Interview with Renya Kikuchi, Chairman of Learning Systems Co., Ltd.

Exporting STEM/Robotics

Social Entrepreneurship Built on the Experience of IT Business

By *Japan SPOTLIGHT* Editorial Section

Contributing to society after reaching a certain age is a dream of many senior business executives. Renya Kikuchi, chairman of Learning Systems which exports STEM/Robotics education (using Lego KITs) to India, is one of those whose dream has come true through his contribution to the improvement of the Indian education system.

Beginning of a Dream

Q: Could you tell me how you came to be interested in India?

Kikuchi: Having worked for more than 40 years in the IT business, as a consultant or as a founder of an IT firm, I got to thinking about what I could leave behind as my contribution to society in return for the benefits I received from it. Whereas money would be exhausted some day, I was told that what you teach kids would remain for a long time. It was around that time that Lego Group started selling a kit of Lego tools called "Lego Education" about 19 years ago.

Renya Kikuchi, Chairman of Learning Systems Co., Ltd.

Lego KITs can be very good tools for education and in particular for increasing the flexibility of children's minds. I was recommended to open a school for using them. Following this suggestion, I founded Learning Systems Inc. and started an after-school private class for the first time in Japan in 1997. We also started a convention of robots built from Lego KITs which today sometimes features on TV.

Japanese primary school education is largely based upon instructionism, I believe. For example, in a kindergarten, a teacher stands within a circle of kids holding each other's hands and all of them are told to do the same things, and if any kid tries to go somewhere else the teacher asks where they are going. The kids are always instructed to memorize everything. By contrast, what I am pursuing as education is constructionism, meaning to learn what you can on your own. Based on this belief, we started an after-school private class to promote constructionism in collaboration with Lego Group. Since then we have opened more than 20 schools all over Japan, starting with Jiyugaoka, Kichijoji, Yokohama and Tachikawa, all in the Tokyo Metropolitan area.

Since several years ago, we have been using the word STEM — meaning an education method combining Science, Technology, Engineering and Mathematics. All are stressful and difficult subjects, and if taught by instructionism students tend to dislike them. Such a learning system was born at a time when many people were starting to refer to young people's loss of interest in science. Against this background, many people now talk about the possible merits of STEM, as even President Barack Obama is saying.

We also created a STEM/Robotics education curriculum and started to use it in our schools. It was then that I met an Indian banker at a software business meeting in Singapore. He told me during a coffee break that it would be interesting to introduce our STEM/Robotics education that he saw on our website to India, where instructionism was still in the mainstream of education. Following his advice, our business in India was started. About four years ago, I went to India for the first time in my life.

I think Indians are very flexible and curious people, and are interested in whatever we suggest, whether or not they can put our ideas into practice. India has also, in my view, some room to improve and a need to be balanced. It is a high-tech country where many people communicate with each other by mobile phone, yet in remote areas most children do not have shoes. When we go to public schools in India, they tell us not to use electricity but to bring them batteries.

Making the Dream Come True in India

Q: How does a STEM/Robotics curriculum in schools using Lego KITs operate?

Kikuchi: In short, it's like learning mathematics by using a robot. For example, we would ask our students to measure the length of a table by using Lego KITs. The Lego KITs contains a computer and with a program that can be downloaded it can move around. We can measure distances by using a motor and tire in this kit. In order to measure a distance precisely by using this rolling tire, the kids would need to know how it could move straight. The human eye is a good sensor for balancing and a man can walk straight to a destination. The kids would have to think how they can make these Lego KITs move straight by adding a sensor to the Lego KITs. They draw a straight line and try to keep the Lego KITs on this line. They would learn that the distance can be calculated by how many revolutions the tire makes and the circumference of the tire. They could start calculating the latter by measuring the tire's radius. This is how we can combine sensing, balancing and mathematical concepts such as a radius or the ratio of the circumference of a circle to its diameter. Setting such problems can also raise the capacity for problem solving. In this example, the kids were not given any knowledge in advance but were obliged to find out how to measure the table on their own.

They say that 87% of patents for robots are owned by Japan. Before starting our project in India, I told them that our technology is far more advanced than any other's because of these patents, and the symbol of our excellent technology is the bullet train. Whenever my Indian friends come to Japan, I take them to Tokyo Station to show them the bullet trains and they are always surprised to see them arrive on time. This is one outcome of our excellent technology.

I also tell the Indians that Japan just happens to be a frontrunner by coincidence in these technologies and the more competent Indians will master them very quickly with our STEM curriculum, in which Japanese creativity is integrated.

Our curriculum is not a fixed one but arranged flexibly for Indian schools. We employ teachers as well, two for each school. They are Indians trained by our Japanese staff in India. A kit for teaching costs around 40,000 yen and this would be very expensive for a school. We lend all the kits to them. So a school is only in charge of attracting students, providing a venue for teaching, and preparing a projector at most and allowing us to use electricity. Everything else is done by us. As I said, we went to India for the first time four years ago and started a project three years ago at one school, and now we have 21 schools using our curriculum. So far, more than 15,000 students in India have experienced this curriculum in private schools.

Q: Would it be difficult to adopt it in government schools due to the expense?

Kikuchi: Yes. However, Indians working for NPOs asked us to do the same project for an Indian government school. In response to this request, we tried a pilot project for two government schools from January to the end of March 2014, for 100 students at each school. The outcome was very positive and the education minister of the state of Karnataka, whose capital is Bangalore, asked us to continue this project, so I think our project for government schools can expand. We hope Indian children will develop the capacity to think about anything on their own through this STEM/Robotics curriculum developed by Japan, at the same time as we promote Japanese robot technology in India.

In this curriculum, we hold the same exam for the students at the beginning and at the end of the program, and in addition to marking them we ask how much more they want to study after the program. With such motivation, I believe they can create something or learn things by themselves. We developed an indicator to measure incentives for voluntary learning initiated by the STEM curriculum in collaboration with Dr. Tairo Nomura, a STEM expert at the University of Saitama. The outcome was encouraging and so we are now trying to put this into practice at a government school in India. If we are successful our business model will completely change. Since there are innumerable government schools in India we will not be able to

do everything by ourselves but will need to cooperate with national institutes. So we are now moving into the stage of a public policy project from a private one.

Q: In Japanese education, instructionism seems to be dominant. But you are pursuing something different based on your wide range of professional experience as an IT expert?

Kikuchi: Yes, that is the case. It is probably because I have been always trying to discover problems in my career as an IT engineer.

Q: In order to realize your idea, you are engaged in exporting a constructionism-oriented education system rather than the mainstream Japanese education system, an instructionism-oriented one.

Kikuchi: We have been providing education using Lego KITs for more than a decade. This constructionism plus STEM/Robotics has been expanded in Japan through our collaboration with university professors. People in other countries have become interested in it and we have simply exported a system in which constructionism was introduced into an instructionism-dominated one.

Q: In addition, robot technology is used in your system. You are selling the most competitive technology in Japan overseas.

Kikuchi: Yes. Robots are truly one of the key technologies expected to stimulate growth under "Abenomics". Robots could change the world by solving problems, not just by speaking or smiling when touched.

I believe STEM/Robotics will encourage our thinking about any actions or movements, such as the change in traffic lights, in our daily life. If kids think a monorail is a wonderful form of transport and they want to use it, they may think more deeply about why this is after having observed many aspects of our society and environment and having made one using Lego KITs. They would find out that a monorail may be necessary because either the railways or streets are reaching their full capacity. In this way they would be unconsciously getting into the real world and working on their problem-solving capacity. In order to solve a problem in the real world, we need to know its essence and origin, and kids who have just started learning would be in the best position to grasp this as they are free from any preoccupations. Our STEM/Robotics education aims to take advantage of this nature of children. We are doing it only in natural sciences now but I believe we can do the same in the area of the arts.

Expanding International Partnering Activities

Q: Is there any possibility that you will expand your activities to other nations?

Kikuchi: We have already started our program in the United States. Specifically, we work with Learning Through Robotics LLC in Utah. We are doing a three-month program for the Alpine School District, a group of schools in Utah, in collaboration with a university. Bangladesh and Sri Lanka are also now asking us to come. As for other Asian nations, except Singapore which already has a science center and studies on STEM, most of them are not so keen. I think there may be some possibilities, however, in Thailand, Vietnam and Indonesia.

Q: I heard from a Japanese IT businessman that a partnership with an Indian company would be very difficult for a Japanese. What do you think of this view?

Kikuchi: I have been involved in business with people from a variety of nations. But I have never had much difficulty in achieving mutual understanding. What is important in partnering with a firm from another country is mutual respect. Any partnership could fail if either side looks down the other. If one does not respect the other side, its

incentive to work with the partner would be lost. So we need to understand Indian culture and lifestyles properly, otherwise Japanese and Indians would not be able to continue their partnerships.

For example, there is what I call an Indian time, and when they say "Please wait for another three minutes." This means we have to wait for another 30 minutes. There is a book about such examples of Indian culture written by a Japanese who spent many years in India. I read it before going to India and found it extremely interesting and I guess it would be necessary to read such a book and get some preliminary knowledge about Indian culture before trying to start a partnership with an Indian firm.

Q: It is often said that an Indian businessman would ask for a partner's decision as quickly as possible but that a Japanese businessman would need some time to make a decision because he has to consult with colleagues and superiors first to gain a consensus. Indian businessmen occasionally feel impatient at such a long decision-making process. Have you had such an experience?

Kikuchi: Yes. It is certainly true that Indians may be hasty in making final decisions, though they tend to forget them very easily. I tell them that we Japanese have a consultation process in a company, but they say they doubt we will reach a conclusion before we die with such a long process. I tell them this is because Japan is a country where nobody likes to take responsibility for the outcome, in particular in the case of large enterprises. But in responding to their doubts, I tell them that I am taking full responsibility for the outcome and with my signature on the contract any business deal would be done.

Q: If we can increase international interactions among children all over the world through STEM/Robotics education, can't we lower such cultural barriers?

Kikuchi: Yes. From the same point of view, I have invited teachers in India to Japan many times. Also, thinking about promoting interactions among the kids, the other day I invited some Indian teachers to the Super Science High School in Japan event authorized by the education ministry.

Future of Japanese Ventures

Q: What do you think about Japanese venture activities? The Japanese business world seems to be

oriented towards large enterprises and venture activities are not as popular as in the other nations.

Kikuchi: In the case of Japan, if you fail in a venture you would lose so much. In such business circumstances, new ventures are not likely to blossom. I believe the Japanese have the competency to start up new businesses, but the business environment here does not accommodate them well.

Q: Having heard your story, I guess if we bring more constructionism into our education instead of instructionism, we may see more people interested in starting up ventures.

Kikuchi: Yes, I think that would be true. Our education program may not be useful for passing difficult entrance exams for well-known universities but it would encourage students to master knowledge and ways of thinking that would be useful in solving practical problems in the real world after their graduation. JS