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# The New Movement of Active Learning in Japanese Higher Education: The Analysis of Active Learning Case in Japanese Graduate Programs

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Additional information is available at the end of the chapter

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## Abstract

Currently, active learning becomes the major concern for Japanese higher education institutions. In this chapter, active learning is defined that students study with clear purposes and are engaged in learning proactively. As a result, active learning brings some learning outcomes. Many previous studies have shown that the learning outcomes of students are strongly associated with the quality of pedagogy and student experience. Such pedagogy often includes active learning methods, and it is often expected that active learning methods are strongly associated with proactive learning of students. Such active learning methods have been introduced in the Japanese graduate programs so called leading graduate programs. In this chapter, after examining the theory and effectiveness of active learning, we will examine the practice of active learning methods introduced in leading graduate program of University of Tsukuba. That program is unique and interdisciplinary programs, which will lead to learning outcomes sought in the new knowledge-based society.

**Keywords:** active learning, teaching-centered, learning-centered, interdisciplinary approach, STEAM

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## 1. Introduction

In recent years, many Japanese universities and colleges have introduced the active learning method. The survey<sup>1</sup> conducted by the MEXT (Ministry of Education, Culture, Sports, Science, and Technology) in 2015 shows that 41.6% of four-year universities and colleges provide the faculty development workshops for promoting active learning methods in a class as compared with that of 26.9% in 2013. At the same time, 70% of four-year universities and colleges responded that they examined to incorporate active learning method effectively into curriculum and also 66% responded that they endeavored to increase classes to introduce active learning methods [1].

There are two factors of rapid spread of active learning in Japanese higher education institutions. First factor is the paradigm transformation from teaching-centered to learning-centered. In the knowledge-based society today, the transition from knowledge attainment-based to new teaching and learning-based educational methods is a worldwide trend. Traditional knowledge transmission-based teaching is effective method for obtaining basic skills, standardized skills, a certain amount of knowledge, and adaptability. However, there is a shared recognition that knowledge transmission-based and memorization-based learning face limitations when it comes to traits such as diversity, creativity, sense of challenge, individuality, proactiveness, and leadership. It is pointed out that the acquisition of practical knowledge and adaptive knowledge has affinity with active learning [2].

Second factor is keenly associated with the higher education policy shift of the MEXT to more learning outcome oriented. Such higher education policy is also applicable to the educational reform in graduate programs. Thus, not only undergraduate education but also the more learning outcomes for the knowledge-based society are sought through the graduate education.

The purposes of this chapter are to examine the MEXT higher education policy in recent years to accelerate the active learning and to show the relationship between active learning methods and learning outcomes in undergraduate education. Then, this chapter explores the case study of graduate education program, which introduces the active learning methods in order to deal with the MEXT policy to accelerate the educational reform of graduate program.

## 2. The learning-centered higher education policy in Japan

The learning-centered policy shift of the MEXT can be traced to the Central Council for Education (CCE) Report (2005), titled “The Future of Japanese Higher Education.” This report confirmed that the twenty-first century as the age of the knowledge-based society, wherein higher education becomes indispensable for both individual and the nation [3].

<sup>1</sup>The MEXT conducts the survey so called “Survey for Educational Reform Situation in Japanese Universities” every year. The survey was conducted for 776 four-year universities and colleges between December of 2015 and February of 2016. The response rate was 99%. [http://www.mext.go.jp/a\\_menu/koutou/daigaku/04052801/\\_icsFiles/afieldfile/2017/12/13/1398426\\_1.pdf](http://www.mext.go.jp/a_menu/koutou/daigaku/04052801/_icsFiles/afieldfile/2017/12/13/1398426_1.pdf) Accessed on June 27, 2018

The CCE report, published in 2008, was revolutionary in the sense that it confirmed this policy shift. Titled "Toward the Construction of Undergraduate Education," the report urged Japanese universities to set common learning outcomes for students of each institution as one method for quality assurance under globalization. In the same report, graduate attributes were utilized as a point of reference to recommend a common standard for learning outcomes. Also, universities are expected to integrate the life experiences of their students together with knowledge obtained from their classes in their undergraduate education [4].

The CCE Report of 2008 is recognized as the starting point for a higher education policy shift from emphasizing diversification and flexibility to one of quality assurance—the latter of which includes outcome assessments and a comprehensive reform plan. Such "quality assurance" has rushed higher education into establishing curricular programs, as well as pedagogical reforms, that have forced universities to adapt to the demands of universalization and the emergence of something resembling a global educational standard. In effect, the report demonstrates the need to clarify three policies in higher education for the sake of quality: namely, those relating to diplomas, curricula, and admissions [5].

The Central Education Council's 2012 [6] report "Toward the Qualitative Transformation of Undergraduate Education for the Future" recognized that reforms in university education to robustly equip students with the ability to face unpredictable times and remain viable form the foundation for solidifying students' lives and the future of Japan. Toward this end, the report stated that advancing qualitative changes in university undergraduate degree programs is essential. The conclusion of the Central Council for Education, released ahead of the report, recognized that proactive learning, meaning "the ability to proactively continue life-long learning," is fostered through sufficient learning time. In other words, the starting point of establishing proactive learning by students is to secure sufficient learning time. In order to accomplish this, the report clarifies that universities have the responsibility to improve undergraduate degree programs, a new point in educational policy [2].

### **3. Active learning as the pedagogy**

The concept of active learning can be reflected in the learning theory developed by Bonwell and Eison in 1990s. They examined characteristics of active learning at the higher education level and clarified the nature of active learning based on the empirical research. In "Active Learning: Creating Excitement in the Classroom" [7], they defined that active learning as (1) students are more actively involved in class than listening lectures, (2) put more emphasis on the development of students' abilities and skills than delivering information, (3) students are involved in higher thought including analysis, integration and evaluation, (4) students are involved in activities such as reading, discussion, and writing, and (5) students can explore phenomena based on their own judgments and values.

Mizokami delineates that the concept of active learning is associated with learning paradigm [8]. Learning paradigm is often compared with teaching paradigm. While teaching paradigm is based on the concept that knowledge should be delivered from the faculty, learning paradigm is regarded as that learning is conducted on student-centered, and knowledge is

not delivered, but is constructed, created, and acquired. Then, he defines that active learning includes all active types of learning, which surmounts passive type of learning. Then, he explains passive type of learning implies that listening to unidirectional knowledge transfer type of lecture and active type of learning indicates that students are engaged in activities such as writing, speaking as well as presenting and the externalization of cognitive process through such activities [8].

Chickering and Gamson indicate that the behaviors of speaking, writing, connection drawing, and applying learning are learning outcomes, and these outcomes are regarded as universal skills, integrative learning experiences, and creative thinking skills in postmodern as well as a knowledge-based society. Therefore, various active learning pedagogies are shared as effective methods to acquire such outcomes. Students often form a group and develop a group study, which has an element of peer learning in such active learning model [9].

Prince argued that active learning functions to take its place of the other pedagogies [10]. One of the characteristics of active learning methods is to use small-group work. Kenney and Suzuki describe that “placing students into small cooperative groups gives them a chance to work toward a common goal while building interpersonal and problem-solving skills” [11]. There are several relevant literatures showing that small-group work functions as a practice of active learning [12–15]. These relevant literatures indicate that many practitioners of active learning introduce small-group work in their classes as a method of active learning [12].

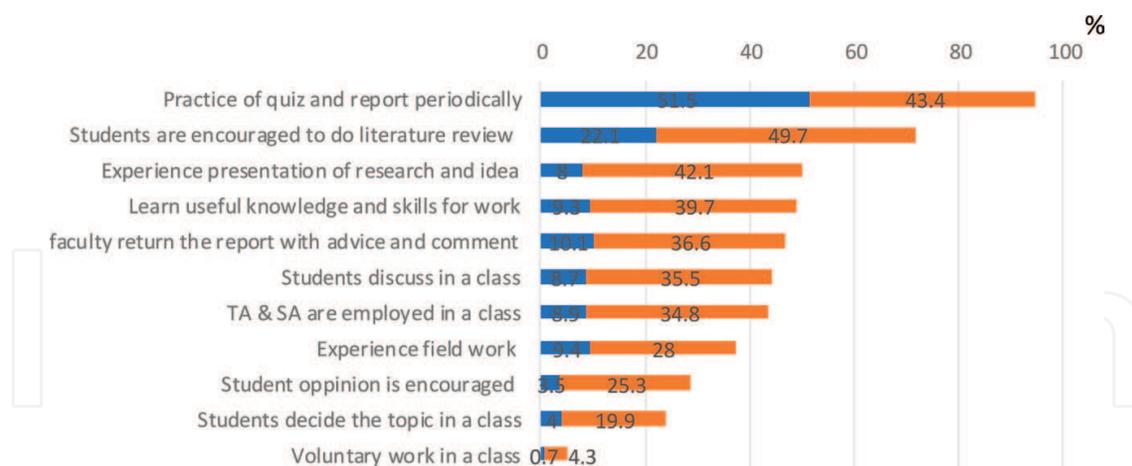
#### **4. First-year experience and active learning**

Japanese universities, first-year students, after entering the universities, experience the active learning through first-year experience class. First-year experience has been expanded rapidly in Japan, with developments taking place over the past 20 years being particularly remarkable.

Aforementioned the 2008 Central Council for Education report indicates “graduate attributes” as a barometer for “learning outcomes” shared within undergraduate programs. Graduate attributes include the following elements: (1) knowledge/understanding, (2) general skills, (3) attitude/intentionality, and (4) comprehensive learning experiences and creative thinking ability. Among these, the element of general skills is positioned as a necessary attribute—whether it is with respect to intellectual, professional, or social pursuits—that includes the components of (1) communication skills, (2) quantitative skills, (3) information literacy, (4) logical thinking capacity, and (5) problem solving ability.

Such skills are expected to be learned via undergraduate education curricula, wherein new educational types and methods such as first-year education and service learning are given high priority in addition to traditional classroom-style lectures [16]. Active learning in particular is becoming a fixed pedagogical method within first-year experience.

Recently, more than 90% of four-year universities and colleges introduce the first-year experience in the curriculum. Those four-year universities and colleges structure FYE as the transitional function to university study, rather than simply attempting to increase the level of knowledge. This function of FYE helps students to become proactively involved with various



**Figure 1.** Experience of active learning at FYE.

elements that they would never have an opportunity to experience within strictly knowledge-based classroom lectures. Hence, active learning methods are frequently employed in the FYE in Japanese four-year universities and colleges. Those active learning methods frequently used in the FYE are discussion, writing, ICT, collaborative learning, debate, and peer teaching.

**Figure 1** shows the frequency of active learning style at FYE classes through the responses of first-year students from four universities in 2010. We conducted the survey for the first-year students in four universities and 4723 first-year students responded for this survey in 2010. As shown in **Figure 1**, when we consider the responses marking both “frequently” and “often,” the rate of students who experience the active learning such as presentation, learn applied skills, and discussion reaches around 50%.

## 5. Active learning and student learning

Although MEXT report of 2008 [4] and 2012 [6] encourages the active learning methods into undergraduate education, there is a question whether or not active learning actually leads to learning outcomes of students. In this section, we will examine the relationship between experiences of active learning and learning outcomes through the student self-reported survey<sup>2</sup>. Here, we will show the results of students’ perception regarding the increase or decrease in analytic and problem-solving skills and critical thinking skills, oral presentation skills, and so on through the JCSS 2010. About 8300 students from national, public, and private four-year higher education institutions participated in this survey. Participating students’ academic disciplines consists of humanities, social sciences, STEM, medical and nursing, and other fields.

For example, the percentage of students in both public/national universities and private universities who answered that their analytic and problem solving skills improved through the experience of “expressing my own thinking or research results in class” exceeded 70%

<sup>2</sup>Yamada continually conducted a set of student surveys called Japanese cooperative Institutional Research Program (JCIRP) since 2004. JCIRP has three different student self-reported surveys including Japanese Freshman survey (JFS), Japanese College Student Survey (JCSS) and Japanese Junior college Student Survey (JCCSS).

(the rate of students of national and public universities is 70.5%, and the rate of students of private universities is 75.9%). On the other hand, students who reported an improvement in analytic and problem-solving skills without having such experiences were less than 30% (the rate of students of national and public universities is 28.5%, and the rate of students of private universities is 24.2%).

The percentage of students who reported an improvement in “critical-thinking skills” through the experience of “finding literature and materials by oneself” was similarly high with a value around 80%. In concrete, 84.4% of students of public/nation universities and 78.9% of students of private universities showed the improvement in these skills. “presentation skills,” and “acquisition of specialized or subject-specific knowledge” through the experience of “expressing my own thinking or research results in class” exceeded 70%. The methodologies of active learning can be seen to be an educational method that leads of students’ proactive learning and to have a relationship to a certain extent with acquisition of learning outcomes related to skills belonging to university undergraduate academic abilities [2].

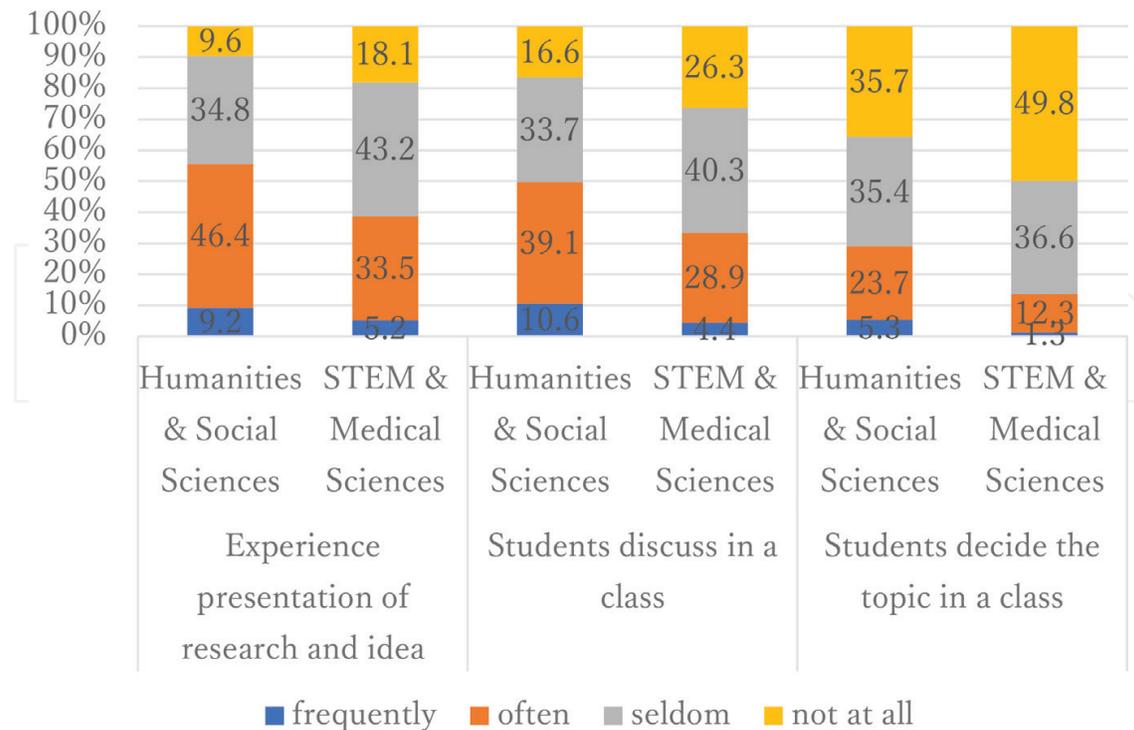
Is there any difference in teaching methods used between the disciplines? We compare the frequency of active learning methods used in a class between humanities and social sciences and STEM and medical sciences as shown in **Figure 2**.

The results reveal that students in the humanities and social sciences have more opportunities to “experience presentation of research and idea,” “discuss in a class,” and “decide the topic in a class” than students in STEM and medical sciences. It is assumed that the curriculum of STEM and medical sciences is more structured, and students are required to obtain large amount of knowledge through the curriculum than those of humanities and social sciences. However, it is pointed out that recently in order to promote active learning, flipped teaching style is encouraged to introduce in STEM and medical science classes.

In addition to introducing active learning methods, it is important to establish environments so students can learn proactively and independently outside of classes. Such representative environmental design to support student active learning is spaces called “Learning Commons.” The MEXT encourages universities to establish learning commons, and thus, many Japanese universities came to install learning commons, which are artificially designed environments, have the effect of encouraging engagement toward proactive learning.

Yamada points out that there are great expectations toward learning commons. However, we must not forget that there are limits to their effects through just design and facilities. We can expect synergy through their interactive use by faculty members and students. Furthermore, it is critical that faculty who are in charge of classes understand the significance of learning commons and design courses that combine learning both inside and outside the classroom by, giving assignments so students use learning commons [2].

So far, we delineated that Japanese higher education policy to promote the active learning in a class and examined active learning as teaching methods for students to lead to leaning outcomes in undergraduate education. However, not only undergraduate education but also graduate education is required to make educational reform, which leads to learning outcomes required in society through the active learning.



**Figure 2.** Frequency of active learning between academic disciplines.

Following the next section, the case study of graduate education program, which introduces the active learning methods in order to deal with the MEXT policy to accelerate the educational reform of graduate program will be explored.

## 6. Active learning and its outcomes: case study of a Japanese graduate program class

In this section, we will present a case study focusing on active learning methods utilized in the University of Tsukuba’s Empowerment Informatics graduate program in Japan. This program belongs to the Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT) Program for Leading Graduate Schools, which promotes educational reform and improvement to make Japanese Universities competitive at the top levels of education internationally. In particular for this study, we will examine the “Advanced Tutorial Studies: Debate class,” a mandatory course utilizing an active learning instruction method. The following three points will be explained:

1. The importance and value of active learning in the context of Japan and this program’s curriculum.
2. Details and characteristics of the specific course the leading graduate program it belongs to.
3. The learning outcomes of this particular active learning case study.

### **6.1. Relationship between Japanese higher education and passive as well as active learning**

In the previous section, we examined the concept of active learning and showed the data of introduction of active learning in Japanese higher education. In this section, the comparison of passive and active learning will be explored in order to develop the case study of active learning in Japanese graduate program.

Looking at the typical methods of teaching and evaluation, it is common to see academic learning environments toward passive learning methods. For example, large lectures where instructors present and students take notes, followed by testing to determine how well students learned the material. These methods tend to focus on student evaluation using simplistic question and answers, which can be reduced simply as correct or incorrect. Dósa and Russ succinctly state, "Learning in higher education today is measured overwhelmingly on the basis of "correctness," that is, whether students sufficiently approached the preset "expert" answer to a test question" [17]. In this nonactive style of learning, outcomes end up being evaluated on the basis of true or false, or multiple-choice questions, where there is a single correct answer. Even in more complex passive learning, there may be open-ended evaluations, such as essays or hands-on projects, but correctness is still boils down to a measurement of how close a student demonstrates an expected answer, in other words, there may be a scale of correctness. One flaw in this approach is a lack of dimensionality required in real world problem solving. To take an example, in design, it would be naive to suggest that there is a single correct outcome. Instead, in real world projects, there are tradeoffs between form, scale, esthetics, utility, reliability and durability, cost effectiveness, and so on. Yet, how can teaching methods help account for these complexities?

In contrast to passive learning, active learning refers to methods where students play an active role in their learning process. Historically, active learning has found most traction in the social sciences, which focus on human subjects and qualitative experiences. These fields and the nature of their study lend themselves well to active learning in the form of small discussion groups, which allow for voicing and recognition of a variety of perspectives and opinions on subject matter [18]. For instance, in the Socratic style of learning, students exercise critical thinking in open ended discussions seeking the answer to a given question. As a discussion, it is understood that there is no one single correct answer. As students in the group discuss and logically share their thoughts, their peers simultaneously evaluate the persuasiveness and the speaker's approach in order to judge the value of their answer and provide critique. Salemi argues that one benefit of active learning is that it forces students to demonstrate competency with existing knowledge and demonstrates their ability to use those concepts in critical problem solving or analysis [19]. This process of analyzing issues and applying critical thinking of existing and new knowledge requires practice and is often missing from passive learning environments. Furthermore, because active learning demonstrates student thought process and reasoning on a frequent basis, instructors receive more in-depth and frequent points of data to evaluate both student learning and the effectiveness of their teaching. Research conducted by Becker has shown that students learn more comprehensively and are more committed to their studies when instructors use active learning in their teaching [20].

Previous active learning studies indicated the challenge of introducing it was not only for the students, but also for the instructors. Michael argued that “faculty perceptions about possible pedagogical barriers to active learning are more the result of lack of experience with or knowledge of this approach than a reflection of the realities of the classroom” [21]. College instructors often are lacking formal training in pedagogy, rarely study teaching and learning methodologies, and are hesitant to diverge from the standardized lecture/test driven learning pattern. Additionally, certain fields of studies do not lend as well to discussion type formats. Lab work or extremely technical knowledge transmission found in the Science Technology Engineering and Math (STEM) fields can be problematic to introduce in an active learning style [18]. Thus, even in more liberal Western higher education, there is a divide between social sciences and STEM fields, where active learning is largely omitted from STEM field classrooms. However, Springer et al. showed that STEM students engaging in small-group of work demonstrated the significant higher levels of learning outcomes [22].

Despite the benefits associative with active learning classrooms, it is not widely used, especially in East Asian education. Traditionally, the Japanese higher education learning style has predominately focused on the passive learning style of knowledge memorization and recall, following what is known as the “Confucian model” [23]. Hawkins explains the defining characteristic of the Confucius model as, “traits of self-denial, frugality, fortitude, patience, self-discipline, rote learning, memorization and delayed gratification” [23]. As the world is becoming increasingly globalized and internationally interconnected and Japanese higher education seeks to compete in world rankings, its education style is gradually shifting from a Confucian model to the more Western Socratic model that favors group discussion and active learning classrooms. This change aligns with more modern higher education global academic trends that are beginning to focus on solving problems with diverse answers, finding new approaches and solutions, and incorporating multidisciplinary and practical collaboration. The introduction of active learning presents a pedagogical method, which satisfies these needs. In Japan, as aforementioned earlier, MEXT further sees the introduction of active learning as a way to strengthen the links between education and knowledge and the ability to apply that knowledge in real-world scenarios for the benefit of society. In this regard, MEXT states, “it is important to utilize such knowledge and skills in actual society and actual life while discovering issues for oneself, seek solutions to those issues independently and cooperatively, and to express and practically apply the fruits of learning” [24].

## **6.2. Learning in STEAM graduate program**

The purpose in this work is to provide a case study of one Science Technology Engineering Arts and Math (STEAM) graduate program in Japan and to explain how active learning is introduced in the curriculum and the learning outcomes. Examining the University of Tsukuba’s Empowerment Informatics “Advanced Tutorial Studies: Debate Class,” this chapter will explore how the active learning pedagogical style influenced learning outcomes. The addition of an active learning debate class in the curriculum lends itself two of the programs goals: (1) interdisciplinary ability – allowing students to examine problems from broader perspectives and to see the “big picture. (2) Frontline ability – giving students the skills they need as entrepreneurs and leaders, presenting their ideas logically and convincingly. Additionally,

this course expands upon internationalization goals, by offering a setting where domestic and international students collaborate and communicate closely together to solve problems. In the Empowerment Informatics graduate program, this course belongs to is both highly international and multidisciplinary, as it focuses on the integration of technology and humanistic goals. Thus, the academic backgrounds of students in this course are comprised of a variety of the STEAM fields. In this regard, it is important to understand how this active learning style class functions amidst diversity of culture, language, and academic background, affecting the interactions between students, and how instructors position themselves. For instance, in the cohort this study looks at, enrolled students consisted of three international students, one from the United States, two from Europe, and six Japanese students. Two of the international students came from a Media and Art design background, and the other remaining students' academic backgrounds heavily focused on robotics, medical robotics, AI, and other STEM fields.

This course consists of nine debate sessions, each with different topics based on general educational knowledge and topics linking student's academic work to society. **Table 1** shows the high-level debate questions used in this session of the course.

### 6.3. Preparation before the debate class

For the purpose of this class, students had to prepare to argue their group's position, thinking critically, challenging, defending, and improvising to build unique and persuasive arguments. Importantly, this class developed team building and Japanese students were challenged to participate in these debates all in English. Before the actual debate class session, students had one week to prepare their arguments, whether in favor or against the proposed question. Students rotated per debate to take on the role of a facilitator. For a given week, the facilitator's job was to provide the debate topic and coordinate between the two groups

Class no	Debate title topic
1	In contemporary education, has marketing become more important than research production in fostering international recognition?
2	Should workplaces encourage the application of Artificial Intelligence (AI)?
3	Should the retirement age be increased?
4	Should we make a limitation around technologies that enhance body functions of healthy people?
5	Higher education should be conducted in English or in each country's native languages?
6	Do companies and universities need special regulation or strategies to increase the percentage of women in technical and high-level management positions?
7	Is the research of military technologies necessary for technical development?
8	Should personal mobility devices (such as Segway, UNI-CUB, Hoverboard, etc.) be regulated on public roads?
9	In our contemporary society, should universities focus more on STEM education?

**Table 1.** Nine example session debate titles.

taking on roles as supporting and nonsupporting sides for the debate. The instructor and the student facilitator also helped to prepare students by researching and providing a narrative and introduction to the topic. For example, given the debate topic, “In our contemporary society, should universities focus more on STEM education,” the following points were raised by the facilitator:

By focus we mean:

- Increasing research funding for disciplines like engineering and applied sciences at the expenses of more theoretical faculties.
- Reducing the number of faculty in humanities (literature, history, and philosophy) and social sciences (anthropology and sociology).
- Providing more degrees related to engineering and science.
- Discourage students from undertaking a humanistic education.

Suggested points and reading:

- From an interview with Paola Antonelli (curator of the design section of MoMa, New York):  
*“I went to architecture school. And in Italy at that time, it was highly theoretical. When you emerged, you could become an architect, but not necessarily. You could become a graphic designer, or a furniture designer. Fashion designer Gianfranco Ferré was an architect. You could become a chef. When taught in this philosophical, abstract way, design is a universal donor to any field that is about making and constructing, whether in the digital world or in the physical world.”*
- An excerpt of “A Personal Chronology,” from “The Language of New Media” by Lev Manovich.

#### **6.4. How faculty as an instructor evaluated each nine individuals**

Through the nine debating classes, there were five points of focus: (1) how much each individual prepared for the debate, (2) how well they worked in a team with students of diverse cultural backgrounds and fields of study, (3) how well students communicated with each other in English, (4) through preparation and improvisation, how well did they argue their points during the debate, and (5) how each individual was actively involved. Clearly, the evaluation of students in this active learning environment extended well beyond the content of their participation, but also considered how they were able to apply their knowledge, work in diverse teams, and give consideration on real-world problems from multiple perspectives.

To evidence how students were evaluated along these guidelines, we provide a sample excerpt from instructor comments on an individual student in this course:

*... always contributed his knowledge enthusiastically in the debating class. Since he is from abroad, his cultural, historical, and educational background provided different points of view and perspectives from the other students, who were mostly Japanese. What made this debating class unique was that many of the debate topics came from strong historical, political or philosophical points of view that varied from country to country. Despite the fact that the students study in the EMP program while*

*specializing in different fields of social robotics, AI, and art, there was great chemistry and it stimulated Japanese students to think from a different point of view. ... presented his arguments and opinions by providing his own cultural and historical experiences associated with his home country, which led Japanese students to reconsider from their own point of view. Sometimes the topic varied; however, it was clear that he and the other two international students tried to connect and find the similarities in the topic, when the debate was not going back and forth. Some Japanese students were not trained in a spontaneous discussion style classroom; however, the foreign students just like ... were more active and provided many strong points, which led to a great discussion. I think at the same time, it was also a great opportunity for ... who comes from abroad to learn and understand the unique perspectives that Japanese students provided from their own cultural, historical, and educational backgrounds. Overall, his class participation was perfect = A*

### 6.5. Findings of the active learning debate class

Throughout this class, the cultural, academic, educational, and social background of each of the nine students had a significant role and impact. Students who were trained and educated in Western countries such as the United States and Europe had completely different set of values, mindset, and understanding of the different debate topics. Their dissimilar culture, societal values, and concerns affected a range of topics, such as how they perceive AI, the role and importance of robotics, how each country's education should be and perceived, and so on. More importantly, what stood out the most was how language, each student's cultural background and style of sharing their knowledge had a significant impact on their participation. For instance, the majority of students who were educated in Western countries were trained to approach their arguments philosophically, providing examples to build their opinions logically. Notable, all of the international students seemed to be very confident to share their opinion without hesitation in comparison to the Japanese students.

Through observation, the Japanese students faced difficulty in sharing their opinions on the basis of philosophy, and the majority of them indicated that they never had the chance to study Western philosophy in depth. Since this class was structured while considering the international backgrounds of students, most cited examples from their cultural backgrounds, relating how topics are perceived in their home country and the rationales behind this thinking. Initially, Japanese students were reluctant to speak and did not engage as actively in sharing their opinions. However, through this bidirectional communication, as the class went on they shared more and became familiar with the class style, atmosphere, and communicating with each classmate. By the end of the class, the Japanese graduate students in particular became more active in terms of speaking and sharing their thoughts, though still behind their international peers. Nine weeks spent in this active learning style debating class provided a new approach of teaching and learning and changed the way students approached classroom learning and development.

### 6.6. Student development and outcomes

Through the nine class sessions, students reached and developed deeper understanding of course concepts. Share their opinions, but also hearing the other students and then changing, adjusting, or think critically, and beginning to consider problems from multiple

perspectives. They also gained more confidence and started to feel more open to frankly share their thoughts and opinions with their classmates, whether they were international or domestic Japanese students, the atmosphere of the class changed drastically compared to the first introductory class. This same pattern was found among other students being introduced to active learning discussions, Salemi found, "the more the students participate and get used to the class, students prepare better for active learning classes because they know that they will be asked to contribute, and students will like to talk about class material with their peers using familiar language" [19]. Likewise, in our class, the more the students participated in the class, they were speaking to their peers more in familiar language and sharing terminologies with each other. Discussion among a diverse group of peers revealed the differing approaches individuals take based on their own background and perspective and sharing these in discussion benefited the entire group. Additionally, students benefit from variety in the class atmosphere, learn through each other, and realize that they aid in teaching other students, becoming reflective learners. Students learn from their peers, and they try harder to make them understand more, think in-depth, and explain their arguments in a more logical and persuasive way. This class introduced a new engaging learning atmosphere compared to the typical passive learning style Japanese student experience. Students gain confidence, feel more comfortable in sharing their knowledge and opinions, gain satisfaction from hearing and being involved in the class with their peers, and share their opinions in a more real-world exercise. Students started to be more active in class participation, obtaining the sense of awareness that they played an important role in their learning and had a responsibility for what they said and shared.

## 7. Conclusion

In the environment where the MEXT has shifted the learning-centered policy in recent years, this chapter shows how active learning becomes the major concern for Japanese higher education institutions, and active learning methods have been encouraged to utilize in the undergraduate education in order to develop the proactive learning. Many previous studies have shown that the learning outcomes of students are strongly associated with the quality of pedagogy and student experience. Such pedagogy often includes active learning methods and it is often expected that active learning methods are strongly associated with proactive learning of students. In terms of graduate education, there are small number of studies spotlighted the active learning methods. However, in a knowledge-based society, more active learning and the Socratic model are important to be introduced in Japanese graduate programs in order for students to obtain more interdisciplinary and frontline learning skills.

In the case of debate class shown, using active learning to examine queries allowed us to view questions from a broader perspective and take into account multiple perspectives. Active learning discussions allow each participant to be introspective, share his or her knowledge, and then reconsider their points of view by hearing from others. One clear benefit is that the critical application and extension of knowledge happen naturally in the Socratic style of active learning. Most traditional Japanese style classes severely limit or disregard the value of active learning.

Furthermore, even in Western education, there is a divide where the Socratic style of learning is more commonly used in the social sciences and humanities. On the other hand, due to the nature of STEM classes where lab exercises and experimental style of learning happens, simplistic and quantitative teaching and learning assessment has become ingrained.

As Japanese higher education aims to introduce Western style active learning, one point of concern is proper training for both students and faculty. In order to mix students coming from these two distinct academic backgrounds into one debate/discussion style of active learning class, instructors need to pay careful attention to understand each student's characteristics, each individual's personality, and how students will express themselves and react in a group made of diverse backgrounds. As this study found, Japanese students had little foundational experience in this model of learning and initially found it quite difficult compared to their international peers. Similarly, because active learning is not commonly adopted in Japanese academic traditions, faculty would benefit from training, or first-hand experience with this type of instruction. Michael explains to improve the quality of active learning style classes, faculty development programming, conducted locally or at national meetings of academic disciplines are important [21]. Additionally, it is important for faculty development to learn and take courses to understand the outcomes of active learning compared to lecture style classes. These sessions give teachers opportunities to see the techniques in action and practice to them eventually.

Despite these challenges, we feel that there is real potential for active learning in Japan's ongoing educational reform strategy. MEXT policy papers frequently suggest the need to further internationalization, interdisciplinary approaches, and an ability to link academic knowledge to real world problem solving for the benefit of society. The class of this case study focuses on providing a great example of how reflective discussion can bridge these boundaries. Internationalization efforts are often critiqued as being superficial, for example, even where there are significant numbers of international students, studies have found that they are not as well integrated within their Japanese universities, dampening the beneficial aspects of internationalization [25]. Yet classes like the one this case study examines create an environment where both international and domestic points of view are examined in depth and widen the perspective of all students involved. In addition to the instructor teaching and sharing their own learnings and understandings on an academic topic, in an active learning pedagogical style, students also share their thoughts by discussing topics together. In this manner, students are able to communicate ideas with a deeper and philosophical understanding by sharing the perspectives and beliefs that underlay their opinions.

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