

Transformation of Modern Society and Teacher Training to Develop Creative Teachers

SEAMEO-University of Tsukuba Symposium VII (Tokyo)
Theme: Reform and Development in Teacher Education for the Digital Economy
10 February 2019

Dr. Hiroshi Sato
University of Tsukuba
Japan

1. Transformation of Society and the Path for Education

- * Future forecasts and educational training are closely connected.
- * That's because children will become working adults in the future. First graders in the 2018 school year will become adults in 2032.
- * They will turn 30 in 2042 and 40 in 2052. Even after 2050, they will be the backbone of society.
- * What sort of society will we have 10, 20, or 30 years in the future?
- * It is necessary to forecast the future as much as possible and teach people about the corresponding knowledge that will be required.

- * We've seen with the evolution of the smartphone in the 2010s, society is changing rapidly.
- * Today, VR (virtual reality) and AR (augmented reality) are said to be on the next-generation platforms.
- * The fourth industrial revolution is known as Society 5.0.
- * As industrial structures change, work also changes, and so do the needed capabilities of workers.
- * If those capabilities are changing, then the things we should be teaching in school should also change.
- * In short, the fourth industrial revolution and educational reform are related.

- * Japan has always been an “education nation”.
- * We need to continue to nurture education and scholarship. If we don’t reform education and improve teacher professional capabilities, we may be left behind by the fourth industrial revolution.
- * We cannot forget that the quality of school education and teacher training is supported ultimately by academic research.
- * Education and research provide the foundation for the fourth industrial revolution.

- * After the fourth industrial revolution, human beings' central activity will be inquiry, which is the source of identity and self-efficacy.
- * **This sort of society is called a “harmonious and inquisitive society.”**
- * And this makes it the task of education to train for symbiotic qualities and the ability to inquire or research.
- * For a harmonious and inquisitive society, we need creative teachers.
- * **We need to redefine a teacher's specialty as being at its core a creative practice.**
- * **It will become important to have a philosophy of symbiosis and inquiry when training teachers at the university level.**

- * In this speech, I will advance my arguments based on this point of view.
- * **How will society change, and how should school education and teachers change with it?**
- * **As AI advances, teachers must change. What are the immutable parts of being a teacher?**
- * **And what makes a creative teacher?**
- * **To realize this, what sort of training is necessary?**

2. The Development of Artificial Intelligence and Work in the Near Future

- * The further development of AI and robots is predicted. It has been forecast that the development of AI “is highly expected to end up replacing about 49% of Japan’s working population with technological AI and robots” (Terada et al 2017, 96).
- * Thus, how will the quality of work change?
- * As AI takes center stage, new work related to it will be born. It may be enough for people to find specialized work in the field of supporting AI.
- * It could be through sharing and collaborating with AI. For example, doctors have begun collaborating with AI at the University of Tokyo and Jichi (Collaboration with Japan’s prefectures) Medical University.

3. What will Become of Teachers?

- * So how will the quality of a teacher's work change as specialized AI or first-generation general AI spreads?
- * This question connects to how a teacher's specialization will be redefined.
- * AI Researcher, Yutaka Matsuo predicts that AI will enter the education field deeply around 2030 (Matsuo 2015, 51).
- * If so, the relationship between AI and teachers should be debated in education research.

- * Famous big data players such as Recruit, Microsoft, Pearson, and IBM have already entered into businesses of educational practices.
- * Strategies can be devised for measures and countermeasures related to group learning by grade and school through access to a database.
- * In the UK and Australia, schools have large discretionary budgets, so they use it to hire private education consultants (former principals who open businesses) for proposals and analysis.
- * The principal needs to use the consultant's knowledge and data and also exercise leadership.


- * What will the teacher's work be?
- * I'd like you to envision teachers teaching students in various classrooms and overseeing a homeroom.
- * Each student has his or her own individuality, and their guardians probably hold a variety of opinions. And their feelings change day to day.
- * Teachers must read the students' expressions, understand them, form a trusting bond, and teach a lesson.
- * However, the students are children, and they are not always in touch with their own emotions.
- * The classroom teacher needs to be observant. I don't think AI can handle that sort of work.

4. The New Teacher's Specialty: The Creative Teacher

- * When we speak of being creative, we're not talking about designers or scientists, for example. Teachers don't have to force a uniqueness or originality.
- * Instead, what is needed is the ability to see the actual situation with the children and understand and analyze the change, variety, societal features (for example, change in play, friendships, communication), and family environment of the students.
- * **Then, the teacher will shape the classroom experience and the lessons to encourage a child to grow into an adult who can enjoy a comfortable life.**

- * **Teachers should not just reply on AI; they should think about what AI cannot do.**
- * AI cannot cooperate with others, negotiate, network, support (for example, helping a child expand his or her narrow horizons).
- * Help with difficulties faced with development.), meaningfully change curriculum direction to reflect environment and context, motivate, encourage, build a child's confidence (inspire, influence, encourage, fire up, help feel alive and vital). This is a teacher's work.

- * In **lesson studies**, the class observer does not offer one-sided opinions.
- * If there is criticism, there should be practical advice on how to change.
- * When criticizing a certain aspect, the observer should put themselves in the teacher's shoes and think what they would do in a similar situation.
- * “What sort of question would I pose to get the child to speak further?”
- * Through this detailed vision, the observer can exchange ideas from the same stance as the teacher.
- * It is important to say that **this sort of lesson study is a creative activity for teachers.**

- 
- * The fourth industrial revolution's advance means our society will be structured on our actual world, a mix of our world and the virtual world, and the virtual world alone.
 - * If a school or teacher uses virtual material and AI, **teachers should keep a pivot foot in the actual world, bring up ethics, and support the children's societal and realistic development.**

5. Teacher Training from Now - The Tsukuba University Example

- * I will offer one detailed example.
- * From April 2017, the Master's Program in Education at the University of Tsukuba offered an international baccalaureate degree through an accredited program.
- * It is called the Pedagogics (International Education) Master's Program.
- * The objectives of the specialization are to develop internationally minded inquirers with a sound understanding of innovative thinking in education and the skills necessary to plan and conduct research on issues in International Education.

- * As part of this educational training curriculum, the required courses for the IBCTL are:
- * “Pedagogy for a Changing World II”
- * “Assessment for Learning I”
- * “Assessment for Learning II”
- * “Curriculum as Process I”
- * “Curriculum as Process II”
- * “The IB Primary Years Programme”
- * “The IB Middle Years Programme”
- * “The IB Diploma Programme”
- * “Professional Learning and Reflective Practice.”
- * (There are many other subjects to choose from; a master’s thesis is also required.)


- * Normally, the method for introducing and expounding on the principles of a curriculum happens during lectures in teacher training.
- * But in this class, the principles aren't taught first; they are acquired through inquiry and arrived at last through this process.
- * **“With humanism as a basis, we respect symbiosis and inquiry,”** Akiko Taira told me when we talked on January 17, 2019.
- * **“To conduct human-centric teacher training, we put ICT to work. As the fourth industrial revolution progresses, humanity and students' feelings of accomplishment become important, and at the same time, the trend is to use ICT. The IB program is changing in this direction too.”**

- * The IB teacher training program at the graduate school of the University of Tsukuba is cooperating with schools.
- * In the future, the university will cooperate with the Senior High School at Sakado, a University of Tsukuba affiliate that employs the DP program.
- * Moreover, on December 11, 2018, **the University of Tsukuba entered into a partnership agreement with the Saitama City Board of Education.**
- * The main objective is to cooperate with the Omiya International Secondary School that opens in April 2019.
- * Through this cooperation, **a mutual exchange between the school (lessons) and the university (research) will take place, and both the quality of the lessons and the academic research is expected to improve.**

Omiya International Secondary School has organized a consistent 6-year middle school curriculum.

- * First- through 4th-year students learn in IB MYP (middle years programme).
- * Fifth-year students (similar to 2nd-year high school students in Japan) and 6th-year students (3rd year of high school in Japan) divide the students into three paths: **the global course (IB DP), liberal arts, and STEM**. In MYP, morning is used for All English time.
- * Saturday morning is called **Learner Directed Time**. One unit a week is on **English Inquiry**, and another weekly unit is spent on **the 3G Project (Grit, Growth, Global)**.

- * The graduate school at the University of Tsukuba is cooperating with more than just Omiya International Secondary School.
- * **Because of the fourth industrial revolution, humanity becomes more important than ever for our society. Inquiry is the core activity of human beings.**
- * At the same time, we need to become tolerant of diversity and respect our symbiosis with others.
- * To create this symbiotic, inquisitive society, we need creative teachers.
- * To activate the training of creative teachers, we will need even more effort and tools from here on out.

- 
- * Thank you very much for your kind attention.
 - * I was very glad to see all of you.

References

- * Tomota Terada, Etona Ueda, Hirotoishi Kishi, Aiko Mori, “Who Will Support Japan’s Labor Force”, Toyo Keizai Co. 2017
- * The British Economist Editorial: “Technology in 2050,” Bungeishunju 2017
- * Maki Sakamoto, “Maki Sakamoto Sensei Teaches You How to Understand AI in This Book”, Ohmsha Ltd. 2017
- * Yutaka Matsuo, “What’s Ahead for Deep Learning, the Future of AI”, 2015
- * <http://www.gdep.jp/seminar/20150526/DLF2015-01-MATSUO.pdf> (accessed on July 21, 2015)
- * Noriyuki Yanagawa, Noriko Arai, Shinya Oouchi, “Human Strength, Management Styles in the Age of AI”, NIRA (Nippon Institute for Research Advancement) opinion paper, No. 25, 2016.
- * Shinya Higuchi, Otoyoshi Shiroduka, “AI - The Definitive Edition”, Toyo Keizai Co., 2017.
- * Central Education Council Report, “About Improving the Capabilities of Teachers through Educational Training: Heading toward a Format where We Can Learn from Each Other and Raise the Level of Educational Communication”, 2015
- * Yoshiharu Habu, “The Core of AI”, NHK Publishing, 2017
- * Andy Hargreaves, “Schools in a Knowledge Society and Education in an Age of Unease for Teachers”, Kaneko Shobo, 2015
- * Bubb, S. and Earley, P., Leading and Managing Continuing Professional Development, Second Edition, Paul Chapman Publishing, 2007.