Advances in Social Science, Education and Humanities Research, volume 503
Proceedings of the 1st International Conference on Early Childhood Care Education and Parenting (ICECCEP 2019)

Early Childhood Care and Education Practices in Japan for the Era of Society 5.0

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ABSTRACT
With a backdrop of a decreasing and aging population along with advancing technologies, the Japanese government envisioned "Society 5.0" in the fifth science and technology basic plan issued in 2016. This paper aims to outline characteristics of Society 5.0 and skills considered necessary for the proposed future, and further discusses what is expected for Early Childhood Care and Education (ECCE) in Japan. Government policies and reports as well as other studies on Japanese ECCE are used for review and analyses. The country aspires to build a human-centered society by integrating cyberspaces and physical space, so as to attain both economic growth and solutions to issues. Skills needed for Society 5.0 encompass digital literacy built upon basic academic and social skills, scientific and mathematical knowledge, critical thinking, autonomous learning, curiosity, inquisitiveness, rich sensitivity, perseverance, and entrepreneurial spirit, among others. For materializing Society 5.0 in the country, quality ECCE should be universally provided to all young children. ECCE practices including teachers' roles should remain the same, however, since its unique characteristics and principles are unchanged regardless of societal changes. More ICT may be applied in future ECCE, and yet only in a manner to improve their practices without undermining important principles such as child-centeredness, play-based learning, and holistic development through direct experiences.
Keywords: *Early childhood; care and education; Japan; society 5.0*

1. INTRODUCTION

According to UNESCO, we have no global standard model of Early Childhood Care and Education (ECCE) that fits to the diverse needs of the world [1]. Nonetheless, this does not mitigate the importance of learning from other countries' practices, because some may precedingly experience societal changes that others could undergo subsequently. One such illustration is Japan. Their population decreased for the first time in the national census of 2015 to around 127 million [2] and will dip below 100 million in 2053 by the government's estimates [3]. Although countries like South Korea, Taiwan, Singapore and Italy suffer from even lower total fertility rates than that of Japan more recently, the nation's uniqueness lies not only in the declining population but also in the accelerating aging society. The population aged 65 and above accounts for 28.1% of all residents in 2018, the highest in the world, and is estimated to reach as far as 38.4% in 2065 [3].

In addition to these challenges, as with any other developed nation, Japan is in the midst of a major technological transformation, where new technologies such as Artificial Intelligence (AI), big data, Internet of Things (IoT), and robotics become important parts of daily life. Accordingly, the Japanese government envisioned "Society 5.0" in the fifth science and technology basic plan issued in 2016 as a future world to aim for. Such societal shifting definitely brings about changes in the types of abilities that humans should be equipped with, and correspondingly what is expected for education, including ECCE. What kinds of skills and attitudes should ECCE seek to develop among young children in order to lay strong foundations for life? Japan's proposal and their policies may be worth a little scrutiny.

The paper therefore aims to outline characteristics of Society 5.0 and skills considered necessary for the proposed future, and further discusses what is expected for ECCE in Japan to prepare themselves for the coming era. Three questions are addressed: 1) What is Society 5.0? 2) What skills do we need to develop for the new society? and 3) How should ECCE prepare a future generation? Government policies and reports as well as studies on Japanese ECCE are used for review and analyses. The paper is structured in such a way as to provide answers to the above inquiries in order, which are followed by discussion and conclusions.

2. WHAT IS SOCIETY 5.0?

The idea of Society 5.0 was first introduced in Japan's five-year national strategy of science and technology by the cabinet office in 2016. It is named after the past four kinds of society the world experienced, namely, Society 1.0 relying on hunting and gathering, Society 2.0 based on agriculture, Society 3.0 after the industrial revolution, and Society 4.0 built on information. The government defines Society 5.0 as "a human-centered society that balances economic advancement with the resolution of social problems by a system that highly integrates cyberspace and physical space" [4].

One may wonder what differences are between Society 5.0 and "Industry 4.0" prepositioned by the German government in 2011, from which the term "the fourth industrial revolution" began to be recognized globally. While Industry 4.0 intends to boost production efficiency by creating "a smart factory" powered by manufacturing technologies such as cyber-physical systems, IoT, AI, and others, Society 5.0 is a more far-reaching concept than Industry 4.0, which

portrays a comprehensive blueprint of the future society [5]. In the latter, digital technologies will be utilized to construct an inclusive and sustainable social and economic system by materializing the fourth industrial revolution in industry as well as renovations of various aspects of people's lifestyles.

Still, one essential commonality between Society 5.0 and Industry 4.0 lies in their creation of highly converged systems between cyberspace and physical space, that is, a strategic integration of virtual and real zones of life. Currently, people use cloud computing services in cyberspace for storing, retrieving and analyzing information and data in physical space. In other words, much work still remains in the hands of humans. In Society 5.0 as well as Industry 4.0, on the other hand, cyberspace accumulates data from sensors of IoT in physical space, and analyzes accumulated big data by AI, and subsequently furnishes people back with valued-added information as the analytical results.

There are two major characteristics unique to Society 5.0. One is the simultaneous achievement of economic growth and solutions for chronic social problems. Manufacturing industry, for instance, can enhance competitivity through needs-oriented product planning based on the demands forecast by AI, and tailoring products to customers' particular needs in a mass production. The use of robots and efficient production management through inter-plant coordination also help to overcome labor-shortage problems. In the field of agriculture, AI's analyses on weather information and food market data will facilitate an efficient farming plan, and automatized farm work by robot tractors, drones, and others minimizes demands for human labor. Moreover, products are made available to consumers at the optimal time when needed, thus reducing unnecessary food wastage. Solutions are also found in the field of health and nursing care. Residents in depopulated rural areas, for example, can lead a healthy life by regular automatic health checkups and remote diagnoses and treatments of illnesses by medical doctors from a distance [4].

The other characteristic of Society 5.0 is found in its strong emphasis on human-centeredness, although Industry 4.0 also adopted a policy of putting people first. A future world of Society 5.0 should be designed in such a manner that people are placed at the heart of society and bestowed with vitality, comfort as well as high quality life, without being controlled or manipulated by AI or robots. Thus, the government names it alternatively as "super-smart society," where people from all different walks of life have their diverse needs fulfilled, receive quality services, and are able to live a comfortable and vigorous life [6].

2.1 Skills considered necessary for Society 5.0

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The notion of Society 5.0, however positive and attractive it may sound, certainly leaves ordinary people with some concerns and uneasiness. Wouldn't some of us end up jobless after all? Wouldn't we be left with a sense of inabilities, overwhelmed by flawless and data-driven AI? Could we catch up with the speed of technology advancement? Would children grow up well while living in blurred boundaries between virtual and physical spheres? What if the technology divide among people exacerbates the existing inequality? Not only do these and other worries add further rationale for making the future systems human-centered, but they make us ponder what are our strengths as human beings.

In fact, there are more than a few areas where humans predominate AI [7]. Since AI cannot go beyond tasks explicable by algorism, it is unlikely to substitute humans in those duties requiring creativity and higher-ordered thinking skills. Nor is it good at handling negotiations among stakeholders of different interests or making judgements based on ethical considerations. It is neither able to deal with unexpected situations nor make meanings behind information and phenomena in physical space.

Taking those advantages of humans into consideration, we should contemplate what skills need to be developed for Society 5.0. On the issue in question the Ministry of Education, Culture, Sports, Science and Technology (MEXT) of Japan held several discussion sessions with experts and among ministry officials, and released a report titled "Human resource development for Society 5.0: Changes to society, changed to learning" in 2018. They divide skills into two categories, one for leaders who will guide the new society and the other for future citizens [7].

Leaders of Society 5.0 obviously require advanced knowledge and abilities to produce technological innovations and to discover breakthrough knowledge [6] [7]. Skills required for creating new platform businesses include abilities in connecting different fields, entrepreneurial spirit, scientific and artistic ideas, leadership, social skills, respect for diversity, and ethics among others. Other leaders in manufacturing and other services, with their willingness and skills to apply new digital technologies in their own fields, disseminate technological advancements throughout the society, and continue to learn further renovations autonomously.

Commonly needed skills for future citizens are grouped into three [7]. First and foremost, they should be equipped with skills to accurately comprehend and respond to texts and information, which are built upon basic academic abilities such as language and mathematical knowledge and other social skills to dialog and cooperate with others. Second, they should be able to engage in and apply scientific reasoning and inquiries in their daily life. Critical thinking abilities are prerequisite for those, not to mention scientific and mathematical knowledge. Finally, abilities unique to humans should be well nurtured both at home and school. These include curiosity, inquisitiveness, rich sensitivity, power to discover and create value, perseverance to produce new things, and autonomous learning.

3. Challenges to develop skills needed for Society 5.0 in Japan

Where is Japan currently situated in terms of such skill development? Despite its global image of a technologically advanced nation, Japan faces a number of challenges ahead for AI-related human resource development [6]. The United States has long held its supremacy in AI-related research, recently followed by China [7]. The top-level academic articles in machine leaning, for example, are mostly authored by Americans, with Japan being ranked as low as 11th in 2016 [8]. Similarly, challenges are also found in applying digital innovations, as evidenced by a low proportion of companies adopting IoT, big data, and AI, and an overall low level of entrepreneurship [8]. Consequently, Japan unfortunately does not show much of a presence in international platform businesses either [7].

One of the country's strengths is observed in its high achievement levels of school education, attested by the Programme for International Student Assessment (PISA) results of the Organization for Economic Cooperation and Development (OECD). They measure 15-year-old children's knowledge and skills for life, such as reading comprehension, math literacy, and science literacy every three years. Japan has been ranked among the top-level

countries since its outset in 2000 and is expected to maintain its eminence for Society 5.0 [7]. However, the latest results of PISA 2018 showed the country's sharp fall to the 15th rank in reading comprehension, sparking a debate on what went wrong in school education. Totally computer-based, the tests of 2018 were designed to assess reading comprehension abilities in a digital world in particular, with an increased number of digital texts including on-line texts at web sites, E-mail messages, posting and others [9]. In other words, the outcome proves Japanese children's weakness in accurately interpreting digital texts, one of the above-mentioned crucial skills.

The results seemingly reflect the reality of Japanese formal education. Schools are not yet sufficiently furnished with Information and Communication Technology (ICT) equipment, and thus provide few opportunities for learning using it [10]. For example, only 7.8 percent of Japanese students used digital devices in math classes at least once a week in 2018, whereas 37.8 percent did so in OECD countries on average. According to the latest report of MEXT [11], the availability of computers for education purposes is 5.4 children per equipment in 2019 on average at all schools from primary to upper secondary education. Classrooms with wireless LAN account for as low as 41.0% of all. Under the circumstances, the government intends to increase budget allocation for consolidating ICT infrastructure at schools, in order to achieve the goal of one computer per student at all primary and junior secondary schools and a provision of high-speed large-capacity communication at school by 2023 [12].

4. WHAT IS EXPECTED FOR ECCE IN SOCIETY 5.0?

In order to foster the skills described above toward Society 5.0, what is expected for ECCE? Related government policy documents and other reports are grouped in two, some without reference to ECCE, and the others with it, as follows:

4.1 Some policy documents without reference to ECCE

The fifth science and technology basic plan contains a chapter on high-quality human resource development to reinforce the bedrock of scientific and technological innovations; however, it does not refer to ECCE but mostly to research and development and higher education [6]. The same applies equally to "Integrated innovation strategy" approved by the cabinet in 2018 [13], "AI technology strategy implementation plan" in 2018 [14], "AI strategy 2019" [15], and "Integrated innovation strategy 2019" [16]. The fifth plan refers to the necessity of education reforms, among others, for incorporating active learning methods from elementary to graduate education levels, through which students will learn autonomously and actively, be creative, deepen interests in subjects like science and math, and grow into human resources necessary for future innovations. Other approaches for school education include talent education, support to schools with futuristic curricula of science and math, and encouragement for nurturing entrepreneurial mentality from elementary education onward.

Similarly, the "Integrated strategy innovation" in 2018 sets the goal related to school education where all secondary education graduates acquire IT literacy by 2032 [13]. The "AI strategy 2019" further explains that IT literacy education at school should be facilitated by improved ICT school infrastructure, introduction of cross-subject studies such as Science, Technology, Engineering, Art, and Mathematics (STEAM) education in collaboration with local communities and industries, and the use of "study logs," which are electronic learning portfolios where individual students' learning trajectories are recorded and analyzed for more individualized supports [15].

4.2 Other policy documents with reference to ECCE

Reference to ECCE is found in those elaborated by MEXT such as "Human resource development for Society 5.0" in 2018 [7], "Measures for promoting the use of advanced technologies that support learning in the new era" in 2019 [17], and "Progress report draft by the special committee on the modality of primary and secondary education in the new era" in 2019 [18]. Other documents with reference to ECCE are "Social principles of human-centric AI" by the cabinet office in 2019 [19], and "Basic policy on economic and fiscal management and reform 2019" adopted at a cabinet meeting [20].

Among all the above, "Human resource development for Society 5.0" [7] most explicitly sets forth what is expected for ECCE by describing future policy directions in different stages of life. It argues that quality ECCE should be universally provided to all young children, given the fact that it lays underpinnings for the life-long process of character building now and in the future. Accordingly, current ECCE practices should largely remain unchanged, since unique characteristics of early childhood are universal across eras, examples of which are the significance of child-initiated play, children's interactions with others and their environments, and teacher's individualized and comprehensive supports.

Nonetheless, ECCE may not be entirely free from changes, either. The above report states that technological innovations can be effectively utilized both for improving teachers' instructions as well as reducing their heavy workload. They advise that teachers' instructional techniques accumulated as rules of thumb, for instance, can be deciphered by digitally monitoring and analyzing children's activities, teachers' supports, and environmental characteristics. By the same token, "Measures for promoting the use of advanced technologies that support learning in the new era" [17] proposes the use of sensors to collect and analyze data of children's voices and levels of involvement along with teachers' interactions, and the introduction of an integrated system for supporting clerical work at ECCE centers. How ICT can be utilized for quality enhancement of ECCE also constitutes a moot point in "Progress report draft by the special committee on the modality of primary and secondary education in the new era" [18]. It advises only a complementary use of ICT in ECCE, however, and asserts the importance of children's direct experiences in the real world during early childhood.

In the "Basic policy on economic and fiscal management and reform 2019" [20], a free provision of ECCE is listed among human resource development strategies for the age of Society 5.0. In fact, the government for the first time in history started to waive user fees of public and private nursery centers for all children aged 3 to 5, and for those children aged below 3 from low-income families, and up to a fixed amount in the case of kindergartens and uncertified nursey centers, with increased tax revenue due to the consumption tax hike from October 2019. The policy simultaneously underscores the need for quality improvement in ECCE services.

5. CURRENT SITUATION AND CHALLENGES OF ECCE FOR SOCIETY 5.0 IN JAPAN

The preceding subsections describe that challenges of Japanese ECCE for the new society reside in the provision of quality ECCE to all young children and possible ICT application for reducing teachers' clerical workload and improving teachers' skills, while holding constant the basic principles of ECCE practices. Let us look at the current situation in each and further discuss their challenges below.

5.1 Quantitative expansion of ECCE

Net enrollment rates of ECCE in Japan as of 2018 clearly indicate room for improvement in quantitative expansion (Fig. 1). While nearly all children aged 4 and 5 are enrolled in either kindergartens, nursery centers, or unified ECEC centers, about 5% of 3-year-olds remain unenrolled. With the recent reform of free ECCE for all children aged 3 and above, however, the access of this age range will soon reach universal. As for children below 3, more than half of them do not use any services, although the proportion of users increases as the child's age rises. In fact, there are quite a few children aged 1 and 2 who are on a waiting list of certified nursery centers mostly in large cities where the service supply does not match the market demand.

The government took the initiative to introduce changes for service expansion by the Comprehensive Support System for Children and Child-rearing (CSSCC), system-wide reform of ECCE in 2015. The scope of reasons for childcare needs was widened, for example, so that reasons like job-hunting, schooling, and part-time work became acceptable for their children to be admitted to nursery centers. In addition, diverse modalities of ECCE including small-scale childcare and family-style daycare services were established and financially supported by the government for children younger than 3 years old. Still the solution of the wait-listed children entails further efforts of public and private sectors and paves the way for more child-rearing parents to enter the labor market.

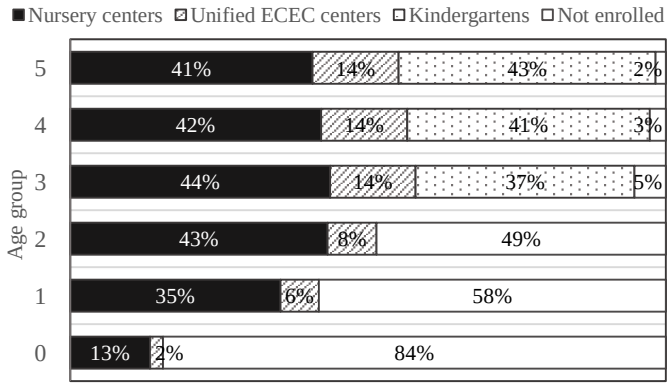

FIGURE 1. NET ENROLLMENT RATES OF ECCE IN JAPAN BY AGE AND CENTER TYPE (YEAR 2018)

(Source) Cabinet office, "Annual report on the declining birthrate," Tokyo, 2019.

5.2 Quality improvement of ECCE

Let us look at ECCE quality issues from three aspects, which are structural quality, operational quality, and process quality [22]. Structural quality deals with standard settings for physical environment and human resources by law and regulations, while operational quality concerns management quality of policies and ECCE centers including the issues of leadership and teamwork. Process quality relates to interactions among peers, between children and teachers, and among teachers. Each dimension in Japan's case is discussed below.

First, a recent international comparative survey on ECCE quality discloses that the country has a number of challenges in terms of structural quality [23]. The issues extend from teachers' relatively lower qualifications to a maximum class size as large as 35 children for kindergartens and ECEC centers. A majority of Japanese ECCE teachers are without bachelor's degree though being specialized in ECCE. Low renumerations, coupled with a weak sense of being valued by others, result in high teacher turnover rates and failing to attract a competent workforce.

Likewise, operational quality proves weak both in finance and management [23]. Total expenditure on Japan's ECCE was merely 0.2% as a percentage of GDP in 2016, much lower than the average of OECD countries which was 0.8%. Academic qualifications of ECCE center directors are the lowest among the 8 countries studied by OECD, with less than half of them with bachelor's degrees or higher. Exerting leadership is hampered by inadequate budget and resources of their centers along with ECCE staff shortage and absence.

Lastly, Japan seems to face a fewer issues in process quality, known as the major determent of child development and learning in ECCE. The process-related basic principles are generally put into practice at ECCE centers, examples of which are child-centered approach, child-initiated play, ECCE through environment, comprehensive support, and serving individual children's needs and interests. The ECCE though environment, a chief notion of ECCE methodologies, represents that teachers should promote child development by creating a learning environment desirable for children based on a good understanding of individual children's interests and anticipated actions, such that children become more involved in play and actively interact with others and their physical surroundings [24].

At the heart of Japanese school curricula lies the concept of a "zest for life" which fosters students' harmonious development between academic abilities, rich humanity, and sound body. ECCE is not an exception, and such principle is tangible in the "Ideal image of a young child by the end of early childhood," adopted by the current ECCE curriculum guidelines of 2018. It envisions children's qualities and abilities desirably developed by the time they graduate from kindergartens, nursery centers, or ECEC centers. Ten listed qualities and abilities are: Sound mind and body; Independence; Cooperativity; Fostering of morality and normative consciousness; Social participation; Fostering of thinking abilities; Connection to nature and respect for life; Interests in and sensitivity to quantity, figures, signs and letters, etc.; Mutual verbal communication; and Rich sensitivity and expression [24].

Balanced practices between intelligence, moral, and physical education at ECCE centers are evidenced by a private research institute's nation-wide survey in 2018 [21]. They asked ECCE centers to select three most important goals of ECCE among the goals set by themselves. The top five answers covered different aspects of child development: "Sound body," "Play freely," "Be considerate to others," "Acquire basic daily habits," and "Develop thinking skills." On the other hand, the least popular goal was to "learn letters and numbers," which indicates that more weight is attached to nurturing the child's own interests in letters and numbers through their play rather than inculcating simple skills to children without contextual meaning.

5.3 Use of ICT in ECCE

Table 1 shows the results of a survey by a private research institute on the use of ICT at Japanese ECCE centers in 2018 [21]. Most teachers use personal computers (PCs) for work; however, only a few use other devices like tablets and mobile phones. Nearly half of the centers have monitor cameras for safety checks of children. It draws our attention that the use of PCs and tablets for children's activities is close to none regardless of the types of ECCE centers, meanwhile the use of TV monitors varies among different types of centers ranging from 7.6% to 26.7%.

MEXT's report on "Human resource development for Society 5.0" [7] points to the necessity of changing stakeholders' mindset for the possible use of ICT in ECCE as a critical issue. Indeed, a sense of aversion against technological device application prevails among ECCE practitioners, mostly in pedagogical activities and partially even in some clerical work.

6. DISCUSSION AND CONCLUSIONS

It may be natural that skills necessary for Society 5.0 described above bear considerable resemblance to those required for the realization of Industry 4.0. Both emphasize the importance of developing digital literacy, attitudes and abilities for lifelong learning, curiosity, for instance, proclaiming that a well-educated workforce serves as a solid foundation for what lies ahead [25] [26]. Yet, the German-government scheme, given its weight on industrial and manufacturing revolution, mainly discusses in depth and details the skill development in technical vocational education known as a dual system and further training opportunities in a company environment rather than basic education, at least in the "Plattform Industrie 4.0," governmental steering body of Industry 4.0 [25] [27].

Absence of ECCE was apparent not only in Industry 4.0 papers but also in some of Society 5.0 policies and reports, as already noted in Section IV of this paper. The reasons are worth thinking about. For one thing, it merits consideration that those documents without reference to ECCE turn their attention mostly on the acquisition of digital literacy, basic and advanced science and math skills, entrepreneurial spirits, and interdisciplinary interests and knowledge, all of which are directly related to the outcomes of primary education and above. While Japanese ECCE certainly fosters essential foundations for such qualities and abilities, people generally regards ECCE not as a preparatory phase of primary schooling but as the time to develop "a basis for the lifelong formation of one's personality," as stipulated in Basic Education Act (No. 120 of December 22, 2006). This is evidenced by the fact that quite a few ECCE practitioners and researchers in the country feel somewhat uncomfortable with the wording of Target 4.2 of Sustainable Development Goals, where the goal of ECCE is narrowly defined to preparing children for primary education. Likewise, the authors of those papers may have treated ECCE differently from primary and subsequent levels of education by understanding its unique characteristics, and consciously or unconsciously excluded it from their minds in writing up the documents.

Another possible reason may be current Japanese ECCE practices being intentionally kept distanced from those new technologies and ICT innovations. As ECCE lays foundations for the lifelong formation of personality development, it places much importance on children's direct experiences and active interactions with their surrounding environment including people, objects, social events and nature through child-initiated play, in order to achieve child development well-balanced between cognitive, non-cognitive, and physical aspects. Direct instructions on 3Rs for children and familiarizing young children with ICT devices seem contradictory to such priorities and could be the last thing that Japanese ECCE teachers could think of applying in their practices.

We should also inquire why ECCE teachers in Japan are reluctant in applying ICT devices such as PCs and tablets for children's activities, as shown in Table 1 of Section IV. Surprisingly, none of the governmental reports recommend such use. They believe that introducing ICT in children's play would undermine their healthy growth by reducing direct experiences, exposure to nature, and interactions with peers and adults. Still, relatively high percentages of using TV monitors for children's activities in Table 1 look contradictory to such belief and requires better explanation. Similarly, not only a few teachers hesitate active use of ICT in administrative work, claiming that it could disrupt a caring relationship with parents and children and weaken their observational abilities on children. Some of these arguments may be grounded, while others ungrounded. What is important for Japanese ECCE practitioners is to be more open for discussion, and make fair judgements based on scientific evidence. There could be some possible ways to apply ICT to children's activities, for example, in a manner by which children's play is enriched and their work becomes more creative, as is the case of Reggio Emilia in Italy.

Perhaps, it may warrant attention to blindly accept another government's idea of categorizing ECCE teachers' support patterns through data analyses of AI for more efficient teacher education. While classifying ECCE teachers' support patterns may well be done, judging how to apply them on what circumstances

TABLE 1. ICT IN KINDERGARTENS, NURSERY CENTERS, AND ECEC CENTERS IN JAPAN (2018) [a]

	Kindergartens		Nursery centers		ECEC centers	
	National/ Public	Private	Public	Private	Public	Private
PCs for ECCE teachers' work	97.2	89.1	96.1	93.5	97.3	94.9
Tablets for ECCE teaches' work	3.6	18.1	3.6	26.3	10.1	34.4
Mobile phones for ECCE teachers' work	1.0	12.3	1.9	11.3	2.0	11.1
Other electronic devices for ECCE activities (e.g.: nap time censors)	0.3	1.2	2.5	10.5	3.4	10.8
Monitor cameras for children's safety	35.3	51.8	23.9	52.3	33.8	67.4
TV monitors for ECCE activities	24.9	26.7	7.6	19.5	13.5	26.7
PCs for children	0.5	3.8	0.2	1.0	0.7	1.8
Tablets for children	0.7	2.4	0.1	1.4	0.0	4.5

(Note) [a] Based on the answers by 4,565 schools/centers out of 16,307 to which the questionnaires were sent.
(Source) Benesse educational research and development institute, "The third basic study on early childhood care and education," 2019.

cannot be easily analyzed or taught, since their assistance is too contextual and individualized to be deciphered.

It has been discussed in this paper what is expected for ECCE in materializing the future of Society 5.0 in Japan, after clarifying the features of the coming era and skills that need to be developed for future leaders and citizens. The findings are summarized as follows. First, quality ECCE services should be universally provided to all young children, so that each individual can start life with strong foundations regardless of their family background and is more likely to maximize their development to the full potential. The Japanese government has already taken important measures for its advancements such as waiving user fees and is expected to make continuous efforts for structural and operational quality enhancement. Second, no matter how much the society changes, unique characteristics of ECCE and accordingly their practices remain the same, such as the importance of child-initiated play, direct experiences through interactions, and play-based learning. They are intended to foster children's curiosity, independence, foundations of autonomous learning, inquisitive mind, interests in the surrounding environment, attention, perseverance, rich humanity, and social skills, all of which are important attributes of future citizens. Third, ECCE teachers' roles for promoting children's development also remain unchanged. They are expected to continue providing comprehensive and individualized supports to children, and to promote holistic child development by carefully designing environment surrounding children where teachers' educational intentions are embedded.

At the same time, some possible changes may accrue to ECCE. As the fourth point, effective use of ICT in administrative work may lead to alleviation of ECCE staff's heavy workload. Handwriting can be replaced by PC and other devices for planning, monitoring and evaluation of ECCE and daily communication with parents. Lastly, Japanese ECCE administrators and teachers should not hesitate to discuss possible ways to apply ICT for better child understanding and more creative children's play. For instance, systematically gathered data on children's behaviors and their environment by sensors may be analyzed to improve child understanding and teachers' better supports. Still, under the rule of human-centeredness of Society 5.0, ICT in ECCE should be applied in a manner to improve their practices without undermining its principles such as child-centeredness, play-based learning, and holistic development through direct experiences.

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