

# **Technostress and Leadership:**

## **A case study in higher education during the COVID-19 crisis**

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MASTER'S THESIS

January 2021

Master of Business Administration

Educational Leadership

## ABSTRACT

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Technostress and Leadership: A Case Study in Higher Education During the COVID-19 Crisis

Master's thesis 68 pages, appendices 7 pages  
January 2021

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Use of Information and Communication Technology (ICT) in the workplace over the past decades has brought increased efficiency, productivity and flexibility. One side effect of this change has been the emergence of 'technostress', a form of stress as a result of an inability to adapt to or cope with technology. This can have severe impacts on employee well-being, job satisfaction and performance.

This study investigated the technostress experiences of a group of English-language teachers at a private university in Tokyo, Japan following a sudden pivot to online learning due to the 2020 COVID-19 situation. The study aimed to understand the levels of technostress of teachers, what the main creators and inhibitors are, and what role leadership played in assisting teachers in dealing with technostress, and what improvements leadership could make.

The analysis was based on surveys collected from 30 teachers and follow-up interviews with 11 of these teachers. The survey contained an amended version of a pre-existing scale and also a number of open-ended questions.

Research findings indicated that technostress was experienced by 60% of the teachers. The main creator was techno-overload due to the changes in teaching format, from face-to-face to online. Isolation and disconnect due to student reluctance to use webcams during synchronous classes was also a commonly reported creator. The main inhibitor was IT support provision. Leadership was found to have supported most in sharing content for classes. It was recommended that leadership should create more opportunities for peer-sharing and provide clearer guidance on best-practices for online classes.

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Key words: technostress, technology, education, leadership

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## 1. INTRODUCTION

### 1.1. Background

In 2020, the Coronavirus disease COVID-19 (hereafter COVID-19) pandemic had a profound effect on how people perform their jobs globally (Koley and Dhole, 2020, p. 111). Due to local lockdowns and social distancing requirements, many organizations forced employees to work from home, regardless of prior experience or preparation (Dey, Al-Karaghoul and Muhammad, 2020, p. 299). Employees, once accustomed to working within an organization's physical boundaries, had to adjust to working in a 'remote virtual environment' (Carnevale and Hatak, 2020, p. 2). Educational institutions also faced this challenge, and in most countries schools and universities closed and moved to online teaching with about 1.2 billion students globally, representing around 68% of the student population, impacted by this (Abulibdeh, 2020, p. 552).

As a result of the pandemic, teachers were required to rethink and reformat how they delivered their classes, using online platforms and tools, which may have been new to them and their students. Virtual settings replaced physical classroom. During periods of remote work, Internet and Communication Technology (ICT) is instrumental in providing greater 'flexibility, effectiveness, productivity and responsiveness' but also can bring numerous downsides such as isolation, work intensification, limited collaboration, limited engagement and 'technostress' (Abulibdeh, 2020, p. 556-7). Teachers may have faced such stress and anxiety while using ICT at this time depending on a number of factors such as their experience, support networks, and their own and institutional attitudes toward using technology to teach.

This thesis explores one such case, that of an English language program at a private university in Tokyo, Japan. At this university, 80 teachers deliver three hours of English language classes each week to approximately 4000 first and second-year students. Since its establishment, this program has been exclusively delivered on campus with no on-line offering. In fact, prior to the pandemic in 2020, only 13% of employees in Japan were able to work from home (Dooley and Inoue, 2020).

A week prior to the start of the new academic year, in spring 2020, it was announced that all classes at the university would be postponed and initially delivered online for a number of weeks. This was extended ultimately for the duration of the academic year itself, with the majority of classes remaining online. The initial postponement was to allow for time to adjust to and plan for online learning. This allowed the leadership team (hereafter the program coordinators) further time to decide upon an acceptable format for online learning; whether classes should be delivered synchronously or asynchronously.

It was decided that for teachers who felt confident delivering synchronous classes via video conference this option would be permitted. Other teachers were required to use the university Learning Management System (LMS) named 'Manaba' to upload learning activities for students each week. As teachers had not previously been required to use the LMS, it was decided that the program coordinators would create lessons for an initial number of weeks for teachers to upload. Eventually, a decision was taken to provide these weekly activity packs for the entire semester to ensure consistency, although teachers were also encouraged to create their own activities.

In preparation for this transition to online learning, it was not possible to offer extensive training. Training fosters adjustment to working online and when lacking, such as during the COVID-19 pandemic, employees may suffer from technostress (Vaziri et al., 2020, p. 1078). The university IT department was operating beyond capacity as it services both staff and students. The IT department provided some general instructional videos (in Japanese), sent updates via email (in Japanese) and also offered an online forum for teachers (in both languages) to ask questions. The program coordinators created basic instructional videos, in English and Japanese, showing how to upload activities, check scores, manually grade etc. Two optional training and question and answer sessions were also held via video conference. Despite the lack of sufficient training and short notice, the use of external platforms for teaching such as the Google suite of functions, which teachers may have been already familiar with, was not permitted due to privacy concerns and student access issues.

The first semester ended in late July and at this time the university administration decided that the second semester, and hence the entire academic year, would be delivered online. Accordingly, the program coordinators decided that, in light of the sufficient notice period, the number of ready-made lessons would be greatly reduced (by 60%) in the second semester. This would require teachers to spend more time preparing material and learning how to use Manaba. In addition, it was required that all teachers deliver synchronous lessons using Zoom, either weekly or every other week.

The decisions taken for the second semester required teachers to use more technology more often to deliver their classes. It would not be possible to do one's job without regular use of ICT. The program coordinators would continue to be available and offer support, but the expectation would be for teachers to work more autonomously and be responsible for their own content. This is what was expected each academic year up to this point when teaching on campus.

## **1.2. Research Questions**

The research questions of this thesis are as follows:

- Do teachers at the university suffer from technostress, if so what are the main technostress creators?
- According to the teachers' perceptions, what technostress inhibitors have been provided by the university leadership?
- What coping strategies have the teachers themselves adopted to deal with technostress?
- How has the COVID-19 pandemic impacted teachers' technostress?

As leaders should play a role in supporting employees while dealing with stress (Vaziri et al.; 2020, p. 1078), the aim of this thesis is to provide leadership with insights into the technostress experiences of the teaching body. Through learning what the main causes of and solutions to technostress are, the program coordinators will be provided with a list of recommendations for actions to be implemented. It is important for leadership to understand the impact of

technostress on their employees and take action accordingly in order to alleviate technostress (Shu, Tu and Wang, 2015, p. 936).

The research approach used in this thesis is a mix of both quantitative and qualitative data collection methods. It is in the format of a case study using surveys with questions designed to collect both forms of data as well as interviews collecting qualitative data. The survey used both quantitative and qualitative data collection methods. The former was achieved by amending a pre-existing instrument, and the latter by the inclusion of a number of open-ended questions related to the research questions. The interviews were semi-structured in nature.

### **1.3. Structure of Thesis**

This thesis consists of a review of literature that pertains to technostress. An exploration of the concept introduces definitions. Then factors that lead to technostress, called 'creators', are explored as well as the mechanisms that limit or prevent technostress, called 'inhibitors'. The review also examines literature relating to technostress and teaching and also any applicable research that has been published during the COVID-19 pandemic.

The research methodology is introduced, which includes details of the sample involved. Analysis of the findings are presented next, and the thesis concludes with discussion points, recommendations for the university, a consideration of limitations and finally, suggestions for further research.

## 2. THEORETICAL BACKGROUND

### 2.1. Defining Technostress

Over the past decades, workplaces and work processes have been transformed by the rapid adoption of Information and Communication Technology (ICT). Benefits of using ICT include increased 'flexibility, effectiveness, productivity and responsiveness' (Abulibdeh, 2020, p. 556-7). However, due to the rapid integration of such technology, there has been a resulting negative side effect termed 'technostress'. This can be described as a 'stress phenomenon occurring before and after ICT use in work life' (Çoklar, et al., 2016, p. 1332). The concept technostress was first coined in the early 1980s by Brod, who described this phenomenon as 'a modern disease of adaptation caused by the inability to cope with new technologies in a healthy manner', a result of 'an individual's attempts to deal with the constantly evolving ICTs and the changing physical, social and cognitive responses demanded by their use' (Brod, 1984 in Ragu-Nathan et al., 2008, p. 418).

Outward signs of technostress can include an 'increase in adrenaline levels, headache, heart attack, digestive problems, aggression, insomnia, asthma, tonus, increase in heart rate and blood pressure' (Çoklar, Efiltili and Şahin, 2017, p. 28). Technostress has also been categorized as an occupational health issue in some jurisdictions, for example in Italy where a 2007 ruling by the Court of Turin recognized it as such, requiring appropriate preventative measures are provided by employers (Chiappetta, 2017).

Salanova, Llorens and Ventura (2014, p. 423) propose that the term technostress is an umbrella terms which encompasses two separate yet related phenomena; 'technostrain' and 'technoaddiction'. Technoaddiction can be defined as a 'specific technostress experience due to an uncontrollable compulsion to use ICT' and to 'use it for long periods of time in an excessive way' (Salanova, Llorens and Ventura, 2014, p. 424). Techno-addiction is a form of workaholism and results in an inability to disconnect from work-related technology after standard working hours and a compulsion to continue working (Brivio et al., 2018, p. 2). Technoaddiction is not studied as part of this research.

Technostress can manifest in feelings of anxiety, fatigue, and scepticism when using ICT. Anxiety, or more specifically 'techno-anxiety' (Brivio et al., 2018, p. 1) refers to the 'fear, apprehension and agitation' occurring when using or anticipating using ICT (Salanova, Llorens and Ventura et al., 2014, pp. 423-424). This may include a fear of hitting the wrong keys, losing work, and general hesitation in using ICT. Outward manifestations of this computer-related anxiety can include exercising excess caution, feelings of being hassled, negative comments and attempts to minimize the necessity of computers (Ragu-Nathan et al., 2008, p. 420). Fatigue while using ICT has been described as information fatigue syndrome (IFS) which can lead to 'poor decision making, difficulty in memorizing and remembering and reduced attention span'. Scepticism can refer to 'indifferent, detached, and distant attitudes toward the use of ICT'. Feeling inefficacious refers to the perception of levels of inefficacy while using ICT. When one is in this frame of mind it is difficult to feel confident with the use of ICT (Salanova, Llorens and Ventura, 2014, p. 424).

While technostress is an adverse outcome of engaging with technology, it can be distinguished from 'technophobia'. The latter has been categorized as a 'specific phobia', which is a 'psychological disorder characterised by excessive, irrational fear of a specific object or situation'. While technostress arises as a direct result of using ICT, technophobia is an extreme reactive behaviour which can occur without use or interaction (Agogo and Hess, 2018, p. 574-80). Technophobia is not studied as part of this research.

The impacts of technostress can have profound implications for educational leaders. In the research of the impact of technostress on factors such as job satisfaction, organizational commitment and continuance commitment (one's intention to stay within an organization) of 608 employees, Ragu-Nathan et al., (2008, p. 429) found that there was a positive relationship between technostress and these factors. Given the connection between technostress and employee wellbeing, performance and commitment, it is important for leaders to be aware of how this phenomenon can manifest and impact the workforce.

## 2.2. Technostress Creators

A number of factors can lead to technostress. These are referred to as *creators*, a term which will be used throughout this thesis. Ragu-Nathan et al. (2008, pp. 421–422) attribute technostress to a number of characteristics of the modern work environment in their identification of technostress creators. First, is the resulting constant connectivity which can extend the workday, as employees often will feel obliged to respond after hours. This can result in the feeling of never being able to escape work. Second, ICT has increased information overload as employees are constantly exposed to streams of information on an on-going basis. This leads to feelings of being overwhelmed with more information or requests than one can handle, leading to information fatigue. Third, the proliferation of ICT into the workplace has required employees to stay up to date with technology and terminology. This requires knowledge of ever-expanding processes, applications and jargon. Some technology can be difficult to learn and accompanying manuals can be complex. Fourth, the constantly changing nature of technology means that it can be challenging to establish a knowledge base to build upon. This may result in feelings of insecurity about job demands which can lead to conflict with management and job dissatisfaction. Fifth, ICT can require extensive planning in order to successfully integrate which can be a stressful process. Post integration there may be issues such as errors, data loss, and inadequate support which can create a feeling of being unable to cope.

In their study, Ayyagari, Grover and Purvis (2011, p.834-8) developed a model of how an inadequate person-environment fit can result in specific ICT-related characteristics manifesting in five ways: work overload, role ambiguity, invasion of privacy, work-home conflict and job insecurity. According to Ayyagari, Grover and Purvis work overload is the perception that tasks surpass abilities. Role ambiguity refers to the lack of information needed to complete one's role. Invasion of privacy is the perception that privacy has been violated. Work-home conflict is the perceived conflict between work and family demands. Job insecurity is a perception that one is in danger of losing their job.

Syvänen et al. (2006, pp. 98-100) propose five factors which can influence the technostress levels of a teacher. These are levels of ICT competence, attitude

toward ICT use in the context of education, the concordance of ICT with the teacher's style of teaching, institutional support of ICT, and frequency of educational use of ICT. Çoklar, Efiltili and Şahin (2017, p.29) cite several studies which attribute technostress to matters of support from the institution such as lack of professional development and training, inadequate technology, poor quality devices and low human interaction. They also cite several specific computer issues such as breakdowns, slowness issues remembering login credentials, slow connectivity, and too many email addresses.

### **2.3. Technostress Inhibitors**

Ragu-Nathan et al. (2008, p.422) define technostress inhibitors as 'organizational mechanisms that have the potential to reduce the effects of technostress'. Technostress inhibitors include organizational and technical support for end users. Another mechanism is initial training in order to understand how to use ICT used in the job. The authors reference a study (from the now defunct [www.technostress.com](http://www.technostress.com)) in which those who received 'excellent to good' training cited more positive reactions to new ICT than those who received 'fair to terrible training'. The provision of training enhances self-efficacy when using ICT which can lead to a reduction in technostress caused by complexity and fears around job security (Shu, Tu and Wang, 2015, p. 935).

Another example of a technostress inhibitor is to involve employees during the initial planning and implementation phase, encouraging discussions for best use, therefore reducing the likelihood of resistance. Li and Wang (2020), in their study, found that this inhibitor is the most impactful in preventing technostress. Communicating change and articulating the benefits is a further example of a technostress inhibitor (Ragu-Nathan et. al, 2008, p. 422).

Dong et al. (2020, p. 154) recommend promoting teacher collaboration in lesson planning in order to share workload and the establishment of curriculum design teams to work on integrating technology into teaching. Brivio et al (2018, p. 2) state that 'technostress is a manifestation of a lack of safety culture'. A safety culture includes processes, professional practices, rule, regulations, and laws that ensure the well-being of individuals. They state that this is created through

appropriate communication, exchange of values and information, which is assisted by 'Positive Technology'. Positive Technology should meet the needs of the role in question, it should be appropriately designed and trained and should support social processes. Through the proactive application of such Positive Technology steps, technostress creators such as overload and techno-invasion can be proactively avoided.

#### **2.4. Technostress and Teachers**

Although teaching is not a traditional office-based role with a constant need to engage in ICT use, it has become increasingly digitized with many institutions adopting ICT, flipped classrooms, massive online open courses and associated learner technology (Li and Wang, 2020). Çoklar et al. (2016, p. 1332) state that continued pressure for technology integration into education on an institutional as well as a societal level can result in technostress among teachers. There are several factors which may cause this, as described by (Dong et al., 2020, p. 148). First, there is a demand to learn new processes, applications and terminology which can create more work and time pressure. Second, increased integration of technology into teaching may require the teacher to change how he/she works. Thirdly, technostress may arise when teachers feel obliged to use ICT even if it does not complement their personal teaching preference (Syvänen et al., 2016, p. 96). Finally, the technology itself may not be adequately designed, causing confusion and frustration, and reluctance to use said technology.

Several studies have been undertaken to examine the impact of technostress on those in the teaching profession. Research undertaken by Syvänen et al (2016, p. 96) involving 2741 Finnish school-teachers explored how demographic factors are related to with techostress. It was found that female teachers suffered more than male teachers, and that those with more experience in the role (16-30 years) experienced more techostress than those with less experience (15 years or under). They propose that job-related factors may impact technostress more than demographics and concluded that ICT competence was the single greatest determining factor in technostress.

In their study of 366 Chinese K-12 in-service teachers Dong et al. (2020, pp 153-4) concluded that teachers' TPACK (Technological Pedagogical Content Knowledge) correlated with technostress levels among teachers. Levels arise if the competences required are beyond the teachers' ICT skill levels. Furthermore, they discovered that teachers' computer self-efficacy was more important than institutional support, with the recommendation that training programs should include problem-solving skills rather than focused procedures for specific issues, which can further lead to increased confidence.

In a more concentrated study, Al-Fudail and Mellar (2008, pp. 1103-1107) proposed a model that demonstrated that technostress arose out of a discrepancy between the subjective and objective demands on the teacher to use technology to perform their job and their ability to actually do so as well as their subjective and objective need and supply do fulfil the needs of their role. This small study involved nine teachers. 32 hours of lessons were observed and recorded, during which each teacher had a skin response monitor attached in order to monitor psychophysiological arousal. They were also interviewed after teaching. They reported experiencing technostress due to demands of preparation, errors in the technology experienced by the teacher or their students, the need to train students in the basics, inadequate training and a lack of technical and social support.

Çoklar et al. (2016, pp. 1332-1335) carried out quantitative research into the technostress levels of 370 schoolteachers in central Turkey to examine if factors such as gender, length of service and internet usage cause these levels to vary. The results showed that teachers reported medium to low levels of technostress, that gender or length or service was not a factor in reported technostress levels but that technostress levels were higher for those who only used the internet for a minimal amount. In another study in Turkey, the same research team measured technostress levels of 64 teachers across various departments with the intention to describe the relationship between gender and technostress, using similar research methodology. From the responses of teachers, five reasons for technostress were identified: individual problems (inability, lack of education, inability to translate), technical issues, education-orientated problems (supply of technology, impact on students), health issues and time issues. The analysis

revealed that individual issues and technical issues were the greatest cause of technostress. When compared by gender, male teachers reported that individual problems (involving financial problems and foreign language problems) were the largest reason for technostress, compared to the female teachers for whom technical issues were the greatest reason (Çoklar et al., 2016, pp. 84-87).

Educational leaders have a role to play in teachers' attitudes toward ICT and reducing possible technostress. Leaders should strive to provide more 'support, training and guidance' in the use of ICT through the provision of technical support and continuous training. This will facilitate teachers' capabilities in using ICT, hence reducing technostress (Harahap and Effiyanti, 2015).

## **2.5. Technostress and COVID-19**

The 2020 COVID-19 pandemic situation led to widespread changes in how educational institutions functioned. Due to lockdown and social distancing requirements, educational institutions at all levels have had to conduct online teaching, and according to UNESCO, more than 1.5 billion students have been affected by school closures (UNESCO, 2020). The pandemic led to greater penetration of ICT in all aspects of society and its impacts are not yet known but greater levels of technostress may be anticipated as a result (Bondanini et al., 2020, p. 15).

While there has been extensive research into technostress prior to the pandemic, research since the outbreak and subsequent global lockdowns has been limited. One recent study of technostress creators of 228 private university lecturers in Indonesia found that despite there being a connection between techno-complexity and teaching performance, techno-uncertainty, techno-overload and techno-insecurity did not impact performance (Christian, Purwanto and Wibowo 2020, pp. 2803–2805). A study in Italy (Molino et al., 2020, pp. 12–13) used an Italian translation of the Technostress Creators Scale, as developed by Ragu-Nathan et al (2008, pp. 424-427) to measure the impact of working from home on the technostress of over 1600 workers across several sectors, including not limited to those in education. In contrast to the study in Indonesia, it was found that there was more reported techno-overload and techno-invasion than techno

complexity, with individuals feeling more compelled to work faster and longer and felt as if ICT had invaded their home lives.

This study is the only known study at the time of writing, which is researching the technostress experience of teachers in Japan since the event of COVID-19.

### **3. METHODOLOGY**

#### **3.1. Methodological Approach**

This study seeks to measure different technostress creators and inhibitors among a group of 80 English language teachers at a private university in Tokyo and does so in the format of a case study. A case study is an appropriate choice for a study which aims to produce development suggestions, especially as it 'produces knowledge about a current phenomenon taking place in its real situation and operating environment' (Ojasalo, Moilanen and Ritalahti, 2020). In addition, a case study is suitable for a study which focuses upon a restricted target group rather than a larger one and in cases which examine internal operations and employee relationships (Ojasalo, Moilanen and Ritalahti, 2020). A case study takes multiple approaches, in this instance surveys and interviews, in order to reflect participants' perspectives, as well as 'hold policy to account in terms of the complex realities of implementation and the unintended consequences of policy in action' (Stark and Torrance, 2005, p. 33).

The case study for this thesis was done via quantitative and qualitative research methods with the use of an online self-administered survey sent via email as well as interviews conducted using video conferencing technology.

Surveys offer the advantage of allowing for the gathering of a large amount of data in a fast manner providing data which can be analysed statistically (Ojasalo, Moilanen and Ritalahti, 2020). The survey was completed electronically using an online survey tool, commonly used at the university, which has allowed the respondents to answer with ease. It has been decided to use only one format, the electronic form, in order to reduce the likelihood that data collected may vary from one format to another (Andres, 2012, p. 2). Using an online survey of this nature has many advantages. It is low-cost, cheap, fast and allows for a high number of respondents and hence a greater volume of data can be collected (Cohen, Manion and Morrison, 2018, p. 622). The online form layout ensures that answers cannot be left blank before submission and in addition the flexibility offered by the platform allows for different question formats such as multiple choice, Likert scales etc. Further advantages of utilizing online surveys of this nature include

the provision for anonymity and self-administration, the latter being important under social distancing circumstances. One disadvantage of using online surveys is that their various advantages have caused an increase in their proliferation and as a result this survey 'flood' has caused survey fatigue which may cause a decreased number of responses (Ojasalo, Moilanen and Ritalahti, 2020). To counteract this, the chair of the English Program sent a preliminary email to introduce the study and asked for participation. In this email, the chair also reminded teachers that the study would be anonymous and voluntary so as not to create pressure on teachers to complete and encourage honest responses.

The survey was self-administered which has several advantages for this study. Self-administered surveys allow for the respondents to respond in their own time which allows them to reflect deeper on responses and reduces the chances of answering in haste. This increases the accuracy of responses guaranteeing better quality of information. Self-administered surveys require accurate and clear instruction in order to ensure that respondents are confident in the meaning behind questions (Andres, 2012, p. 3). An initial concern in this regard is that not all of the teachers are native English speakers but considering they were hired to teach fully accredited English communication classes the survey was conducted in English only. In addition, two non-native English-speaking teachers, one Japanese, one non-Japanese who were not part of the study, volunteered to proof-read the questions for clarity of language.

### **3.2. Access to the Case Study Population**

Access to the sample was permitted by the committee who oversees both of the programs as well as the chair of the English program who read the final version of the survey before it was sent. The initial draft of the Technostress Creators Scale was provided to the chair who requested that items pertaining to job satisfaction, organizational and continuance commitment were removed. It was not deemed appropriate to investigate these factors in the context of this study, especially given the fact that many teachers are employed on temporary contracts.

Participating in the research was voluntary and by doing so the participants consented to allow their responses to form part of this study. Informed consent, that is 'procedures for individuals to choose whether or not to participate in the research' (Cohen, Manion and Morrison, 2018, p. 246) was facilitated by meeting the following four elements: competence, voluntarism, full information and comprehension. Participants in the study being adults in full-time employment and in good standing at the university were deemed to be competent. Participants were also free to volunteer in the study and could opt not to participate. Full information regarding the purpose and intent of the study was provided in both the email sent accompanying the survey. Participants had the opportunity to ask any questions they may have had at any stage throughout the research.

### **3.3. Population of the Study**

The research utilized convenience sampling, using the readily available English teacher population at the university. There are two programs which are taught, English A and English B (commonly referred to as Eigo A and Eigo B). While this researcher acts as a supervisor for the one of these groups, it was decided to include both groups in the study. All teachers report to the same management structure and teach under the same conditions, so data collected was equally valid. For quantitative research, it has been recommended to have a minimum sample size of thirty respondents for greater reliability and to facilitate more sophisticated data analysis (Cohen, Manion and Morrison, 2018, p. 204). The sample size by combining both the English programs gave a maximum possible respondent sample of 80 teachers. Using this sample also allowed for non-probability sampling which allowed this research to represent a defined group of respondents and eliminated randomization that probability samples will yield (Cohen, Manion and Morrison, 2018, p. 385).

An overview of the demographic distribution of the survey population can be seen in TABLE 1 below. The teachers in the population were mainly Japanese nationals, totalling 62, with 18 teachers being non-Japanese, mainly originating from countries where English is the native language. There were 42 male teachers and 38 females. The majority of teachers, a total of 35, were hired from agencies to teach one day per week at the university for a total of 30 weeks per

academic year. Another group of 31 teachers were hired directly by the university, also on one-day contracts. Of the remaining teachers, six were tenured faculty members and eight were 'guest lecturers' from affiliated universities who spend between one to four years working at the university on a full-time basis. Due to confidentiality reasons, it has not been possible to obtain the ages of the teachers from the administration of the university.

TABLE 1. Demographic distribution of the survey population<sup>1</sup>

Category	Gender		Nationality		Position			
	Male	Female	Japanese	Non Japanese	Faculty Members	Part time agency	Part time directly hired	Guest Lecturers
Percentage	53	47	77	23	8	44	38	10

### 3.4. Survey

The survey used was an amended version of the Technostress Creators Scale developed by Ragu-Nathan et al (2008, pp. 424-427). The scale was developed based on key concepts related to technostress creators and inhibitors as collected from their literature review on this topic. The items in the original scale were validated through interviews with end users from both business and academia. The scale consisted of statements related to five technostress creators and three technostress inhibitors which the authors identified. In addition, statements pertaining to job satisfaction, organizational and continuance commitment were included. The five creators and three inhibitors have been described as follows (Tarafdar et al., 2007, pp. 314-315):

- Techno-overload occurs in cases where one's workload increases, one must change work habits or must work faster and longer.
- Techno-invasion describes situations where the lines between work life and personal life are blurred and one feels compelled to always be 'connected'
- Techno-complexity is concerned with feelings of inadequacy while dealing with ICT due to its complexity.

<sup>1</sup> All figures have been rounded up.

- Techno-insecurity relates to feelings that one's job security is threatened by changing ICT or by more technically capable employees.
- Techno-uncertainty is concerned with the ever-changing nature of technology which causes unsettling feelings of stress and a feeling that one always needs to keep updated.
- Literacy facilitation describes initiatives which enable overall understanding and increased levels of comfort and assurance (such as training, documentation and peer-to-peer sharing).
- Technical support provision refers to the technical assistance provided to employees to assist in resolving problems and challenges while using ICT.
- Involvement facilitation relates to the level of engagement which employees feel in phases and matters of ICT integration.

Using a Likert-scale, respondents responded to a number of statements regarding their perceptions of technostress creators and of technostress inhibitors as experienced from working at the university. A Likert-scale is a 'psychometric scale for measuring a series of attitude related propositions' (Likert, 1932, in Chyung et al., 2017, p. 15). The original scale contained between three to two number statements related to each of the technostress creators as identified by Ragu-Nathan et al. (2008, pp. 424-427).

For this study an amended version of the Ragu-Nathan et al. (2008, pp. 424-427) scale was used due to organizational and managerial constraints. First, as teachers are a mixture of tenured, part-time and agency staff, statements regarding organizational commitment were not included. Second, the items related to job satisfaction and tecno-insecurity were also removed upon request of the program chair. Third, as teachers had been hired under various contract types, in some cases for a predetermined maximum number of years, it was also decided not to include items that refer to continuance commitment. This resulted in a scale with four technostress creators (techno-overload, techno-invasion, techno-complexity and techno-uncertainty) and three inhibitors (literacy facilitation, technical support provision, involvement facilitation), all of which are mechanisms of institutional or managerial actions.

Some of the questions were removed or amended to better reflect the reality of working at the university, specifically adapting them to gather data on online

teaching. An additional item regarding language, upon the suggestion of the chair of the program, was added to the set of questions pertaining to techno-complexity creators.

The use of the Likert scale-based questions in the survey is beneficial to measure degrees of sensitivity and differentiating responses while still generating numbers which allow for analysis. However, Likert scale-based questions do not allow respondents to add comments which is why open-ended questions were added at the end of the survey. Furthermore, it was noted that East Asian respondents have a tendency to opt for the mean point of the scale (Cohen, Manion and Morrison, 2007, p. 325-7). Rather than using an even number scale it has been decided to use the same range as the original scale, with five options (strongly disagree, disagree, neither agree nor disagree agree and strongly agree). Use of the scale of this type with a mid-point allows for respondents to express a neutral opinion (Chyung et al., 2017, p. 18).

The survey opened with some initial multiple-choice questions to gather information regarding the sample demographics. These included questions on gender, nationality, native language, position at the university, age and tenure (in years). At the end of the survey a small number of open-ended questions were included to collect information to provide qualitative data for the study. It was decided to limit those questions to a total of four, as open-ended questions may require greater time to respond making the survey seem long and discouraging (Cohen, Manion and Morrison, 2007, p 322). These questions gathered information on teachers' experience of technostress, technostress creators, coping skills/strategies developed, and the role of leadership in dealing with technostress. Open-ended questions allow for participants to add comments in relation to any questions that appear earlier in the survey. Open-ended questions are important in qualitative research as they can provide 'authenticity, richness, depth of response, honesty and candour' (Cohen, Manion and Morrison, 2007, p.330).

Responses to the statements in the survey were analysed using content analysis. This is a semi-quantitative approach involving 'establishing categories and then counting the number of instances in which they are used in a text' (Marks and

Yardley, 2004, p.1). This form of analysis involves examining the frequency of occurrence of categories. The statements were analysed in the context of categories based the research questions, including technostress, creators, inhibitors, coping strategies and leadership. Statements were then colour coded and frequency was established. This same form of analysis, content analysis was also used in the interview which followed the surveys. Audio files were downloaded and then transcribed once the transcriptions were then coded as and analysed for frequency.

The final survey design hence follows the sequence below:

- Opening questions inquiring about factual information.
- Statements with one-to-five Likert-scale responses (where one indicates strong disagreement and five indicates strong agreement).
- Open ended questions asking for opinions and experiences related to teaching online.

This sequence of questions, starting with objective facts, through justifications and personal opinions was designed to open with straightforward factual questions which are straightforward to answer and therefore ease the respondents into the task. This progresses into a middle with questions that require more thought and an end with those of high interest to encourage completion (Cohen, Manion and Morrison, 2007, p.337).

The survey was sent to all teachers on October 26, 2020 and was open for completion for a period of two weeks. It was sent with an introduction email containing a covering letter. The covering letter is an important tool to increase the likelihood of a higher number of responses as it creates trust and increases motivation through providing transparency behind the research purpose and guarantees of anonymity and the voluntary nature of participation (Ojasalo, Moilanen and Ritalahti, 2020). The covering letter sent with the survey included the purpose, deadline, statement of anonymity and expectations of participation (voluntary) and expressing advance gratitude. A further email with a second covering letter was sent a week later as a reminder, repeating the main

information from the initial covering letter, thanking those who participated and reminding others of the value of their participation.

The survey contained an opening statement with clear instructions on how to complete, expected completion time, purpose, reminder of anonymity and a statement that the final thesis would be available online. The expected completion time was estimated to take 20 minutes which was based on feedback gathered from the survey pre-test.

### **3.5. Survey Pre-Test**

A survey should always be tested before its administration (Ojasalo, Moilanen and Ritalahti 2020). A small pre-test using the initial amended version of the survey was carried out prior to starting the data collection. The survey was sent to four people, none of which were teachers on the program. Two were native English speakers, one was a Japanese speaker and one a speaker of another language. These four individuals were asked to provide feedback on the duration of the survey and highlight any questions which were unclear, invalid, difficult to comprehend, overly leading. They were also asked to provide feedback on the layout, appearance and time to complete (Cohen, Manion and Morrison, 2007, p.341). Due to this feedback, it was decided to reduce the number of questions on the survey as well as the number of sections in order to increase the likelihood of teachers completing it and reduce the time spent to complete which may risk response accuracy. The number of questions was therefore reduced from 45 items to 32 items, across three sections, rather than the initial five. In addition, some questions were reworded, and additional comments were added to the introduction for clarity.

### **3.6. Participant Overview**

In total, 30 teachers completed the survey. This represents 38% of the target sample. One possible cause for this low response rate could be the fact that the survey was created and administered by a researcher who is also one of the program coordinators. Teachers may have felt reluctant to respond in case there were concerns about giving negative impressions of their performance, despite

the fact that anonymity was assured. Only respondents who volunteered to take part in the interview stage disclosed their contact details, and their personal information has been withheld to ensure anonymity.

With 44% of the teachers being hired through agencies, there may have also been concerns that data was being collected on performance. This may have led to fears that disclosing issues caused by online teaching would lead to termination of agency staff. Furthermore, as the amount of time spent using ICT since the pandemic began has increased, there may have been 'computer fatigue' causing a general avoidance of any unnecessary time spent online outside of work duties. It is also noteworthy that in Japan in general, there has been a decrease in responses to surveys over the past number of decades. Inaba (2007, p. 11) suggests that this is due to concerns about an increase in crimes where personal information has been abused.

As shown in TABLE 2 below, 53% of the respondents were male, and 47% were female. 57% were non-Japanese, with Japanese making up for the remainder. 17% identified as being in the 22-35 age range, with 46% being in the 35-55 age range and the remaining 37% being in the 55+ age range. Of the respondents, 13% were permanent faculty members, 37% were part time teachers supplied by agencies, 30% were directly hired part time teachers and the remaining 20% were 'guest lecturers' from an affiliated university.

TABLE 2. Demographic distribution of survey respondents

Category	Gender		Nationality		Position			
	Male	Female	Japanese	Non Japanese	Faculty Members	Part time agency	Part time directly hired	Guest Lecturers
Percentage	53	47	43	57	13	37	30	20

Compared to the survey sample, there was a high rate of response from the guest lecturers who account for 10% of the target sample but 20% of the respondents. While the ratio of non-Japanese teachers is 23% among the target sample, that of the respondents came to 57%.

### 3.7. Interviews

The second part of the case study involved interviewing a number of teachers who agreed to participate in follow-up interviews at their convenience. Interviews have the advantage of providing data quickly and allows the interviewee to freely disclose information relevant to them individually. Furthermore, they can be sources of data which can open new perspectives on a topic (Ojasalo, Moilanen and Ritalahti, 2020). The primary purpose of these interviews was to clarify information and gain a deeper understanding into individual experiences of teachers in terms of technostress, the pandemic and the role of leadership within this context.

In total, 30 teachers completed the survey, of whom 14 volunteered for follow-up interviews. Of these 14 teachers, 11 responded to direct emails requesting an interview. The remaining three were unresponsive, resulting in a total of 11 interviewees. Interviews took place in the weeks after the survey had been collected, from November 06, 2020 to December 01, 2020, and were arranged at the convenience of the interviewees. The interviews took the format of semi-structured interviews in order to conduct the data collection as uniformly as possible. Structured interviews rely on a formal list of questions, require the interviewer to elicit as much information as possible from the interviewees and require the interviewer to act in a consistent manner when interviewing different participants (Yin, 2016, p. 141). Participants were asked a number of open-ended questions in order to collect qualitative data. The questions, which mostly relate to the research questions of this thesis are listed in Appendix 2.

The first two questions act as grand tour questions. Grand tour questions allow the interview to have a comfortable start, open the interview with a subject that is relevant to the research and direct the participant as minimally as possible (Yin, 2016, p. 145).

The third question relates to the first research question of this thesis: Do teachers at the university suffer from technostress, if so what are the main technostress creators? This question allows the participants to outline their own experience of technostress and how they adjusted to the pivot to online learning. The fourth question relates to the fourth thesis research question: How has the COVID-19 pandemic impacted teachers' technostress? while the fifth question relates to the

third thesis research question What coping strategies have the teachers themselves adopted to deal with technostress? This was also asked in the survey but by adding it to the interview, it allowed for participants to go into greater detail. It also allows for the identification of any technostress inhibitors which may have been developed by the teachers. The final two questions, six and seven, relate to the second thesis research question: According to the teachers' perceptions, what technostress inhibitors have been provided by the university? Both these questions relate to actions taken by leadership and can identify any technostress inhibitors which the leaderships of the university provided and any technostress creators which were not adequately prevented.

Each interview was conducted using video conferencing software. This allowed for the interviews to be held in the participants' homes ensuring health and safety with the elimination of direct contact. A further advantage of using video conferencing software was that, with participants' consent, the interview could be recorded and readily converted into an audio file for later transcription. While there can be a loss of rapport while conducting interviews over video conference, participants are in a familiar environment, which may make them more likely speak openly, particularly shy or introverted participants (Lo Iacono, Symonds and Brown, 2016, p.6).

Each interviewee received a consent form outlining the purpose of the interview, its format, the confidential and anonymous feature, details of how to withdraw and an option for them to sign off to consent. Signed consent forms were returned and archived.

Each interview started with an opening statement to reiterate points outlined in the consent form and explain definitions of key terms, namely 'technostress' and 'online teaching'.

The interview was carried out following guidelines for standardized interviewer behaviour. These are (i) presenting the study (ii) asking the questions as written (iii) probing when needed (iv) recording the answers (v) minimizing the interpersonal relationship between the interviewer and subject (Fowler, 2009).

## **4. RESEARCH FINDINGS**

### **4.1. Technostress Statements**

The following chapter presents the findings of the quantitative and qualitative research undertaken for this thesis. First, each technostress creator, will be examined, according to the responses to the statements in the survey in conjunction with supporting comments that teachers made in their responses to the open-ended questions. Second, each technostress inhibitor will be examined in the same manner. Third, the statements to the open-ended questions will be examined in the context of major themes from the thesis research questions. Finally analysis of the interviews will be presented, based on each of the thesis research questions.

### **4.2. Creator: Techno-Overload**

The first three statements in the survey which were 'Teaching online has increased my workload compared to teaching face to face', 'Teaching online has caused me to change my work habits in order to adapt to new technology' and 'I feel like I now have a higher workload because of the complexity of the technology used to teach face to face' all relate to the technostress creator of 'techno overload'. Respondents were largely in agreement with these statements, as demonstrated in FIGURES 1, 2 and 3 below. This is similar to the results of the findings of the Italian study which also took place during the COVID-19 using the same scale (Molino et al., 2020, pp. 12–13). Of all statements relating to the four creators, these elicited the strongest agreement from the teachers in the survey. In FIGURE 1 and all subsequent figures, 1 indicates strongly disagree, 2 indicates disagree, 3 indicates neither disagree nor agree, 4 indicates agree and 5 indicates strongly agree with the given statement.

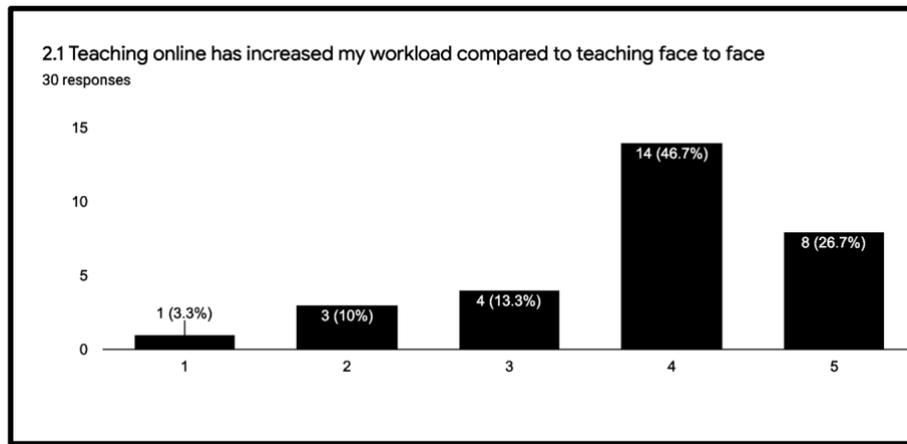


FIGURE 1. Responses to 2.1.

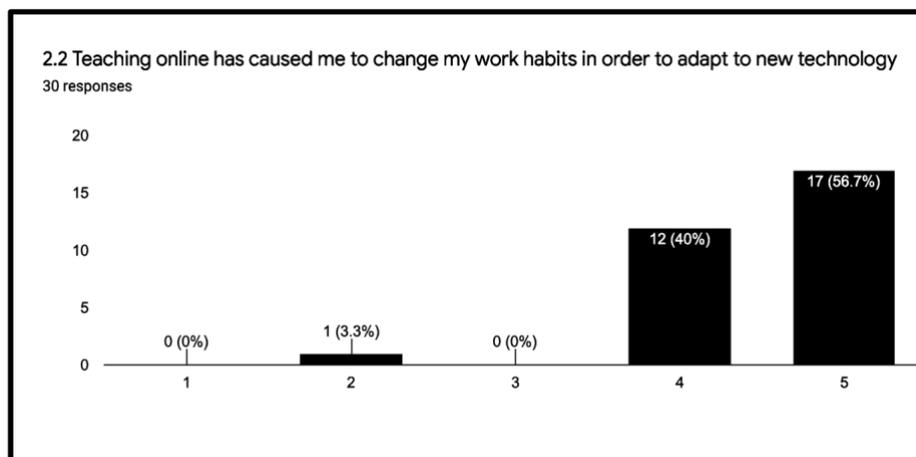


FIGURE 2. Responses to 2.2.

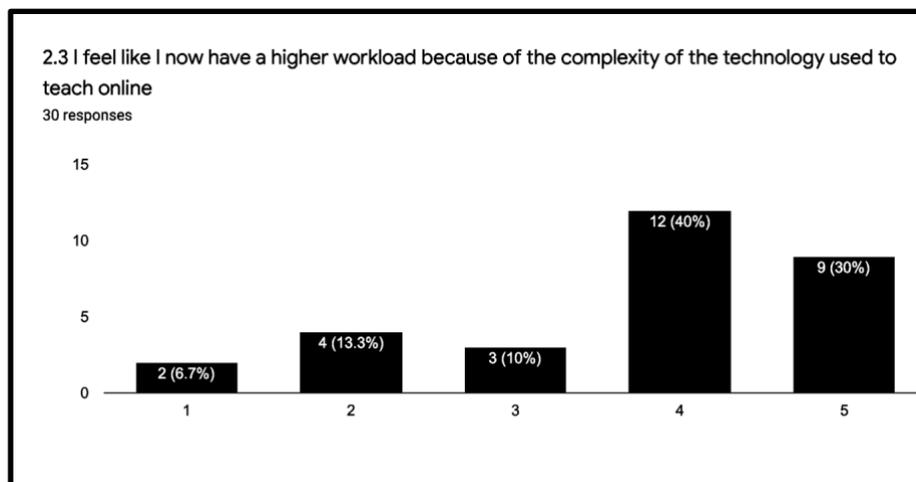


FIGURE 3. Responses to 2.3.

With techno overload being a perception that one's workload surpasses their abilities, a number of comments in the third section of the survey (responses to the open-ended questions about teachers' experiences) support the high-level

agreement with these statements. These include comments on preparation, marking and corresponding with students and colleagues:

*'Checking students' writing was such hard work and it took me so much time'*

*'I usually print out some handouts and distribute them to students. but now, I need to prep them in PPT or word documents to show them in Zoom lessons or upload into LMS. This time consuming process is stressful.'*

*'This is a whole new world. It takes me twice as long to do half as much'.*

*'Lack of face-to-face contact with IT staff or teaching colleagues means questions hard to find answers to. Usually have to email which is time consuming'*

#### **4.3. Creator: Techno-Invasion**

The next set of questions relate to the creator of techno-invasion. Techno-invasion describes situations where the lines between work life and personal life are blurred and one feels compelled to always be 'connected' (Tarafdar et al., 2007, p. 315). This especially relevant to the COVID-19 lockdown as the ensuing switch to working from home 'blurred the boundary between work and personal lives', especially as employees often use the same technology for work and personal reasons (Dey, Al-Karaghoulis and Muhammad, 2020, p. 299). The statements regarding techno-invasion are 'I feel my personal life has been invaded since the switch to online teaching', 'I feel like I need to be in touch with the university more frequently due to teaching online', and 'I feel like I have to use my free time to keep up to date on technology needed to teach online'. The responses to this were mixed, with 50% of respondents agreeing or strongly agreeing with the first as per FIGURE 4 below. Over 50% neither agreed nor disagreed with the second statement, as per FIGURE 5. In the case of the third statement, 63% either agreed or strongly agreed as per FIGURE 6. Comments which support agreement with increased techno-invasion include:

*'I did find it tiring to be constantly at the computer though'.*

*'lack of private time to deal with IT matters, spend much less time with my family and take care of my child, lack of sleep, having to give up other jobs, which has caused me to lose a lot of money to earn'*

*'I get much less sleep compared to pre-pandemic days. I often find myself dozing off at the keyboard'*

Of note is the fact that the third statement for this creator, 'I feel like I have to use my free time to keep up to date on technology needed to teach online', elicited the strongest agreement of all three statements and in the responses to question 3.1, later in the survey, pertaining factors that were perceived to cause technostress, some teachers made comments which could suggest that further time was needed on their part to increase their skills and knowledge in their free time in order to teach online:

*'Was asked to use Zoom with no training'*

*'Full-time staff had some but not much LMS training. Part-time staff were given none.'*

*'lack of knowledge of the hardware and the software'*

The agreement for this creator, techno-invasion, was not as strong as with the previous one, techno-overload.

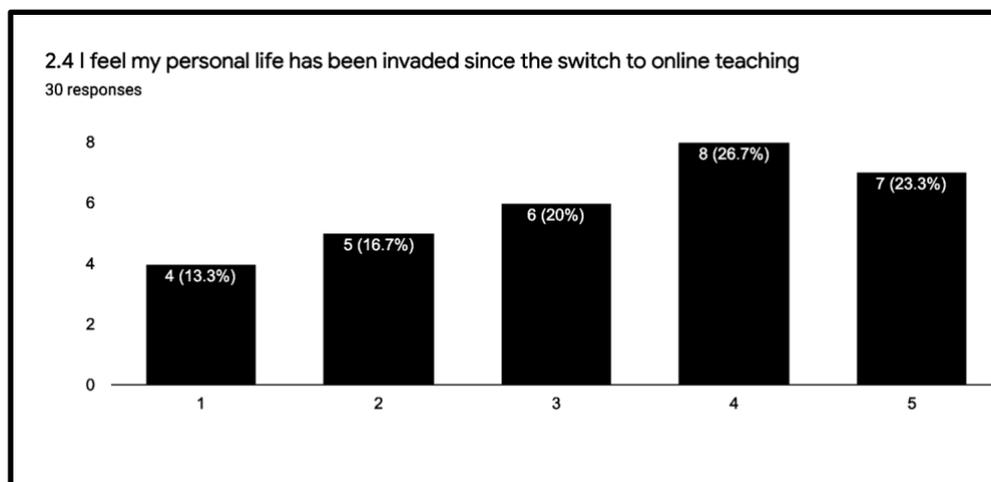


FIGURE 4. Responses to 2.4.

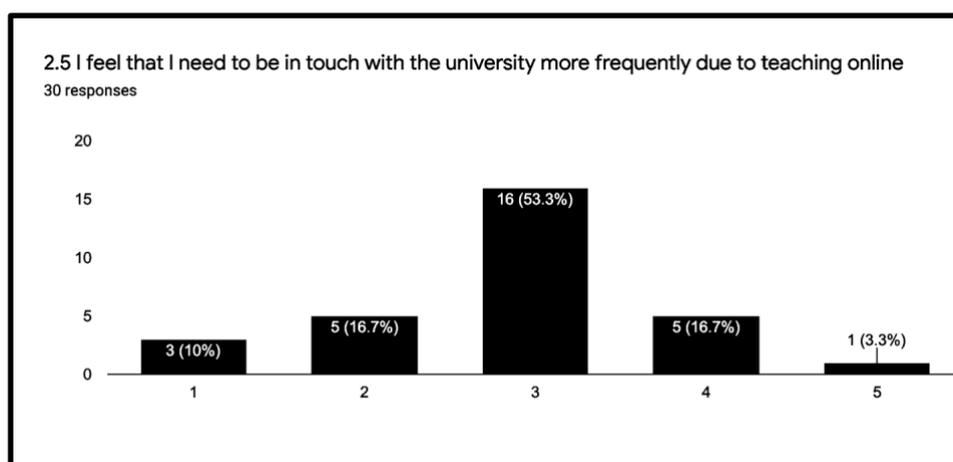


FIGURE 5. Responses to 2.5.

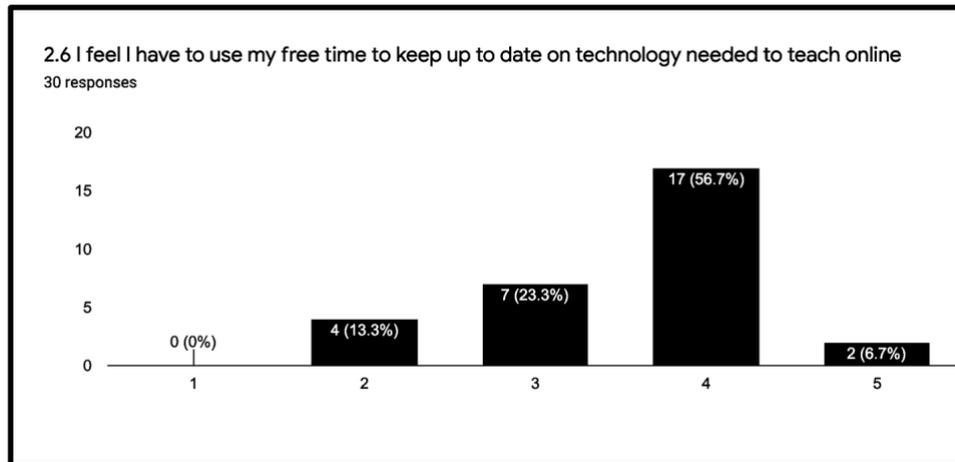


FIGURE 6. Responses to 2.6.

#### 4.4. Creator: Techno-Complexity

The next set of statements pertain to techno-complexity, for which three amended statements were included from the original Technostress Creator Scale survey. These are 'I feel like I do not know enough about the technology required to teach online to do my job to my satisfaction', 'I need a long time to understand and use new technology', and 'I often find it too complex to understand and use new technology required to teach online'. One further statement was added on the suggestion of the chair of the program, who was interested in the role language played, so this was added as 'I am unable to understand instructions/information about the technology because the language used is too complex'.

Responses were largely in disagreement with these statements. Taking the final question, pertaining to language, in this set, 70% disagreed or strongly disagreed, with only a total of 17% of respondents either agreeing or disagreeing, as can be seen in FIGURE 10. From the responses to question 3.1, regarding factors contributing to technostress, only two teachers mentioned language related issues:

*'Unclear English manual for LMS, Overload of information in Japanese from university makes me worry about missing information'*

*'lack of knowledge of the Japanese language'*

For the first three questions regarding this contributor, techno complexity, more than 50% of the respondents disagreed or strongly disagreed with each statement, as seen in FIGURE 7, 8 and 9 below. This suggests that the technology used by the university to teach has not presented any major challenges in terms of its usability for online teaching and that teachers are sufficiently technically literate for techno complexity not to be a contributing factor to their technostress. In the responses to question 3.1 indeed, only two teachers mentioned the complexity of the ICT, one of which did mention that this was because of their own attitude ('psychological barrier') and not the technology itself:

*'The complexity of the LMS. It is not all intuitive and also it is not an efficient application.'*

*'I am not familiar with technology so using ICT is really challenging, probably not because of technical problems but psychological barrier in myself.'*

These results are partly in contrast to the study by Li and Wang (2020), which also used the same scale and showed that techno-complexity was one of the leading causes of technostress in university teachers.

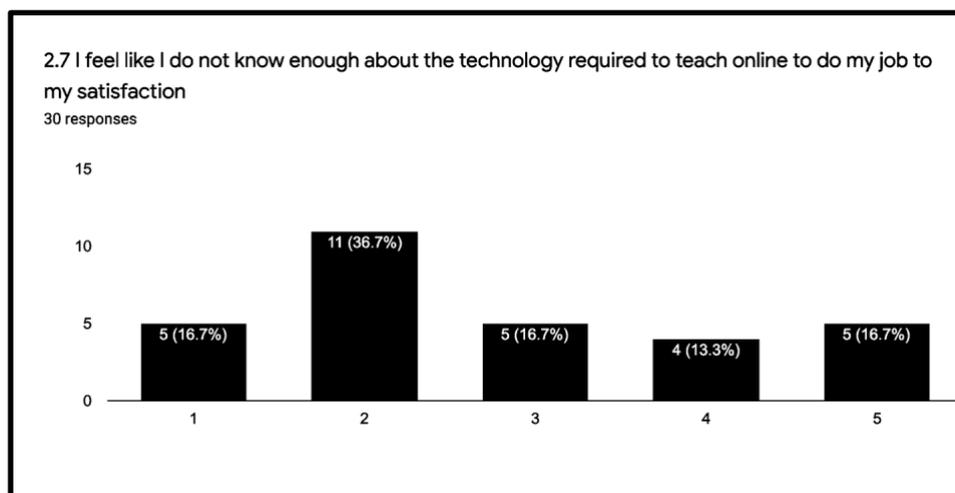


FIGURE 7. Responses to 2.7.

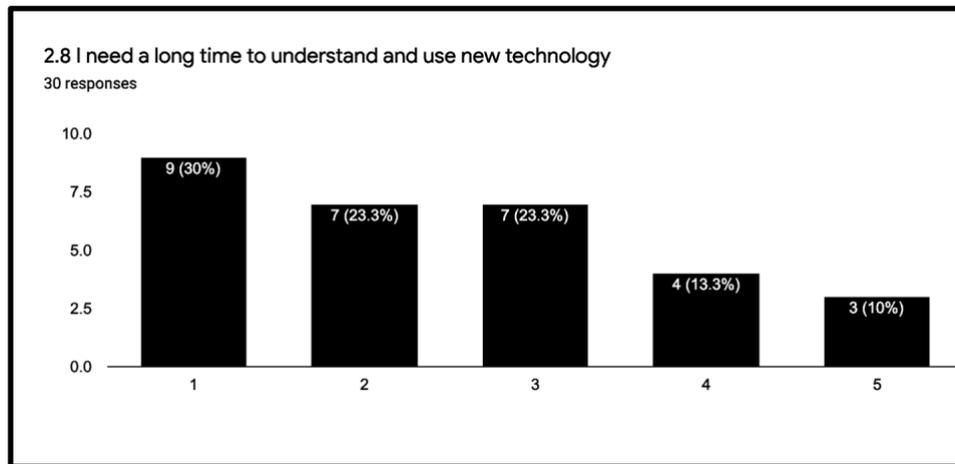


FIGURE 8. Responses to 2.8.

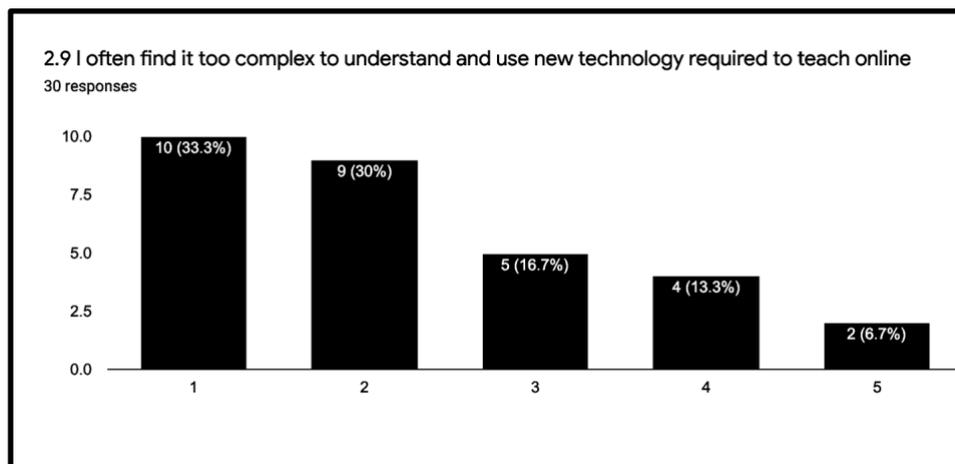


FIGURE 9. Responses to 2.9.

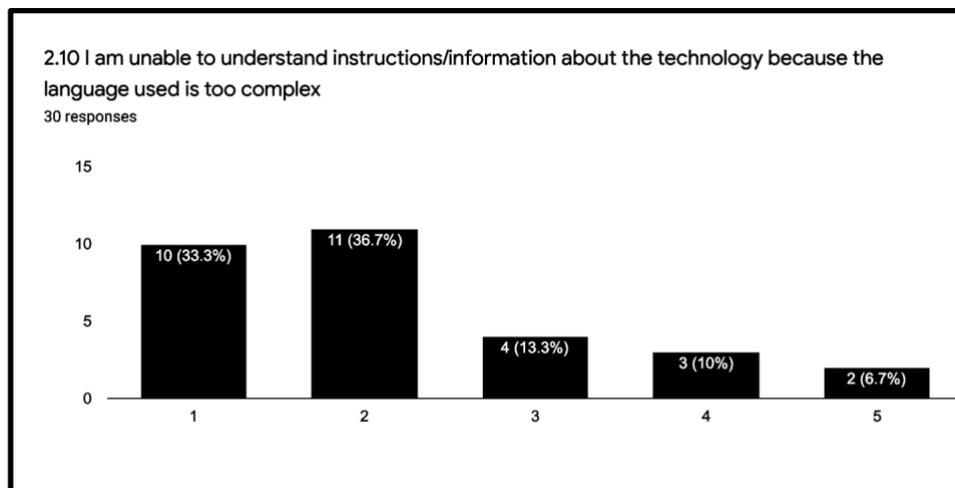


FIGURE 10. Responses to 10.

#### 4.5. Creator: Techno-Uncertainty

The final technostress creator to be examined is 'techno-uncertainty' for which two statements were included: 'There are always new developments in the technology we are required to use to do our jobs', and 'There are constant changes in computer software in our organization'. From the original scale, questions related to hardware and networks were removed as the university does not provide teachers with either of these for online teaching. Responses showed an agreement with the first statement, 2.11, regarding technology, as shown in FIGURE 11 below. There was less agreement with statement 2.12 which explicitly refers to software, as shown in FIGURE 12 below. The high agreement with the first statement, 'There are always new developments in the technology we are required to use to do our jobs', may be due to the changes in instructions regarding the use of technology since the period of online learning. Responses to question 3.1 would support this. For example:

*'Confused/unclear direction from university about what we are allowed to do in order to switch to online learning. For example, we were initially told not to use Word documents as students may not have access (then we were told it was OK)'*

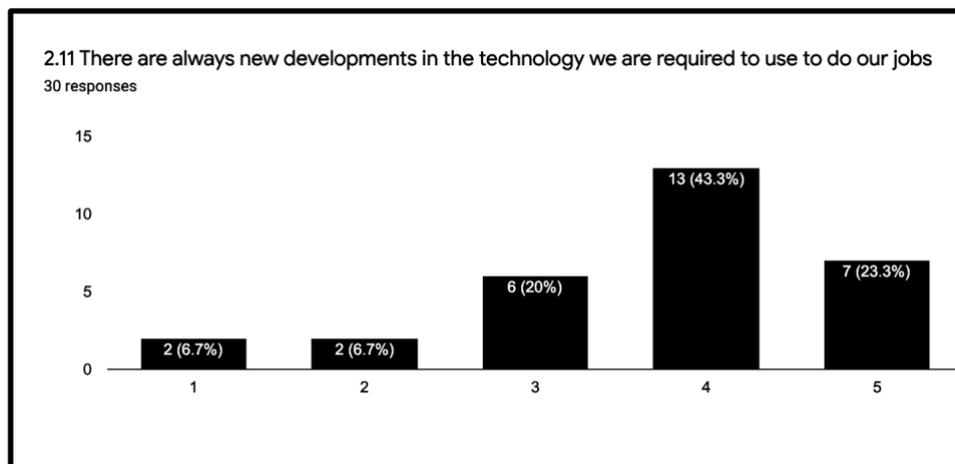


FIGURE 11. Responses to 2.11.

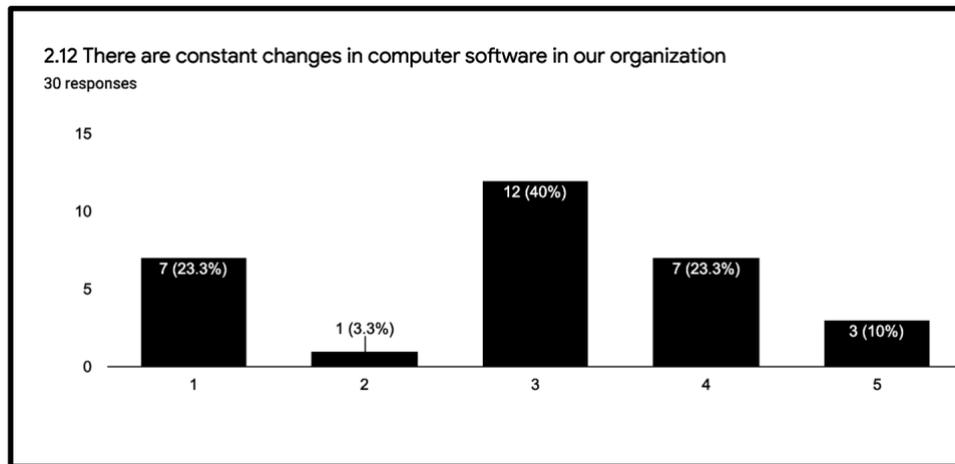


FIGURE 12. Responses to 2.12.

#### 4.6. Inhibitor: Literacy Facilitation

The next four statements relate to 'literacy facilitation', which is an inhibitor of technostress. The four statements which relate to literature facilitation are 'The university encourages knowledge sharing to help deal with new technology', 'The university encourages teamwork in dealing with online teaching related technology problems', 'The university provides sufficient training before the introduction of new technology' and 'The university provides good documentation/instructional videos on using new technology'. Responses to this were quite divided.

If the statements are divided into two subcategories, with statements 2.13 and 2.14 relating to themes of sharing and collaboration and the statements 2.15 and 2.16 relating to themes of institutional training and instructions there is a noticeable division. For the former pair of statements, related to sharing and collaboration, 50% of respondents agreed or agreed strongly, with the first statement and 46% with the second. 14% disagree or strongly disagree with the first statement and 30% with the second. This can be seen in FIGURES 13 and 14 below.

In the responses to question 3.2 regarding strategies and skills the teachers developed to deal with technostress, two specifically mentioned sharing

*'share roles with co-workers'*

*'discussing and sharing with a colleague teaching the same Eigo B<sup>2</sup> helped me feel less stress.'*

Additionally, in the responses to 3.4, regarding if and how the program coordinators helped teachers deal with technostress, sharing was mentioned as follows:

*'They shared information actively.'*

*'Guest Lecturers often share issues, solutions and ideas together so that also reduces the reliance on the Coordinators.'*

For the same question though, there were comments stating the need for even more sharing opportunities:

*'I think it is better to hold more discussions and sharing about teaching the Eigo program more often even through Zoom.'*

A further comment also highlights the importance of these online meetings as beneficial opportunities for sharing:

*'Online meetings helped me to reduce the ICT stress because I feel that I'm not the only person who's left behind.'*

For statements 2.15 and 2.16, related to training and instructions, the responses were more divided, with only 30% agreeing or strongly agreeing that sufficient training was provided by the university and only 44% agreeing or strongly agreeing that good documentation or instructions were provided by the university. These results can be seen in FIGURES 15 and 16 below.

From the responses to the statements pertaining to literature facilitation it is clear that there had not been sufficient action taken by the university to ensure this inhibitor was fully facilitated to the satisfaction of the teachers. The statements with the highest rate of agreement related to knowledge sharing but there was a decline in agreement for statements regarding training and documentation.

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<sup>2</sup> 'Eigo B', or 'Eigo', is the name by which the course is commonly referred to by teachers.

From the responses to questions 3.2 regarding skills and strategies related to coping with technostress and the role in leadership in dealing with technostress there were three comments made about training:

*'All relevant information, instructions, training videos, etc. were clear, succinct, easy to follow.'*

*'The zoom workshops before the semesters were really helpful.'*

*'Yes, by kindly providing so many resources and video tutorials in the first semester, the coordinators greatly reduced the amount of technostress I experienced. The coordinators also regularly offered assistance and provided discussion opportunities.'*

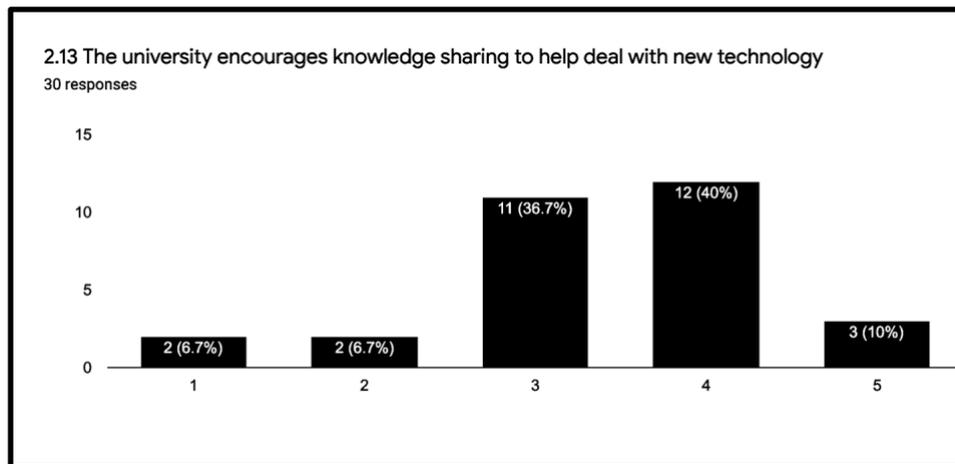


FIGURE 13. Responses to 2.13.

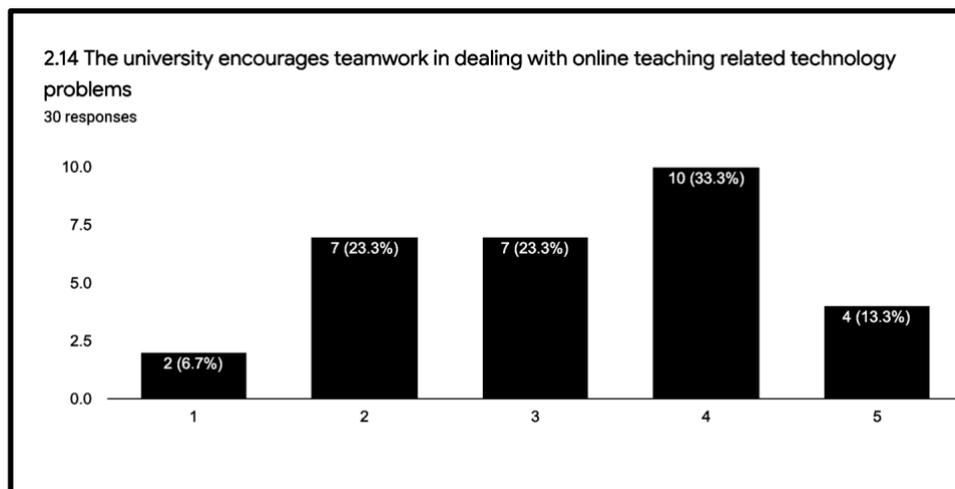


FIGURE 14. Responses to 2.14.

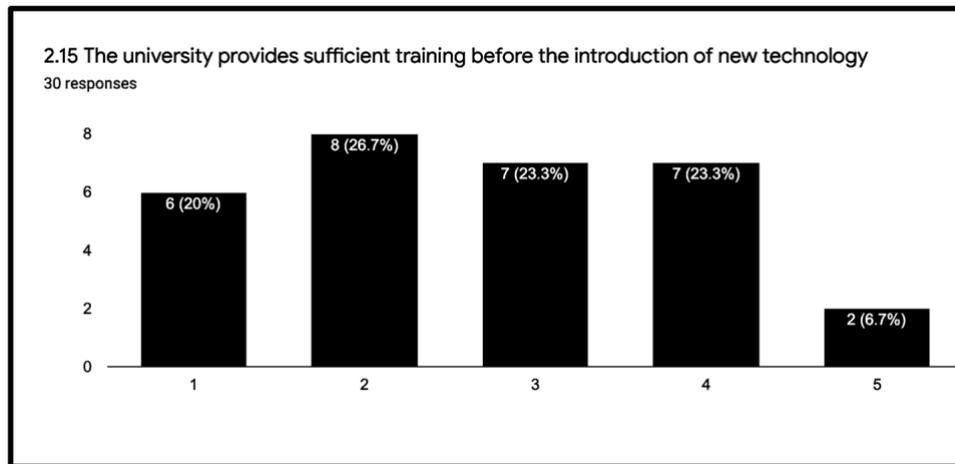


FIGURE 15. Responses to 2.15.

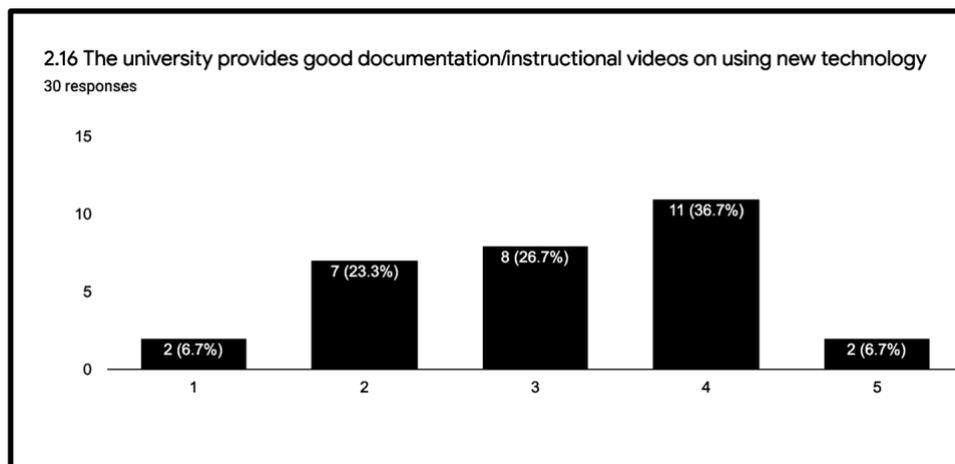


FIGURE 16. Responses to 2.16.

#### 4.7. Inhibitor: Technical Support Provision

The next set of statements in the survey relate to the inhibitor of technical support provision. These statements are 'The support team (course coordinators & IT helpdesk) provides enough assistance with technology', 'The support team (course coordinators & IT helpdesk) is knowledgeable when it comes to questions about technology' and 'The support team (course coordinators & IT helpdesk) is helpful with questions/support needed when using technology'. Respondents showed a high level of agreement with all three statements (as shown in FIGURES 17, 18 and 19), with total agreement or strong agreement being 63%, 77% and 83% respectively. Although this set of questions related to IT Helpdesk services, it was decided to rename this the 'support team' and clarify that as being the both IT Helpdesk and the coordinators, as it is common practice at the university for teachers to contact the coordinators with ITC-related questions and

many issues are resolved by the coordinators without the need for the teacher to contact the Helpdesk.

Many of the responded to questions 3.4 regarding the role of leadership by the program coordinators mention how helpful they have been:

*'Yes, any time I had a question they answered promptly and thoroughly.'*

*'The coordinators have always been very willing to offer any assistance when asked'*

*'They taught me a lot and I always feel their understanding and cooperation.'*

*'Yes, whenever I have questions, I email them, and they get back to me very quickly with spot on answers.'*

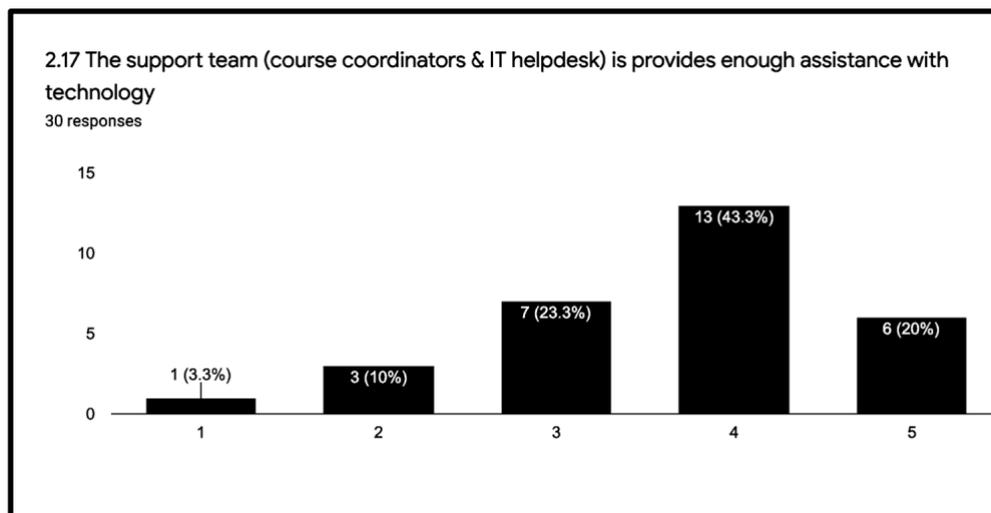


FIGURE 17. Responses to 2.17.

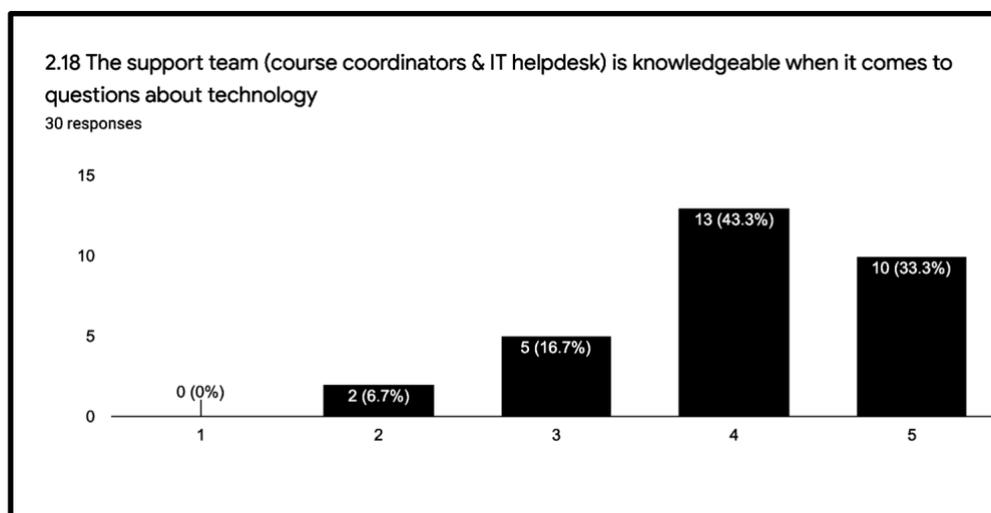


FIGURE 18. Responses to 2.18.

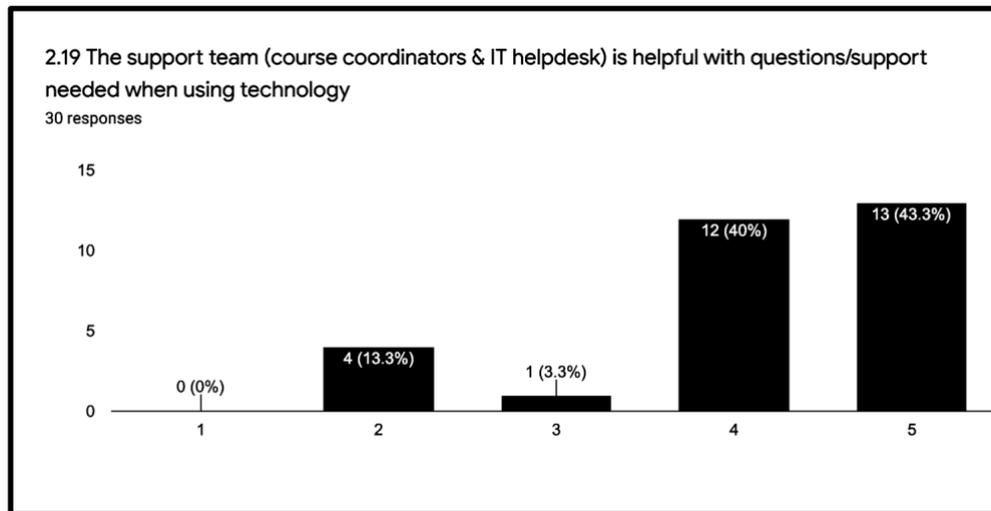


FIGURE 19. Responses to 2.19.

It is evident from the responses to the statements and comments made by the teachers that the inhibitor of Technical Support Facilitation was one of the strengths of the program. Li and Wang (2020) found that this inhibitor is the most impactful in preventing technostress.

#### 4.8. Inhibitor: Involvement Facilitation

The final set of questions relate to the inhibitor involvement facilitation. The statements which relate to this inhibitor are: 'I feel encouraged by the university to try out new technology for online teaching', 'I am acknowledged for using new technology for online teaching' and 'I am consulted before the introduction of new technology for online teaching'.

The responses to statements 2.20 and 2.21 had agreement rates totalling 37% for each, as per FIGURES 20 and 21 below. Only the final statement, 2.22, had high rates of disagreement totalling 42%, as per FIGURE 2.22. It is clear that the presence of this inhibitor is not strongly felt within this program. None of the statements to the open-ended questions suggested strong feelings of being encouraged, acknowledged or consulted.

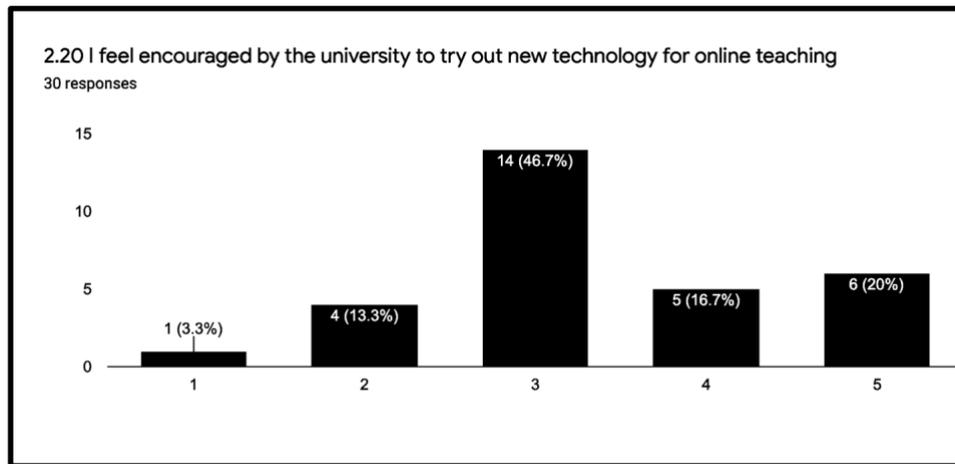


FIGURE 20. Responses to 2.20.

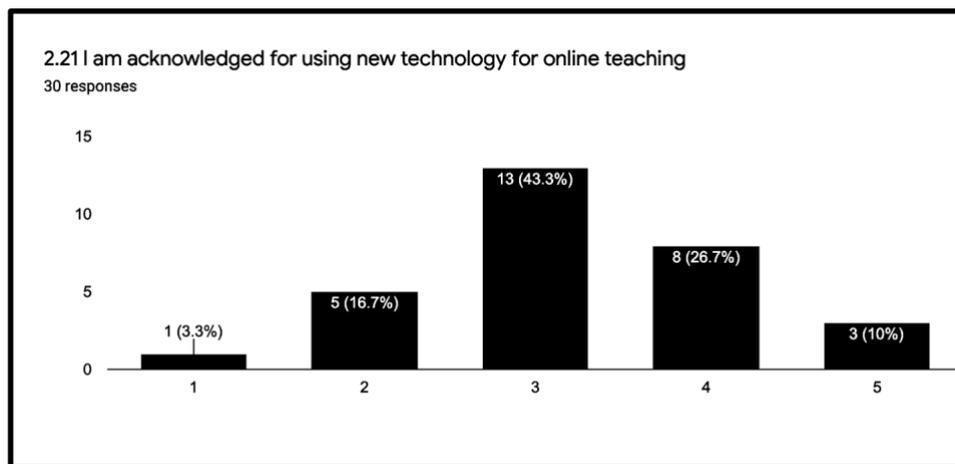


FIGURE 21. Responses to 2.21.

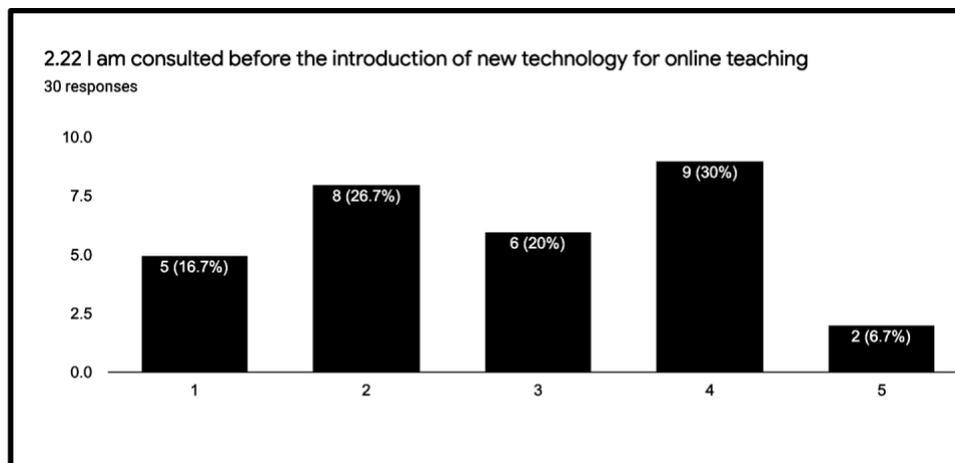


FIGURE 22. Responses to 2.22.

#### 4.9. Teachers' Experiences

The third section of the survey provided four open-ended questions for the teachers to provide insight into their experiences of teaching online, especially in relation to technostress, since the pivot to online teaching at the start of the academic year. These questions were designed to gain insights into whether teachers felt they experienced technostress, what factors contributed to that, what strategies or skills they employed to cope and whether the program coordinators helped teachers deal with technostress.

#### 4.10. Levels of Technostress

Question 3.1 asked 'How has the sudden pivot to online teaching for the Eigo program impacted your technostress levels in your opinion?' and provided a definition of technostress as well. Using content analysis, it can be concluded that responses to this question fell into four categories.

Two of these categories report technostress with one group of teachers reporting declining technostress. In total, these categories reporting technostress total 60%, as 43% of teachers reported technostress and 17% reported technostress that declined. In the first category, where technostress was reported, teachers responding with statements including:

*'The level of my technostress went up rapidly.'*

*'it has as I am unsure if I am doing a good job and a lot of the ICT is not user-friendly.'*

*'Using Manaba has increased my stress levels in terms of not being able to quickly change or accept answers depending on the type of activity. I think in terms of techno-stress it has increased'*

In the second category technostress was reported but declined. In this category teachers responded with statements that reported technostress but mentioned that this reduced as time passed. Example statements included:

*'At first, stress was high, but it's declined over time'*

*'I think at first the stress level was greatly increased, but now it is much easier.'*

*'in the beginning, it was a lot and I felt like I chewed more than I could swallow, but it got better as the semester went on.'*

For the third category which totals 20% of the responses, teachers clearly reported in their responses that they had not experienced any technostress. Statements made to support this include:

*'I have previous experience in online teaching, so I don't feel that it's impacted on me negatively.'*

*'In fact, it made me realize that I am actually quite good at using technology for teaching.'*

*'I was actually excited about learning new technologies. I suspected the shift would occur, and trained myself during the break. I was also already using a lot of the technology that I use now.'*

The final category contains responses which are vague or unclear so it cannot be satisfactorily concluded that these teachers experienced technostress. A total of six responses, equalling 20% belong to this category.

#### **4.11. Factors Contributing to Technostress**

The second question in this section covered factors that contribute to teachers' technostress; 'Technostress can be described as a 'stress phenomenon occurring before, during and after ICT (Internet & Communication Technology) use in work'. Please describe any factors which, in your opinion, cause this type of stress in relation to your role as an English teacher of the Eigo Program'. A number of trends are apparent from examining the answers of those teachers who reported technostress (even if it declined over time) and also from those who gave inconclusive answers. Firstly, several teachers cite technical issues and concerns, as below, as being a source of their technostress, either caused by the hardware or the software. This can be interpreted as technostress created by 'techno-complexity', which is technostress caused by the complex nature of technology (Tarafdar et al., 2007, pp. 314-315). Despite the fact that this creator scored low among teachers in their responses to the statements in section 4.2.3 above, some comments described techno-complexity as follows:

*'I felt that I could eventually overcome misunderstandings, but equipment failure and network restrictions-problems I cannot control without a lot of time.'*

*'Too many problems with my old PC drive me crazy frequently.'*

*'I think the stress related to Eigo teaching is more due to how outdated Manaba is. Other Learning Management Systems (LMS) would have been much more effective in terms of student learning and managing the workload.'*

*'The process of assignments uploading is really time demanding and inconvenient. For me it is the most stressful issue.'*

Further responses to this question related to teachers' comfort using and knowledge of ICT for teaching, with one respondent outlining shortcomings of the university in providing adequate training.

*'I am not adept at using online technology. My past experience has involved direct face-to-face interaction with my students. This is a whole new world.'*

*'I am not familiar with technology so using ICT is really challenging'*

*'Was asked to use Zoom with no training'*

*'LMS requires Excel skills, again no training'*

*'Full-time staff had some but not much LMS training. Part-time staff were given none.'*

Another category of responses related to the increase in time taken to undertake one's job and the consequential increase in time spent using ICT. As the comments below relate to further time being required to complete one's tasks, they can be interpreted as relating to the creator of 'techno-overload', in particular the aspect by which workload is increased as a result of using ICT. This reflects the strong response to the statements for this creator in section 4.2.1 above.

*'I need to prep them in PPT or word document to show them in Zoom lesson or upload into LMS. This time consuming process is stressful.'*

*'We spend a lot more time on computers, so we feel fatigued'*

*'Lack of face-to-face contact with IT staff or teaching colleagues means questions hard to find answers to. Usually have to email which is time consuming'*

*'lack of preparation time, forced to send email to too many students back in a short time, lack of private time to deal with IT matters, spend much less time with my family and take care of my child, lack of sleep'*

The change in workstyle caused by the pivot to online learning was a further factor in causing technostress, in particular the fact that there was a physical distance between student and teacher. Several comments include this point which seems to be a factor in stress experienced:

*'We can't communicate with students and colleagues face to face.'*

*'I fear that I cannot build meaningful relationships and connections with my students while teaching online. I feel that online teaching acts as an additional barrier to the, already difficult, process of gaining trust from students.'*

*'lack of the visual feedback normally available when monitoring students in the classroom*

*'I am worried about the students' understanding of my instructions, materials, and feedback*

*'I haven't been able to properly support them or even grade them fairly because I can only evaluate their work and attitude while I am with them in the same breakout room. To avoid that, I end up giving them fewer pair/group tasks, which does not really agree with my teaching philosophy.'*

Comments regarding the lack of physical proximity were even made by those teachers who responded to say that they suffered no technical stress:

*'I often feel stressed because of difficulties grasping my students' reactions and their level of comprehension.'*

*'One class of students refuses to use their cameras, so this causes stress from isolation.'*

ICT use has been found to create social isolation when one operates virtually (Bondanini et al., 2020, p.3) and can hence affect human relationships.

#### **4.12. Teacher's Skills and Strategies**

The next open-ended question related to which skills and strategies the teachers employed in order to deal with technostress; 'Please describe any coping skills/strategies you may have developed in order to deal with technostress in relation to your role as an English teacher of the Eigo Program.' This question is designed to uncover if teachers have been applying any technostress inhibitors and if so, is this a result of action taken by leadership.

In the case of the inhibitor 'literacy facilitation' which relates to sharing, teamwork and training, three teachers, as below, explicitly mentioned that they shared with colleagues in order to cope with technostress, however it was not stated if this was via channels created by the university such as the online meetings or the sharing forum created for the program.

*'share roles with co-workers'*

*'sharing activities is the easiest and the most beneficial way.'*

*'There is nothing special but discussing and sharing with a colleague teaching the same Eigo B helped me feel less stress.'*

Only one of the respondents mentioned training, having taken some online courses. This was not an inhibitor offered by the university:

*'I took a couple of online courses for online teaching before the term started, which made me feel quite confident before the course started.'*

The remaining inhibitors are 'technical support provision' and 'involvement facilitation' which relate to the role of the IT Helpdesk and support teams (in this case the coordinators) and action taken to encourage, acknowledge and consult teachers in terms of IT use. Only one comment, which relates to the former inhibitor, explicitly related to either of these inhibitors:

*'Read the LMS manual cover-to-cover to try and make sure I knew how it worked'*

*'Spoke to coordinator a lot, because he is far more tech savvy than me'*

Teachers responded in greater numbers to describe skills and strategies they had used which do not relate to any of the inhibitors employed by the university. Several describe strategies which involve amending how they teach in order to suit the online environment such as:

*'I was trying to use the same teaching methodology that had worked for me face to face and was becoming frustrated when it didn't. I tried to think about what would work in this new situation and focus on what we can do instead of what we can't. This includes trying a lot of new things and seeing what works. I found this approach effective and my teaching is going a lot better now.'*

*'At this point, my coping strategies are to do my best as much as possible but at the same time accept that fact, that it will never be as good as face-to-face teaching.'*

*'I have learned to keep things simple, for myself and my students. Simple activities with simple instructions.'*

In these examples, teachers have had to adjust the way that they work to suit working with ICT and these responses reinforce the high number of teachers that agreed with statements pertaining to 'techno-overload' in section 4.2.1 above, in particular statement 2.2 which in turn can be a reason for higher workload as indicated to the high number of agreements to statements 2.1 and 2.3.

A further strategy which respondents described using was managing time, with seven responses including reference to this, in comments such as:

*'I divide my work into shorter time periods in order to reduce time for looking at screen at one time.'*

*'Time management is the greatest strategy to reduce technostress. Having set work hours allows me to have a healthy work-life balance.'*

*'I try to segment work and life as much as possible.'*

In section 4.2.2 above, which discusses the technostress creator 'techno-invasion', the majority of respondents agreed or strongly agreed with statements relating to the presence of this creator since the pivot online. From the responses to this open-ended question, it would seem that there is an awareness of how this change has impacted scheduling and a conscious effort on behalf of several teachers to practice time-management to mitigate against this creator.

Besides those described above, some teachers mentioned maintaining their physical and mental well-being. Ill health can be a symptom in severe cases of technostress (Çoklar, Efiltili and Şahin, 2017, p. 28) therefore self-care is an important strategy to mitigate against technostress.

*'I try to keep up my physical condition. If you do not keep up your health, you cannot carry out your duties as a teacher.'*

*'Scheduling activities when giving the assignments, trying a healthy diet'*

*'I'm just trying to get up for walks, but I honestly don't have enough time between classes. I have purchased a computer stand that will permit me to stand up sometimes.'*

*'Fresh air and some exercise help as do non-work hobbies to wind down with.'*

#### **4.13. Technostress and Leadership**

The final of the open-ended questions in this section relates to the role of leadership, namely the course coordinators; 'Has the leadership of the Eigo program (the coordinators) helped you deal with technostress? Please explain your answer'. This question is designed to understand which actions, if any, taken by the program coordinators were most beneficial in mitigating against

technostress.

In terms of the technostress inhibitor 'literacy facilitation', several teachers provided responses which describe actions taken by the coordinators that describing this inhibitor. A total of ten respondents explicitly mentioned the content for classes which was created by the coordinators as being beneficial such as in the following comments:

*'the fact that they prepared a lot of the LMS assignments for us teachers definitely helped reduce my stress.'*

*'Their activities for manaba (LMS) helped me a lot! without their support, it would have made things worse and I might have left after the first semester.'*

*'Providing the materials has proven extremely helpful for us. Especially for Guest Lecturers who teach so many other courses too.'*

This inhibitor, 'literacy facilitation' includes actions taken to promote sharing knowledge (Li and Wang, 2020) so the above are examples of how leadership successfully employed this. Another aspect of this inhibitor is training. The coordinators provided training materials prior to the start of the academic year and also offered some online meetings to provide some fundamental instruction and answer teachers' questions. A number of responses described how beneficial these were:

*'Online meetings helped me to reduce the ICT stress because I feel that I'm not the only person who's left behind.'*

*'Yes, by kindly providing so many resources and video tutorials in the first semester, the coordinators greatly reduced the amount of technostress I experienced. The coordinators also regularly offered assistance and provided discussion opportunities.'*

*'They were very helpful that they scheduled online meetings several times.'*

The next technostress inhibitor is 'technical support provision'. This inhibitor refers to training, training documentation and how supportive and knowledgeable staff are in ICT-related matters. A number of respondents describe the coordinators as being helpful in this regard:

*'whenever I have questions, I email them and they get back to me very quickly with spot on answers'*

*-'All relevant information, instructions, training videos, etc. were clear, succinct, easy to follow'*

*'The coordinators have always been very willing to offer any assistance when asked but inevitably I feel they are much more familiar with how to deal with problems than I am.'*

The third inhibitor which forms part of this study is 'involvement facilitation', and none of the respondents describe the leadership as taking any actions which pertain to this inhibitor.

Of interest is the fact that some respondents mention that they did not need the support of the leadership as they were able to manage independently. In particular, one respondent was able to articulate how his own team within the university was successfully employing sharing:

*'I've not felt the need to go to the Eigo Coordinators because I'm usually able to deal with tech issues myself or contact the relevant IT staff. Also, Guest Lecturers often share issues, solutions and ideas together so that also reduces the reliance on the coordinators.'*

#### 4.14. Interviews

A total of 14 teachers agreed to take part in follow up interviews, of which 11 responded to follow-up emails to arrange these. The profile of the interviewees is outlined in TABLE 3. below.

TABLE 3. Demographic Distribution of Interview Participants

Category	Gender		Nationality		Position			
	Male	Female	Japanese	Non Japanese	Faculty Members	Part time agency	Part time directly hired	Guest Lecturers
Percentage	73	27	27	73	9	27	27	37

These teachers were interviewed between 11 November 2020 and 01 December 2020. The interviews were conducted and recorded using video conferencing software for social distancing reasons. Following the interviews, the recordings were then transcribed and the transcriptions were coded to identify responses under the themes below:

- Experience of technostress and adjustment
- Impact of pandemic on stress
- Strategies used to mitigate against technostress
- Positive action taken by leadership
- Leadership shortcomings

The coding format selected relates to the thesis research questions

#### 4.15. Experience of Technostress and Adjustment

Teachers were asked to discuss their experience of technostress which was caused by the pivot to online learning through the question 'Do you feel like using ICT as your primary method of teaching, as opposed to teaching in person, caused any increase in technostress? Describe your adjustment process.'

In the responses to this question, the teachers reported feelings of technostress to varying degrees. Comments ranged from not experiencing any stress caused by technology, to initial anxiety that subsided to feelings of needing to quit. Two of the teachers reported low levels of stress and this was because both had extensive experience of using ICT, one already having taught online previously, and the other had experimented extensively with using ICT and had even published on this topic. Both of these teachers however reported feelings of technostress due to not being able to see students and resulting isolation and feelings of discomfort:

*'I feel stressed because I don't see and feel the responses from the students because of that I feel distance, not just the physical distance, but also emotional distance between myself and the students. That gives me stress.'*

*'the biggest stress is just getting students to cooperate. And I think that's maybe the same with an evening class situation. It's just now when they decide not to cooperate, they just, you know, hide themselves. They don't show themselves. And it just makes it more frustrating because you don't know you don't see responses. You don't visually see what they're doing if they're actually listening to you or not. That can be a stress.'*

*'I sometimes feel like stress because I cannot see what are students doing during the classes even if I can see their faces.'*

These feelings of discomfort caused by not being able to see the students and understand their participation levels was similarly described by five of the other nine teachers, with two teachers even resorting to using new teaching techniques as a result; one using gamification and the other as follows:

*'I started to worry about the participation of the students because I cannot watch the students while they are doing pair-work and group-work. So I started to use task-based language teaching because in that approach, they need to discuss lots of things in pairs and they have no time to rest.'*

Other types of technostress which were described by the teachers in their responses to this question can be interpreted as being forms of techno-overload, techno-complexity and techno-invasion. Five teachers described feelings of techno overload such as:

*'I'm spending a lot of time on emails and having to deal with even if you're using Zoom, you might have another document to deal with at the same time. So I think this is extremely mentally tiring to do all these things. And I think this might be the main cause of stress.'*

The other teachers explicitly described their workload increasing with more time being required such as in giving feedback to students. Techno-complexity is described in the responses of one teacher who discussed how the platform provided by the university is complicated, for example:

*'I felt stressed with how to program or whether I programmed the tasks right, for example, and if an error came.'*

This teacher, whose comments can be interpreted as referring to techno-complexity, mentioned a preference for using ICT that he would use usually in the classroom but he was not permitted due to a decision by the university to restrict only to the LMS, stating that:

*'there's definitely been an increase in technostress, but I think it's more so because of the LMS platform that we have to use. And I think because of the limitations of the platform, that's the reason for the technostress, not actually using the technology.'*

No teachers mentioned techno-invasion as being a factor in their technostress apart from one who mentioned that the pivot to online learning and working from home meant that he had lost commuting time and was then readily accessible to his family after, losing that time he had to grade and plan, which can be interpreted as a form of techno-invasion as he is working later at night as a result:

*'The stress of trying to manage my schedule becomes a bit more challenging when I'm at home, OK? I finish class, my son's there and he's demanding attention, so trying to manage the time to actually do the work that has to be done after the class can be challenging. I often find I am often up late at night after the son goes to bed, doing that work that I used to do on the train.'*

In conclusion, from the interviews it can be said that all teachers experienced technostress but to varying degrees, with those who had experience or expertise in online teaching suffering least. The most common creator was the sense of isolation caused by teaching online as it is not possible to see students which also results in insecurity. Several teachers reported techno-overload, one reported techno-invasion. Techno-complexity and techno-uncertainty were not described.

#### **4.16. Impact of Pandemic on Stress**

Teachers were asked to consider the connection between the COVID 19 pandemic situation and their experience of technostress. With the pandemic causing illness, deaths, local lockdowns, event cancellations and economic damage (Koley and Dhole, 2020, p.1) it could be expected that it caused some degree of stress in the teachers. A question was included in the interview in order to encourage teachers to reflect upon whether the pandemic was in any way related to their technostress which was: To what extent do you believe that any stress caused by teaching online was caused by general stress due to the ongoing pandemic situation?

Responses to this varied from four teachers who commented that the pandemic was not a cause of stress to one teacher who commented that it was a major cause of stress. One teacher was unsure. Four teachers reported that there was some stress caused by the pandemic with one commenting that the situation was not as bad in Japan as other countries and another commenting that pandemic-related stress fell in the second semester when the numbers of infections in Japan were lower (Aldrich and Yoshida, 2020, p. 217) . A number of these teachers commented that while they did feel some stress because of the pandemic, most stress was caused by teaching online. One teacher described the situation as below:

*'I would say personally, maybe 70% stress is caused by online teaching and 30% is caused by the pandemic or 80-20. In the summer, we didn't have any classes. and I didn't feel so much stress. I felt some stress or worry about the pandemic or other things, but because we didn't have online classes, I didn't have that same stress'*

Of interest is the fact that one teacher commenting on the pandemic being a major cause of stress was based outside Japan in a country with stricter lockdown laws than Japan.

*'I think if I had to put a number figure on it, I think 80 percent of that stress was probably due to the outside conditions, you know, the pandemic, the stress of being in another country and not really being sure of what's going on in general. So that didn't help.'*

#### **4.17. Strategies Used to Mitigate Against Technostress**

For the research question regarding coping strategies adopted by teachers to avoid technostress, the next interview question was, 'what do you believe you have done successfully in order to adjust to online teaching and using technology as your primary method of delivery?'

In response to this question, a number of teachers described taking steps to change their approach in teaching. This included developing materials suited to online teaching, spending more time to develop clear instructions, thinking more from the student perspective, being stricter or changing one's mindset. In regard to the latter point, the teacher who changed his mindset, this comment highlights

the importance of awareness of the difference between in-class and online teaching:

*'not try to take the old method and use it exactly the same way. And in the new method trying to focus on what I can actually do instead of what I used to do. So trying to manage expectations and thinking about what the limitations are. And I found when I accepted those limitations and thought about it from that perspective, then I could focus on what I could do.'*

This point suggests a need for training teachers in the fundamentals of online teaching, which is something that was not provided by the university, nor were any resources on this topic offered. On the theme of training and learning, four teachers mentioned taking steps to learn and increase their knowledge in order to adjust to online teaching.

*'But what have I done? I've just educated myself. I guess that's the short answer.'*

This shows the role of the technostress inhibitor 'literacy facilitation' which has a role to play in mitigating against technostress.

A further strategy which was adopted by some of the teachers to cope in the adjustment period is that of time management, with three teachers identifying this. One teacher described how he structured his time which may have led to reduced experience of techno-invasion, one of the technostress creators:

*'I started off with, personally, not very good time management at the beginning of the first semester of 2020. And that was contributing a lot more to my stress, so what I found was I really had to look at what I was doing in face to face classes and try to just live my days out that way where I would commit certain hours to preparation, you know, leave it for the day and then come back to it the next day during those hours that I committed to.'*

A number of teachers did not provide very concrete responses to this question, with one even commenting that this was the hardest question to respond to. This may suggest that coping strategies are not something which some of the teachers are aware of and is perhaps something that the leadership of the university or program should introduce and support.

#### 4.18. Positive Action Taken by Leadership

The final pair of questions related to how teachers perceived the role of leadership, both the leadership of the English program (the program coordinators) and the higher-level leadership of the university. Leaders are key sources of support in dealing with employee stress (Vaziri et al.; 2020, p. 1078). The first of these questions explored what positive action leadership took in helping teachers deal with technostress, which is related to the research question ‘according to the teachers’ perceptions, what technostress inhibitors have been provided by the university leadership?’. The teachers were asked in the interview ‘what do you think that the leadership at the university has done successfully to help you adjust to teaching online? By leadership this means the Eigo Coordinators as well as the overall leadership of your department and the university itself.’

The most common response to this question involved the activities that were shared by the coordinators for teachers to use in class. Eight out of the eleven teachers mentioned these directly as per the example below:

*‘the coordinators of the Eigo course have been immensely helpful in terms of definitely reducing that stress that I felt, providing teachers with materials and things that had already been developed from the textbook to be posted online. I saved a lot of time for myself and I mean, I assume a lot of other teachers as well.’*

Providing these activities was partially done to serve as an example of how to format activities for an online platform and as such can be seen as ‘knowledge sharing’ which is one of the features of technostress inhibitor of ‘literacy facilitation’. Sharing was also facilitated through the establishment of an online forum for teachers to share resources and knowledge. This was also mentioned as positive action by one of the teachers. ‘Literacy facilitation’ also includes training and the provision of documentation which were mentioned by several teachers in the interviews. Three teachers mentioning the videos that had been created and another three mentioning the online meetings that included training and opportunities for question and answers. One teacher highlighted the value of the latter, especially the opportunity to share:

*'They provided workshops on Zoom at the beginning of the end of the semester, and that helped me a lot, and it also makes me feel really relieved to see everybody, the other teachers on the screen and just listening to what they're doing and how they're coping make me feel relieved.'*

Another of the technostress inhibitors, that of 'technical support provision' which involves the resources, support and service provided by the technical support team. For this research it has been decided to include the coordinators as part of the technical support team due to the fact that many of the technical related queries from teachers were dealt with by the coordinators directly. Three of the teachers acknowledged the support that was provided by the IT department and a further two commenting on the support from the coordinators such as:

*'that's one way they've helped us, I guess, is they came up with ideas. They come up with ideas to sort of solve problems. I mean, the I.T. department's been pretty, pretty helpful'*

In conclusion, the leadership team has taken positive steps to inhibit technostress among teachers through resource and documentation sharing, support IT services and decisive leadership.

#### **4.19. Leadership Shortcomings**

The final question in the interviews examined once again the role of leadership, but this time from the point of view of what leadership could improve upon. Teachers were asked 'What do you think leadership could start doing/should have done better to help in the adjustment to online teaching?'

Two major themes emerged from the responses to this question. The first being the need for leadership to provide guidance especially in terms of teaching and also rules for students. Six teachers mentioned this in various ways. The university did not provide a code of conduct for online learning for either teachers or students and encouraged a considerate, flexible approach. From the responses it does seem that there was a need for leadership to provide more clarity with one teacher articulating this as follows:

*'More clarity, like a comprehensive list of rules, that's a comprehensive list of rules that the university provides all students. So then teachers don't have to waste time explaining our*

*expectations to students and we don't have to spend time dealing with students who don't want to follow our expectations.'*

Several teachers mentioned the issue of students not using their webcams during online classes and the lack of clear guidelines from leadership on this. As per section 4.3.1 above, this gave rise to a feeling of discomfort and isolation among teachers while conducting synchronous classes.

The second major theme to emerge in the responses to this question was the needs for more opportunities for peer sharing. Four teachers explicitly mentioned this was needed more. As mentioned in relation to the previous point, sharing forms part of the inhibitor 'literacy facilitation' and while there was much sharing from the coordinators in a top-down manner, there were limited opportunities for peer-to-peer sharing. One teacher articulated the benefits of this as follows:

*'I wonder if I can have more regular meetings, once in a month or every two months. Not mandatory, but for any teachers to join. Actually, I want to join a lot to discuss and share our experiences, but it is time I think we also need not just technical support, but the emotional support and to help each other among the teachers as well.'*

Additional points regarding how leadership could have assisted better included the limits placed on technology use and the provision for more of the theories behind online learning. The latter echoes the point made by one of the teachers as described in section 4.3.3 who felt a change in mindset was needed to teach online. Notably, three teachers did not feel like leadership could have done more to assist at this time, highlighting that the sudden pivot to online learning caused by the pandemic situation was unexpected.

## 5. DISCUSSION

### 5.1. Technostress and Technostress Creators

A total of 30 teachers participated in this study. From the responses to both the surveys and the interviews it is clear that the sudden pivot to online learning at the start of the academic year resulted in technostress, albeit to varying degrees. A total of 60% of the teachers responses with comments which indicate some experience of technostress.

Of the creators measured, it is apparent that techno-overload impacted the teachers most, and related statements elicited the highest levels of agreement. With a sudden shift to online learning this could be expected, with teachers forced to reformat how they delivered the classes and assessment. This was reflected in the comments in response to the open-ended questions and by individual teachers during the interviews. Several teachers explicitly commented on how simple tasks such as giving student feedback took much more time and hence more time was needed to complete work. Given the fact that the entire program had been delivered online prior to the academic year, there was a considerable amount of work to be done in order to format the course to the online environment. This result is similar to the study carried out in Italy (Molino et al., 2020, pp. 12–13), also using an amended version of the scale, where techno-overload was found to be the most prevalent creator. This study involved employees from various sectors, including education. It would seem that due to the changes in work habits caused by working online from home, that techno-overload has a significant impact.

Techno-invasion was also reported, albeit not as highly as techno-overload, with the need to spend personal time on keeping up to date with technology eliciting a high agreement. From comments made it is clear that some teachers are cognizant of the impact of teaching online (while being obliged to stay home). Some teachers described in their responses, time management steps that they had taken to structure their work patterns ensuring a healthy balance. A further reason for the lower reported experience of this creator may be a result of time saved due to no longer commuting. Some teachers may find themselves with

more time rather than less. However, similar to the Italian study (Molino et al., 2020, pp. 12–13), this creator was a factor in teachers' technostress.

From the responses to the scale it seemed that techno-complexity was not a main factor contributing to teachers' technostress levels. This is in contrast to a similar study (Christian, Purwanto and Wibowo 2020, pp. 2803–2805) of university teachers' technostress experiences during a period teaching online in Indonesia in 2020 due to COVID-19, where complexity was the main creator. Statements related to the presence of this creator elicited high levels of disagreement, as did the additionally included statement regarding the complexity of language. The latter may be due to the fact that instructions were always provided in English and Japanese so there was no requirement to translate. Several teachers responded to the open-ended questions to suggest that there was some degree of techno-complexity, albeit not to the same level as techno-overload. However, the technology used by the university to teach did not present any major challenges in terms of its usability for online teaching. Teachers were sufficiently technically literate for techno complexity not to be a main contributing factor to their technostress.

The final creator measured in the scale is techno-uncertainty, which is related to uncertainty caused by rapidly changing technology (Ragu-Nathan et al., 2008, p. 418). For this creator, there was a high agreement to the statement related to changing technology and a more even response to the one related to changing software. Since the pivot to online learning in April, there had been no updates to the software required to teach the classes, so the high agreements were not expected. Comments made by teachers suggested the university seemed to lack clarity regarding technology permitted which may have been a cause of this creator. Teachers were forbidden to teach with tools that they frequently used and were obliged to solely use the university LMS.

One creator of technostress not directly measured by the scale is that of the isolation, discomfort and uncertainty that teachers felt due to the physical distance between them by not being in a traditional classroom setting. ICT can create feelings of isolation when used virtually such as this case (Bondanini et al., 2020, p.3). The physical distance between students and teachers led to

barriers in building trust with students, difficulties in understanding student reactions and restrictions on monitoring students' real-time work. As further described in the interviews, this discomfort and stress was particularly exacerbated by students' unwillingness to use webcams during synchronous learning time. This condition is not a result of any of the technostress creators measured on the scale. As teaching languages relies a lot upon person-to-person communication, the pivot to online teaching has greatly changed how these teachers do their jobs. The physical distance from students and the fact that many cannot even see the faces of those they teach has caused a form of technostress caused by isolation.

## **5.2. Technostress Inhibitors**

Technostress inhibitors measured in the study were those of literacy facilitation, technical support facilitation and involvement facilitation. The inhibitors of job satisfaction, organizational commitment and continuance commitment were excluded due to organizational concerns and restrictions.

The first inhibitor, that of literacy facilitation has two components. The first relates to encouraging peer sharing of knowledge and the second relates to the provision of adequate training and instructional content. Teachers felt more strongly that sharing had been facilitated. According to the research, both from the surveys and the interviews, the program coordinators, in their capacity as leaders of the program, have been instrumental in sharing materials for use by teachers and hence it was agreed that this component of this inhibitor was provided. Some teachers also described how discussing and sharing with colleagues assisted in reducing technostress and one interviewee even called for further opportunities to share with peers.

The second component of literacy facilitation relates to the provision of training and related content. Teachers did not agree as strongly that this component was facilitated by the university. Teachers who referenced the training content in their comments described the material that was provided by the program coordinators, and not the higher levels of the university (in the form of general training), which suggests that training related to course, delivered by the program coordinators is

more beneficial. According to Li and Wang (2020), literacy facilitation should be tailored to teachers' needs and should 'respect their time and effort constraints'. Failing to achieve this can cause the literacy facilitation attempts to be a new source of technostress especially for senior teachers. The program coordinators should continue to support teachers by providing these tailored training resources which directly relate to the course content and aims.

The second inhibitor is technical support facilitation, which relates to technical support provided to resolve issues involving ICT (Li and Wang, 2020). In the survey the statements related to this were worded to include the program coordinators as they responded to technical support questions related to the LMS in addition to the university IT staff. According to the research this inhibitor is strong at the university with many of the comments supporting this in reference to the assistance provided by the program coordinators, both in terms of the level of support as well as the willingness to help. This inhibitor may be a cause for the low levels of techno-complexity, as teachers were able to receive support when they had technical questions or issues which did not make the complexity of the technology a main cause of stress.

The final inhibitor is 'involvement facilitation' which is related to the level of engagement of employees in the process of ICT integration (Li and Wang, 2020). This inhibitor was not strongly reported by the teachers. This is likely because of the fact that all the decisions related to ICT are made by the committee of faculty members who run the program. As the pivot to online learning was sudden, it was decided by the university that all teaching should be done via the university LMS. Teachers were not involved in this decision. In addition, there were several guidelines issued by the higher-level management at the university stipulating that certain software applications such as Microsoft Word should not be used, imposing restrictions on teachers. Furthermore, as many of the teachers of this program are part-time and/or are recruited through an agency, it is not common practice to consult them on ICT decisions.

While involvement facilitation acts as an inhibitor, it may be the most difficult to implement effectively. With eighty teachers it is challenging to ensure that teachers are involved in decisions related to ICT selection and integration,

especially in the case of agency-hired teachers and those who do not speak Japanese and may not be able to participate in discussions fully.

### **5.3. Teachers' Coping Strategies**

In the open-ended questions in the survey and during the interviews, teachers were asked to discuss strategies they have developed in order to cope with technostress. Teachers described applying a mix of strategies in dealing with technostress including sharing with colleagues, managing time and reformatting how they teach in order to suit an online environment. Time management emerged as a common strategy for dealing with technostress and this suggests that, either consciously or unconsciously, teachers are aware of how the pivot to online teaching can affect their work-life balance and have taken steps to deal with this.

Another strategy employed by teachers was to approach how they teach classes in order to suit the online environment, with teachers describing various ways of doing so such as creating new materials or simplifying tasks. In responses to the surveys, very few teachers commented on learning more about teaching online or professional development as an effective strategy to mitigate against technostress, although this was mentioned by several teachers in the interview stage. The university should seek out ways to promote knowledge building on online learning as a form of literacy facilitation. Through greater understanding of the fundamentals of teaching online, teachers will be better prepared to offer more effective classes. This could be in the format of workshops which could also promote peer-sharing, which is a strategy already used by some teachers, but as identified in one of the interviews, could be promoted more by the university.

### **5.4. Impact of the Pandemic**

During the interviews, teachers were asked to consider the connection between the COVID-19 pandemic situation and their experience of technostress. From the responses, it is clear that the pandemic situation caused by COVID-19 has resulted in some stress but teaching online has been reported as the main cause of stress during this situation. The only case where pandemic-related stress was

reported high was the case of a teacher based physically overseas, so the situation in Japan, where only a mild lockdown with no penalties was enforced (Yamamoto et al., 2020, p. 2), may be a cause of low pandemic-related stress.

### **5.5. The Role of Leadership**

The role of the program coordinators as a leadership team was key in several aspects which were highlighted in responses from the teachers. The program coordinators facilitated the inhibitors of literacy facilitation through content sharing and bespoke training. Several teachers mentioned how helpful having the class content provided to them from the program coordinators was. As the pivot to online learning was quite swift, the provision of this content allowed teachers to get familiar with using the LMS without the additional burden of creating the content. As teachers are employed to plan and deliver classes, the amount of provided content was reduced by 60% in the second semester. Teachers were deemed to have had sufficient exposure and time to learn how to create content. This put an onus on teachers to create their own content, but this did not elicit comments which indicated that it caused an increase in technostress. Bespoke training content, in the form of instructional videos on creating activities for language learning, was provided. These resources also elicited positive comments from the teachers.

The program coordinators also were actively involved in providing technical support to teachers, alongside the IT department. IT Support Provision was found to be the most prevalent inhibitor among teachers in this research. Being experts in how to use the LMS was an advantage to the program coordinators, and by providing technical support to teachers, rather than directing to the technical support department, this ensured timelier responses. This may also have reduced techno-complexity as teachers were able to receive timely and accurate responses to questions, which could explain why this technostress creator was not reported as high as some of the others.

## 6. CONCLUSIONS AND RECOMMENDATIONS

This study was designed to measure the impact of technostress on a group of university teachers of English at a private university during a period online learning as a result of the COVID-19 crisis in 2020. The study sought to understand the levels of technostress, the main creators and inhibitors and what role leadership played in mitigating against technostress. The study aims to provide the leadership team, namely the program coordinators with recommendations for actions to be implemented to assist teachers in dealing with technostress, or preventing it.

At the time of writing, it has been decided that for the first semester of the new academic year, commencing in April 2021, the English program will be again delivered online. In light of this fact the leadership team of the program could take steps in order to prepare teachers and assist in mitigating against technostress. As institutions have had to focus on adapting their operational models during the pandemic, an opportunity has also been presented to develop strategies to survive and be sustainable in the post-COVID-19 landscape (Dey, Al-Karaghoul and Muhammad, 2020, p. 300). Given the fact that the course content is to remain the same, and the delivery formats will continue to be both via asynchronous (LMS) and synchronous (Zoom), it is not recommended to significantly make major changes to the syllabus at this stage. This will avoid techno-overload which was so highly reported in this study. Teachers can build upon content and methodologies that they employed in this academic year, without the pressure to start over again.

The leadership is urged to provide training and documentation, both on the fundamentals and principles behind online training as well as on technical aspects of delivering online classes. This will boost the confidence of teachers when dealing with ICT as 'individuals with higher computer self-efficacy will more easily adapt to the changes and developments in computer technology' (Shu, Tu and Wang, 2015, p. 927). As professional development related to online teaching is to the benefit of all teachers, not solely English language teachers, this could be facilitated by the higher-level management of the university. Subject specific training, in this case related to the English program can be administered by the

program coordinators in the form of webinars which can also provide opportunities for peer sharing. The bespoke training provided by the coordinators was found to be effective, so should continue.

The online forum for teachers to share content could also be promoted more. Sharing could also be encouraged by establishing voluntary working groups for teachers to share ideas on how best to integrate technology into curriculum design as recommended by Dong et al. (2020, p. 154) as an effective inhibitor of technostress. As well as practical support, this could also provide emotional support. Learning facilitation, in the format of training and peer-to-peer sharing opportunities could continue once students and teachers have returned to campus to promote on-going professional development.

As well as increasing its training offering, the higher-level management of the university could provide more concrete guidelines for best practices while attending online classes. In particular management could promote the use of webcams in class, especially for communication classes, to reduce the sense of isolation and disconnection that teachers have been experiencing while teaching.

The leadership team of the English program, the program coordinators, could continue to support teachers with technical related issues. By increasing the training offered, as mentioned in the first point above, this will increase the likelihood that the teachers will be able to resolve technical issues themselves.

Involvement facilitation has been found to be an effective inhibitor to technostress. To involve such a large group of teachers (especially the many agency teachers) in discussions and integration stages of technology would be challenging. One suggestion would be to invite staff from the IT Department to the aforementioned webinars to discuss any updates or revisions to ICT that may directly impact teachers. This will allow teachers provide feedback and have a sense of involvement.

Finally, the leadership team is urged introduce the teachers to the concept of technostress in order to raise awareness. By educating teachers on technostress, its creators and inhibitors they will be more likely to develop strategies to cope

and as 'leaders' of their own classes be more likely to avoid practices that increase their own students' technostress.

### **6.1. Limitations of the Study**

There are a number of limitations to this study that need to be considered when interpreting the results. Less than 50% of the target sample responded to the survey. Of these teachers who did respond, 36% took part in the follow up interviews. All of these interview candidates were teachers of the Eigo B course which is primarily focused on speaking skills. These classes may be more challenging for teachers to deliver virtually, compared to the A course which is more focussed on reading and grammar skills. Furthermore, the non-Japanese teachers responded in a higher proportion, accounting for 57% of survey respondents despite the fact that they account for 18% of the teachers. There may have been hesitation of some teachers to respond or respond accurately as this researcher is also one of the coordinators of the program and hence is in a leadership role. Finally, as this study was undertaken during the COVID 19 period, teachers may have been impacted by stress due to the global pandemic and also may have been less prepared to teach online.

The survey was an amended version of the Technostress Creators Scale developed by Ragu-Nathan et al (2008, pp. 424-427). As the scale was shortened and amended in order to suit the realities of working at the university as well as teaching online, the results cannot be fully compared with similar studies which employ the rating scale. In addition, the creator techno-insecurity and the inhibitors job satisfaction, organizational commitment and continuance commitment were not measured. A Likert scale was used in the survey. As mentioned previously, there is a higher likelihood that East-Asian respondents will opt for the midpoint (Cohen, Manion and Morrison 2007, p. 325-7), there were only four statements out of 22 for which the midpoint was the most popular response.

The researcher for this thesis is also in a position of leadership and this may have impacted how the respondents answered. Also, the chair of the program sent out an email at the start of the data collection in order to encourage teachers to

participate. This may have impacted willingness to participate and in addition, how teachers responded to questions regarding the role of leadership and technical support provision, which elicited positive comments. Prior to this there had been no opportunity for teachers to provide feedback on leadership in this anonymous format.

## **6.2. Future Research**

This study employed qualitative and quantitative data collection methods, the latter of which was an amended version of a previously published scale to measure technostress creators and inhibitors. Not all creators and inhibitors were measured, as those relating to job satisfaction, security and commitment were omitted. This study could be limited to only the full-time teachers and could include the full version of the scale which would provide insights into the job satisfaction and commitment of employees. In addition, the study, if translated into Japanese, could be extended to all teaching staff, not just English-language teachers.

This study solely focussed on the experience of teachers during a period spent teaching online due to COVID-19. Studies of student experience would also be warranted, as similarly there had been no precedent for online learning prior to the sudden shift caused as a result of the pandemic.

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**APPENDICES****Appendix 1. Survey****Teaching and Technostress Questionnaire**

*The following voluntary questionnaire is intended to collect data regarding the impact that Internet and Communication Technology (ICT) used in your role as an Eigo A or Eigo B (English A or B) teacher has on you.*

*The results will be part of an MBA in Educational Leadership which I am pursuing at Tampere University of Applied Sciences, Finland, and will be available online.*

*Please answer the questions as they relate to the Eigo classes you teach at this university and also consider out of class tasks (planning and administration) when you complete your answers.*

*If you would be willing to be interviewed as part of this research, please include your name and contact e-mail address at the end.*

*All data collected will be handled anonymously for academic research purposes only.*

*The estimated completion time is about 15 minutes.*

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1.1 Please select your gender.

Male            Female

1.2 Please select your nationality.

Japanese      Non-Japanese

1.3 Please select your age range.

22-35            36-55            55+

1.4 What best describes your position at this university?

Permanent faculty member

Guest Lecturer from an affiliated university

Directly hired part time teacher

Agency part time teacher

### **Section Two: Technostress Statements**

*Please respond to the following statements in terms of how they apply to your experience of using ICT in relation to your role as an Eigo A or Eigo B (English A or B) teacher at this university. Please consider both in-class (teaching) and out of class work (planning and administration) when you complete your answers.*

*\* Teaching Online refers to classes you may teach in real-time using video conference technology as well as assignments you provide for students to do at their own pace, for example using Manaba.*

2.1 Teaching online has increased my workload compared to teaching face to face

[Strongly disagree/Disagree/Neither agree nor disagree/Agree/Strongly Agree]

2.2 Teaching online has caused me to change my work habits in order to adapt to new technology

[Strongly disagree/Disagree/Neither agree nor disagree/Agree/Strongly Agree]

2.3 I feel like I now have a higher workload because of the complexity of the technology used to teach online

[Strongly disagree/Disagree/Neither agree nor disagree/Agree/Strongly Agree]

2.4 I feel my personal life has been invaded since the switch to online teaching

[Strongly disagree/Disagree/Neither agree nor disagree/Agree/Strongly Agree]

2.5 I feel that I need to be in touch with the university more frequently due to teaching online

[Strongly disagree/Disagree/Neither agree nor disagree/Agree/Strongly Agree]

2.6 I feel I have to use my free time to keep up to date on technology needed to teach online

[Strongly disagree/Disagree/Neither agree nor disagree/Agree/Strongly Agree]

2.7 I feel like I do not know enough about the technology required to teach online to do my job to my satisfaction

[Strongly disagree/Disagree/Neither agree nor disagree/Agree/Strongly Agree]

2.8 I need a long time to understand and use new technology

[Strongly disagree/Disagree/Neither agree nor disagree/Agree/Strongly Agree]

2.9 I often find it too complex to understand and use new technology required to teach online

[Strongly disagree/Disagree/Neither agree nor disagree/Agree/Strongly Agree]

2.10 I am unable to understand instructions/information about the technology because the language used is too complex

[Strongly disagree/Disagree/Neither agree nor disagree/Agree/Strongly Agree]

2.11 There are always new developments in the technology we are required to use to do our jobs

[Strongly disagree/Disagree/Neither agree nor disagree/Agree/Strongly Agree]

2.12 There are constant changes in computer software in our organization

[Strongly disagree/Disagree/Neither agree nor disagree/Agree/Strongly Agree]

2.13 The university encourages knowledge sharing to help deal with new technology

[Strongly disagree/Disagree/Neither agree nor disagree/Agree/Strongly Agree]

2.14 The university encourages teamwork in dealing with online teaching related technology problems

[Strongly disagree/Disagree/Neither agree nor disagree/Agree/Strongly Agree]

2.15 The university provides sufficient training before the introduction of new technology

[Strongly disagree/Disagree/Neither agree nor disagree/Agree/Strongly Agree]

2.16 The university provides good documentation/instructional videos on using new technology

[Strongly disagree/Disagree/Neither agree nor disagree/Agree/Strongly Agree]

2.17 The support team (course coordinators & IT helpdesk) provides enough assistance with technology

[Strongly disagree/Disagree/Neither agree nor disagree/Agree/Strongly Agree]

2.18 The support team (course coordinators & IT helpdesk) is knowledgeable when it comes to questions about technology

[Strongly disagree/Disagree/Neither agree nor disagree/Agree/Strongly Agree]

2.19 The support team (course coordinators & IT helpdesk) is helpful with questions/support needed when using technology

[Strongly disagree/Disagree/Neither agree nor disagree/Agree/Strongly Agree]

2.20 I feel encouraged by the university to try out new technology for online teaching

[Strongly disagree/Disagree/Neither agree nor disagree/Agree/Strongly Agree]

2.21 I am acknowledged for using new technology for online teaching

[Strongly disagree/Disagree/Neither agree nor disagree/Agree/Strongly Agree]

2.22 I am consulted before the introduction of new technology for online

[Strongly disagree/Disagree/Neither agree nor disagree/Agree/Strongly Agree]

### **Section Three: Your experiences**

3.1 How has the sudden pivot to online teaching for the Eigo program impacted your technostress levels in your opinion? Technostress can be described as a “stress phenomenon occurring before, during and after ICT use in work”.

3.2 Technostress can be described as a “stress phenomenon occurring before, during and after ICT use in work”. Please describe any factors which, in your opinion, cause this type of stress in relation to your role as an English teacher of the Eigo Program.

3.3 Please describe any coping skills/strategies you may have developed in order to deal with technostress in relation to your role as an English teacher of the Eigo Program.

3.4 Has the leadership of the Eigo program (the coordinators) helped you deal with technostress? Please explain your answer.

4.1 I would like to follow up with this research with some interviews in order to gain more insight into your experiences teaching online. Would you be willing to be interviewed as part of the research for this thesis? This should take 20 minutes and will be held in November/early December. If you are willing, then please leave your name and contact details below.

5.1 Please provide your name and contact details and I will follow up regarding the interview.

## Appendix 2. Interview Questions

Thank you very much for completing the survey and agreeing to this follow-up interview.

Before we start, let me tell you a little bit about the interview process. You will be asked seven open-ended questions. Please answer as accurately as you can. Take your time. Consult records if you want. Ask me to clarify if you have any questions about what is wanted. I will only ask these questions, but I may ask you to clarify or for more details. All questions relate to teaching Eigo classes and any administration and planning related to that.

As explained in the consent form, I will be recording this interview and transcribing it in order to use it as data for my research. All data will be securely stored as part of the requirements of my university Tampere University of Applied Sciences.

Please do not consider me as an Eigo coordinator or a colleague for the duration of this interview. As mentioned, all research for my thesis is confidential and anonymous.

### Interview Questions

1. Please describe how you were using Internet and Communication Technology (ICT) to teach your Eigo B classes while teaching on campus prior to the move to online teaching. You can give details of hardware and software you were using.
2. How comfortable would you say you were using technology prior to moving online?
3. Do you feel like using ICT as your primary method of teaching, as opposed to teaching in person, caused any increase in technostress? Describe your adjustment process.

4. To what extent do you believe that any stress caused by teaching online was caused by general stress due to the ongoing pandemic situation?
5. What do you believe you have done successfully in order to adjust to online teaching and using technology as your primary method of delivery?
6. What do you think that the leadership at the university has done successfully to help you adjust to teaching online? By leadership this means the Eigo Coordinators as well as the overall leadership of your department and the university itself.
7. What do you think leadership could start doing/should have done better to help in the adjustment to online teaching?