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The Etymology of *Sport* — a Pastime.

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[Special Feature]

Sports

ISSUE 3

July 2016

A future where exercise is a part of everyday life, created by advanced technologies

Everyone gets old, but how we age is not common to everyone. Some age healthily and lively, while others may become sick or bedridden. Everyone of course hopes to "remain healthy, regardless of their age," but in modern times, where the burden of nursing and medical care increases in conjunction with the declining birth rate and aging population, the extension of a "healthy life expectancy" is a challenge to be tackled as a country, beyond the obvious desire for this by individuals.

The Center of Innovation Science and Technology based Radical Innovation and Entrepreneurship Program (COI STREAM), which was launched by the Ministry of Education, Culture, Sports, Science and Technology in 2013, heralds "Secure

sustainability as a country advanced in its aging population and declining birth rate" as one of its three visions. A "Bright Future for All Ages with Health Innovation by Daily Exercise" was adopted in 2013 on a trial basis and was officially adopted by COI STREAM in 2015, an advanced research core representing Japan. In this, we target contributing to the extension of a healthy life expectancy by making exercise a part of everyday life.

"The main feature of our research core is an attempt to make exercise an everyday affair from the viewpoint of 'Spaces'," says Tadao Isaka, serving as the leader of the research core. "We are currently studying a new sports health technology that can radically change the 'value of space,' referring to smartwear, space-sharing, and

exercise induction/retention technologies." He reports on progress, saying, "From 2015 and onward, a Juntendo University research team aiming at the elimination of 'becoming bedridden' by preventing locomotive syndrome has joined our university as a satellite partner, proceeding with research to contribute to health maintenance and improvement from the perspectives of both 'sports & exercise' and 'medicine.'"

As explained by Isaka, for each research theme "that is in full view of social implementation through cooperation with corporations, not just remaining as research," they are full of surprises that may well appear in the "dreams about the future" of children.

For example, Naruhiro Shiozawa, studying "smart-wear technology," is working with Toyobo to develop "Undergarments that can measure physical and mental conditions." The objective involves measuring body temperature, perspiration, respiration rate, and heart rate, etc., in real time by mounting a device to measure human body data within the undergarment. Grasping physical and mental conditions will make it possible to develop a wide variety of programs and applications to inspire a feeling such as, "I want to exercise" and "Exercise is enjoyable," depending on individual conditions, or to change the contents of exercise and environments.

Shiozawa says, "We are initially developing undergarments with an

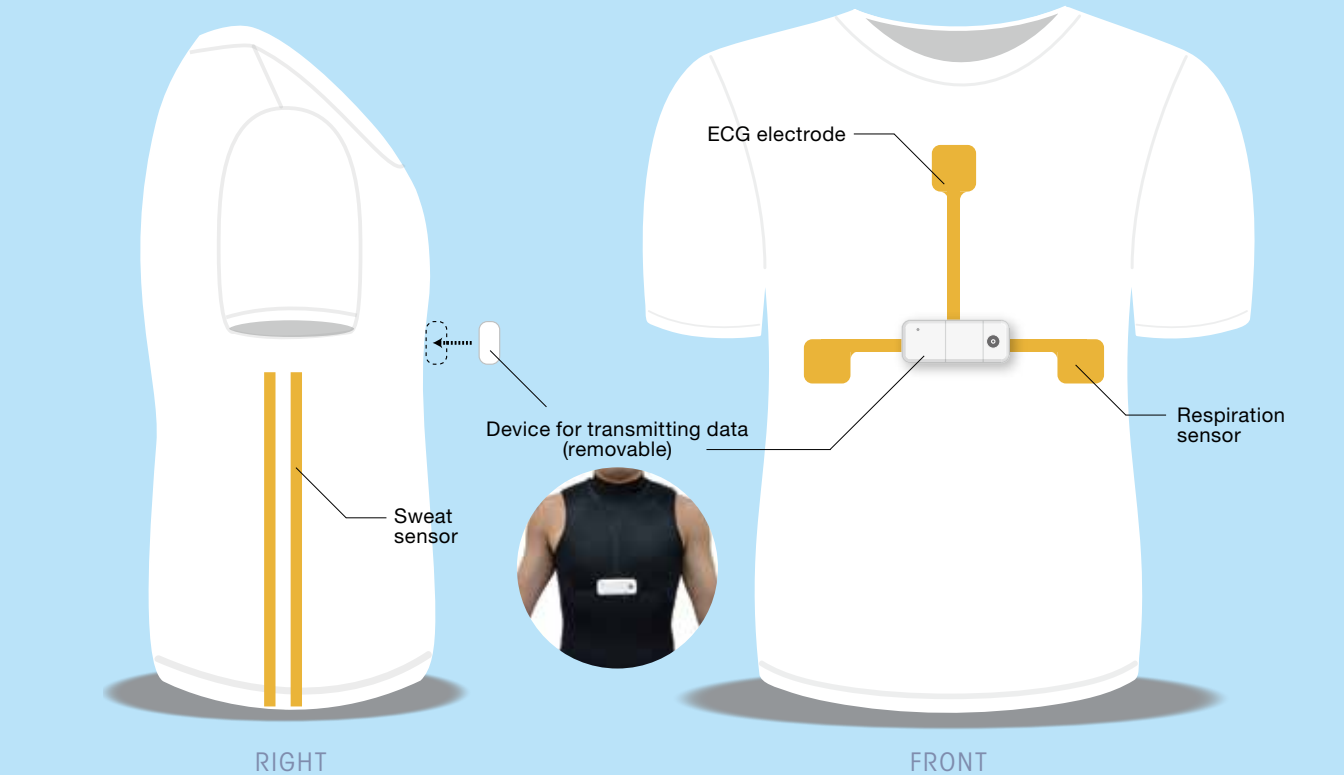
electrocardiogram measurement function that enables to grasp physical and mental conditions in the most versatile manner." Toyobo Co., Ltd., a fiber material manufacturer, has joined with research members in support of this development.

As Shiozawa says, "It would be ideal that instead of especially wearing undergarments for measurements, to wear them as part of everyday life and to measure physical and mental conditions without being aware of it. For this reason, we paid great attention not to damage

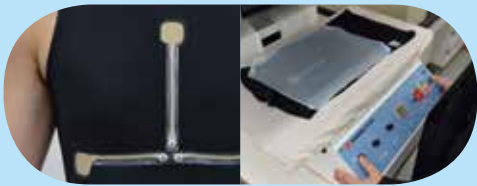
any of the functions as clothing." The finished prototype looks like just an ordinary undergarment at first glance and is as comfortable as ordinary products. However, the undergarment is made of a special material excellent in terms of elasticity and is printed with electrodes, and on the front there is a removable device that can utilize an ECG.

It is not only comfortable, but it can also stably and accurately collect data, which is another important development challenge. When you move your body,

A futuristic undergarment that measures the wearer's physical condition and gives advice on proper exercise.



Not only during exercise, but also when working, driving, or sleeping, the undergarment should be worn to take measurements. The target is a level of quality that allows it to be worn as clothing in everyday life, not just intentionally for taking measurements.

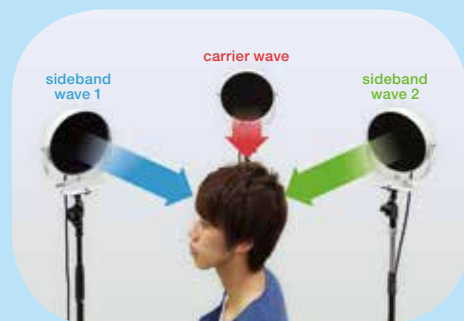
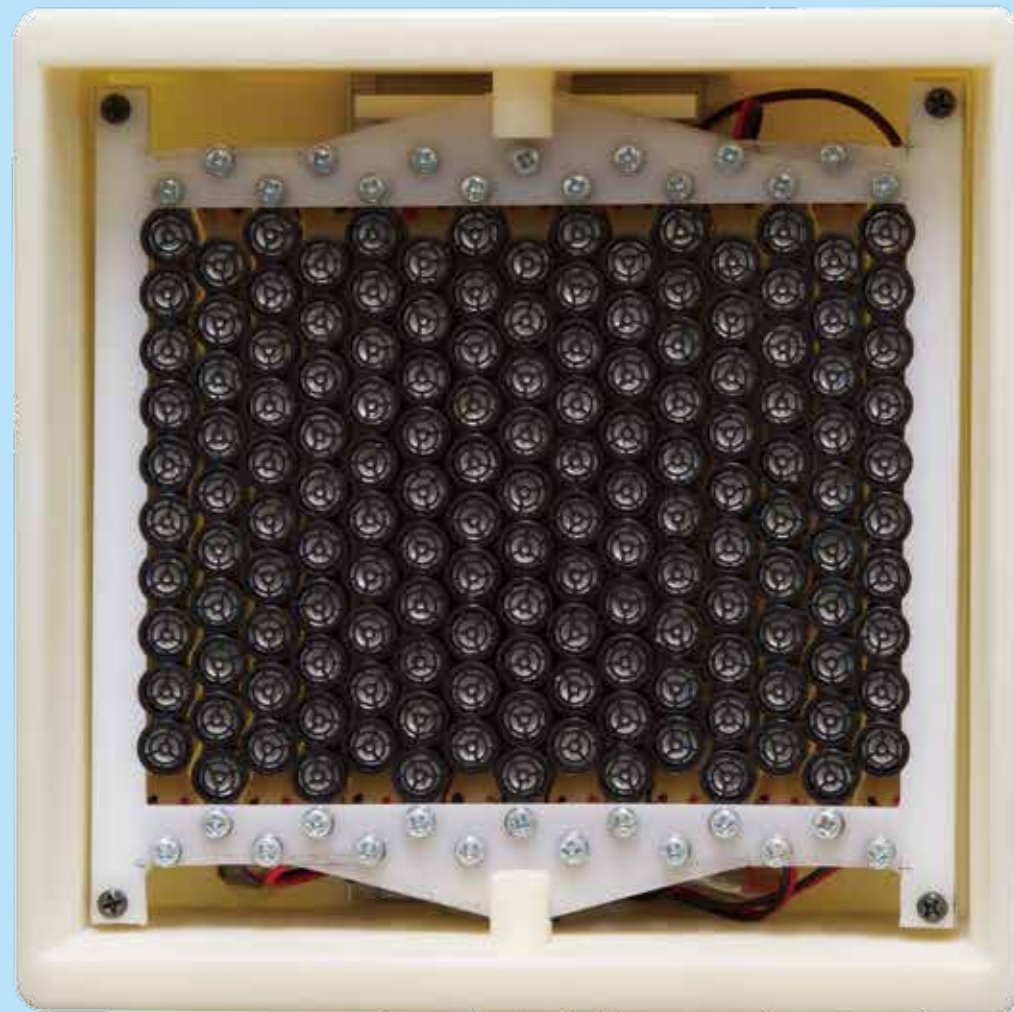


Electrodes are printed on a special material featuring excellent elasticity. The data transmission device mounted on the front is removable.

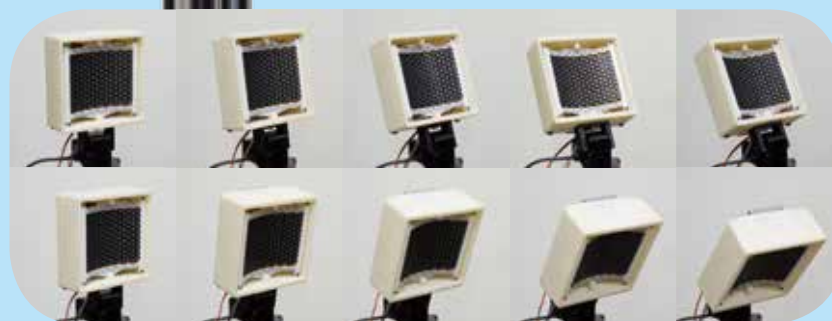


A system to enable one to naturally exercise will be created by, for example, feeding back data in real time for communication among users of different generations. This could also be useful for diagnosis via the Internet.

Flexible ultrasound loudspeaker:
Ultrasound elements are vertically aligned on a board to control the curvature of the emission plane. The reach of sound can be controlled at one's discretion.



Audio spot for minimum domain: Amplitude modulated waves are separated, and three loudspeakers emit a sideband wave 1, a carrier wave, and sideband wave 2. These are demodulated at the single point where they intersect to become an audible sound.



A flexible ultrasound loudspeaker is combined with an electric-driven panning head to automatically control the direction of emission. Based on the number of users and the range of use, the playback area is automatically controlled.

Only you can hear things from under the "audible-sound spotlight"; creating multiple sound domains in a single space.

the undergarment will also move, thus measurements cannot be necessarily made at constant electrode position. For this reason, it was necessary to use ingenuity in the positioning and wiring of the electrodes to achieve more accurate sensing, along with improving device performance.

At the same time, Takanobu Nishiura is trying to create a "Space that makes people want to exercise" using acoustics. He is developing an ultrasound directional loudspeaker.

Nishiura explains, "Sound waves travel differently (directivity) depending on the frequencies. According to him, when the frequency is low, sound generally travels concentrically (omni-directional), while a higher frequency travels straight. In other words, the lower the frequency is, the wider the sound travels, while the higher the frequency is, the straighter the sound travels at an acute angle. However, ultrasound waves with high frequencies cannot be detected by human ears. For this reason, Nishiura successfully generated a sound that is audible to human ears that has directivity like an ultrasound sound wave by modulating and emitting music and audio within an audible range and by demodulating it in the atmosphere. By controlling the directivity of sound, it has become possible to create a sound space that can be heard only in a specific direction and at a specific range.

Furthermore, Nishiura designed a curved loudspeaker surface and developed a parametric loudspeaker that can freely control the direction and range in which sound travels by automatically controlling the curvature. The "audio spot" using this loudspeaker transmits the sound within a limited direction and range, much like a spotlight, making it possible to create completely different sound domains in a single space. "Even when we generate multiple sounds in a space, if the sound domains are different, one cannot hear other sound domains. For example, elderly people, youths, and children can share the same space, while receiving audio exercise instructions that are suitable for each group," Nishiura explains. They have conducted many demonstration tests, confirming the possibilities of contributing to exercise promotion. At a new gymnasium at Ritsumeikan University Biwako-Kusatsu Campus, which is due to be completed in the fall of 2016, these

ultrasound loudspeakers will be installed to realize space-sharing via sound. "We want to eliminate any spaces where exercise will be inhibited by sound," says Nishiura, looking further into the future.

Shiozawa says that, while discussing the development going forward, "Toward full-scale commercialization, our next step is to meet the standard as a clothing item." Currently, they are tackling the challenge of performance improvement as a product, such as strength. At the same time, they are also proceeding with implementing sensors to measure other inputs, such as perspiration and body temperature. They also "Have an idea to implement ultrasound loudspeakers in smartwear." The idea is to mount ultrasound loudspeakers on the shoulder of smartwear to send audio information to the ears, so as to promote exercise. Though some technological issues still remain, realization is said to be in the not-so-distant future.

Nishiura is also developing an "audio spot for minimum domain" to reproduce sound in a minimum domain of a space by further exploring audio spot technology. By separating amplitude modulated waves and emitting each separated amplitude modulated wave from multiple directions using parametric loudspeakers, audible sound is demodulated only at a point where these waves intersect. If commercialized, it will become possible to let adults and children of different

heights listen to different audio guides while in front of a painting at a museum, for example, or play back different sounds without interference in a driver's seat, passenger's seat, or back seat of a vehicle.

Isaka expresses his enthusiasm by saying, "The point is that by the year 2021, to what extent will research results be able to be implemented in society? The real challenges are yet to come." What kind of exercise space will become a reality? It is very exciting to think about what will happen in 10 years' time.



Space-sharing using ultrasound loudspeakers: Each group hears a different sound so as to receive exercise instructions suitable for them.



Takanobu Nishiura (Left)

Professor, College of Information Science and Engineering

Subject of Research: Research into analysis, understanding, reproduction, and synthesis of acoustic sound environments
Research Keywords: Intelligent Informatics, Media Informatics/ Databases

Tadao Isaka (Center)

Professor, College of Sport and Health Science

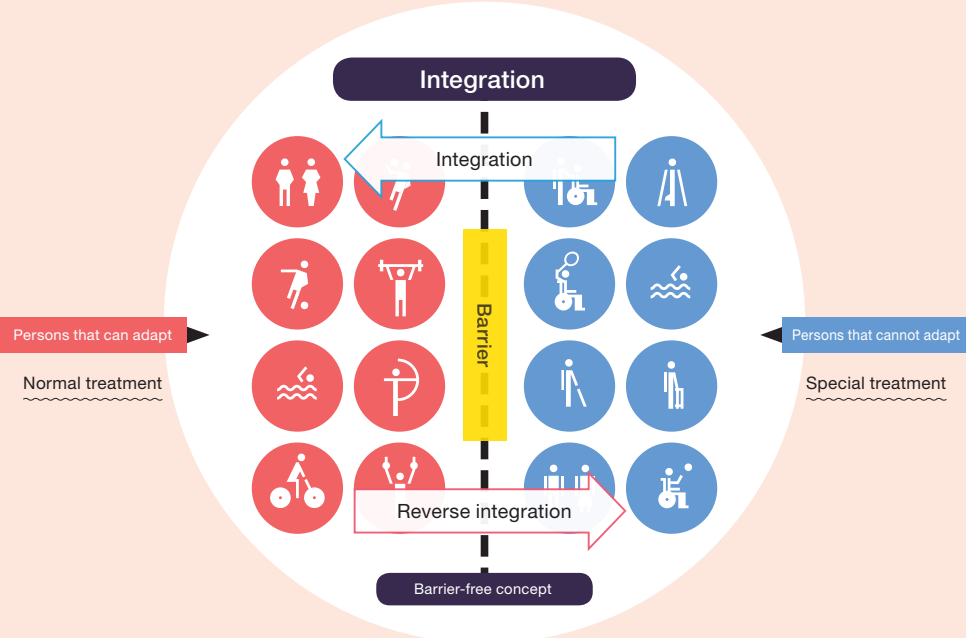
Subject of Research: Study of muscle strength and power of human performance, evaluation of joint torque demonstrated in daily behavior and at work, kinematic and dynamic analysis of behavior in sports
Research Keyword: Sports Science

Naruhiro Shiozawa (Right)

Associate Professor, College of Sport and Health Science

Subject of Research: Biosignal instrumentation non-restrictive measurement
Research Keywords: Biomedical Engineering, Sports Science

What type of sport facilities can allow people both with and without disabilities to enjoy sports/exercise together?



In recent years, increased attention has been given to both the Paralympics and the Olympics. The media increasingly features athletes achieving world-class performance in individual events for para-sports, such as wheelchair basketball, for example. However, considering everyday life, are there opportunities for people with disabilities and without disabilities to play and enjoy sport together?

"With increasing levels of attention being given to adapted physical activity and sport, mainstream discussions have been focusing on the idea that people with disabilities and without disabilities should enjoy sports 'together' without separating them," explains Chihiro Kanayama, engaged in research focusing on opportunities for people with disabilities to play sports, with her background of knowledge on sports management and targeting the promotion of adapted physical activity and sport. She explains that the real intention of adapted physical activity and sport is the "Development of sport adapted to each person by contriving

favorable rules and sporting goods without adhering to personal physical capabilities, age, or disability," and continues that what is considered especially important for their promotion is the concept of "inclusion."

For adapted physical activity and sport in Japan, concepts of separation, integration, and then inclusion have been introduced and materialized in series. Kanayama explains, "While integration pays attention to differences such as individual disabilities and individuality, and enables people to adapt to sport they cannot do by using tools and different rules, the concept of inclusion is to discover what is in common before what is different." This means to think about tools and rules that everyone can make use of, whether one has a disability or not. According to Kanayama, this overlaps the shift from "barrier-free design" to "universal design."

Kanayama explains that taking a cue from the enactment of the Basic Act on Sport in 2011, which

heralds the promotion of sport for people with disabilities, the development of adapted sport in communities is shifting from sport facilities with priority for people with disabilities to general public sport facilities. In other words, it means that inclusion is being promoted at public sport facilities, but the reality of this is not that visible. Kanayama's interest is to clarify issues from the perspective of quantitative data and to place focus on solutions. "Above all, the absolute number of people with disabilities is fewer compared to those without a disability. Conventional research on adapted physical activity and sport has mainly focused on the individuality of disabilities, and there are not that many quantitative reports. However, to move society or the government, scientific evidence based on quantitative data is emphasized," says Kanayama explaining the high importance of quantitative research.

As part of this effort, Kanayama conducted a survey on the evaluation of service quality toward people with disabilities using facilities at three different

types of public sport facilities. The facilities subject to the survey were of three types, namely, facilities dedicated to people with disabilities, shared facilities with priority use for people with disabilities, and general public facilities that can be used by anyone. One of the results revealed by analyzing user responses to 33 questions was that shared and general public types of facilities that were inclusive were highly appreciated by people with disabilities in terms of their "facilities." For people with disabilities, a clear announcement of "This facility can be used by anyone with a disability," is directly related to whether they will use it or not. In addition, facilities that are inclusive received a favorable evaluation from people with disabilities in terms of "sense of empathy," such as staff consideration and attentive service. However, an analysis in further detail also revealed that evaluations of the "appeal that facilities can be used" and "greater attention given" were not necessarily linked to satisfaction with actual use.

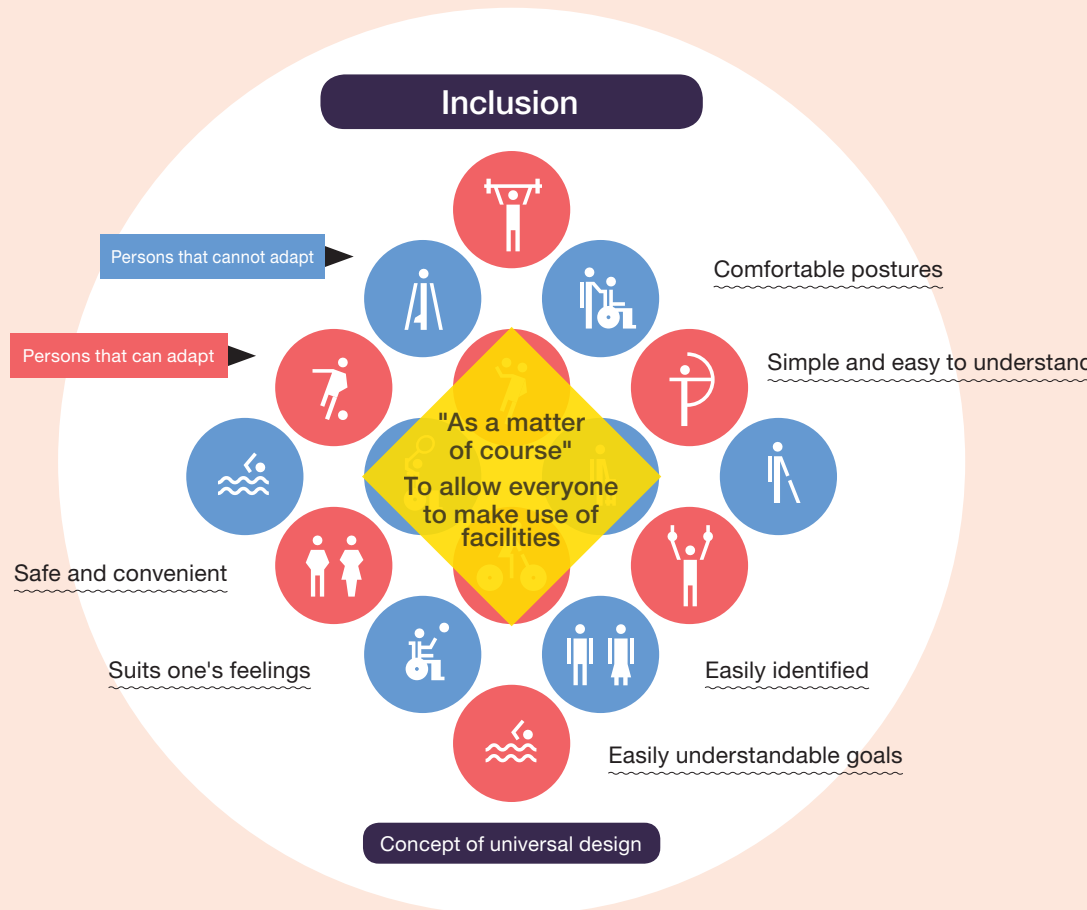
Private companies are often involved in the management of shared and general public facilities, and the challenge is that they are not sufficient in terms of their professional ability to support people with disabilities," Kanayama says. Furthermore, there is the issue of "cost" behind this. Naturally, resources are required to develop the professional capabilities of staff, so as to prepare facility equipment and tools that everyone can use. Under the current designated administrator system used by many municipalities, it is difficult to operate sport facilities in the long term, making it an obstacle to secure training opportunities for staff members and to nurture successors. Also, at service facilities with a welfare-related objective, options for users are extremely limited, thus Kanayama presents a proposal as follows. "People with disabilities should be the customer, not just a user." "Although the concept of paying user fees has not quite penetrated into adapted physical activity and sport, it is important for disabled users to increase their options for sporting opportunities by paying a nominal fee."

In addition, Kanayama will conduct a survey of service strategies by expanding subjects to 116 sport facilities with priority given to people with disabilities across Japan. "In Japan, neither policies nor responses by individual sport facilities have caught up with the quickly rising interest in adapted physical activity and sport," she says while expressing this sense of crisis. Research conducted by Kanayama that focuses on the opinions of people with disabilities in a "quantitative" manner is sure to greatly contribute to establishing more inclusive facilities in Japan in the near future.

Chihiro Kanayama

Professor,
College of Social Sciences

Subject of Research: Research on the preferred shape of physical education and sport in an inclusive society with people with disabilities as subjects and with supporters such as teachers, instructors, and volunteers, in addition to support organizations such as schools and public sport facilities.
Research Keyword: Sports Science



Consider this from a viewpoint of inclusion that looks to "commonality" rather than "differences."

People in Japan can still fondly recall that, at the Rugby World Cup in 2015, the Japan team had three wins for the first time ever in the history of the event. This was something that really excited Japan. A main topic of media coverage comparable to this very accomplishment was the fact that so-called, "foreigners" were included in the Japanese team. Opinions on this in Japan were both positive and negative. The negative viewpoints involved, "As they represent Japan, they have to be Japanese," while the positive viewpoints voiced acceptance, considering that, "As they are competing for Japan, nationality or place of birth has got nothing to do with it." Each sport has its own rules about what types of people can represent a country, but eligibility rules to play for national representative teams are different than those of the Olympics, requiring actual nationality. It is stated that a player may only play for a country's representative rugby team if they were born in that country, one of their parents or grandparents were born in the country, or they have lived in the country in question for 36 consecutive months, and that if they satisfy any of these three conditions, they can represent a country in an international competition. Tsuyoshi Matsushima questions, "However, have we ever considered as to when, where, and for what this rule was established and by whom in the first place?"

Matsushima has long been questioning "What is the reason of being of sports?" while studying the generation and development of sports, especially the history of rugby. He says, "We accept the current rules or state of sports without any doubts. It is like the 'horror' of having the state of your life or society controlled without you ever knowing it."

According to Matsushima, rugby originally started in England, and from there it spread across the globe. World Rugby, which now governs rugby as an international sports federation, was originally a local organization ruling four associations born in the U.K. and the Republic of Ireland. Since the first world cup took place in 1987, World Rugby quickly developed into an international organization consisting of more than 100 countries and regions to control rugby

across the globe, but it has turned into a "black box." Matsushima points out, "Rules and every other decision have been promoted by the countries involved in the foundation of World Rugby. If we take a close look at not only the decision-making process but the world of rugby itself, we can find inclusions and exclusions in different shapes and sizes," which reveals a reality where positive ideals of sports such as a "culture of mankind" and "fairness" are not necessarily under real consideration.

Matsushima has carefully and attentively read World Rugby's minutes and other documents and clarified the process revealed in the method by which World Rugby had achieved global popularity. He says that his work intends to make clear the power of sports as a part of society, much like politics and the economy, and in addition that it forms society itself as a part of

people's social consciousness.

In connecting sports and the economy, in 1995, World Rugby eliminated its amateur regulations and fully accepted commercialization and professionalization. With this in progress, World Rugby and organizations under its umbrella faced certain issues, such as hosting commercial events, securing the safety of players, creating exciting matches for audiences, participating in the Olympic movement, and supporting developing countries and female rugby. World Rugby and said organizations proceeded with these reforms, while also being involved with media, business enterprises, and political organizations in various different ways. Now, it can be safely said that rugby is beyond that of simple entertainment. It has become the work and life of many people, and the issue of how to enhance

the attractiveness of rugby and increase player population, its fans, and its audience is critical for the existence of the world of rugby and all that this entails. Matsushima says, "Simply changing a single rule not only causes great influence on the world of rugby but it can in fact also control the life and death of individual rugby players. How can a decision made according to social trends and organizational structures cause such a ripple effect? I want to expand my viewpoint from the entire rugby industry to individual athletes."

Let's get back to the initial discussion. In his study, Matsushima also clarified how the eligibility rules to play for national representative teams originated and how such have been changed, which reveals that the source of the current eligibility rules was a decision made at World Rugby in 1892. This involved solving a problem regarding eligibility between the members of that time, along with England and Scotland and the issue of the treatment of residents from British colonies living in the U.K. At this juncture, differences of nationalities or other countries such as Japan were not even considered. "That caused an argument about multinational and multiethnic team formations in Japan in the 1990s and afterwards, and as a result, the Japan rugby team has become a mechanism to embody the image of Japanese people based on diverse nationalities at the World Cup and that of Japanese people based on Japanese nationality at the Olympic Games," Matsushima explains.

As rugby poses questions about nationalism, such as "What is a Japanese person?" and "What shape should our country take?," sports exposes aspects and issues of modern society and creates a future regardless of being right or wrong. Matsushima concludes, "That is what makes it so interesting."

Reasons as to why the Japan national rugby team has so many foreign players

Who are the actual people that decide how to ensure fairness in sports?



Tsuyoshi Matsushima

Associate Professor,
College of Social Sciences

Subject of Research: Study on the generation and development of sports cultures in the process of globalization, study of the characteristics and functions of international sports organizations
Research Keywords: Sports Science, Sports Sociology

An event called the "Nagahama Health Walk" was held in Nagahama City, Shiga Prefecture for three months from September to November 2015. This was the second installment of the event since it began in 2014. The objective was to provide an opportunity for local residents to exercise. Participants formed teams of three or five people and took on the challenge of walking a total of 200km or 120km for 10 days. This meant that each participant would walk longer than 4 km per day.

Haruo Noma, the mastermind of the event, has conducted a substantial amount of empirical research aimed at "embedding exercise in lifestyle and culture." In response to a request from the City of Nagahama, he worked together with Kyoto University and Kindai University to develop a social service system aimed at promoting healthiness called "Tekupeko".

Noma says he represents the feelings of many people when he says, "Everyone seems to know that unless you establish

exercise habits early on, it will be too late when you get old or when your health starts to deteriorate. And if you become ill, not only will you suffer, you will also need to spend extra time and money on remedies. However, even if you realize this in theory, it is not that easy to start doing something good for your health 10 or 20 years down the line. For people that do not like exercise, it is even harder." His research pursues the question of, "What should be done to change the feelings or behavior of these people?"

As Noma explains, "Our target is to develop technology and mechanisms to solve social and lifestyle issues using information technology as a tool." His interest consistently turns to "Passing on the benefits of information technology to society."

For example, one of his achievements in promoting behavior modification using information technology is the development of "Tekupiko." This is a system that induces physical movement

at shopping malls using a treasure hunt game. Beacons that transmit a Bluetooth signal are installed at various locations in a mall, and shoppers receive the transmissions on their smartphones. This system enables customers to browse shops while also engaging in a treasure hunt on their smartphone. As a result, the shoppers have a more enjoyable shopping experience.

At Noma's laboratory, people's behavior is analyzed based on the movement data of shoppers collected at actual shopping malls. Based on this, Noma thinks about what types of information could be transmitted to provide more shopping enjoyment and induce more customer purchases in multi-generational groups.

The target city for this survey is Nagahama. As a typical city in the countryside, it has a high automobile usage rate. Many residents use their cars to travel only very short

Information technology that changes feelings and behavior

distances. According to a city survey, only about half of the population walk or use a bicycle even for short distances that are only 10 minutes on foot. This lack of exercise due to that kind of a lifestyle is an issue for the municipality, as it increases the risk of medical problems in the future.

How can we get people who habitually travel by car to walk? Noma had the idea of making exercise a game, and to naturally let people develop the habit of exercising while enjoying the game. "One of the ways to modify behavior is to give a 'reward' when a goal is achieved," Noma says. For this reason, he planned the Nagahama Health Walk as a game to encourage behavior modification and decided to give both positive and negative incentives. A reward is given if a goal is fulfilled and the participation fee is forfeited if it is not.

To promote behavior modification to an even greater extent, Noma and his team employed ideas like "visualization" and "making friends." They then developed a smartphone application called "Tekupeko." With this, an automatic measuring device measures body weight and energy

consumption over the course of a day. The results are accessible from a smartphone at any time. Noma says, "The key point here is the 'automatic' counting and confirmation using a familiar tool, like a smartphone." Thus, this application aims to encourage physical activity by minimizing effort on the part of the user.

An additionally unique feature was the formation of teams of three or five participants in order to achieve a specific goal. "Even a person who tends to think of excuses to give up will feel ashamed about giving up once they feel some responsibility to their team. We incorporated this key human psychological aspect."

Consequently, the total number of participants in the Nagahama Health Walk exceeded 1,000 people. And more than 90% fulfilled the target distance, making the event a great success.

Noma's next task was to analyze the data collected from the event and derive a behavioral model for the question of, "In what situations will people

walk?" He says, "Our goal is to make people who tend to not exercise, including myself, adhere to exercise. If we can find the optimal variables, we can develop an approach suitable for these people."

Going forward, mechanisms to adhere to exercise not only for 10 days, but also for longer periods like one month, six months, and one year, will become necessary. Noma will use computing technology to build and widely disseminate an optimal model to ensure that people continue walking.


Haruo Noma

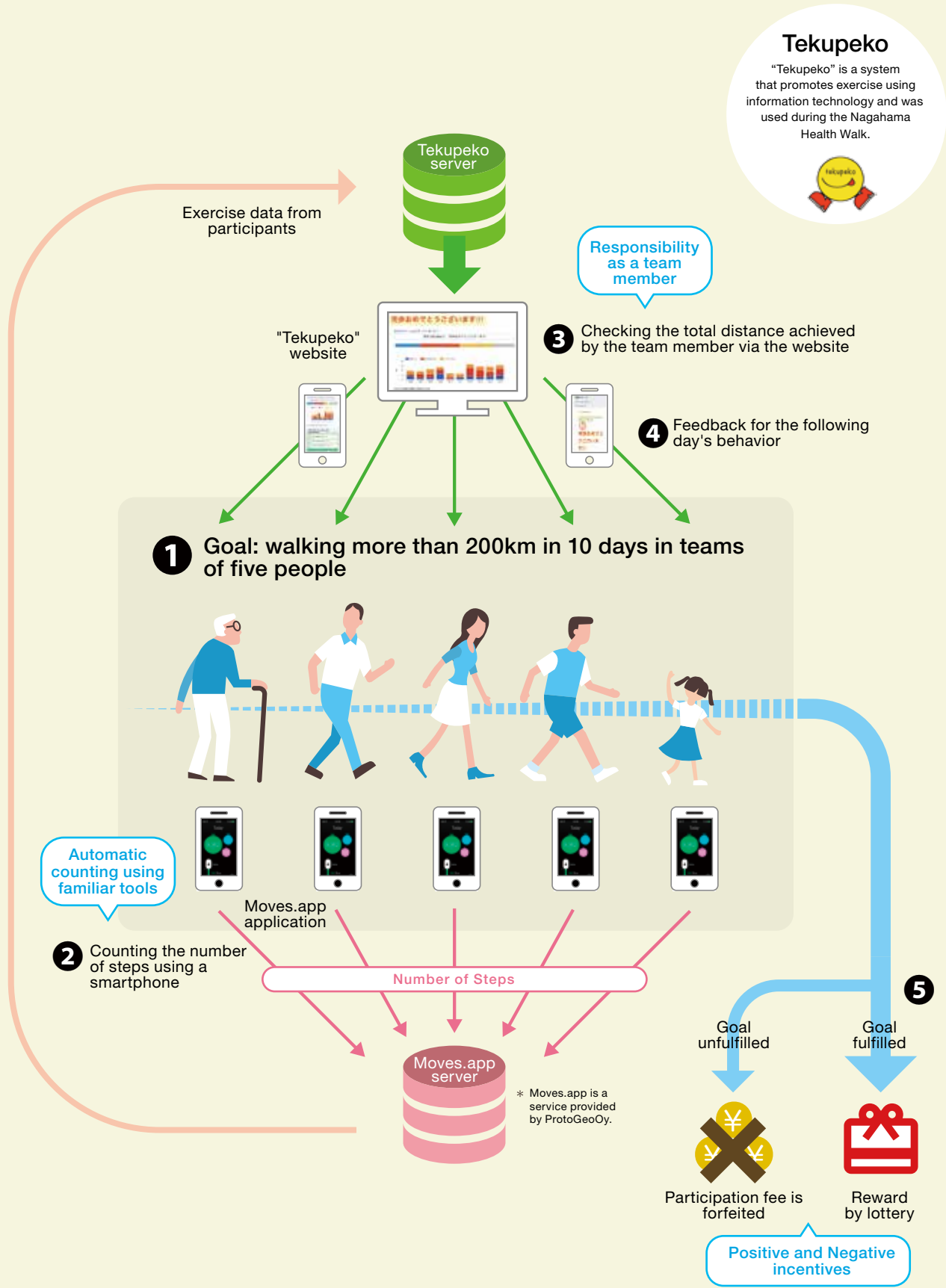
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Professor,
College of Information Science
and Engineering

Subject of Research: Research into daily life improvements via media applications, development of MEMS-based micro-scale tactile sensors actualizing human-like dexterous tactile sensations

Research Keywords: Human Interface and Interaction, Intelligent Robotics, Life/Health/Medical Informatics, Rehabilitation science/Welfare engineering





The secret to motivating sedentary people to keep exercising

"Outer Space" in "Sports"

Achievements in the development of space technology are widespread, resulting in unimaginable applications.

Out of pure curiosity about the unknown and more with the purpose of pursuing the possibilities of space for the prosperity of humankind and the development of civilization, humans have been reaching toward space. In particular, the global development of space technology in and after the second half of the 20th century has made progress at an astonishing speed, with many technological developments being made. The development of space technology, with huge amounts of capital involved all across the country, is expanding its range to various fields on Earth, not just in space.

After being involved in the International Space Station (ISS) and other development projects for space technologies at the National Space Development Agency of Japan (NASDA) and at the Japan Aerospace Exploration Agency (JAXA), Nobuaki Minato went to France to learn more about cutting-edge

aerospace management taking place around the world. Currently, as a university researcher, he focuses on technological marketing studies so as to analyze the future potential of cutting-edge science and technology beyond the domains of aerospace.

"MOT, or the Management of Technology, is considered essential for companies with technological strengths, and it originated from the development of space technology," Minato explains. It actually dates back to the U.S. Apollo program in the 1960s. To make this unprecedented gigantic project of sending a man to the moon a success, it was necessary to unite all knowledge across all fields of technology and the required integrated management covering everything from basic research to technological development, production, and operation. "The foundation of management is said to be people, things,

and money, and at that time, a viewpoint of 'managing technology' became necessary for the first time," says Minato, explaining the origin of MOT. Since that time, MOT has been utilized in the R&D strategies of private companies, has made great achievements, and has been systematized into academic fields. When discussing the development of space technology, technological achievements are just one part of it.

Training to fulfill a mission in space contributing to sports team-building

The development of space technology is a domain where teamwork is essential. The subject systems are large in scale and very complicated, with a high level of uncertainty. A spaceship in orbit can only be remotely controlled, and after launch, it cannot be repaired on the ground, thus systems need to be reliable, they need to incorporate redundancies, and they need to be robust. In outer space, where a return to Earth is not at all easy, even a minor error by an astronaut could be critical. Previous operational mistakes involving spacecraft were not necessarily caused by a lack of individual knowledge or skill but often due to the way of working as a team. A team where members cannot point out a leader's mistake is not likely to accomplish safe and secure operations. In

other words, even if individual abilities are of a high level, it doesn't always mean that total performance can be maximized as a team. For this reason, in the development of space technology, every situation possible has been assumed, where design technology as a system to withstand things and management methods as a team have been accumulated. Such technologies and know-how are then used in many ways and applied to various fields of business on Earth. Sports are no exception, and one of them is "application for training."

A mission in outer space is achieved by not only the astronauts but as a team, including the people providing support on the ground. For this very reason, astronaut training includes Space Flight Resource Management (SFRM). This is a course for learning how to work as a team to achieve a mission, making decisions as a team, and ultimately making the team function properly. During actual training, a leader and their subordinates take on the challenge of climbing a mountain in the summer and winter months while exchanging positions within the team on a daily basis. "What is emphasized is the assumption that space is an unpredictable environment and to make the team function even if an unforeseeable event occurs to the leader," says Minato, explaining the intentions of the training, which enables everyone to carry out functions necessary for the team both as a leader and as a

subordinate.

"Training to identify one's role, which can change due to a certain situation, and to take action in consideration of the team would also be effective for every team sport," Minato says. "At my laboratory, we are proceeding with a study to apply this to leadership development for businesspersons."

Development of new products and services using space technology

Another viewpoint is to take advantage of space technology for the development of sports products and services. For example, the Global Positioning System (GPS) originally developed as a military system in the U.S. is now indispensable in the tactical analysis of sports emphasizing formations, such as American football, rugby, and even soccer. Furthermore, Minato adds, "As a unique field, wing technology that was developed for collecting spaceships was later developed into a sport: hang gliding." Also, in an environment with microgravity, the skin on the soles of the feet of astronauts deteriorate because of a lack of load from not walking. In fact, there is an example where to maintain the strength of the skin of astronauts' soles, a sporting goods manufacturer took the bold decision to develop "Shoes that cause friction" and

is now trying to apply the technology to nursing support products. This exemplifies the fact that reverse thinking generated from challenges associated with space resulted in the development of an innovative product concept.

"Space is an unknown and untrodden frontier," Minato says. "That is why the development of space technology gives birth to multitudes of ideas for devising and realizing innovative concepts and management power, which in turn offers lots of opportunities for applications to other fields. Our goal is to design a feasible and sustainable future by utilizing the knowledge obtained through the development of space technology." The results are sure to lead to further innovations that will change the future.



Source: Japan Aerospace Exploration Agency (JAXA)

One of the research projects that Minato is tackling is the development of a hypersonic aircraft. This involves an aircraft of the future that flies at a speed around five times the speed of sound (Mach). It can fly from Japan to the U.S., currently taking more than 10 hours, in about two hours. To realize such an innovative system, basic research and element technology development are not sufficient. Research from technology management is essential, such as securing a vast amount of development funds, project management over many years, design and assessment of business models that can withstand competition in the marketplace, and strategic partnerships with international cooperative partners.



Nobuaki Minato

Associate Professor, Graduate School of Technology Management

Subject of Research: System design for new product and service development, modeling and simulation for advanced aerospace projects
Research Keywords: Technology Marketing, Product Development and Service Design, Aerospace Systems

Approaching the mechanism of exercise effect

There are of course quite a number of people who have had the experience of resolving to exercise for health or dietary restrictions only to eventually fizzle out in the end. One of the main reasons many people give up is that "achievements" are hard to visualize. Even if you devote yourself to training, it will take a few months at the very least to really see any changes in body shape or weight. It is therefore rather difficult to remain motivated while not achieving immediate results from your efforts.

"It takes at least a few months for the effects of exercise to become visible. But inside the body, a wide variety of changes are already taking place after only a week or two. If you can understand these changes inside your body, you will be able to better motivate yourself to adhere to exercise for a long period of time," says Motoyuki lemitsu. lemitsu is studying why habitual exercise can contribute to the maintenance and enhancement of health. He also studies the types of exercises that are more effective on the molecular level. His focus is the prevention of lifestyle-related diseases such as cardiovascular and cerebrovascular diseases through exercise.

As a person grows older, blood vessels age, lose their flexibility, and gradually stiffen. This is known as "arteriosclerosis". Furthermore, increase in the stiffening of arteries not only increases blood pressure, generating an additional burden on the heart, but also causes accumulated excess cholesterol in blood vessels, thin vascular lumens, and ultimately blocks the lumens to cause myocardial infarction or cerebral infarction. "Sir William Osler (1849–1919) once said, 'A man is as old as his arteries.' But unlike the one-way process of aging, blood vessels can actually be rejuvenated by exercising, regardless of how old you are," lemitsu states. "However, the mechanism as to why exercise reduces the risk of

cardiovascular and cerebrovascular diseases has not yet been fully clarified."

To address this, lemitsu had persons of middle age or older do continuous aerobic exercise training three days a week for a period of two or three months. He found that the secretion of hormones in the blood that increase vasodilation reduce arterial

stiffness. In addition, he discovered hormones that showed changes in just a short period of two to four weeks after beginning exercise training and identified the possibility that these hormones might play a key role behind the effects of exercise. lemitsu feels that the contraction of combusted adipose tissues and muscles might secrete hormones from skeletal muscles that increase

vasodilation. He is researching this right now.

It is good news for top-level athletes that the effects of exercise can be seen through observing changes in the body. To increase muscle mass, you must continually do resistance training for a long period of time, but lemitsu is exploring a substance that can check whether training has resulted in any effects within one month.

As illustrated above, if we can identify the body's response to exercise, then obese patients, middle-aged to older adults, and athletes can change the type, time, or intensity of exercise depending on their objectives and steadily achieve effects. lemitsu explains the goal, saying, "Eventually, we want to link this to the development of a blood biomarker to indicate the effects of exercise in the body in the form of scientific number values."

lemitsu also works with companies to develop supplements to acquire the effects of exercise more efficiently and to verify their effects.

lemitsu has been engaged in research using animals, paying attention to sex steroid hormones as hormones associated with the prevention and improvement of diabetes, which can be a risk for the development of arteriosclerosis. "By administration of sex steroid hormones in diabetic rats, it was recognized that their fasting blood glucose levels, which was the cause of diabetes, were lowered, and that the such effects further increased by engaging in exercise in tandem," lemitsu reported. "With diabetes, the production ability of sex steroid hormones is lowered, so we hope to develop a supplement to compensate for the lower amount," he explains. Currently, based on the results of basic research using animals, he is engaged in developing new supplements with applications to human beings through joint research with a private company.

In a cooperative project with yet a different company, he found through animal experiments that administrating chlorella for a long period of time may increase the ability to adjust glycolysis metabolism in skeletal muscles and improve exercise performance when required to repeatedly exert explosive power for short periods of time. If this effect is confirmed in human beings, chlorella supplements may become a very significant aid for athletes to increase power.

lemitsu keeps his gaze focused beyond basic studies. "I believe it is my mission to contribute the results of basic studies to humankind in order to show the effects of exercise based on scientific evidence. In other words, I want to conduct research that links the basics with real life applications."

Invisible changes have already occurred in the body immediately after exercise training.



Motoyuki lemitsu
.....
Professor,
College of Sport and Health Science

Subject of Research: Development of exercise and diet (supplement) therapies for the prevention and reduction of cardiovascular disease risks
Research Keywords: Applied Health Science, Sports Science

No regulation or policy that requires Japanese schools to employ risk management professional for sports injuries

Athletic trainers are needed for athletic activities in Japan

Athletic activities vary from athletic team activities at school to professional sports and from daily practices to weekend games. In the U.S., "athletic trainers" who are the experts in sports injuries are almost always at the site of athletic activities.

In recent years, athletic training has drawn more attention in Japan. Still, the profession is underrecognized by the public for its importance and qualification. "In Japan, the word, 'a trainer,' is often perceived as an expert to merely improve athlete's physical performance or to assist individual's body weight control at a fitness gym. Athletic trainers are, in fact, specialized in managing risks for a broad range of athletic injuries and illnesses (including prevention of athletic injuries and illnesses, assessment of and immediate care for athletic injuries, and

rehabilitation of athletes to safely return to play following an injury) at athletic settings. Hence, athletic trainers play a significant role in minimizing the risks of injuries or illnesses that could be catastrophic and fatal. Due to their important roles, athletic trainers in the U.S. ("Certified Athletic Trainers" [ATCs]) are recognized as an allied health professional by American Medical Association," says Hidefusa Okamatsu, who received ATC credential and worked as an athletic trainer in the U.S.

"In case a student athlete collapses during athletic activity, we need to quickly and appropriately evaluate his or her condition, provide emergency care, and decide whether emergency medical service system should be activated. In medical emergencies, the athletic trainers should be able to handle a broad spectrum of conditions, including contusion (bruise),

ligamentous injuries, dislocations, fractures (broken bones), brain damage (concussion and hematoma), vertebral and spinal cord injuries, heat-related illnesses, and even sudden death syndrome," Okamatsu says.

During athletic activities, anything can happen at any time. As athletic trainers have to make quick and appropriate decisions and flexibly respond to any situation, they need to have an extended knowledge in a variety of fields. The knowledge covers multidisciplinary fields, including not only medical fields, especially orthopedic and emergency medicines, but also kinesiology, physical training, physiology, biochemistry, nutrition, psychology, and so on. For this reason, to become a certified athletic trainer in the U.S., you must graduate from a four-year college or graduate school that has an accredited athletic training curriculum and pass a Board of Certification exam ("The accredited athletic training program will be offered only at graduate schools by 2022). Okamatsu completed his bachelor's degree in athletic training with 1,500 hours of clinical experience over three years under supervision of certified athletic trainers at North Dakota State University in the U.S.

This clinical experience helped athletic training students improve their practical athletic training skills.

Okamatsu points out an important issue in Japan, saying, "There is no risk management specialist who can handle the injuries that may occur during physical activities, including physical education classes or athletic activities." One of the reasons he returned to Japan, accepting an invitation from Ritsumeikan University, was to change this situation. To achieve this goal, he enthusiastically educates the students to increase the number of athletic trainers in Japan. Okamatsu's current role in the College of Sport and Health Science at Ritsumeikan University is to prepare students to become certified athletic trainers, which includes teaching athletic training in English. The College of Sport and Health Science at Ritsumeikan University recently launched the Global Athletic Trainers (GAT) program, which assists the students to become certified athletic trainer in the U.S. The program consists of a preparation phase at Ritsumeikan University and a curriculum phase at accredited athletic training program in the U.S. (transferring to the graduate school of East Stroudsburg University in Pennsylvania is required).

At the same time, Okamatsu feels that, "Only increasing the number of athletic trainer is not enough." "The top priority is to create an environment in which athletic trainers can perform their capability," he continued. In Japan, qualification of an athletic trainer is not offered by Ministry of Health, Labour and Welfare, but is offered by the Japan Sports Association under the Ministry of Education, Culture, Sports, Science and Technology. Therefore, athletic training is not considered as a medical qualification in Japan. At present, there is no regulation or policy in place to employ athletic trainers at schools. The fact is that even if you are certified, there is no place to perform your professional skills.

To increase the number of athletic trainers responsible for risk management in injuries and illnesses during athletic activities in Japan, Okamatsu has continued to promote their importance, while working on providing athletic training education at the university. He suggests athletic trainers cooperate with orthopedic clinics to promote the athletic training profession. Okamatsu says, "The core of sports medicine team should be orthopedics. Athletic trainers

work at orthopedic clinics, and the clinics offer outreach athletic training services. In the outreach athletic training services, athletic trainers would be dispatched to schools in the community and offer athletic training services for patients."

In Japanese athletic settings, especially at schools, it is controversial that some coaches, especially devoting themselves to younger athletes' development, believe practice stressing on insanely extraordinary physical demand with or without scientific foundation is required to grow the mental toughness to win in the young athletes. Okamatsu's challenge to "Changing the anecdotal or experience-based Japanese sports culture" is just a beginning.



During a college American football game in the U.S., athletic trainers (Okamatsu is on the right) support an injured player and took him off the field. Their role is to assess his/her condition and give necessary immediate care. Athletic trainers attend all practice sessions and games even on the road.

Hidefusa Okamatsu

Assistant Professor,
College of Sport and Health Science

Subject of Research: Study of sports injury prevention and athletic rehabilitation
Research Keywords: Athletic Training, Sports Injuries, Anterior Cruciate Ligament (ACL)



"Eating program" for the development of local junior athletes

I want to ensure that food that aids physical activity is delicious," says Kumiko Ebi, explaining the objective of her study. She not only studies "food" for growing young athletes in local communities but also contributes to the development of young athletes through nutritional support to incorporate the concept of "local production for local consumption."

As a registered dietitian, Ebi has supported top Japanese athletes via "food" by, for example, taking charge of nutritional support for JOC-certified athletes at the Beijing Olympics. In the process, she renewed her awareness of the reality that most young athletes that will become the future of Japanese sports grow up in an environment without sufficient nutritional support. "It is young athletes in the middle of the process of building up their bodies that most require nutritional support." She has been

continually searching for methods to enable stable nutritional support for young athletes in local communities.

"The daily nutrition of young athletes really depends on not only the athletes themselves but also on the support of coaches and families, etc.," Ebi says. To change the dietary environment for young athletes in local communities, she launched the Society to Promote Food and Sports ("Shokusupo") in 2010, in which teachers instructing physical education and extracurricular activities at junior and senior high schools, mainly in Shiga Prefecture and Kyoto Prefecture, voluntarily get together, and she has been supporting the society's activities since that time. At Shokusupo, the leaders present the reality and problems of their teams and clubs, while Ebi and graduate school students certified as registered dietitians provide nutritional instructions and advice. The aim is to disseminate the importance of

"food" to local communities by gathering leaders with many achievements and broad influence from various schools and by having them play a pivotal role.

Starting out as a part of a research project at Ebi's laboratory, nutritional education provided to a Women's Softball Club at Hieizan High School in Shiga Prefecture turned out to be one of the successful cases. Under instructions from graduate students that are registered dietitians, players set individual targets such as an increase of muscle and the lowering of body fat percentage, and tried to improve their meals or eating habits. As a result, their attitudes toward eating, not to mention their physiques, changed. Ebi says, "As players communicated the nutritional instructions they received at school to their families, indirect intervention effects were a success." This is a good example where a virtuous circle was created where efforts toward "food"


An ideal match for rice and tofu: Okra stock

Ingredients (Amount to prepare at a time: 1/2 for one serving)

150 g okra	3 tablespoons of
50 g Japanese wild ginger	mentsuyu noodle soup
100 g eggplant	20 g ground sesame
Handful of dried bonito flakes	

Directions

- 1 Cut eggplants in half lengthwise, and then thinly slice them into half-moon-shaped pieces. Soak them in salted water to remove astringent taste.
- 2 Boil the okras briefly in boiling water. Then, soak them in cold water.
- 3 Remove the wetness from the okras. Cut them into round slices. Cut the Japanese wild ginger into thin slices.
- 4 Mix the eggplant, okras and Japanese wild ginger with the dried bonito flakes, mentsuyu noodle soup, and ground sesame.



女子部活食
Food for Female Athletes
その一冊が、カラダを作る。

Kumiko Ebi, *Joshibukatsushoku* (Food for Female Athletes), published by Baseball Magazine Sha

Focusing on proper nutrition for female athletes and promoting cooking by oneself, this book features many recipes that can help support female athleticism. Here are some recipes from it.

Adding healthy minerals via something sweet: Double tofu brownies

Ingredients (For 6 servings: 1 serving as one meal)

1/2 cake of "silken" tofu (150 g)	2.5 g baking powder
30 g cake flour	20 g chocolate (broken into small pieces)
20 g cocoa powder	10 g cranberries
30 g sugar	10 g pistachio nuts
1 egg	
2 pieces of freeze-dried tofu	

Directions

- 1 Preheat oven to 180°C. Grind the freeze-dried tofu.
- 2 Mix together the cocoa powder, sugar, egg, "silken" tofu, ground freeze-dried tofu, baking powder, and cake flour.
- 3 Place the dough on a baking sheet with waxed paper and flatten it out. Sprinkle on the chocolate pieces and bake for 30 minutes in an oven pre-heated to 180°C.
- 4 Arrange the brownies on a plate and garnish them with cranberries and/or pistachio nuts.

starting with leaders were handed down to athletes and then finally their families.

Shokusupo also concentrates on young leaders. "When leaders suggest dietary improvements to athletes, they face many difficulties, such as their own lack of knowledge or having to deal with the athletes' parents. To handle this, once a year an 'extended study meeting for leaders' is held to respond to such concerns."

Six years have already passed since Ebi started this initiative, and the number of participants in Shokusupo has increased every year. The range of nutritional guidance has been expanding to sports clubs at junior and senior high schools.

Among her initiatives, Ebi is also focusing on changing dietary environments for young athletes in local communities as nutritional support for junior high school students and female athletes.

For junior high school students undergoing drastic physical and mental changes amid the development of secondary sexual characteristics (puberty), "food" has a very important meaning. Ebi hopes that they can become able to think about "food" so as to improve their bodies by themselves. The graduate students involved also devised a tool that can serve as a start. "Sports nutrition sugoroku" enables athletes to gain knowledge on sports nutrition and the food materials that are available in their community. They are currently creating this system with the target of distributing it to all junior high school students in Shiga Prefecture.

In addition, young female athletes tend to have serious issues about food. Female athletes in their teens and 20s often display "Female Athlete Triad," in which low energy ingestion results in irregular menstruation



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or lowered bone density. "Competitiveness can increase when eating properly and following proper nutrition, but quite a number of female athletes reduce their intake of food, believing that they cannot improve their times or records if they are fat," Ebi says.

In addition, Ebi is concerned about the decreasing number of female students joining sports clubs. "The number of female students who are thin because they neither exercise nor eat properly is increasing, but surely such women can grow into adults that can play an active role in society?" Ebi worries about this and is hoping that a solution of sorts will appear, and has thus devised recipes to increase the nutritional intake of young women who enjoy eating and exercising. She also

published a book, *Joshibukatsushoku* (Food for Female Athletes).

Some graduate students who studied sports nutrition have started a career in nutritional support for future Olympic athletes, much like Ebi did. "I feel that one of my main achievements in these six years is that I could help my graduate students—who once supported young athletes in their local communities—to develop into diet and nutrition support providers for world-class athletes," Ebi says.

Ebi is also engaged in training sports dietitians. Her efforts are sure to lead to the development of not only athletes that can support the future of sports but also the human resources to support these athletes.



Kumiko Ebi
Professor, College of Sport and Health Science

Subject of Research: Research on the effects of nutritional support and food education
Research Keywords: Sports Nutrition, Nutrition Science, Young Athletes, Dietary Education, Nutrition Education
Photograph: Members of the Ebi laboratory; from left: Yuka Shudo, Aya Kaizaki, Kumiko Ebi, Yukako Murakami, Nanako Nakayama, and Chika Kondo

Growing athletes requires nutritional support in individual local communities

Relationships of trust making for a stronger team

Before you know it, a weaker team on paper can beat a strong team via untiring efforts and teamwork, to advance through a tournament. Have you ever felt this exhilarating feeling, while witnessing the miraculous advance of a team overwhelmingly inferior in terms of potential defeating a higher-ranked team?

"In team sports, factors apart from skill or athletic ability can greatly affect the competitiveness of a team," Kazuho Yamaura says, while explaining the reason why differences in actual potential are not the only factor that decides a winner. Studying human relationships and leadership in corporate organizations and team sports, Yamaura pays attention to relationships between leaders such as managers and coaches and their followers or players, and conducts surveys and research on how they make a winning team.

Corporate organizations and sports teams are the same as organizations, and they share many points in terms of their vitalization. What is interesting regarding Yamaura's studies of

corporate organizations as subjects is that the way that superiors express praise or disapproval can contribute to organizational improvements.

Based on corporate survey results, Yamaura clarified that to enable praise to have a positive effect, trusting relationships are necessary between leaders and followers. "What is important before an act of praising or disapproval is whether there is a trusting relationship in place as a basis. Without such a relationship, words of praise will not actually affect the counterparty, or they could even cause a negative effect," Yamaura says, adding that if one praises someone else, the subject of the praise is important.

"When a superior observes the efforts that his or her subordinate makes and praises the process, it will lead to positive effects," according to Yamaura. Without understanding how subordinates work, a superior cannot praise the process of efforts. At a certain company where Yamaura conducted training, the positive utilization of a system to record operations and employee development

was encouraged to share information.

Consequently, as the mutual understanding of each employee's work improved, superiors became able to genuinely praise subordinates, and as additional effects, communication became more active and the workplace atmosphere improved. At the same time, through her surveys, Yamaura confirmed that mutually negative or bitter speech and behavior would cause the collapse of relationships of trust.

Such relationships between a leader and followers in a corporate organization can often be found in sports teams. Yamaura conducted a survey of American football and rugby teams at universities and high schools. In addition to inquiries to managers, coaches, and other leaders and players, she observed both games and training sessions, pursuing in detail the organizational makeup of sports teams for a one-year period.

"In a team that makes me feel, 'That is a good team,' as is the case with corporate organizations, the manager and coaches

positively talk to players and maintain communication, while of course praising them," Yamaura says, while talking about the results from the survey. In teams, where the manager and coaches always try to maintain good relationships with the players, players often show the leaders their respect and trust. If you can build a relationship like this, the players can willingly accept the strict guidance that must be given from time-to-time.

In the process of this study, what attracted her attention was the huge role played by substitute players in improving player motivation. For strong teams with many players, there are many substitutes that cannot even practice with the regular players, not to mention playing in actual games. It is only natural that regular players maintain high levels of motivation and practice enthusiastically, but Yamaura considers, "How the substitutes commit to the team seems to affect how strong a team can be." A team will become stronger if the substitutes can share the same targets and motivation

comparable to regular players and positively cheer on and support regulars even if they do not play in the game. Yamaura analyzes this as follows, "The presence of not only captains and other formal leaders but also informal leaders that encourage substitutes to support the regulars from behind the scenes may well be necessary for team sports."

"In sports teams or companies, unless followers themselves set their own targets and voluntarily think about what they should do, not just being forced by leaders like superiors or managers, they cannot grow," Yamaura says. "A team where players maintain good communication with the managers and coaches, but where the players think on their own and enjoy the game, will sooner or later become stronger. I want to demonstrate this and show how teams should be structured, how leaders

should act, at the core, and what types of relationships should exist between leaders and followers, in order to make the team stronger." Yamaura concludes.

Kazuho Yamaura
Professor, College of Sport and Health Science



Subject of Research: Study on leadership and the development of such, research on the influence of superior-subordinate relationships and organizational environments on motivation
Research Keywords: Organization Psychology, Social Psychology

Relationships between the head coach and players in a winning team overcoming differences of actual potential

The essence of sport is "play" and this is also something that can enrich society.

"Creating a new sport." Heralding this theme, the students of a seminar instructed by Yoshifusa Ichii tackled a joint study and created a new sport called, "Tolitolyla," over a period of two years from 2014.

Ichii has explored the "essence of sports" by redefining it in the context of social issues. He believes that sports are a mirror that reflects not only human history, culture, and how society is structured but also a desire regarding "what shape society should take." He explains the aim of this initiative by saying, "Through the experience of creating a new sport, I thought that students might be able to learn about the very essence of sports firsthand."

In fact, students had to face the fundamental question of "What is 'sports'?" from the initial stage, in order to come up with new ideas. Some of the ideas that the students devised at first were just imitations of existing sports or a mixture of multiple different sports. They were far from being a new sport. Then, what should they do to create a sport in an unprecedented way, while satisfying the factors required as a sport? The discussions began from this point.

There are several views for discussion on the essence of "sports." Ichii pays special attention to their nature as form of play. Shun Mitani engaged in the development of Tolitolyla as a student in Ichii's seminar reflects, "When we went back to the starting point such that the essence of sport is play, it became clear then that a new sport would have to be both enjoyable and fun."

Once they arrived at this viewpoint of play, the rules regulating sports started to reveal several different aspects. We tend to think that rules are a list of "Don't do this or that," generally to protect player safety and maintain fairness and equality, and that if one violates a rule, one will suffer a penalty. "However, while actually creating a sport, we thought about 'how to make it fun,' and so the rules were created to reflect this," says Mitani, as he explains his own experience.

From the viewpoint of "whether it is

fun as a game" or "whether players can enjoy it," students decided on various rules including the size of the court, the number of players, and the actions permitted for each player, and actually went about playing the game in compliance with the rules so as to further improve on them. For example, when it turned out that the ball was concentrated in a single place, holding up the game, a new rule was added to enable "turning things around with a shot" so that the game could develop more quickly.

"As students experienced things in person, the rules are a mechanism to dynamically proceed with the game, which is in fact a characteristic and feature that makes individual sports stand out," Ichii goes on to explain.

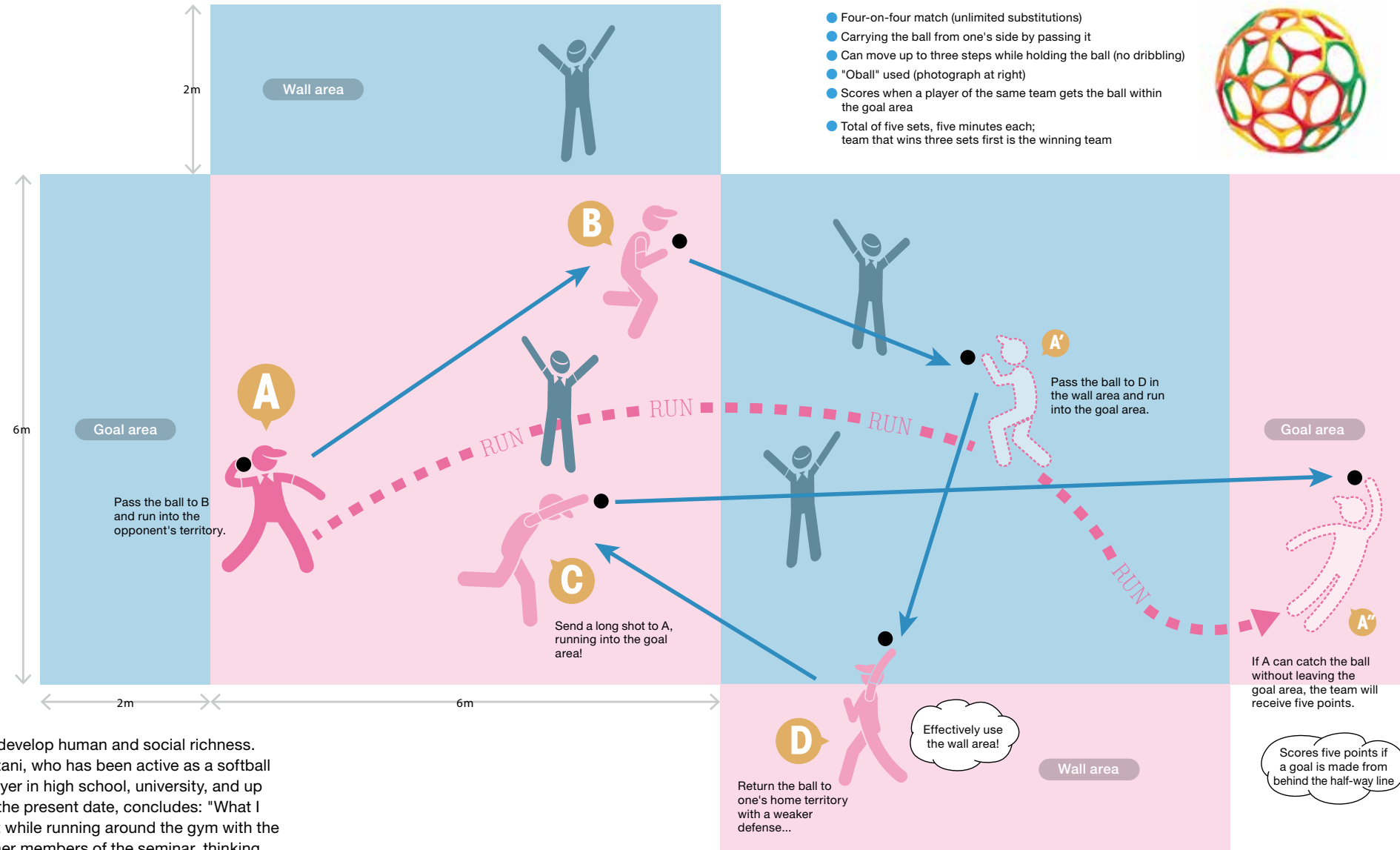
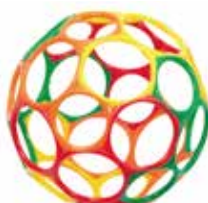
In modern times, sports are linked to fashion and health promotion, they penetrate into general lifestyles and are indispensable for making life and society richer. At the same time, especially in the world of competitive sports, elements of "play" or "fun" have been lost in the pursuit of competitiveness because success in sports is connected with economic success, resulting in doping, acts of violence such as corporal punishment by instructors, match-fixing, and many other issues. Regarding these issues, Ichii gives an opinion that is somewhat different from a conventional viewpoint. "For example, the reason why doping is prohibited is because it is considered in many cases to be damaging to the players' health, as per the unnaturalness of taking artificial drugs and the unfairness of it all. However, if we go back to the essence of sport, the prevalence of unfairness or cheating will make it uninteresting or unenjoyable. For this reason, there is the idea that doping will destroy sports from the roots."

"Play" is the origin of the richness of humans. Ichii says, "A mindset to pursue fun and novelty will be a source of innovation and will thereby enrich society," emphasizing not only the educational or economic effects of sports but also their importance as a vehicle

to develop human and social richness. Mitani, who has been active as a softball player in high school, university, and up to the present date, concludes: "What I felt while running around the gym with the other members of the seminar, thinking how we could make Tolitolyla more enjoyable, was the exact same feeling when enthusiastically running after the ball during a softball match. When I realized and noticed this, it was then that I thought that I understood the very essence of sports."

HOW TO PLAY Tolitolyla

- Four-on-four match (unlimited substitutions)
- Carrying the ball from one's side by passing it
- Can move up to three steps while holding the ball (no dribbling)
- "Oball" used (photograph at right)
- Scores when a player of the same team gets the ball within the goal area
- Total of five sets, five minutes each; team that wins three sets first is the winning team



What is "sports"? In creating a new sport, we faced this essential question.

Shun Mitani (Left)

Master's degree program, Graduate School of Sociology

Subject of Research: Creation and history of rubber-ball sports, studies of changes in playing styles and revisions of rules with the introduction of "softballs" to existing sports (such as baseball and tennis) from the viewpoint of "play," which constitutes the essence of sports

Yoshifusa Ichii (Right)

Professor, College of Social Sciences

Subject of Research: Exploring the essence and structure of sports while redefining the position of sports in various social settings
Research Keywords: Sports Culture, Leisure Study, Aging and Popular Culture



RESEARCH TOPICS

Masayoshi Mishina, Professor, The Research Organization of Science and Technology, won the Japan Academy Prize

Masayoshi Mishina (Professor, The Research Organization of Science and Technology) won the 106th (2016) Japan Academy Prize. The award is given to outstanding academic research achievements and is one of the most prestigious academic prizes in Japan.

The Japan Academy Prize was presented to Mishina for his "Studies on Synaptic Molecules, Learning and Memory."

Mishina elucidated the molecular entity of glutamate receptors that mediate excitatory synaptic transmission in the brains of higher animals and showed that the N-methyl-D-aspartate (NMDA)-type glutamate receptor determines thresholds for both hippocampal synaptic plasticity and contextual learning, serving as a molecular basis for learning and memory. Mishina also revealed that glutamate receptor $\delta 2$ regulates cerebellar synaptic plasticity and motor learning and induces synapse formation via trans-synaptic interaction with presynaptic neurexins. He further showed that IL1RAPL1, which is responsible for intellectual disabilities, induces the excitatory synapse formation of cortical neurons through trans-synaptic interaction with presynaptic protein tyrosine phosphatase (PTP δ). Findings of Mishina that synaptic molecules regulating synaptic plasticity and synapse formation underlie learning and memory contributed to the development of a field for understanding the molecular basis of higher-order brain functions and their disorders.

The achievements of Mishina that revealed the molecular basis of learning and memory has been highly evaluated all over the world. He has received many authoritative prizes, including the Medal with Purple Ribbon and the Takeda Medical Award.



government, and the U.S., representing small government, as these countries tend to be considered as the opposite ends of a scale, in fact both share a large number of working women and a high birthrate. Through a historical viewpoint and through international comparison, the book highlights where Japan is now, considers the shape that Japanese society should take, and shines a light on the problems that families in Japan currently face.

Masanori Murakami, Deputy President, R-GIRO, won the Honda Memorial Prize

Masanori Murakami, Deputy President of R-GIRO, won the 57th Honda Memorial Prize. This prize is one of a number of projects that take place in memory of the achievements of the late Kotaro Honda, who contributed to the development of metallurgy. It is awarded to researchers who have conducted research on science & technology, especially for metals and their peripheral materials, and that made major contribution to the world of science. Murakami received the award for his research on the creation of high-performance metal electrode materials for next-generation electronic devices. On May 27, 2016, an award ceremony and a memorial lecture took place at Gakushikaikan.



Junya Tsutsui, Professor, College of Social Sciences, won the Real Estate Companies Association of Japan Award

Junya Tsutsui (Professor, College of Social Sciences) won the 6th Real Estate Companies Association of Japan (RECAJ) Award. As part of the social contribution activities of RECAJ, the award recognizes writings and findings that contribute to an understanding of the wide range of issues that RECAJ faces by allowing many readers to access various pieces of work focusing on the Japanese economy and people's daily lives.



In his book, which won the RECAJ Award, Shigoto to Kazoku: Nihon wa Naze Hatarakizuraku Uminikuinoka (Work and Family: Why It's Hard to Work and Have a Child in Japan), Tsutsui points out that, in Japan, where females find it somewhat difficult to work due to male-centric working environments, resulting in a seriously declining birthrate, the current ways of working and families have reached a limit. Meanwhile, in Sweden, representing big

Senior Researchers, Hideki Yui and Maika Nakao, won Encouragement Awards from the History of Science Society of Japan

A book written by Hideki Yui (Senior Researcher, Kinugasa Research Organization, Ritsumeikan University), Jinko Jusei no Kindai - Sengono Kazoku to Iryo gijutsu (Artificial Insemination in the Modern Age: Postwar "Families" and Medicine & Technology), and a doctoral thesis by Maika Nakao (Senior Researcher, also from Kinugasa Research Organization),



Hoshano no Tankyu kara Genshiryoku no Kaiho made: Senzen Nihon no Popular Science (From Research of Radioactivity to the Liberation of Atomic Power: Popular Science in Pre-war Japan), were recognized as unique research achievements and awarded with a 10th (2015) Encouragement Award from the History of Science Society of Japan.

The Encouragement Award from the History of Science Society of Japan is one of four awards that were established in 2006 by the society to recognize persons who have made outstanding achievements regarding research into Japanese science and technological histories for the purpose of recognizing researchers with relatively short histories in research.

Both of the awardees have experience under a Research Fellowship for Young Scientists with the Japan Society for the Promotion of Science and are young researchers establishing their careers as senior researchers at the Kinugasa Research Organization of Ritsumeikan University.

Lecture meeting in celebration of the opening of the Kato Shuichi Collection

On May 7 at Kinugasa Campus, a lecture meeting to celebrate the opening of the Kato Shuichi Collection* took place. At the meeting, Sonja Kato, who served as a member of the municipal assembly of Vienna and who is the daughter of the late Shuichi Kato, and Kenzaburo Oe, a Nobel Prize laureate who was a close friend of Kato, each gave lectures. The approximately 600-strong audience was given insight into the life and mind of Kato, who was one of the main representative international intellectuals of post-war Japan.

In February 2011, Ritsumeikan University received a myriad of books, posthumous writings, and notebooks, which were all donated at the wishes of the bereaved family of the late Shuichi Kato, who served as a Visiting Professor of the College of International Relations and the first Director of the Kyoto Museum for World Peace at Ritsumeikan University. To make all these books, etc., in the form of the "Kato Shuichi Collection," available to the general public and students, sufficient preparations were carried out, and the collection was held at the Hirai Kaichiro Memorial Library on Kinugasa Campus in April 2016. The lecture meeting was held to celebrate the opening.



International symposium in conjunction with the Embassy of Japan in the UK

On March 5, as part of the Top Global University Project, Ritsumeikan University hosted a joint lecture with the Embassy of Japan in the UK, titled, UK-Japan Collaboration Public Lecture: The Past and Future Earth - Climate change and co-existing sustainably with nature, at the embassy, with 75 people participating, including Ambassador Extraordinary and Plenipotentiary of Japan Keiichi Hayashi and other notable people involved living in the U.K.

In addition to Takeshi Nakagawa (Professor, The Research Organization of Science and Technology, and Director of the Research Centre for Palaeoclimatology) and Hiroyuki Mori (Professor, College of Policy Science and Dean, Graduate School of Policy Science), leading researchers in the U.K. such as Eric Wolff (Professor, the University of Cambridge) and Robert Lowe (Professor, University College London) were invited as guest speakers, hosting lectures on various themes such as "Climate Change" and "Sustainable Society." In Session 1, on the theme of climate change, Nakagawa presented research results based on an analysis of the amount of pollen contained in varve collected from Lake Suigetsu in Fukui Prefecture, while Wolff introduced how ice cores are collected in Antarctica, in addition to his research findings on an analysis of CO2 amounts within ice cores.

In the following Session 2, taking sustainable society as a theme, issues and proposals were presented to realize a sustainable society in the fields



of environment and energy. Mori discussed asbestos disasters in Japan using the Great Hanshin-Awaji Earthquake and the Great East Japan Earthquake as examples, while Prof. Lowe introduced his research findings on energy efficiency based on the structures of buildings.

Taking this international symposium as a catalyst, we plan to establish a foundation to promote joint research with University College London and other research institutes in the U.K., in the near future.



International symposium at the Ritsumeikan Inamori Philosophy Research Center

On March 4, at the Colloquium of the Ritsumeikan Ibaraki Future Plaza, the Ritsumeikan Inamori Philosophy Research Center hosted its 1st International Symposium, titled "The Outlook of Globalization on Inamori Management Philosophy," with more than 180 researchers, businesspersons, and students taking part.This symposium was held with the purpose of achieving shared awareness regarding academic research in relation to the Inamori Management Philosophy and its global development and on the theme of "The Outlook of Globalization on Inamori Management Philosophy." Kazuo Inamori, Chairman Emeritus of KYOCERA Corporation and Director Emeritus of the Ritsumeikan Inamori Philosophy Research Center, expressed the significance and expectations of the center, which was established for academic studies regarding his management philosophy.

Ikujiro Nonaka (Professor Emeritus at Hitotsubashi University and a research advisor to the center) gave a keynote lecture, explaining the six requirements necessary for executives (leaders), namely: (1) to have a "good" objective, (2) respect intuition as-is, (3) devise a forum to create wisdom in a timely fashion, (4) be able to comprehend and discuss the essence of things, (5) political influence for realization, and (6) the capability to organize phronesis. Furthermore, he referred to the importance of phronesis and the potential of tacit knowledge, and concluded his speech by saying, "The possibilities for mankind are limitless. Believing in the potential of mankind is the core of the Inamori Management Philosophy." Following a keynote lecture, four research projects were respectively introduced by: Takahiro Nakajima (Professor, Institute for Advanced Studies on Asia, the University of Tokyo), on philosophy; Eugene Choi (Associate Professor, Graduate School of Technology Management, Ritsumeikan University), on management organization; Fumihiro Kanai (Affiliate Professor, Ritsumeikan University) and Etsuko Taniguchi (Affiliate Assistant Professor, Ritsumeikan University) on ways of working, thinking, and living; and Kazuho Yamaura (Associate Professor, College of Sport and Health Science, Ritsumeikan University), on psychology, indicating the directions of the Inamori Management Philosophy in individual academic fields.

Later on, regarding "The Outlook of Globalization on Inamori Management Philosophy," John F. Wilson (Professor, Newcastle University), Sea-Jin Chang (Professor, National University of Singapore), and Shannon French (Professor, Case Western Reserve University) gave lectures, relaying significance and vision in terms of the global development of the Inamori Management Philosophy.



Creation of an electronic library system that is easy to use for visually impaired persons: Joint development project with private companies

The "Integrated Research on Accessible Reading with the Prevalence of E-books" project (Representative: Yoko Matsubara, Professor, Graduate School of Core Ethics and Frontier Sciences) has jointly developed an electronic library system in collaboration with Dai Nippon Printing Co., Ltd., TRC Library Service Inc., Nihon Unisys, Ltd., and Voyager Japan, Inc. This electronic library system incorporates a site viewer (Web browser for browsing) that enables visually impaired persons to search for a particular book, borrow it, and read it aurally by manipulating the keyboard of a

computer and using audio synthesizing software (screen reader). During development, in cooperation with the Sanda-city Council of Social Welfare and the Association of Visually Impaired Persons Working for Public Libraries, opinions from visually impaired persons were widely adopted. E-books offer more reading opportunities for people who have difficulties in reading printed material as a result of visual impairment, developmental disorder, or disability by such means as "enlarging characters for more readability," "using text-to-speech functions," and "converting text into a multimedia format by combining audio and video." Going forward, the system will be experimentally introduced to the Sanda City Library electronic library service (TRC-DL), and following a demonstration test, the service will start in the summer of 2016.

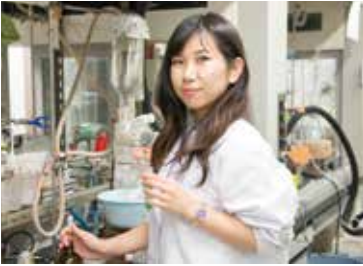


Thesis of Yuki Orikasa, Associate Professor, College of Life Sciences, adopted by Scientific Reports by the Nature Publishing Group

A research group by Yuki Orikasa (Associate Professor, College of Life Sciences) and Yoshiharu Uchimoto (Professor, Graduate School of Human and Environmental Studies, Kyoto University) visualized the extent of the uneven distribution of chemical reactions that take place in the electrodes of lithium-ion batteries and elucidated the occurrence factor of such, in conjunction with Ritsumeikan University, the National Institute of Advanced Industrial Science and Technology (AIST), and KRI, Inc. As of 6 p.m. on May 19, 2016 (Japan time), the details of the research were published in Scientific Reports, which is an online scientific magazine belonging to the Nature Publishing Group, based in the U.K.

Misato Teramura, 1st-year doctoral program, Graduate School of Life Sciences, adopted by the Sasakawa Scientific Research Grant

This grant system was founded for the purpose of supporting research projects for which the theme is unique and full of potential and for young researchers with unprecedented new ideas in terms of concepts and viewpoints. The system also supports young researchers who are 35 years old or younger and who are engaged in research activities, such as graduate school students and temporary or fixed-term researchers for research in humanities , social science, and natural science (mathematics, physics, technology, chemistry, biology, and interdisciplinary studies [excluding medicine]). Teramura of Tamiaki's laboratory conducted research into a chlorophyll biosynthesis pathway based on an activity analysis of antenna pigment synthesis enzymes in green sulfur bacteria. Thanks to the results of this research, she also won a Poster Award from the Japanese Society of Photosynthesis Research.



Innovation Network Corporation of Japan (INCJ), SPARX Group Co., Ltd., and Mitsubishi UFJ Capital Co., Ltd. decided to invest in 3D MEDiA Co., Ltd., a venture company that originated at Ritsumeikan University

3D MEDiA Co., Ltd. (headquarters: Kusatsu City, Shiga Prefecture) is a venture company that originated at Ritsumeikan University. The CEO of the company is Gang Xu (Professor, College of Information Science and Engineering), and the company has developed and is now selling the world's first 3D robot vision system. Innovation Network Corporation of Japan ("INCJ"), SPARX Group Co., Ltd.* ("SPARX"), and Mitsubishi UFJ Capital Co., Ltd., decided to investment in the venture with an upper limit of 800 million yen for INCJ, 250 million yen for SPARX, and 50 million yen for Mitsubishi UFJ Capital Co., Ltd., respectively.

3D MEDiA Co., Ltd., is engaged in the research & development of "eyes" and "brains" for industrial robots. Thanks to the 3D recognition technology (3D vision sensors) that was developed by the company, the addition of 3D vision to serve as "eyes" and a robot control to function as a "brain" will enable robots that could conventionally be programmed to do preset actions to be able to automatically recognize and handle objects for processing that randomly pile up.

With these capital investments, 3D MEDiA Co., Ltd. targets further technological development and the strengthening of its sales organizations



toward the mass production of the technology by opening an R&D base in Tokyo by the summer of 2016, while at the same time establishing an overseas service organization and focusing on the recruitment of human assets to promote business.



* Investment made by Mirai Creation Fund managed and operated by SPARX Group Co., Ltd.

Exhibited at Academic Forum

Between May 11 and 13, 2016, Academic Forum took place at Tokyo Big Sight. Satoshi Konishi (Professor, College of Science and Engineering), exhibited the achievements of his research, "Artificial openable intestinal tract for in vitro medicine evaluation system by using cultured cells." During the product and technology seminars by the exhibiting companies, he gave a short presentation of about 30 minutes. The exhibit created a high level of interest among the audience, resulting in a great overall success.

Exhibited at Service Robot Development Technology Exhibition 2016

Between May 26 and 27, 2016, the Service Robot Development Technology Exhibition 2016 took place at INTEX Osaka. Sadao Kawamura (Professor, College of Science and Engineering) exhibited the results of his research including "Commercialization of calibration-free robot behavior control by integrating visual and joint angle information." He introduced the details and potential of robot control technology and had in-depth discussions with companies that have certain needs for robots. A total of 8,324 people visited during the two-day period of the event.

Research centers opened in AY2016

Research Center for Financial Gerontology and Finance/ Legal Education, Ritsumeikan University

Mainly having been developed in the U.S., financial gerontology is a field of study that deals with financial issues accompanying aging in a comprehensive and interdisciplinary manner, with social conditions that urgently require the construction of a society where citizens can grow old healthily and with a sense of security in terms of financial aspects, as a result of a drastically declining birthrate and an aging population amid tight social security finances.

This research center opened as the first research organization with the central subject being finance gerontology. While conducting comprehensive and interdisciplinary surveys and research regarding aspects of finance, as well as legal and tax affairs, the organization targets not only the active development of systems and products and the fundamental financial and legal technologies to achieve this goal but is also developing an educational curriculum to promote literacy for both those in financial circles and for general residents.

Research Center for Sustainability Science

Sustainability science is a new academic framework that aims at tackling the complex and long-term issues that the world currently faces, such as climate change, biodiversity, and the deterioration of ecosystem services from a comprehensive and integrated approach. It also aims at building a sustainable society in which human activities and the natural environment can co-exist in harmony. In AY2006, Ritsumeikan University established the Research Center for Sustainability Science ("RCS") at the Centre for Promotion of the COE and has elucidated what should be done in terms of solutions to the difficulties that society faces by conducting research activities integrating art and science. Based on research results encompassing nine years at RCS, the Research Center for Sustainability Science at the Research Organization of Open Innovation and Collaboration was newly established as a base to develop and promote RCS in order to carry out research on "How things should be done" or on methods of practice and challenges as a next stage. By improving core research into sustainability science and related practices, enhanced solutions to society's difficulties are being promoted.

COLUMN #1 The World of Shirakawa's Letter Science

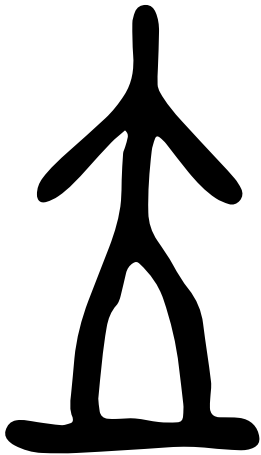
The "立" in Ritsumeikan University

Takao Sugihashi

The "立" character is conceptually derived from "大" and "一." "大" is the shape of a man standing wide, spreading his arms and feet, as seen from the front. "一" indicates the position that the person is standing in. In other words, "立" shows the shape of a person standing in a certain place, meaning "standing." This "立" character means not just standing in itself but standing at a designated place during a ritual, for example. This place was called kurai. The Chinese character for kurai (位) was initially written as "立" and went on to become "位" with ninben added.

In actual fact, the original Chinese character for "並" is spelled as "竝." This has the form of two persons standing side by side, meaning narabu (standing in line). The same applies to "并 (并)" which means a pair lining up in single file, and this is the original character for "并 (併)".

The word ritsumei in the name for Ritsumeikan University comes from a passage in the Jinxin chapter of the Discourses of Mencius: Yoju Tagawazu Mi wo Osamete Motte Kore wo Matsu wa Mei wo Tatsuru Yuen nari. This passages states, "Some die young, as some live long lives. This is decided by fate. Therefore, one's duty consists of cultivating one's mind during this mortal span and thereby establishing one's destiny." This is an actual quote from our website under the section, The Origins of the name "Ritsumeikan", and it is also a common interpretation. However, in the "立" section in Jitsu, Dr. Shirakawa read the first part of the passage as Yoju Utagawazu ("without doubt"), which seems more profound, implying the subtleties of the human mind. What would you make of this?



Framed motto of Ritsumeikan
When Kinmochi Saionji permitted the Kyoto College of Law and Politics to move forward with the name "Ritsumeikan," he wrote the name "Ritsumeikan" in Japanese with bold brush strokes and donated it encased in a frame. However, this was lost in a fire at a school building in 1908, thus instead a framed "Ritsumeikan" produced at the time of the university's foundation in 1869 and stored by the Hashimoto family (a former court noble family consisting of relatives of the Saionji line) was donated to the university.



Stone monument of "The Origins of the Name of Ritsumeikan"
On the monument, a passage from the Jinxin chapter of the Discourses of Mencius, which formed the origin of the name "Ritsumeikan" is inscribed. The monument can be found at Kinugasa Campus. (Go south in a straight direction from the main gate. The monument is located at the end, in front.)
Source: Lifelong Learning and Cultural Assets Division, Fukui Prefecture Education Agency

Takao Sugihashi Director of the Shirakawa Shizuka Institute of East Asian Characters and Culture/Tokunin Professor and Professor Emeritus, Ritsumeikan University

COLUMN #2 Lifestyle recipes

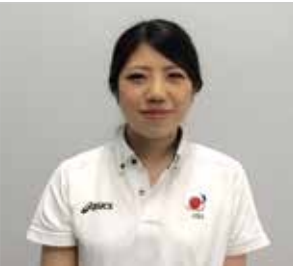
Determination and an inquiring mind, comparable to athletes
Graduate students supporting top athletes

Kumiko Ebi


This summer, the Olympic and Paralympic Games will be held in Rio de Janeiro. It is a gallant festival of sports that all athletes dream of, but please also look out for the support staff. Aya Ishibashi, who was a former member of the Ebi laboratory and who is currently studying at the Graduate School of Sport and Health Science, extends nutritional support to athletes as a contracted researcher for the Japan Institute of Sports Sciences (JISS).

After acquiring qualifications as a registered dietitian at a different university, she began to work as a dietitian at the university's dormitory for its sports clubs. There, she felt the need to study sports nutrition professionally, left her job, and entered Ritsumeikan University. What is most outstanding about Ishibashi is her determination and inquiring mind. Soon after entering Ritsumeikan, she was asked by an amateur female athletic team to accompany them on an American tour and promptly agreed. However, when she was asked, she laughingly admitted, "This is my first time to go abroad." She could have felt uneasy about this, but returned to Japan after fulfilling all her responsibilities. This was highly evaluated, and she went to the U.S. once again to accompany another team, which was then followed by accompanying the Japanese national fencing team to the World Fencing Championships in Russia, thereby accumulating precious experience. Following these support activities, she became a contracted researcher for JISS from April 2015. She is also continuing to study for a doctoral program at Ritsumeikan, and taking advantage of the knowledge acquired from these experiences, she continues to study nutritional intake so as to improve competitive abilities and create optimal conditions for athletes.

Athletes are able to compete in events under an optimal condition thanks to support from researchers like Ishibashi, who accumulate daily tasks just like athletes themselves. Thanks to her efforts, we hope that others can enjoy this particular aspect of such a glorious sporting event.



By using a nutritional evaluation system, providing instructions for a dietary menu as chosen by an athlete

 Graduate School of Sport and Health Science
http://www.ritsumei.ac.jp/gs_shs/

Kumiko Ebi Professor, College of Sport and Health Science
Completed doctoral course second term (Nutrition Science), Graduate School of Nutrition Science, Koshien University in 2007. Doctor of Nutritional Science, Contracted researcher, Department of Sports Medicine, Japan Institute of Sports Sciences, in 2006. Professor at the College of Sport and Health Science, Ritsumeikan University in 2010. Vice Chairperson and Dietetics, Japan Society of Nutrition and Food Science, Japan Sports Association, Japanese Society of Sports Education, Japanese Society of Clinical Sports Medicine, and the Japan Association for the Integrated Study of Dietary Habits.

COLUMN #3 "Altruism" rooted in society

About educational development at RITA LABO

Ritsumeikan Inamori Philosophy Research Center

The Ritsumeikan Inamori Philosophy Research Center aims at disseminating the ideas of "Rita" or "altruism" (i.e., kindly caring for other persons), as the foundation of Kazuo Inamori's management philosophy, to elementary and secondary schools, and conducts activities for practical studies and exchanges on educational programs in relation to "Rita" in the form of RITA LABO.

From the viewpoint of developmental stages in the 4-4-4 system (to shift from the current 6-3-3 system of education for elementary, junior, and senior high schools) based on research into brain science, the period between the first and fourth year at elementary school (seven to 10 years old) is a period for "creating the foundation of character formation through the experience of going through various feelings (experience of understanding various things with a sense of ownership through emotion)." Then, the period between the fifth year of elementary school to the second year of junior high school (11 to 14 years old) involves "becoming interested in surveys and experimentation and working with others to develop logical thinking." The period between the third year of junior high school to the third year of senior high school (15 to 18 years old) involves "getting in touch with different ideas (experiencing different cultures, etc.), relativizing oneself, developing character, and establishing one's independence." Inamori considers that, in corporate management, what is most important is that leaders become executives with their own philosophies and that they continue to improve on their personalities. It is highly likely then that, if we can provide children during developmental stages with education to improve their personality, many more competent leaders can be developed. RITA education in primary and secondary education can be a foundation that enables children to acquire knowledge to improve their altruistic mindsets for their own lives and can also enhance their personality, as they prepare to enter society.

RITA LABO pays attention to the affinity of altruistic mindsets and active learning, and tackles the following forms of education. In "Flipped Learning" as a foundation, we "flip" the style of teaching in which teachers teach a system of knowledge for each subject en masse, and instead emphasize learning from video-based teaching materials involving interesting lectures as homework. Meanwhile, this also involves thinking about solutions to advanced problems through group work in class and with children teaching and learning from each other (i.e., "RITA" [altruism]) via group work in school. In the "Liberal Arts" classes, participants talk about discussion points or themes as set by teachers ("RITA," as friendly rivalry), contemplate the points/themes in a creative manner, and pursue truth and agreement formation. The "Theatrical Education" is a workshop-based class where participants verbally and physically learn about expressions and modes of communication, and over time, they gradually open up their body and mind, and experience independent, collaborative, and communal* relationships person-to-person ("RITA" experience), in order to discuss theatrical plays. In "Project Learning," they participate in activities by people from local communities and learn methods for problem-solution and commitment to practice. In addition, by letting children participate and practice within the community, they can experience altruistic projects that can perhaps change society.

Through the above educational activities, RITA LABO continually addresses the challenge of developing people that can serve as a foundation for Inamori's concept of "creating a society where altruistic mindsets can be extended through communities, countries, and the entire world," with such people being able to face and tackle various social issues.

This text is compiled on the basis of comments by Hiroshi Kuraishi (Director, Ritsumeikan Inamori Philosophy Research Center) and Fumihiro Kanai (Researcher, Ritsumeikan Inamori Philosophy Research Center), published in RITA (Vol. 1, February 17, 2016), issued by the research center.

* "Communal" refers to "used or shared in common by everyone in a group," or "of a community." In the above context, it is used to mean, "People living among one another, being present, and being together."

Ritsumeikan Inamori Philosophy Research Center A research center established at the OIC in June 2015 with a goal of making the study and use of Inamori's management philosophy more universally applicable and more widely practiced from diverse academic viewpoints, such as philosophy, psychology and management. We also promote the research and development of educational programs to help people master Inamori's management philosophy.

Ritsumeikan Saturday Lecture Series

The late Dr. Hiroshi Suekawa, then the President of Ritsumeikan University, proposed that "study and science are for the sake of protecting the benefits and human rights of citizens and the general public. A university is a place to develop human beings through study, and it is important to walk, think and study along with the general public." Therefore, the Ritsumeikan Saturday Lecture Series was established to open the lectures of the university to the general public and strengthen the ties between the university and the local community. Ever since the first lecture entitled "About the Labor Union Act" by Professor Hiroshi Suekawa on March 31, 1946 during the turmoil of the postwar period, for more than half a century, this series of lectures has taken place.

August The World is Now: From Conflict to Reconciliation, from Confrontation to Coexistence

August 20 No.3174

Toward a World without Nuclear Weapons via the Voice of the People: The Hiroshima Panels in the U.S. and Initiatives by the Hibakusha Stories, U.S. NGO

Takayuki Kodera, Director of the Maruki Gallery for The Hiroshima Panels (a public interest incorporated foundation)/ Professor, Faculty of Human Development and Communication, Kyoto Tachibana University

August 27 No.3175

Post-conflict Dilemma in Pursuit of Justice and Reconciliation: Diverse Attempts to Overcome Painful Past

Kyoko Cross, Associate Professor, College of International Relations, Ritsumeikan University

September Challenges and Discoveries by Cognitive Sciences

September 3 No.3176

The Perception of Somatic World: Flat, Tilted, and Shaken Floors

Atsuki Higashiyama, Professor, College of Letters, Ritsumeikan University

September 10 No.3177

Cognitive Science of Thinking: Consciousness and Rationality of Thoughts

Masaki Hattori, Professor, College of Comprehensive Psychology, Ritsumeikan University

September 17 No.3178

Psychophysical Research on Human Vision and Its Applications: New Markets Created between Physics and Psychology

Hiroaki Shinoda, Professor, College of Information Science and Engineering, Ritsumeikan University

September 24 No.3179

Cognitive Mechanisms for Comprehending Explanations: Is It Over by Only Your Talking ?

Hiroki Yamamoto, Professor, College of Comprehensive Psychology, Ritsumeikan University



Ritsumeikan Saturday Lecture Series website
<http://www.ritsumei.ac.jp/acd/re/k-rsc/kikou/doyokozakikoh.htm>

Admission free, no advance application required

Lecture room, Suekawa Memorial Hall, Kinugasa Campus, Ritsumeikan University

EVENT GUIDE

Art Research Center

ARC Days

🕒 August 5 (Friday) to August 6 (Saturday)
📍 Co-learning House II C803, Biwako-Kusatsu Campus, Ritsumeikan University

Application/participation fee: No advance application required, free of charge

Presentations for individual projects at the Digital Archive Research Center for Japanese Cultural Resources (designated as a "Joint Usage/Research Center" for which the Art Research Center was selected by the Ministry of Education, Culture, Sports, Science and Technology); wide ranges of topics on Japanese culture, entertainment, and arts under discussion.



<http://www.arc.ritsumeai.ac.jp/>

Ritsumeikan Center for Game Studies

Replaying Japan 2016

🕒 August 15 (Monday) to August 17 (Wednesday)
📍 University of Leipzig (Germany)

Application/participation fee: No advance application required, free of charge

An international conference covering a wide range of subjects such as Japanese games and associated culture, education, and industry; the event will be jointly hosted by the Institute of East Asian Studies ("Japanology") and the Japanese Game Research Initiative of the University of Leipzig, along with the Ritsumeikan Center for Game Studies and the University of Alberta.



<http://www.rcgs.jp/>

Ritsumeikan Global Innovation Research Organization (R-GIRO)

R-GIRO Third-phase Kickoff Symposium (tentative title)

🕒 September 16 (Friday)
📍 Osaka Ibaraki Campus, Ritsumeikan University

Application/participation fee: No advance application required, free of charge

A kickoff symposium for six projects selected for the Program for the Third-Phase R-GIRO Research on the theme of "Formation of a human symbiosis social model full of vitality and creativity, responding to a declining birthrate and an aging population"; issues to be solved in an aging society with a declining birthrate under discussion.

Institute of Disaster Mitigation for Urban Cultural Heritage

Institute of Disaster Mitigation for Urban Cultural Heritage, Ritsumeikan University
10years Anniversary Symposium of the UNESCO Chair International Training Course on Disaster Risk Management of Cultural Heritage
Accomplishment Report of the TOYOTA Foundation 'Initiative Program'

🕒 September 26 (Monday) 10:00 to 18:10
📍 Conference Room, Soshikan Hall, Kinugasa Campus, Ritsumeikan University

Application/participation fee: No advance application required, free of charge

The 10th anniversary symposium of the UNESCO Chairs Programme international training, which has been continually held since 2006, will take place, during which we look back at activities thus far with experts from international institutions and former trainees and where we discuss "cultural heritage disaster prevention" to protect the shared heritages of mankind. A report will also be given on the initiatives subsidized by the Toyota Foundation.



<http://www.rits-dmuch.jp/jp/project/symposium/program.html>

Institute of Disaster Mitigation for Urban Cultural Heritage

GIS Day in Kansai 2016

🕒 October 22 (Saturday) 10:00 to 17:00
📍 Conference Room, Soshikan Hall, Kinugasa Campus, Ritsumeikan University

Application/participation fee: Advanced application required for workshop, free of charge

Against the backdrop of nationwide improvements in fundamental map information and the penetration of GIS (Geographical Information Systems) utilization through industry-academia-government partnerships, we have invited government officers in charge and other experts to host a lecture meeting. During the workshop in the afternoon, we host not only hands-on training for the general public using ArcGIS and ArcGIS Online but also applied training for disaster prevention and proactive countermeasures using GIS.



<http://www.rits-dmuch.jp/jp/index.html>

Ritsumeikan University

13th Ritsumeikan University Venture Contest in 2016

🕒 Final Competition: December 17 (Saturday)
📍 Osaka Ibaraki Campus, Ritsumeikan University

Application/participation fee: No advance application required, free of charge

This is a business planning contest for students. The goal is to create venture businesses originating from the university and to develop entrepreneurs, and we solicit business startup plans based on technologies or ideas on any business seeds that students might have.



[Facebook]
<https://www.facebook.com/r.startup.2016>

PUBLICATIONS

Seizongaku no Kuwadate

("Scheme of Ars Vivendi")

Research Center for Ars Vivendi,
Ritsumeikan University (Ed.)

Seikatsushoin Co., Ltd.



Terebi ga Misemono Datta Koro -
Shoki Television no Kokogaku

("When TV Was an Exhibition: The Archaeology of Early Television")

Yutaka Iida

Seikyusha Co., Ltd.

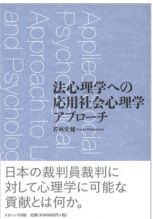


Hoshinrigaku heno
Oyoshakaishinrigaku Approach

("Applied Social Psychological Approach to Forensic Clinical Psychology")

Kosuke Wakabayashi

Nakanishiya Publishing Co., Ltd.



Kankyo Bunmei Ron
Arata na Sekaishi Zo

("On Environmental Civilizations: A New View of World History")

Yoshinori Yasuda

Ronsosha

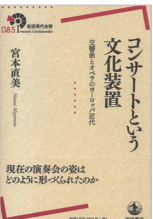


Concert toiu Bunka Sochi -
Kokyokyoku to Opera no
Europe Kindai

("Cultural Mechanisms as a Concerto: Symphonies and Operas in the Modern Age of Europe")

Naomi Miyamoto

Iwanami Shoten, Publishers



Fukushima Daiichi Genpatsu
Hairo Zukan

("Encyclopedia of the "1F": A Guide to the Decommissioning of the Fukushima Daiichi Nuclear Power Station")

Hiroshi Kainuma

Ohta Publishing Company



Tsushima Kaikyo to Munakata no
Kofun Bunka

("The Tumulus Culture of the Tsushima Straits and Munakata")

Yoshinori Yasuda

Yuzankaku, Inc.



Warera wa Ai to Seigi wo Hitei suru -
Noseimahisha Yokota Hiroshi to
"Aoi Shiba"

("As We Deny Love and Justice: 'Aoi Shiba' and Hiroshi Yokota, a Cerebral Palsy Patient")

Hiroshi Yokota, Shinya Tateiwa, and Masaki Usui
Seikatsushoin Co., Ltd.



RADIANT July 2016 Issue 3

Special Feature:Sports

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Chihiro Kanayama (Professor, College of Social Sciences)

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"Eating program" for the development of local
junior athletes

Kumiko Ebi (Professor, College of Sport and Health Science)

20 STORY #9

Relationships of trust making for a stronger team

Kazuho Yamaura (Professor, College of Sport and Health Science)

22 STORY #10

The essence of sport is "play" and this is also
something that can enrich society.

Yoshifusa Ichii (Professor, College of Social Sciences)
Shun Mitani (Master's degree program, Graduate School of Sociology)

24 RESEARCH TOPICS

28 COLUMN / Saturday Lecture Series

30 EVENT GUIDE / PUBLICATIONS