

## OECD Learning Compass 2030 Transformative Competencies

# Creating New Value

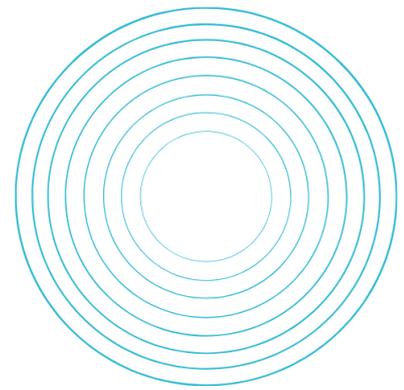
### **Shinya Yamanaka**

Professor, Kyoto University  
Director of the Center for iPS Cell Research and Application (CiRA)  
2012 Nobel Prize in Physiology or Medicine Award Winner  
Kyoto, Japan



# OECD Learning Compass 2030

## Transformative Competencies: Creating New Value



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I believe that “creating new value”, as articulated by the [OECD Learning Compass 2030](#), is a competency that every student needs for the future. This is especially true for aspiring scientists.

One of the most important competencies in science is the willingness to doubt commonly accepted theories. Scientists must be able to think for themselves, without believing 100% of what textbooks and teachers tell them. It is with this mind-set that people generate new ideas. This is particularly important today, given the breakneck pace at which developments in science and technology are advancing; and it will only become more important as progress accelerates further.

For students to develop such a mind-set, it is important that they experience a broad range of learning, including not only studying, but also sports and arts. They must also be allowed to make mistakes and fail, because such moments present new opportunities for learning. It is through mistakes and failures that students can discover new things, develop resilience and learn how to overcome future setbacks. Failure allows students to grow and to develop important strengths. I strongly hope that young people will have the courage to embrace new challenges without the fear of failure.

For students who aspire to become scientists, it is important to reiterate that the natural world is still full of “unknowns”. The mission of scientists is to discover these unknowns. In much the same way that artists use free thinking to create unique works on a blank canvas, scientists use their free thinking to develop and test unique hypotheses about unknowns. Such discoveries can contribute to society in significant ways, through advancements in science and technology, but they also involve potential risks and threats to humans. Scientists must therefore have high ethical standards, as well. I sincerely hope that many children will develop an interest in the natural sciences and grow up to become scientists who contribute to the well-being of humanity.

Finally, I would like to reiterate that it is critically important for schools and teachers to provide opportunities for students to experience a wide range of learning and to ensure that students have space to tackle challenges without fear of failure. Such experience is necessary for future leaders in every field, especially science and technology.

<sup>1</sup> [Professor Shinya Yamanaka](#) is most renowned for his discovery of induced pluripotent stem cells (iPSCs), which are differentiated cells that have been reprogrammed back to the pluripotent state. He is Director of the Center for iPS Cell Research and Application (CiRA), which was founded in 2008 in response to his discovery at Kyoto University, and named Senior Investigator at the Gladstone Institutes from 2007. In recognition of his work, he has been the recipient of many prestigious awards including the Albert Lasker Basic Medical Research Award, the Canada Gairdner International Award, the 100<sup>th</sup> Imperial Prize and Japan Academy Prize, the Kyoto Prize, the Wolf Prize, the Japan Order of Cultural Merit, and the Breakthrough Prize. The significance of iPSCs was culminated with Dr. Yamanaka being co-recipient of the Nobel Prize in Physiology or Medicine in 2012.

With the exception of a post-doctoral stay at the Gladstone Institutes from 1993 to 1996, he has lived and worked in Western Japan. Professor Yamanaka earned his M.D. from Kobe University in 1987 followed by residency in orthopedic surgery. He then went to earn his Ph.D. from Osaka City University in 1993. It was at Gladstone where he first learned genetics and the use of embryonic stem cells. He returned to Osaka City University as staff until 1999 when he joined Nara Institute of Science and Technology (NAIST) and shifted his research focus to reprogramming. He was promoted to professor in 2003 and moved to Kyoto University in 2004.

He serves as a foreign associate of the NAS, fellow of the AACR, and member of EMBO, the Pontifical Academy of Sciences, and the Japan Academy. Professor Yamanaka’s primary vision is to bring iPSC technology to human health care. Therefore, at CiRA, he has recruited a mixture of scientists conducting basic research and clinicians applying this research to disparate diseases and advocates the science regularly to the general public.