Input

OECD Education 2030 Project

A project aimed at revising the key competencies that must be developed for 2030 based on perspectives such as “Knowledge, Skills, Attitudes and Values” and supporting the drafting of policy by each country.
A new learning framework was developed in the OECD after summarizing the opinions of each government, experts and school networks, etc.
(2015-2018)

5. Direction of education policy in the next five years (Third Basic Plan for the Promotion of Education)

Overview of 3rd Basic Plan for the Promotion of Education -(1)

Plan period: FY2018-2022

Part 1 Future direction of Japan's education policy

I. Universal mission of education

Further efforts are necessary to achieve the aims of education stipulated in the Revised Basic Act on Education, namely, "the full development of character" and "nurturing of citizens, sound in mind and body, who are imbued with the qualities necessary for those who will form a peaceful and democratic state and society," and to realize an "education nation" in order to achieve these aims.

II. Education: Current situation and issues

1. Results of efforts up to now

- Achievement of academic ability in primary and secondary education at top levels by world's standards
- Introduction of grant type scholarship system and income contingent scholarship system
- Progression school buildings/facilities earthquake resistant

2. Issues to be addressed based on current situation of society and anticipated changes from 2030

(1) Changes in societal conditions

Decreasing and aging population; technological innovation, globalization, child poverty; regional disparities, etc.

(2) Changes in educational situation

- Learning and daily life problems
- Teacher workload
- Changes in regional and family situation
- Ensuring quality of higher education

(3) International policy trends in education

- Policy Review by OECD etc.

III. Priority areas for education policy in anticipation of changes in society beyond 2030

Principles of "independence," "harmonious collaboration," and "creativity" from the 2nd Basic Plan will be continued, and the followings pursued.

≪Aims for the individual and for society≫

For the individual: Fostering individuals who can create new values while exercising independent judgment and cooperating with a diverse range of people as an independent person.
For society: Sustainable growth and development of society (regional, national, international), realization of society where each person can play an active role and live well with peace of mind.

≪ Priority areas for education policy≫

- With the advance of technological innovation leading to the realization of a "Super Smart Society" (Society 5.0), education for youth and lifelong learning and skills improvement are necessary as part of the human resource development revolution and the productivity revolution in order for people to live full lives in the "100-Year Life" age of longevity.
- Enabling each person to optimize his/her potential and opportunities over the course of one's life through education will be a focal point of education policy from now.

Overview of 3rd Basic Plan for the Promotion of Education -(2)

Part 1 Future direction of Japan's education policy

IV. Basic directions of education policy for next plan

1.Development of capabilities necessary to take on challenges and realize possibilities with aspiration and ambition.
2. Development of various capabilities in order to lead sustainable growth of society.
3. Improvement of environment for enabling lifelong learning and activity.
4. Creation of learning safety net so that anyone can be instrumental in supporting society
5. Improvement of foundation for the promotion of education policy.

V. Viewpoints to be considered, particularly in the forthcoming implementation of educational policies

1. Promotion of evidence-based education policy

- Establishment and complete functionalization of PDCA cycle for education policy
- Building of system in MEXT for promoting Evidence-Based Policy Making (EBPM), strengthening of collaboration with researchers in various fields, unification of data, improvement of delivery systems, etc.

2. Investment in education (direction of education investment during 3rd Basic Plan)

- Steady implementation of "New Economy Policy Package", etc. in order to drastically expand investment in human resources, and greatly reduce the burden of educational cost
- Securing education investment in order to improve the quality of education at each stage of education
- Reference to situation of education investment, such as public fiscal expenditures, in OECD and other countries to develop measures for getting financial sources for necessary budgeting and securing necessary investment in education
- At such times, thorough implementation of evidence-based PDCA cycle to foster understanding among public.

3. Creation of next-generation education anticipating new era

- With rapid changes in social structure, for example, the realization of Society 5.0, expected, continuous promotion of future-oriented R&D, such as creation of next-generation schools
- Development of new policies for the creation of a "sustainable social education system," which will lead to the resolution of regional problems like the decreasing and aging of populations
- Promotion of R&D and cutting-edge efforts for the creation of next-generation education

Overview of 3rd Basic Plan for the Promotion of Education -(3)

Part 2 Goals and Measures for Education Policy within the Coming 5 Years

For each of the 5 basic directions shown in Part 1, compiling

1. Goals of education policy
2. Setting of evaluation indicators and reference indicators to ascertain progress towards goals
3. Compiling of packages of measures necessary for realizing goals

Basic directions	Goals of education policy
1. Development of capabilities necessary to take on challenges and realize possibilities with dreams and aspirations	(1) Cultivation of solid scholastic ability (mainly primary and secondary education stage)
	(2) Cultivation of richness in humanity (mainly primary and secondary education stage)
	(3) Cultivation of sound body (mainly primary and secondary education stage)
	(4) Acquisition of the ability to identify and solve problems (mainly higher education stage)
	(5) Cultivation of abilities and behavior for social and vocational independence (throughout all stages of life)
	(6) Enhancing educational abilities in home, community, promoting collaboration, cooperation with schools
2. Development of various capabilities in order to lead continuous growth of society	(7) Developing human resources who can be active internationally
	(8) Developing human resources who can lead innovation through improvements in graduate school education
	(9) Developing human resources in various fields, e.g., sports, culture, etc.
3. Improvement of environment for enabling lifelong learning and activity	(10) Promotion of lifelong learning in anticipation of age of “100-year-life”
	(11) Promotion of learning to improve the lives of people and continually develop society
	(12) Promotion of recurrent education for adults in order to acquire necessary skills and knowledge for work throughout life
	(13) Promotion of lifelong learning for persons with disabilities
4. Creation of learning safety net so that anyone can be instrumental in supporting society	(14) Consideration of household’s financial situation and geographical conditions
	(15) Providing educational opportunities responding to various needs
5. Improvement of foundation for the promotion education policy	(16) Preparation of sustainable school teaching system for education in the new era
	(17) Preparation of foundation for utilization of ICT
	(18) Preparation of safe/secure high-quality education and research environment
	(19) Ensuring safety of children
	(20) Reform of higher education system leading to strengthening of foundation for education and research
	(21) Introduction of Japanese-style education overseas and internationalization of Japanese education