Understanding and Promoting Gender Diversity Among Senior Faculty at the University of Tokyo: A Student Action Project

Maximilien Berthet, The University of Tokyo, Japan
Saeko Kawataki, The University of Tokyo, Japan
Kozue Okamura, The University of Tokyo, Japan
Mizuki Ishida, The University of Tokyo, Japan
Karthik Varada The University of Tokyo, Japan

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Abstract
Despite active efforts by the University of Tokyo (UTokyo) to promote women's academic career development, the ratio of females remains low throughout the UTokyo community. In particular, the large drop in gender diversity from student level (20% female undergraduates) to senior faculty (8% female full professors), suggests the existence of a "leaky pipeline" along the academic hierarchy. In March 2019, a team of 9 UTokyo students initiated a Student Initiative Project (SIP) to support ongoing efforts within UTokyo to promote gender equality. The objectives were: (i) to understand causes and solutions for low female faculty rates, and (ii) to foster a change in campus culture via gender mainstreaming. The methodology included interviews of female and male researchers at UTokyo, followed by feedback to two Executive Vice-Presidents and the Office for Gender Equality. In parallel, a trilogy of interactive workshops involving panel discussions and documentary screenings were delivered to over 40 UTokyo students and faculty. This paper provides an overview of major findings from the project. Key lessons learnt are that: (i) the leaky pipeline is caused by intersection between gender and wider systemic issues such as job precarity for young faculty; (ii) solutions can be achieved through synergies with top-level university priorities such as international research ranking targets; (iii) student-led initiatives offer an effective means of supporting institutional change on gender equality.

Keywords: Gender Equality, Higher Education, Leaky Pipeline, Student-Led

1. Introduction

The University of Tokyo (UTokyo) is actively promoting women's participation at both student and faculty levels. Promising efforts to support women's academic career development include the UTokyo Vision 2020 “Fostering Diversity” initiative (Gonokami, 2015) and the UTokyo Future Society Initiative (UTokyo, 2017). Figure 1 shows some of the major ongoing gender equality (GE) initiatives at UTokyo.

Figure 1: Major gender equality institutions and projects currently active at UTokyo.

However, the ratio of females remains low throughout the UTokyo community, including among undergraduate students (19.3%) and full professors (7.8%) (UTokyo, 2018), as shown in Figure 2.

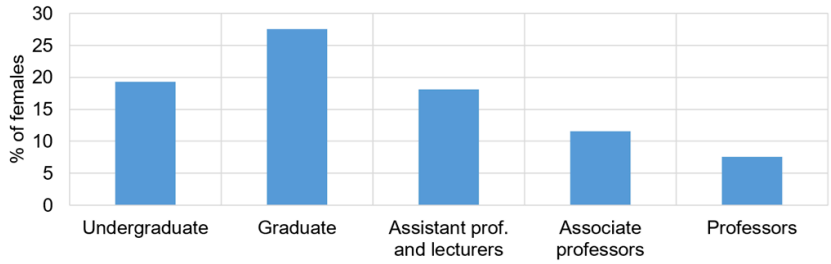

Figure 2: Ratio of females along the academic hierarchy at UTokyo (UTokyo, 2018; UTokyo, 2019).

On one hand, gender imbalance among teaching staff in tertiary education is a systemic issue in Japan, as can be seen in Figure 3. On the other hand, gender ratios among full professors differ between leading Japanese universities, as shown in Figure 4, suggesting that there is still room for improvement at UTokyo even on a domestic level.

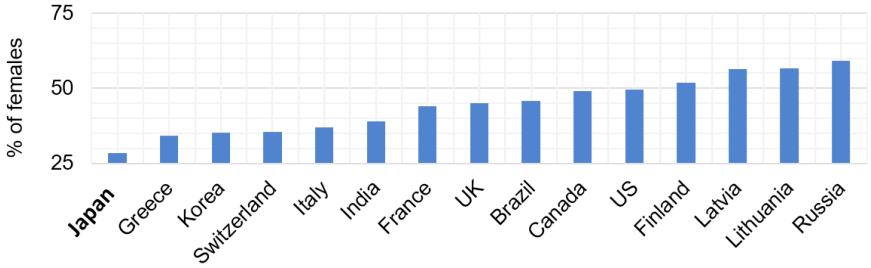

Figure 3: Ratio of female teachers in tertiary education by country (OECD, 2020).

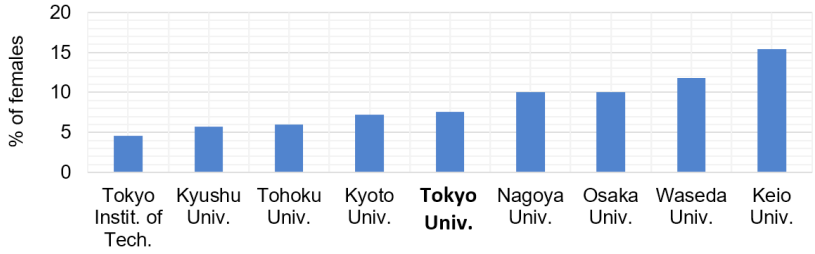

Figure 4: Ratio of female full professors in major Japanese universities (Tokyo Institute of Technology, 2019; Kyushu University, 2019; Tohoku University, 2018; Kyoto University Gender Equality Promotion Center, 2019; UTokyo, 2018; Nagoya University, 2019; Osaka University, 2019; Waseda University, 2018; Keio University, 2019).

A 2017 econometric (non-peer-reviewed) study by Shibayama and Geuna (2017) attempted to identify the main contributors to the present low levels of female researchers in Japanese academia, specifically in the fields of Science, Technology, Engineering and Mathematics (STEM). The large-scale study tracked the career paths of over 100,000 Japanese PhD holders who graduated between 1985 and 2005. On one hand, cohort effects were found to play one role in explaining the lower rates in STEM of senior female researchers compared to PhD holders. In other words, the combined effects of (i) the time delay between graduation with a PhD and promotion to senior researcher level, and (ii) the increase in the proportion of female STEM PhD graduates over time, means that the ratio of female senior academics has lagged behind the pool of junior researchers.

On the other hand, the proportion of female researchers actively continuing academic research after PhD level has not increased in step with the rate of female graduates. In fact it has reduced in some fields, such as science, where the odds ratio (i.e. likelihood of a female researcher leaving an active research position compared to an equivalent male counterpart) was around 2 at the time of the study. This study, though not focused specifically on UTokyo, suggests there is a leaky pipeline of female researchers in Japanese academia. The expression “leaky pipeline” refers to a phenomenon where the ratio of women gradually decreases between entry-level and senior positions, due to barriers against employment and promotion (OECD, 2012). In the context of this study, senior faculty are defined as tenured researchers with a permanent research contract provided by UTokyo.

The objective of this work is to evaluate the causes of the leaky pipeline at UTokyo, and to propose concrete and actionable solutions to improve the situation. To the authors’ knowledge, no prior investigations have examined the leaky pipeline phenomenon at UTokyo. Another original feature of this work is that it was fully initiated and led by students, as part of a UTokyo Student Initiative Project (SIP).

This paper is organised as follows. Section 2 presents the student initiative framework within which the study was conducted. Section 3 explains the interview-based research and development method, followed by key insights gained on causes and solutions for the leaky pipeline of female researchers at UTokyo. Section 4 introduces outreach activities for gender mainstreaming conducted within the project, in response to findings in Section 3. The paper concludes in Section 5 with perspectives for improvement and further extension of the study.

2. Student action project

One original feature of this project is that it was fully initiated and conducted by students, within the framework of the Global Leader Program for Social Design and Management (GSDM) at UTokyo (GSDM, 2020). GSDM is one of 62 Programs for Leading Graduate Schools (JSPS, 2015) offered at 33 Japanese universities, funded until FY2019 by the Ministry of Education, Culture, Sports, Science and Technology (MEXT). GSDM's SIPs provide graduate researchers (mainly PhD students) with mentorship and funding to launch multidisciplinary initiatives of their design, with the purpose of reframing and addressing cross-cutting social issues.

This one-year SIP consisted of 9 students from 6 countries and 5 graduate schools, including 5 female and 4 male members, spanning Master's and PhD levels. The main advantages of this diverse membership were access to a wide variety of stakeholders within the university, and complementary skillsets and time schedules. The project timeline is shown in Figure 5.

The SIP consisted of two streams: (1) research and development (R&D), and (2) outreach. In the R&D stream, the emphasis was on analysis of causes of the leaky pipeline and development of solutions, mainly via interaction with mid-career or senior academics and executive decision-makers at UTokyo. In the complementary outreach stream, the focus was on sharing findings from the R&D stream, receiving feedback, and raising awareness of GE with a wider audience, including non-UTokyo students as well as external organisations. The method adopted and results obtained in the two streams are now presented in more detail.

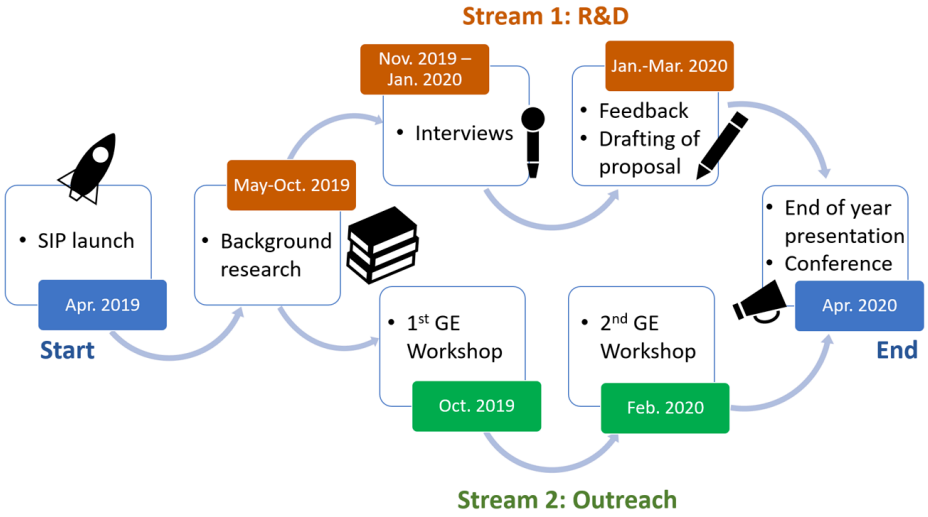

Figure 5: Project timeline.

3. Research and development

The research and development stream formed the main part of this project, and consisted of three steps as shown in Figure 5: (i) background research on GE in academia, (ii) interviews along the leaky pipeline, and (iii) feedback from key stakeholders at UTokyo in order to draft proposals for improving the situation. The methodology adopted and results obtained in each of the three steps are briefly summarised in this section.

3.1 Background research

In order to build capability on GE at UTokyo, our SIP team mobilised three main resources: a literature review on GE in academia; stakeholder mapping around GE within the university; and consultation with the UTokyo Office for Gender Equality (2020). The literature review was accompanied by: completing online training courses on GE offered by UN Women (2020), attending the 3rd Gender Symposium of the Engineering Association of Japan (EAJ) (2020), and joining the GE team at the 2019 Forum for Leading Graduate Schools (2019). The main outcomes of this step were: improved understanding of who to consult with on gender issues within UTokyo, and what questions to ask. This knowledge was used in the next step.

3.2 Interviews along the leaky pipeline: Identification of causes

In order to evaluate causes and solutions for the leaky pipeline of female researchers at UTokyo, an interview-based approach was adopted. Seven researchers, spanning the length of the leaky pipeline (1 full professor, 1 associate professor, 1 assistant professor, 1 project associate lecturer, 3 PhD students) were chosen as interviewees. The small sample size was mitigated by sampling from multiple graduate schools, as well as including a combination of female (6) and male (1) researchers.

The questions centred on two main topics: in your opinion, what are the main causes of the leaky pipeline? And what are the most promising and realistic solutions? The interviews were recorded (when permission was granted by the interviewee) and transcribed. The most frequently recurring keywords and themes were extracted and used to identify five main causes of the leaky pipeline at UTokyo.

The results are summarised in Figure 5. In the figure, the causes are ranked from highest impact (cause 1) to lowest impact (cause 5). This ranking is based two factors: the mention frequency of the causes in the interview transcripts; and their qualitative severity, estimated by the interviewees. One important finding is that the causes often overlap with systemic issues within the university, as will be discussed.

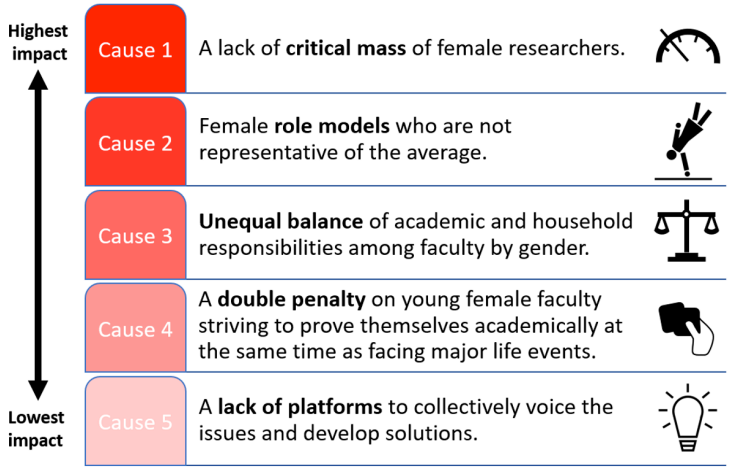

Figure 5. Top 5 causes of the leaky pipeline of female researchers identified in our SIP.

The relation between each cause and outflow from the leaky pipeline can be summarised as follows:

- Cause 1: A lack of critical mass of female researchers is apparent along the entire academic hierarchy (see Figure 2), but is especially pronounced at senior level. The low proportion of senior female research leaders contributes to the leaky pipeline in three main ways, by: (i) limiting career consulting and networking opportunities for junior female researchers, with a potential negative impact on promotion; (ii) making it difficult to reduce (potentially unconscious) bias and discrimination (for example, we were told of a robotics laboratory at UTokyo adorning robots with pink colours during an open day in order to attract new female researchers); and (iii) limiting the number of "realistic" female role models who are representative of the average (related to cause 2). This cause has high impact because it is connected to all subsequent causes.

- Cause 2: Female researcher role models who are usually given the most attention at UTokyo are not representative of the average. Consider the case of a female researcher who is on maternity leave. She would be hailed as a "super-woman" role model if she promptly responds to work-related matters even during the days just after childbirth and returns to full-time work very quickly. This relatively narrow conception of a role model does not provide room for the inevitable and natural variability between individual experiences of childbirth. An equally dedicated female researcher may simply not be able to return to work immediately after childbirth given her health and family conditions. As a result, female researchers may experience impostor syndrome when comparing themselves to exceptional cases. In addition, peer pressure (associated with Japanese cultural norms of endurance and not letting one's work unit down) may be exerted by colleagues on female researchers who take longer maternity leave.

- Cause 3: Female researchers are more likely to be responsible for a greater share of household work than their male colleagues. Among our interviewees, no female researchers had a househusband, while they reported that most of their male colleagues were supported by a housewife. Our female interviewees stated that they are responsible for at least 50% of household-related tasks, which may include housework, and caring for elderly family members. On one hand, overwork is a systemic issue at UTokyo, related to the lack of highly-skilled administrative support staff for academics, as well as heavy reliance on paperwork and time-consuming administrative procedures. On the other hand, intersection with patriarchal gender norms means that female researchers are more likely to experience increased pressure on their academic time schedules, placing them at a potential disadvantage for research output.

- Cause 4: There is severe competition at UTokyo for tenured positions and young researchers aiming to acquire a tenured position are expected to produce significant amounts of research output, which often requires them to be fully dedicated to their work around the clock during early career years. This timing usually coincides with major life events like pregnancy for female researchers who decide to start a family. This is another example of intersection between gender and systemic problems which affect all UTokyo researchers. The university provides a relatively short maternity leave called "ikukyu" (alongside state-provided maternity

leave) to non-tenured faculty, usually lasting around 3 months depending on the contract (UTokyo Office for GE, 2018). As a result, female researchers may face psychological or regulatory pressure to exit their job if requiring unexpectedly long maternal leave. In addition, researchers who avail of maternity leave may face less favourable assessment for promotion, since drops in academic output due to major life events are usually not considered during performance evaluations.

- Cause 5: Despite the number and variety of GE initiatives at UTokyo (see Figure 1), their cross-linkage remains low. Moreover, due to restricted budget and human resources, the scope of the Office for Gender Equality is limited: for example at present, there are no dedicated services for career counselling, or for provision of practical advice for work life balance (related to cause 3). This is one reason for the current slow progress on improving GE.

After the interviews and post-processing, the findings were shared with key UTokyo decision makers in order to receive their feedback. This involved discussions on the relationship between university policy and causes of the leaky pipeline, in view of developing solutions.

3.3 Feedback to and from key stakeholders: Development of solution proposals

In the final step, meetings were held with two Executive Vice-Presidents of UTokyo, one professor in the Graduate School of Public Policy, and two representatives from the Office for Gender Equality in order to formulate concrete and actionable solution proposals.

The top five priorities identified are summarised in Figure 6. In the figure, the solutions are ranked from highest impact (solution 1) to lowest impact (solution 5). The ranking is based on the number and impact of the causes addressed by each solution. Each solution is linked to several of the causes identified in Section 3.3, as shown via the icons in the right-hand column, which also appear in Figure 5.

Each solution is presented in detail below, including its: (i) justification, (ii) expected benefits, (iii) method of implementation, and (iv) major challenges.

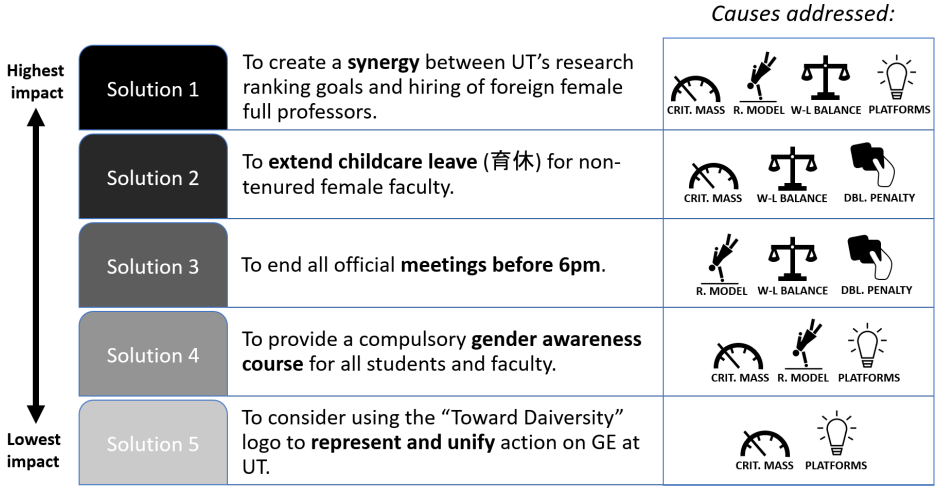

Figure 6. Top 5 solutions for the leaky pipeline of female researchers identified in our SIP.

- Solution 1: To create a synergy between UTokyo's research ranking goals and GE, via hiring of foreign female full professors.

(i) At present, GE is not given high priority status at UTokyo, as mentioned in Section 3.2. Therefore, cultivating links with top priority items is important to catalyse change. Since UTokyo is a research university, one strategy is to emphasise the mutual benefits which GE will bring both to members of the UTokyo community, and to the university's international research rankings. Based on our discussions, increasing hiring of foreign female full professors (especially from the US and Europe) may benefit UTokyo's research performance in two ways. Firstly, by providing a web of contacts at world-leading universities for international collaborations. Secondly, by increasing the proportion of senior female research leaders. Both points may boost UTokyo's position in modernised international research rankings, one of which now provides options to compare universities' performance on the 17 UN Sustainable Development Goals (SDGs) (Times Higher Education World University Rankings, 2020), including goal number 5: GE (although UTokyo is not yet on the list of participating institutions).

(ii) Foreign female researchers are (usually) not imbibed with gender bias related to Japanese cultural baggage, and are therefore more likely to challenge established norms. The three main expected benefits within the UTokyo community are therefore: reduction in gender bias among senior decision makers, bolder leadership on promoting GE, and an increase in positive role models for junior researchers. On the other hand, a great deal of research indicates that diversity within a group may actually increase conflict within the group members, unless the group has an environment that embraces diverse voices (Kravitz, 2006). Therefore, a co-requirement is to develop an enabling environment for diversity, which may not currently exist at UTokyo.

(iii) In order to increase hiring of foreign female researchers at UTokyo, an attractive offer is required. Potential measures could include providing: language and childcare support, research assistants, and stimulating research opportunities. In some regions such as Scandinavia, the proportion of female researchers in areas like science is already near parity (UNESCO, 2019), which means that one option is gender blind recruitment on merit. On the other hand, hiring for domestic female researchers should continue to include affirmative action (which has been supported by UTokyo since at least 2009 (UTokyo GE office, 2009)), due to the present lack of critical mass.

(iv) GE initiatives at UTokyo suffer from limited budgets, which may also impact overseas recruitment. Therefore, one option is to focus on hiring researchers who value non-monetary qualities of UTokyo such as novel research themes.

- Solution 2: To extend childcare leave for non-tenured female faculty.

(i) As mentioned in cause 4 in Section 3.2, maternity leave provided to non-tenured junior faculty is usually 3 months, potentially causing outflow of female researchers from the university. However, since UTokyo has authority over this policy, it can feasibly be changed.

(ii) Expected benefits include reduced early contract termination by junior female faculty, as well as reduced uncertainty for human-resources and laboratory colleagues. In turn, this may contribute to ending a vicious cycle of female researchers being seen as less stable academic "investments" by supervising laboratories, facilitating promotion.

(iii) In order to meet individual needs, the maximum childcare leave period should be extended from the current level and allocated to suit non-tenured faculty members' needs on a case-by-case basis. At present, childcare leave is only available for female researchers, and extension to male researchers should also be considered to account for changing family roles.

(iv) However, a change in policy is not enough, and should be accompanied by a shift in attitudes (e.g. peer pressure and role models) in order for female faculty to avail of more flexible childcare leave periods.

- Solution 3: To end all official meetings before 6pm.

(i) UTokyo has officially discouraged official meetings from taking place beyond regular office hours since at least 2009 (UTokyo, 2009). However, in practise official meetings are regularly held at and beyond 6pm. On one hand, this creates a time burden for all faculty members, regardless of gender. On the other hand, late official meetings may specifically exclude female researchers. Indeed, as mentioned in cause 3, female researchers are more likely to be responsible for the majority of household tasks than their male colleagues, which may include collecting children from public nurseries, most of which close at or around 6pm. Therefore, female researchers are more likely to miss out on important developments in their faculty or department, which may negatively impact research opportunities and promotion.

(ii) Expected benefits are a reduced time burden on all faculty members, and greater flexibility for all members of the UTokyo community to effectively combine research and household life, contributing to a change in role models.

(iii) One method is to transition from simply discouraging late meetings, to enforcement. For example, two options are: creating "nudges" such as posters asking researchers to reconsider if a late official meeting is essential, and (online) log-books requiring researchers to keep a record of their meeting times.

(iv) Convincing full professors to adopt the new policy is expected to be the biggest challenge. With their positive leadership, junior faculty are likely to follow.

- Solution 4: To provide a compulsory gender awareness course to all students and faculty.

(i) As suggested in the introduction, the long-term aim of this project is to increase the proportion of female members of the UTokyo community, and to create a self-sustaining environment which encourages diversity. However, in the absence of a critical mass of female researchers, educational policy provides a short-term means to change campus culture towards respect for diversity. Although courses on harassment are provided to all new students entering the university, and to faculty when changing

academic positions, at present there are no compulsory courses on GE. While courses on harassment are self-evidently important, they do not address potentially underlying issues such as discrimination and bias. This is important, as ironically the low proportion of female researchers means that male researchers may not be aware of gender-related issues mentioned in Section 3.2, and may therefore not appreciate the extent of the problem nor be able to recognise (let alone acknowledge, call out, and change) harmful attitudes.

(ii) Expected benefits are reduction of unconscious bias, among both male and female researchers. Moreover, if UTokyo is seen as actively promoting GE, other effects could include attracting more female researchers (including foreign female full professors) to the university, as well as encouraging other leading Japanese universities to boost their GE efforts.

(iii) At present, a pilot course is being developed by a female Japanese professor in conjunction with the Office for Gender Equality. One priority is to allocate more financial and human resources to this promising project.

(iv) For now, the pilot course will not be provided to faculty members. One challenge is how to meaningfully incorporate gender awareness-raising into their already busy schedules.

- Solution 5: To consider using the "Toward Daiversity" logo to represent and unify action on GE at UTokyo.

(i) In order to increase progress towards GE at UTokyo, greater linkage between existing initiatives (see Figure 1) is required (see cause 5). Our proposal is to introduce a logo to act as a visual and unifying umbrella device for GE at UTokyo.

(ii) Expected benefits include greater visibility of and interlinkage between GE efforts at UTokyo.

(iii) Our SIP team has designed and manufactured a candidate logo, which will be made available to the UTokyo Office for Gender Equality. We hope the Office will use the logo in two ways: as an eye-catching symbol for official endorsement of existing initiatives on GE at UTokyo, by granting usage permission to relevant parties; and as an awareness-raising device distributed during GE events on campus. The logo can be found on our SIP webpage (Towards Gender Equality at UTokyo, 2020).

(iv) One challenge is to strike a balance between coordination of individual GE activities in view of raising their collective impact, and respect for the distinct nature of each initiative.

After completion of the causal analysis (Section 3.2) and development of solution proposals (Section 3.3), our team sent a 10-page letter to UTokyo President Makoto Gonokami[1] in March 2020 summarising our findings and urging him to consider our recommendations. It is noteworthy that several of our recommendations overlap with

[1] In this paper, Japanese names are written with the given name ahead of the surname.

the output of prior work by Toyoizumi (2017) on methods to reduce the gender gap in the Japanese research community. Unfortunately, the timing coincided with the COVID-19 crisis, which understandably changed university priorities. Although we are still waiting for a response, we are currently exploring other pathways for concrete implementation of our recommendations. In addition, our outreach activities have enabled us to share our findings with a wider variety of stakeholders within and beyond UTokyo, creating new partnerships.

4. Outreach

The R&D stream of the SIP focused on a relatively narrow group of researchers and university stakeholders. On the other hand, one recurring finding in Section 3 is a lack of awareness of GE issues within the UTokyo community. In response, a three-part series of outreach activities was conducted in order to share our findings, promote discussion on gender-related issues among both male and female students and faculty members, and contribute to gender mainstreaming.

The three-part workshop consisted of a sequence of discussion sessions, around two hours each, following the progression shown in Figure 7. More detail can be found on the SIP website (Towards GE at UTokyo, 2020).

Figure 7. Sequence of three workshops in the "Gender Series" of discussion sessions.

The first event, "International discussion on shaping gender in Japan", aimed to raise awareness of GE issues specific to the Japanese context, via a documentary screening and a panel discussion with members of the UTokyo Office for Gender Equality. Participants (students and faculty members) were divided into three brainstorming groups, and the two outputs were: brief definitions of GE in Japan today; and identification of the main factors influencing GE. The second event, "Gender-balanced decision making: policy vs reality", encouraged participants to move beyond understanding into analysis and reaction via development of policy proposals. Finally, in the third event we held a discussion between several of our interviewees, faculty members in the School of Public Policy and Institute for Future Initiatives, and GSDM stakeholders in order to share our SIP findings and develop a roadmap for the next stage of our project.

Over 60 students, faculty members, and employees of NGOs and public interest organisations joined the "Gender Series", contributing to fruitful discussions. Several participating organisations have offered to partner with us as we extend the SIP this fiscal year, with potential for a lasting legacy. Multiple students, both male and female, reported feeling empowered after joining the workshops, which was an extremely rewarding outcome, and one participant has joined the SIP team. These results demonstrate that beyond inspiring, outreach can also translate into concrete action.

5. Conclusions

In this work, a student action project was initiated to identify causes and develop solution proposals for the leaky pipeline of female researchers at the University of Tokyo. The main findings can be summarised as follows:

- Five main causes were identified through an interview-based method. The overarching cause is a lack of critical mass of female researchers. Most causes involve intersection between systemic issues which affect all UTokyo researchers, such as severe competition for tenured positions and overwork, and gender-specific issues such as major life events related to childbirth.
- Five promising solutions were developed by consultation with key executive university stakeholders, and recommendation proposals were sent to the President of UTokyo. The main recurring theme is the need to develop linkage between top university priorities, such as UTokyo's international research ranking, and GE. Based on this work, one potential high-impact method is gender-blind recruitment of foreign female full professors, alongside continued affirmative action for domestic researchers.
- Given that one key problem identified was a lack of awareness, a series of three interactive workshops were held to promote discussion on GE between members of the UTokyo community. The workshops' lasting impact, which includes establishing new partnerships on promoting GE at UTokyo, shows that student-led initiatives offer an effective means to support institutional progress on GE.

The most significant limitations of the present work are: the absence of quantitative analysis of causes of the leaky pipeline at UTokyo, as well as for separation of cohort and leakage effects; and the small sample size of interviewees. In addition, more investigation is required into the relationship between the current gender ratio among senior faculty at UTokyo, and the equilibrium gender ratio with equal access and opportunities for males and females. It is conceivable that when all female researchers are given equitable opportunities to pursue a career in academia at UTokyo, the gender ratio at senior (and junior) level could remain below 50%, and yet be considered a gender-equal outcome. Such considerations are important when setting long-term targets for GE. Finally, in future work, this student action project will shift from development of recommendations to concrete implementation.

The main implications of this study are that:

- An equitable academic environment benefits both university executives, students and faculty members, regardless of gender.
- Looking beyond higher education, Japanese societal needs are set to raise demands for effective work-life balance by the female workforce, to combine contributions to the declining national birth rate and to the shrinking economy. A larger number of projects similar to the present initiative are required to effectively prepare for this societal shift.

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Contact email: ge.at.utokyo@gmail.com