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How technostress may affect employee performance in educational work environments

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ABSTRACT

Despite there being a proliferation of research into the relationship between educators and work-related stress, there appears to be a lack of research on how institutions respond to this problem. The development of information and communications technology (ICT) has contributed to extra stress (technostress) in the education sector as the need to use technology increases and technostress develops. Therefore, this research aims to explore the concept, role and effects of technostress in educational work environments. The education sector is one of the top three industries where occupational stress is most present in the UK. With potential consequences such as increased turnover and absenteeism, it can create extremely costly implications for institutions. It is important that educational organisations ensure that levels of technostress are minimised as much as possible in order to prevent these outcomes from occurring. An exploratory qualitative research methodology was used involving forty-five interviews with educators. Findings showed different perspectives and approaches to technostress and revealed role ambiguity, technology in the workplace, work-life balance and organisational perspectives and support including understanding turnover intentions as the main focus areas in relation to the current study of technostress in education.

1. Introduction

Stress is defined as a feeling of mental pressure and tension, which can potentially impact every human being during their entire lifespan (Tarafdar et al., 2007; Hansen and Sullivan, 2003). According to Hansen and Sullivan (2003), occupational stress occurs when employees are unable to cope with their roles due to certain pressures that they cannot ignore. Stress can have extremely damaging consequences for both the workers and their organisations; it has the potential to cause physical and mental health problems as well as decrease job satisfaction and motivation which in turn can increase turnover and absenteeism (Gillespie et al., 2001; Narahari and Koneru, 2017). Therefore, occupational stress can have costly consequences for employers. It is, therefore, becoming increasingly important for organisations to provide more attention to the subject in order to prevent these outcomes from occurring.

The phenomenon was found to be particularly prominent within the UK education sector (HSE, 2019) implying that teaching professionals are more affected than those in other industries. This has been supported by studies worldwide where significant relationships between stress and teachers have been identified (Kinman and Jones, 2008). Furthermore, HSE (2019) also identified higher levels of stress in larger organisations, allowing one to infer that stress may be more present in higher education institutions where larger workforces are common. When considering the workplace, stress can be caused by various factors, one of them being technostress. Technostress concerns the ability of the individual to adjust, to be flexible and cope with the changes in information technology (IT) as it is used in the workplace. The development of the IT sector has made it increasingly more difficult for employees to do so. When this happens, the well-being of employees is disrupted, therefore making them unhappy and less productive.

In the educational environment, IT supports teaching and learning but, equally, it could create tensions for staff and support staff (Narahari and Koneru, 2017; Pearson and Moomaw, 2005). Yang et al. (2018) noted that techno-exhaustion in the educational environment can emanate from technostress which can have negative impacts on job satisfaction, employees' retention and overall job performance. Also, technostress has been examined in the work environment where it has

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been shown that an introduction of technology can have both negative and positive impacts. However, there is a scarcity of research regarding technostress in educational settings in general and in UK education settings in particular. This may be related to the lower use of technology in education, at least until recently. It is worth noting that the UK is one of the largest economies in the world with significant investments in research, development and innovation. According to the UK Department for Education (2020), over £2.4 billion is spent on funding UK schools in order for them to improve and expand. Additionally, £34.8 billion was invested in 2017 in the research and development of the country (The Royal Society, 2019). The interesting element of the UK context is that the country urgently needs to retain and attract intelligent minds, including staff and support staff involved in education.

Building on the previous discussion, this study addresses the gap in the literature by connecting the theoretical concept of technostress to staff and support staff in the educational work environment in the UK (Lazarus, 1995, p.5; Tarafdar et al., 2007; Shahsavarani et al., 2015). Yang (2017) reported that stress found amongst Taiwanese kindergarten teachers had a significant effect on their turnover intentions. This relationship was also recognised by Hansen and Sullivan (2003) and Kim and Stoner (2008), implying that stressed employees can go as far as resigning from their jobs, creating a costly process for the business. Therefore, to see how much of an effect occupational stress has on academics, turnover intentions are also explored. Consequently, the aim of this research is to investigate the effects of technostress on employees' performance by considering staff and support staff in the educational work environment in the UK with the following research objectives: (1) to explore the concept and role of technostress in educational environments; (2) to examine whether technostress affects turnover intentions amongst staff and support staff in the educational work environment; and (3) to provide specific suggestions in order to improve how educational providers can manage better their employees' technostress, including how the well-being of staff and support staff in educational work environments could be enhanced.

We also examine the issue of organisational support for technostress within UK universities which was before, minimal to none. By addressing the merits and demerits of various support methods, and recognising the main stressors present in academic occupations, the study provides in-depth insights into the importance of organisational support in relieving stress. The research identifies information regarding technostress for individuals working in the education field by using semi-structured interviews for data collection. Thus, from a practical perspective, this research can facilitate the creation of future strategies and policies to enhance and support educators. As the research will show, due to the rapid development of technologies, technostress must be considered, especially in educational environments considering that the job performance by educators is highly affected by these developments.

The rest of the paper is structured as follows: The following section analyses and reviews the existing literature in order to identify the current understanding and gaps regarding the topic. The next section discusses the research methodology, the design and procedures used. We then describe the findings of the data and provide the discussion of key findings in comparison with the literature review offered in the second section. Finally, we present the conclusion obtained by summarising the key findings, contributions and limitations of the study and suggestions for possible future research.

2. Literature review

In recent decades, an abundance of importance has been placed on human assets in organisations. Mismanagement of these assets has been found to have significant consequences on the workforce, with stress at the forefront (Baptiste, 2008). In fact, stress was found to be a leading cause of work-related ill health in the UK during 2019 (HSE, 2019). In general, stress has been defined by researchers as 'a transaction' that occurs between a person and their surrounding environment, which is evaluated as harmful to the person's wellbeing (Lazarus, 1995, p.5; Tarafdar et al., 2007; Shahsavarani et al., 2015). This evaluation usually occurs when one feels as though they are unable to meet the demands of the environment or situation due to a lack of resources needed to do so (Narahari and Koneru, 2017). When stress arises in a situation, the recipient often forgets any 'knowledge obtained on stress or how to effectively manage it' (Lazarus, 1995, p.6) leading to feelings of anger, frustration and in extreme cases, depression.

According to Hansen and Sullivan (2003), there are three major components of stress. The first is the stressor - this is the event itself which then leads to the second components, the psychological and physiological effects. These involve the mental and physical reactions one has to the stressor such as the feelings of frustration and tensing of the muscles. The levels of strain that both effects cause is then dependent on the third component – the level of appraisal given by the person at hand. This is where individualistic differences come into play as the amount of strain or stress that a situation cause can vary depending on how the person evaluating it feels that they can cope. Thus, stress cannot be identified as an 'objective phenomenon' but instead as 'predominantly subjective in its nature' (Narahari and Koneru, 2017, p.53).

In the workplace, in particular, occupational stress 'involves the employee's active interpretation of his or her objective circumstances' (Narahari and Koneru, 2017, p.53; Shahsavarani et al., 2015). It usually occurs when one is unable to cope with pressures created from their job role because of a 'poor fit between someone's abilities and his/her work requirements' (p.55). This can also stem from other perceived harm caused by the job role such as a poor job evaluation, disapproval from management or other colleagues (Lazarus, 1995) along with an excessive amount of time and energy that is required of them (Hansen and Sullivan, 2003). In the educational environment, ICTs provide teaching and learning support but also create issues such as tensions for staff and support staff (Yang et al., 2018; Brynjolfsson and Hitt, 1996). As the study of Yang et al. (2018) shows, techno-exhaustion in the educational environment caused by technostress has negative impacts on job satisfaction, teachers' retention and their overall job performance.

2.1. Technostress and its role in the work environment

The term technostress is defined as a disease of adaptation caused by an inability to cope with new technologies in a healthy manner (Narahari and Koneru, 2017). In other words, technostress is the negative link between people and technologies and is a result of changes in the workplace due to the introduction and use of ICTs (Jena and Mahanti, 2014). According to Ragu-Nathan et al. (2008), technostress is the negative result of the use of technology and the fear of using ICTs leads to stress, resistance, anxiety and hostility (Wang et al., 2008).

The studies regarding technostress offer insights on different people and from different perspectives. In the study by Ayyagari et al. (2011), the dominant reasons for technostress are workload and job role uncertainty. Therefore, the intensive use of ICT technology may be a factor for technostress. On the other hand, the study by Salanova et al. (2013) underlined that there was a difference between intensive and occasional users of technology, which meant that people experience different levels of technostress based on their experience. Additionally, Shepherd (2004) examined the relation between the use of computers and technostress and showed that the ability of using technology might reduce the level of technostress. With the development of technological devices, technology has been integrated in every field and its use has become a necessity. As a result, employees have been forced to adjust to the introduction and use of ICTs in the workplace. In recent years, universities have introduced ICTs to improve the efficiency and effectiveness of the information provided by their employees which in turn has an impact on their job performance. However, while the introduction and use of technology are beneficial both to students and institutions, it is also true that the rapid changes in teaching and learning have brought a

number of challenges to staff such as technostress and job burnout (Jena and Mahanti, 2014).

This type of stress has impacts on teachers' intentions when using technology and is associated with lower level of job satisfaction, job performance and intentions of resigning (Fudail and Mellar, 2008). Previous findings also indicate that technostress can also be caused by lack of training, lack of social or technological support and lack of time and resources needed to integrate technology (Fudail and Mellar, 2008). Hence, teachers' skills and knowledge regarding the integration and use of technology might not be broad enough to perform their job (Demerouti et al., 2001). Thus, competences in using technology are necessary for teachers to be able to keep a level of well-being. As previously mentioned, on one hand people who have good ICT competences do not necessary face technostress since they have the necessary skills and knowledge. On the other hand, the opposite can occur as teachers may lack the technical competences and are reluctant to use technology in teaching (Ryan and Deci, 2001). Considering the above, teachers' well-being must be considered and analysed as it has impacts on the manner in which they perceive their job and perform their tasks.

2.2. Benefits and drawbacks of technology, technostress and well-being in the educational workplace

The use of technology in today's society is essential as economic growth and development cannot be accomplished without ICTs. The benefits of using technology are increased productivity, efficiency, and space economy (Francis, 2013). On the other hand, previous studies have shown that technology improves lives both from personal and professional level, but it also causes problems as people cannot adapt, cope with or get used to technology. In fact, some studies have identified the following as components of technostress (Tarafdar et al., 2007): techno-overload: use of technology makes people work too much and too fast; techno-invasion: always being connected, no matter the place or time; techno-complexity: situations are too complex, and people need to spend resources and time to keep up with technology; techno-insecurity: people do not feel confident enough to use technology; techno-uncertainty: people are not sure if the technology will remain the same or will need continuous changes and updates. Thus, technostress has an impact on the well-being of people as it causes decreased job satisfaction, organisational commitment and productivity (Ennis, 2005). Equally, dissatisfaction, reduced well-being, emotional exhaustion and low levels of productivity are a few common outcomes of technostress (Narahari and Koneru, 2017; Yang et al., 2018). Nowadays working in an organization is extremely demanding on employees due to the fact they face high levels of workload and pressure to meet their job demands. As evidence has showed, stress has an enormous impact on the well-being of an employee. Cohen and Single (2001) examined a few symptoms of stress and highlighted the following: anxiety and anger; physical symptoms (e.g., blood pressure and muscle tension); changes in long-term behaviour (e.g., starting smoking or drinking); and depression and anxiety.

The introduction and use of technology in education causes stress for teachers as it often creates a demand to learn new things and adapt to new technologies, which requires time and effort that might lead to work overload and time pressure (Syvanen et al., 2016). In other words, teachers have to change the way they work to be able to keep up with the continuous changes and development of technology. Ragu-Nathan et al. (2008) have reported a negative association between technostress and job satisfaction. Job satisfaction is an essential element to the well-being of an individual as it represents the relationship between what one wants from their job and how they perceive it. Additionally, the study by Tarafdar et al. (2007) has shown that fast changing technology can either enhance or reduce the job performance of employees. Low levels of job satisfaction and job performance not only have consequence from a personal point of view but also on the organization itself as it affects the quality of what they offer and the overall productivity (Baptiste, 2008; Narahari and Koneru, 2017; Gillespie et al., 2001).

One important consequence of stress is employee burnout. This is a state of 'extreme physical and psychological exhaustion' (Hansen and Sullivan, 2003, p.613), and occurs when problems, such as workload, are unrelenting. It was originally a term introduced by Maslach et al. (1986) to refer to extreme emotions felt by workers dealing with emotionally demanding individuals. Outcomes of this emotional experience have been linked to substance abuse, mental illness and in extreme cases, suicide (Cass et al., 2016). The organization is then also harmed in terms of lower work performance and high levels of absenteeism as well as turnover (Hansen and Sullivan, 2003).

Another significant consequence for organisations is often increased turnover, as indicated above. Yang et al. (2018) concluded that stress had 'a positive indirect effect on turnover intention when studying its role amongst Taiwanese kindergarten teachers. This idea is further supported by Kim and Stoner's study (2008), which implied that burnout was a mediator between a social worker's relationship with role stress and resignation intentions; the level of one's role stress was linked to the level of burnout experienced and higher levels of both led to increased intentions to resign. Considering the above, it becomes obvious that technostress has a tremendous impact on someone's well-being. On the other hand, numerous research studies (Ayyagari, 2012; Ragu-Nathan et al., 2008; Tarafdar et al., 2007) on job satisfaction and technostress demonstrated a positive association between these two elements owing to the organisational commitment towards supporting their employees.

To summarise, the literature review indicated that prior studies on technostress were predominantly focused on technostress stressors, impacts of technostress, and individual and technology characteristics that influence technostress. Much of the prior research in technostress has examined the work environment and have demonstrated that the introduction of technology can have both negative and positive impacts. The number of studies regarding technostress in the educational environment are low, and almost non-existent in the UK. Reasons behind this might be that the use of technology in education is fairly low compared to its personal use. Although online courses have been available since 1995, only during the past decade have they become more relevant and have received financial resources (Booker et al., 2014). Nevertheless, the UK educational environment will be an excellent choice to examine the above considering its key, premier role in the global education system, its major education brand attracting a significant share of international students, its well-established quality education-related processes which are followed by other national educational environments and its extremely powerful research which drives innovation and entrepreneurship at global scale (British Council, 2012). The above elements provide key differentiators for the UK educational environment and justify our rationale to focus on it.

3. Research methodology

This study aims to evaluate the impact of technostress on the performance of staff and support staff in UK higher education institutions. A qualitative based approach is followed to gain in-depth responses and to permit the uncovering of alternative explanations. A thematic analysis is then administered, ensuring that key themes were recognised, and the questions were answered efficiently (Bryman, 2016). The chosen data collection method is semi-structured interviews, which are conducted in the later part of 2021. This enables us to tailor the pre-defined questions based on the responses given, ensuring the research objectives are accomplished thoroughly (Corbin and Strauss, 2015). Qualitative research produces findings with the aim of comprehending the world from the perspectives of the participants and takes into consideration and understands the opinions of participants according to their experiences. For this reason, the participants can talk openly about their experiences covering the questions and objectives of this research (Robson, 2002).

Interviews are highly favourable when pursuing qualitative research,

enabling in-depth discussions on the topic being investigated (Robson, 2002). Adopting an exploratory study to establish a relationship between two variables can be done through the use of semi-structured interviews (Corbin and Strauss, 2015). This method enables the researchers to vary the questions depending on the flow of the conversation and responses in order to delve into the topic as appropriate, ensuring the aims and objectives are fulfilled. Due to external circumstances (Covid-19 pandemic) the interviews were conducted via Microsoft Teams to ensure safety of all the participants. Microsoft Teams interviews enabled the researchers to make contact with each of the respondents, allowing accurate interpretation of the discussions made through the use of body language analysis. Owing to using individual interviews, it was possible for the participants to openly talk about how they feel regarding technostress and their professions (Bryman and Belll, 2015). In total, we conducted forty-five interviews with staff and support staff in the educational work environment.

For the purposes of this study, an academic was defined as a teaching fellow, lecturer or professor. Participants were also required to be working in their position on a full-time basis of at least 40 h a week. This sample was deemed as a good fit for the study as all participants were then full-time working academics and support staff at higher education institutions within the UK. To ensure these conditions are met, three screening questions were included in the survey. A total of sixty-five academics and support staff were approached via email, resulting in a total of forty-five responses. Of these, eighteen were female and twenty-seven were male. The sample size was greater than expected, and of a sufficient level according to Guest et al. (2006), who implied that 12 participants were sufficient to reach data saturation, provided that participants held a 'certain degree of expertise about the domain of inquiry' (p.74). However, qualitative data has its limitations, as a smaller sample size is less representative than a quantitative data collection method and makes it impossible to identify precise correlations.

During the process of data transcribing, the researchers become familiar with coding the key dimensions and facts (Bryman and Burgess, 2002). After the data were categorised into themes, patterns and relationships between categories and themes were identified for later comparisons with those mentioned in the literature survey section. Finally, the data were interpreted as a whole to address the questions and objectives of this research (Bryman and Burgess, 2002).

To interpret the data, a thematic analysis technique was applied using NVivo 12 software. This technique required the identification of key themes and patterns in qualitative data by implementing a coding system created by the researcher. Identified themes were then reviewed and defined further, before being used to answer the research questions that were outlined previously (Bryman, 2016). Thematic analysis was, therefore, most appropriate as theme identification allowed conclusions to be drawn about the common causes of technostress as well as relevant perceptions and consequences. Bazeley (2013) suggests that research can be deemed vague if each theme's importance or relation to another is not thoroughly justified or recognised. Hence it was essential that the data analysis detailed each theme's significance and how they related to the existing literature previously discussed in the Literature review.

Qualitative research has been criticised with regards to validity and reliability due to the lack of rigidity in the methodology, researcher bias and findings predominately revolving around personal opinions and experiences. In order to ensure full creditability of the data generated and the research as a whole, we endeavoured to keep a full record of all the data. Furthermore, the trustworthiness of a research project relies on essential measures used to evaluate it such as reliability, validity and replication and, in the case of qualitative research, the relevance of these measures can be debatable (Bryman, 2016). Thus, an alternative approach was proposed by Lincoln and Guba (1986), which is based on other measures: credibility, transferability, dependability and conformability. Therefore, this research will follow Lincoln and Guba's (1986) approach to ensure the trustworthiness of the research in terms of the measures outlined above.

4. Findings

4.1. The concept of technostress in the educational work environment

In this section, we present findings of the study with regard to the concept of technostress in education. The themes derived from the interviews are the following: role ambiguity, technology, work-life balance, and organisational perspective and support. Codes and categories are depicted in Appendix I with quotes from the participants. Furthermore, the themes are described in detail in the subsections that follow.

For example, the workload was the most common stressor, with many participants labelling it as the main cause. As it was stated:

> "I face a substantial amount of stress during certain times of the year when we're expected to teach and mark many academic papers….I want students to do well and therefore devote extra office hours to support them but this is hard when I have other work to complete."

A few participants considered publishing their research as another stressor:

> "It is very stressful trying to publish my own research amongst other tasks because so much time and work goes into it and the risk of it not being published at all is always a concern."

4.2. Role ambiguity

One of the most common themes emerged from the interviews was the issue of role ambiguity. When first asked if they are aware of what is expected from them, most participants were sure of what they need to do in their profession. When asked to discuss a typical workday, the uncertainty of what their role means became obvious, as described by a participant:

> "The role was not that well defined when I started but I think over time I have a clear idea what the role is now based on the needs within the school that I work. You kind of figure out what support to provide, what it means, the day-to-day activities but my initial reflection was that the role was poorly defined. A lot of academic roles have generic job description so you don't always get a clear idea of what you should do. You do figure that over time and it becomes clearer."

Additionally, a consequence of role ambiguity emerged from the interviews as most of them described lack of time to handle their various activities and a necessity in taking part, as described by another participant:

> "I have to volunteer for a number of activities which is enjoyable but to some extent I don't have any time allocated to do them. Now I feel that the university gives me enough time because the workload model is such that you have clear days but in essence there is no allocated time to do these types of activities, to be a national champion. I do a lot of work with the ICAEW (Institute of Chartered Accountants in England and Wales) and that means that I am away from campus 30 days a year in London on a variety of work and have to engage, which means I have less time which makes me less relaxed. I also take part in various student activities after the work hours and again that has an impact on my time."

4.3. Technology

Nowadays, the use of technology in the work environment is inevitable and necessary for the growth of an organization. Hence, having the ability to use technology is an important aspect when it comes to using it as an educator. This is explained by a participant:

"There is some resistance always in using technology and you have to learn new things. They say we need change, and they make changes but some of my colleagues don't want changes (for example, recently there was an issue of adopting e-assessment via cloud computing). Every new thing is a challenge that you have to face and cope with and move on with."

Learning how to use technology properly has a great impact on the life of an educator and their performance; as explained by a participant, resilience and digital literacy are essential:

"Over the years you kind of gain some technological resilience and that comes with experience; not being phased if something happens. Not putting too much pressure on yourself, being kind to yourself and understanding it is not your mistake if technology fails also helps as we have to think of finding a solution to it instead of being so hard on us. Building resilience and a digital literacy over time is important. I do feel a bit better and more relaxed now about issues regarding technology (e.g. now regularly use email and teaching platforms) then I was 10 years ago and manage to work around it."

4.4. Work-life balance

A participant spoke of the benefits of flexible working. The organization offers 'relatively flexible working place hours'. She expanded on this, explaining that:

"This has personally reduced my stress levels both physically and financially as it allows me to fulfil my roles as a lecturer and as a parent."

A good work-life balance is an important aspect of a healthy work environment and is essential as it helps reduce stress and prevent burnout in the workplace. This is explained by some participants as they manage their life by prioritising:

"If I can't manage my workload or if things are piling up, I would just have to prioritise and make sure that I either cut back on one particular element or just don't succeed in another element. In other words, you have to manage the stress because otherwise you cannot manage your family life."

The majority of the participants found prioritising difficult due to the lack of boundaries in the workplace; they describe having to work long hours and put their private life on hold in order to be able to work properly.

4.5. Impact of technostress on staff and support staff in education

A few participants noted that the available services were not well promoted, leading to a lack of knowledge about them. Although having never sought it, it was felt that 'more awareness' would be helpful:

"Just knowing what's there would help me feel able to manage my stress more at the most difficult times of the year... this will further decrease the stigma around mental health."

They believed line managers could provide more support too. They provided similar views on 'actively monitoring' stress levels:

"They could seek on a daily basis to identify stressors for every individual member and then seek (where possible) to remove them. This is standard in various work systems. We don't do it. We don't know how stressed anyone is."

It was highlighted that technostress has a great impact on individuals as the use of technology is necessary and essential in every field. For this reason, the following themes, which derived from the interviews, will be described in the subsections below: effects on turnover, managing technology, managing technostress, and organisational perspective and approach (see Fig. 1).

4.6. Effects on turnover

All participants stated that overall, they do not agree with the question concerning turnover intentions. Eight strongly disagreed. A common reason preventing them was the 'gratification' of 'being an educator'. For example:

"The level of technostress that I feel is perfectly normal… The overall rewarding aspects like helping my students succeed are what helps me to know that I love it. If this changes that will be what comes into consideration, not stress".

This was supported by another interviewee, who said that his role 'keeps him going and feel alive'. Two academics even acknowledged that most of the stress is 'self-inflicted', driven by their 'passion for the job'. The remaining participants, however, expressed occasional agreement. One interviewee shared that although she partially agreed with the question about turnover intention resulting from technostress, she did not resign due to the 'many fulfilling and enjoyable aspects' of her job, but also because she believed that it wouldn't be 'much different with another employer'. Another interviewee shared that 'there have certainly been high-stress scenarios' that nearly reached 'breaking point' in which 'further resources to help would've been extremely useful'. Another interviewee added that 'when the workload builds up', sometimes she 'can't see how to get through and it feels like a break from the job is needed'. However, ultimately all refrain from doing so due to their 'love' for their occupation.

4.7. Managing technology

When taking into account their individual problems when using technology, the participants reported different issues. Firstly, a participant explained that lack of time is an issue that creates a great amount of stress for them:

"For me, teaching and delivering can be quite stressful because you want to know you are well prepared and in a good mental state to deliver a workshop and for me that involves having some time prior to the seminars to get the room ready and prepare all the resources and materials and technology, think about what to do in the session."

Secondly, the pressure on education to improve and develop continuously has an impact on the well-being of educators and makes them stressed, as described by another participant:

"Yes, I think so and it is becoming more so with the pressures now. I think in general there is a lot of pressure on education to do more than just lectures and try new things and technologies."

Thirdly, the majority of the participants feel that technical issues such as technology not working as intended creates high levels of stress; one participant explained it:

"Of course, when technology does not operate as planned then it is a major area of stress as I don't have lecture notes or anything to support me. When Blackboard or the computer don't work in a lecture space, I find that harder to deal with."

4.8. Managing technostress

Human factors such as emotions, can have a great impact on the quality of work and employees' performance as mentioned in the Literature review section. One participant described this aspect when talking about the approach to managing technostress:

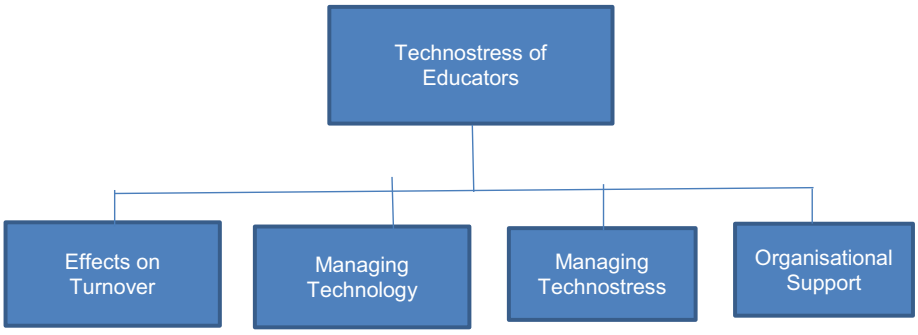


Fig. 1. Technostress of educators.

"I do get anxiety when starting using something new but once I learned it, I master it. Sometimes if something annoys me, I'll stop using it and I am still learning."

This aspect was also underlined by another participant:

"Some people will try it first and if it doesn't work, they'll go; But I prefer to give technology more chances and see if I can get it to work."

On the other hand, one participant explained that they do not consider technostress or stress related to the workplace that relevant to their life:

"I do not consider levels of stress at work something that I should be prioritising and when it comes to it, stress in my personal life e.g., regarding my family is more relevant to me."

"Technostress does not affect my job performance as I like using it. Most of the time, technology enables me to work faster, better and more efficiently."

4.9. Organisational perspective and approach

As discussed in the Literature review section, job performance not only has consequences from a personal point of view but also on the organization itself as it affects the quality of what is offered and overall productivity. When it comes to considering the organisational perspective and approach of an organization, common themes emerged: uncertainty, lack of organization and information. A participant explained that:

"I don't think they do offer any type of training."

"Well, theoretically if I dug around somewhere, I will probably find some training on different things. I guess there is training somewhere; you can understand from my voice that the training is probably not well advertised or I either missed it."

The reason behind this, is explained by another participant:

"My general impression is that the technology is there, but people don't necessarily have the courage to use it that much, and people have to be proactive and look for what they need. I think that often colleagues in other part of the university are not always aware of what's available for them to use in their teaching."

4.10. Improvement strategies

Participants were asked to suggest improvements to the approach their organization is taking when it comes to dealing with technostress and helping their employees. One participant suggested investments and minimum standards:

"Investing money into staff to deliver high quality online resources is essential for the future as I would like to see staff time be used in a valuable manner."

"I would like us to be a bit more corporate in our approach as a university."

Other participants also suggested that the organization should provide training:

"Provide a lot training. Different people need different levels of training and sometimes I prefer seeing how do to something, but others might like reading it. Mentoring could also help especially if you have a senior mentor using the technologies we have who can also mentor us on using technologies and I do it with my colleagues."

"We encourage people to use different technologies when teaching and we run workshops for staff to showcase different types of technology."

One participant also suggested going further into the problem and considering physiological aspects of technostress:

"It would be interesting to consider the social stigma that someone might feel if they don't understand technology and yet they are surrounded by others that do."

5. Discussion

The literature review brands stress as a common reaction within the workplace, particularly in education, as HSE (2019) named the sector as one of the top three whereby stress is most present. The results corroborate this, as all participants recited their personal stressful experiences whilst working as an educator. By describing it as 'commonplace' and something that one cannot 'ignore', stress can inferably be overpowering and inescapable within this role.

5.1. Technostress: role in education and impact on staff

The main focus areas of the role of technostress in education are role ambiguity, technology in the workplace, work-life balance, turnover intentions, and personal and organisational perspectives. We discuss them in more detail below.

5.2. Role ambiguity

Role ambiguity is a relevant issue as it creates employee distress when responsibilities and boundaries are not well defined. The findings of the study revealed that there is a lack of structure and organization for what is expected from educators which has great impact on their life. In agreement to that, Ayyagari et al. (2011) explained that role ambiguity puts pressure on employees as they do not have the necessary knowledge on how they should perform their job which leads to situation of

continuous stress. In our study, the main reasons behind technostress are workload and job role uncertainty. In fact, these aspects have been mentioned by the majority of the participants when discussing why they feel stressed when using technology.

5.3. Technology in the workplace

The use of technology in today's society is essential as technology has been integrated in every field. As a consequence, technology has become a prerequisite necessary for the growth of an organization and its employees. According to Yang et al. (2018), due to the continuous changes and investments in education, teaching competences have changed, and educators have to keep up with the advent of technology. In addition, the findings of this research discovered that having the ability to use technology is important for an educator and an on-going issue related to this matter is the necessity to always be able to overcome and adapt to the continuous changes in technology. Our findings further highlighted the significance of the challenges brought using ICTs in the workplace as many find using them stressful. Overall, many of the participants mentioned that the issues they face when using technology are the following: not being able to be up to date with technology, the unknown aspects of new technologies and the complexity of them. Particularly, people who cannot adapt or get used to technology have problems in terms of techno- complexity, −insecurity, −uncertainty and -overload. On this note, Fudail and Mellar's (2008) study showed that when technology is not used effectively, instead of facilitating educators, it has great impact on their well-being.

On the other hand, this research also showed that many educators take into account the complexity and challenges that they might face due to technostress and yet consider technology as an enabler as it helps them perform better. In fact, as we show, technology provides benefits to its users, such as increased productivity, efficiency and reduction of routine. In addition, when used properly it also provides an increased level of productivity and satisfaction, an improved organisational culture and image and reputation for the organization as a whole (Ryan and Deci, 2001).

5.4. Work-life balance

Research has shown that various human factors, such as emotions, can have a great impact on the quality of personal and work life of employees (Jena and Mahanti, 2014; Ryan and Deci, 2001). As we show, the well-being of individuals is not only essential from a personal perspective but also from an organisational one as it can provide long-term benefits such as increased productivity and morale, reduced risk of illness and overall a better work environment and climate. Additionally, lack of boundaries and long hours were also mentioned as having an impact on educators. A great emphasis was also given to the schedule of educators as being hectic. Jena and Mahanti (2014) had earlier highlighted that although the introduction of ICTs in education is beneficial, it is also true that the fast changes put a lot of pressure on educators to develop their skills and continue to maintain their high-level performance.

5.5. Technostress: effects on staff in education in the UK

As evident from the findings and results, individual problems, personal and organisational perspectives and approaches must be taken into account in order to be able to analyse the effects on staff in education in the UK.

5.6. The effects on turnover intentions amongst staff and support staff

Findings in this department largely contrasted with those reported by Narahari and Koneru (2017) who implied that increased turnover intentions were a significant consequence of occupational stress. Yang (2017) also found a positive relationship between these variables in Taiwanese kindergarten teachers, suggesting it was present amongst educators. In this study, however, findings suggested that although technostress is commonplace in their occupations, academics and support staff did not believe this affected their decisions to resign. Whilst there was some indication that this was occasionally possible, the passion and enjoyment that came with their roles overtook it. This is in contrast with Yang's results, and it could be due to the gratification involved with helping students further their academic careers, which is likely higher when students are adults compared to infants.

On the other hand, one participant stated that he refrained from leaving because the effects of stress within his role would be indifferent regardless of what institution he worked for. This implies that occupational stress amongst academics is largely the same throughout UK Universities and so academics may instead feel that there is no point in switching between institutions. This is further supported by the majority of participants also believing that technostress felt in their current jobs was no different from their previous places of work.

5.7. Managing technology

Technostress in educators is extremely relevant owing to the use of technology in education. Previous studies have indicated that technostress can be caused by many other elements, such as the need of training, lack of support, extra time and resources (Fudail and Mellar, 2008). In fact, the findings revealed that the main individual problems when it comes to technostress are lack of time, pressure of improvement and development, and technical issues. The majority of the participants expressed a lack of time to be able to learn existing technologies and to keep up with new updates. For instance, many educators have to be well prepared to deliver their information and at the same time to be able to handle all resources and technology involved in their task. Hence, according to Syvanen et al. (2016) many educators have to face work overload and time pressure to be able to adapt to the continuous changes and development of technology.

Additionally, our findings showed another aspect of technostress related to technical issues. An area of major stress for educators is when technology does not operate as planned and fails. Ryan and Deci (2001) had earlier highlighted that this is caused by a lack of technical competences and reluctancy to use technology. These issues were also underlined by many participants as the main problems of technology in education.

5.8. Organisational perspective and approach

Prior research shows that technostress has direct negative effects on employee performance and in turn, affects the organization too. According to Narahari and Koneru (2017), the consequences of occupational stress can be grouped at individual and organisational levels. The individual level includes ‘unwanted feelings and behaviours’ such as job dissatisfaction, lowered motivation and morale as well as higher turnover intentions felt by the employee (p.57). Also included on this level are the negative effects stress has on one's physical and mental health such as increased blood pressure and insomnia, along with depression, boredom and emotional fatigue. These can have a significant impact on the employer as they are likely to cause problems at the organisational level. Such symptoms include performance and productivity losses and lower quality products/services which can lead to damages to the company's reputation. This, as previously stated, can be extremely costly in terms of reduced productivity as well as costs involved with labour turnover. In certain cases, one employee's lowered work standards can add to the stress of their colleagues, leading to a ‘destructive cycle of increasing stress and poor performance’ (Gillespie et al., 2001, p.65).

The findings of this study suggest that the influence of the organization and its approach in helping their employees with dealing with technostress is extremely relevant. Uncertainty and lack of organization

and information were the main areas revealed by the participants. The majority were not sure if training is present in their organization. As shown by Fudail and Mellar (2008), there is a need to train and support employees in using and integrating technology as it helps improve the life of the employees and also the organization as a whole.

The introduction and use of technology in education causes stress as it creates a demand to learn new things and adapt to new technologies, which requires time and effort that might lead to work overload and time pressure (Syvanen et al., 2016). Our research has shown that technostress has negative impacts on individuals and the lack of information from an organization creates problems for employees; other studies on technostress and job satisfaction (Ragu-Nathan et al., 2008) demonstrated that there can be a positive association between these two concepts because of the organisational commitments towards supporting individuals. In other words, there is a need for organisations to be more proactive and invest time and resources in supporting their employees to overcoming technostress.

This research has also considered some areas of improvement that might be useful for a better organisational approach. As highlighted by the participants, possible organisational improvements are as follows: investments and minimum standards in the use of technology; training; communication; and unity. Training, investments and minimum standards were mentioned in the literature review as possible factors that might have an impact on the levels of technostress, communication and unity of an organization; however, these were not taken into account in previous works. Our study also noted that communication and unity of an organization are important as training might be getting lost without proper communication and organization.

6. Conclusions

The overall aim of this study was to understand how technostress amongst educators was created and managed within their institutions. Particularly, the paper aimed to understand the effects of technostress on UK educators by taking into account their well-being, and performance (Hansen and Sullivan, 2003). The research explored whether academics had experienced technostress within their roles and sought to identify its main causes. The study also aimed to understand what support academics were offered along with what they required, to further knowledge in institutional support. Whether technostress affected turnover intentions was also investigated to understand potential consequences. A significant number of themes emerged from the findings that revealed the concept of technostress and its role in education including role ambiguity, technology in the workplace, work-life balance, turnover intentions and abilities and demands. Additionally, this work has illustrated numerous implications which need to be considered carefully. Specifically, technology in the workplace and work-life balance was mentioned by all participants and must be taken into account as the most necessary areas of focus. The majority highlighted that in order to address them properly, there is a need for communication and unity regarding the existing challenges.

The study concluded that technostress is common amongst educators, although also uncovered that its prevalence fluctuates throughout the academic year due to certain high-pressure periods. Stress was also associated with certain physical health problems, outlined in the results and discussion. Educators feel significantly responsible for the academic careers of their students whilst also facing pressure from superiors, who set high standards in line with the sector's status in society. How technostress affects the well-being of staff and support staff in the educational work environment in the UK? We find that, with the use of technological devices, technology has been well integrated in fields such as education. Hence, universities introduce and use technology in order to improve what they offer. Considering this, the impacts of technostress on educators in the UK are also apparent. For example, technology appeared mainly as a challenge for educators due to the need to be able to keep up with it. Educators also had issues with the complexity, insecurity, uncertainty and overload of technology. From another perspective, technology is regarded as an enabler in performing their tasks.

As a consequence of the use of technology, the work-life balance of educators has been seriously affected. The findings showed that lack of time and boundaries have great impacts on the personal life and well-being of individuals. Furthermore, many educators that feel stressed and overwhelmed when using technology end up giving up on trying to learn and develop any further due to the pressure put on them, which has tremendous consequence on their performance, productivity and also on the organization as a whole as it affects the quality of what they offer and the overall productivity. In fact, findings revealed that the influence of the organization and its approach in helping their employees with dealing with technostress is extremely relevant. Lastly, the study introduced important domains such as communication and unity for organisations, which have been overlooked by previous literature.

Regarding theoretical contributions, this research adds value to the existing literature on technostress by proving more profound understanding on its role and impacts. The study has addressed the gap in the literature about technostress and organisational support within the education sector (Lazarus, 1995, p.5; Hansen and Sullivan, 2003; Tarafdar et al., 2007; Shahsavarani et al., 2015). It has done so by identifying the main stressors and assessing available support in the educational work environment. These findings have then provided insights into the importance of combatting technostress and how it potentially affects education-related workforce. Additionally, the study revealed the importance of communications and unity in organization in order to help their employees. This work has also generated numerous practical contributions as our findings can facilitate the creation and design of strategies to improve the life and performance of educators. This is a very important managerial implication as running relevant sessions for staff will help them to understand technology and its functionalities better whilst relevant competencies and skills will be developed increasing job satisfaction and well-being for these employees. The study also makes useful practical contributions to human resources managers and superiors in the education sector. These findings can be used practically to improve existing policies and services to relieve stress levels that could otherwise have damaging consequences.

Equally, this work has some limitations as we focused on a specific national educational environment (UK Higher Education Institutions) and employed a specific methodology. Specifically, due to the COVID-19 outbreak, face-to-face interviews were not possible. Instead, online interviews had to be conducted. Future research could consider other national educational environments highlighting the role of technostress and the approaches followed by other educational providers. Additionally, technostress is materializing in other sectors especially sectors related to white-collar, office jobs and, therefore, it will be worth exploring its role, importance and impact on employees from these sectors. Educational providers will need to commit to this training, invest appropriate time and resources and encourage employees to attend this training by having a clear, consistent and encouraging communication approach. Overall, senior managers in educational organisations need to be cognisant of the role of technostress and the impact it may have on employees' workload and role uncertainty. Finally, educators desired access to onsite counselling as well as active monitoring of stress levels in the workplace to combat stressors. Increased awareness of available support and stress itself was also deemed important. No particular method was chosen inferring that individualistic needs play a significant role.

Author statement

All authors have contributed towards the preparation of this research work.

Declaration of competing interest

The authors declare that they have no conflict of interest.

Data availability

The data that has been used is confidential.

Appendix A

Appendix I

Examples of key themes and codes derived regarding technostress and its impact.

Themes	Code	Quote
Technology in education	Curiosity Being proactive Good management Stressful Challenging	*"There is a lot of stress in my job and I managed it. I think I have not collapsed yet, but technology is an enabler,* e.g. *doing this interview and when I started my academic career and had to submit something I have to print it, and send it* via *letters and post and hope they will get there. It would take months and months. Now, when everything is ready, I go to the webpage of the journal and do it. The first time I had to do it, it was really stressful, I had to do it more times and I was upset. Now I learned how to use the systems and in half an hour the paper will be submitted, and I'm done."*
Stress	Physical elements Time Overload Prioritising	*"The things that add to my stress are non-technological issues. For example, marking physical exam papers because I don't have dexterity to do it and as a result, marking exams is quite difficult. On the other hand, marking courseworks is great since they are online, I can use Turnitin app and voice feedback."* *"Of course, when technology does not operate as planned then it is a major area of stress as I don't have lecture notes or anything to support me. When Blackboard or the computer don't work in a lecture space, I find that harder to deal with."*
Organisational approach	Lack of time Lack of support Lack of commitment	*"I think we could do better as we don't have any traditional technology jobs and after a few restructures, although that is improving, it is not always clear who's role is to support different types of technology. Sometimes we need to be proactive and look for them."* *"I guess there is training somewhere; you can understand from my voice that the training is probably not well advertised or I either missed it. They are very receptive on the other hand, if I need some training and ask for it, I'm sure I'll receive it and be supported."*
Individual problems	Inevitable change Annoying Too much pressure Time	*"So, a stressful day might be where there is a number of commitments without any breaks in between. I can think of one recently where I had some workshops to deliver but also some meetings which meant going from one thing to another one. For me, teaching and delivering can be quite stressful because you want to know you are well prepared and in a good mental state to deliver a workshop and for me that involves having some time prior to the seminars to get the room ready and prepare all the resources and materials, think about what to do in the session."*
Technical problems	Fails Lack of time No organization	*"Not having enough time contributes to my technostress, having the pressure of knowing I need technology to deliver education can be stressful, having the pressure of knowing people are waiting for you to deliver your information. In terms of addressing that, having a backup plan is necessary as things are out of our control when technology fails.* *Giving the current situation, a lot of things will be moved online so part of my role will be helping staff to practice the new tools and technologies needed. The other thing around technostress is when the technology fails which can be really stressful as it doesn't do what you are expecting or sometimes there is an update which makes it difficult for people to use the technology, which for me is stressful as it is not always communicated."*
Organisational perspective	Uncertainty Lack of training Inconsistent Lack of cooperation and communication	*"My general impression is that the technology is there, but people don't necessarily have the courage to use it that much, and people have to be proactive and look for what they need. We are a quite unusual School as we have an Education Development office and I think that often colleagues in other part of the university are not always aware of what's available for them to use in their teaching."*
Suggestions	Investments Minimum standards Unity Consistency Cooperation	*"Provide a lot of training. Different people need different levels of training and sometimes I prefer seeing how do to something, but others might like reading it. Mentoring could also help especially if you have a senior mentor using the technologies we have, and who can also mentor us on using technologies and I do it with my colleagues."*

References

Ayyagari, R., 2012. Impact of information overload and task-technology fit on technostress. In: Proceedings of the Southern Association for Information Systems Conference, pp. 18–22.

Ayyagari, R., Grover, V., Purvis, R.L., 2011. Technostress: technology antecedents and implications. MIS Q. 35 (4), 831–858.

Baptiste, N.R., 2008. Tightening the link between employee wellbeing at work and performance: a new dimension for HRM. Manag. Decis. 46 (2), 284–309.

Bazeley, P., 2013. Quantitative Data Analysis: Practical Strategies. Sage, London.

Booker, Q.E., Rebman, C.M., Kitchens, F.L., 2014. A model for testing technostress in the online education environment: an exploratory study. Issue. Inform. Syst. 15 (3), 214–222.

British Council, 2012. The Shape of Things to Come: Higher Education Global Trends and Emerging Opportunities to 2020. Council, British.

Bryman, A., 2016. Social Research Methods. Oxford University Press, Oxford.

Bryman, A., Belll, E., 2015. Business Research Methods, 4th edn. Oxford University Press, Oxford.

Bryman, A., Burgess, R., 2002. Analyzing qualitative data, 2nd edn. Routledge, London.

Brynjolfsson, E., Hitt, L., 1996. Productivity, profitability and consumer surplus: three different measures of information technology value. MIS Q. 20 (2), 121–142.

Cass, I., Duska, L.R., Blank, S.V., Cheng, G., Frederick, P.J., Hill, E.K., Matthews, C.M., Pua, T.L., Rath, K.S., Ruskin, R., Thaker, P.H., 2016. Stress and burnout among gynecologic oncologists: a Society of Gynecologic Oncology Evidence-based review and recommendations. Obstet. Gynecol. Surv. 71 (12), 715–717.

Cohen, J.R., Single, L.E., 2001. An examination of the perceived impact of flexible work arrangements on professional opportunities in public accounting. J. Bus. Ethics 32, 317–328.

Corbin, J., Strauss, A., 2015. Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory, 4th edn. SAGE Publications Inc., Thousand Oaks.

Demerouti, E., Bakker, A.B., Nachreiner, F., Schaufeli, W.B., 2001. The job demands-resources model of burnout. J. Appl. Psychol. 86 (3), 499–512.

Department for Education, 2020. Realising the Potential of Technology in Education: A Strategy for Education Providers and the Technology Industry (Available at). https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/791931/DfE-Education_Technology_Strategy.pdf.

Ennis, L.A., 2005. The evolution of technostress. Comput. Libr. 25 (8), 10–19.

Francis, O. O., 2013. Work Values, Achievement Motivation and Technostress as Determinants of Job Burnout among Library Personnel in Automated Federal University Libraries in Nigeria, Library Philosophy and Practice. Available at: http://digitalcommons.unl.edu/libphilprac/919.

Fudail, M., Mellar, H., 2008. Investigating teacher stress when using technology. Comp. Educ. 51, 1103–1110.

Gillespie, N.A., Walsh, M.H.W.A., Winefield, A.H., Dua, J., Stough, C., 2001. Occupational stress in universities: staff perceptions of the causes, consequences and moderators of stress. Work Stress. 15 (1), 53–72.

Guest, G., Bunce, A., Johnson, L., 2006. How many interviews are enough? An experiment with data saturation and variability. Field Methods 18 (1), 59–82.

Hansen, J.I., Sullivan, B.A., 2003. Assessment of Workplace Stress: Occupational Stress, Its Consequences, and Common Causes of Teacher Stress, 613-4.

HSE (Health and Safety Executive), 2019. Work-Related Stress, Anxiety or Depression Statistics in Great Britain, 2019. Health and Safety Executive, London, pp. 1–9.
Jena, R.K., Mahanti, P.K., 2014. An empirical study of technostress among Indian academician. Int. J. Educ. Learn. 3 (2), 1–10. https://doi.org/10.14257/ijel.2014.3.2.01.
Kim, H., Stoner, M., 2008. Burnout and turnover intention among social workers: effects of role stress, job autonomy and social support. Adm. Soc. Work. 32 (3), 5–25.
Kinman, G., Jones, F., 2008. A life beyond work? Job demands, work-life balance, and wellbeing in UK academics. J. Hum. Behav. Soc. Environ. 17 (1–2), 41–60.
Lazarus, R.S., 1995. Psychological stress in the workplace. Occupational Stress: A Handbook 1, 3–14.
Lincoln, Y.S., Guba, E.G., 1986. But is it rigorous? Trustworthiness and authenticity in naturalistic evaluation, Naturalistic Evaluation: New directions of Evaluation 30, 73–84. https://doi.org/10.1002/ev.1427.
Maslach, C., Jackson, S.E., Leiter, M.P., Schaufeli, W.B., Schwab, R.L., 1986. Maslach Burnout Inventory, vol. 21. Consulting psychologists press, Palo Alto, CA, pp. 3463–3464.
Narahari, C.L., Koneru, D.K., 2017. A study on the role of occupational stress in organisations. Int. J. Eng. Technol. Eng. Manag. Appl. Sci. 5, 53–59.
Pearson, L.C., Moomaw, W., 2005. The relationship between teacher autonomy and stress, work satisfaction, empowerment, and professionalism. Educ. Res. Q. 29 (1), 38–54.
Ragu-Nathan, T.S., Tarafdar, M., Ragu-Nathan, B.S., Tu, Q., 2008. The consequences of technostress for end users in organizations: conceptual development and empirical validation. Inf. Syst. Res. 19 (4), 417–433.
Robson, C., 2002. Real World Research, 2nd edn. Blackwell, Oxford.
Ryan, M., Deci, L.E., 2001. On happiness and human potentials: a review of research on hedonic and eudaimonic well-being. Annu. Rev. Psychol. 52, 141–166. https://doi.org/10.1146/annurev.psych.52.1.141.
Salanova, M., Llorens, S., Cifre, E., 2013. The dark side of technologies: technostress among users of informations and communication technologies. Int. J. Psychol. 48 (3), 422–436.
Shahsavarani, A.M., Abadi, E.A.M., Kalkhoran, M.H., 2015. Facts and theories through literature review. Int. J. Med. Rev. 2 (2), 230–241.
Shepherd, S.S.G., 2004. 'Relationships between computer skills and technostress: How does this affect me?', in *Proceedings of the 2004 ASCUE Conference*. Myrtle Beach, South Carolina.
Syvanen, A., Mäkiniemi, J.P., Syrjä, S., Heikkilä-Tammi, K., Viteli, J., 2016, November. When does the educational use of ICT become a source of technostress for Finnish teachers? In Seminar. Net 12 (2).
Tarafdar, M., Tu, Q., Ragu-Nathan, B.S., Ragu-Nathan, T.S., 2007. The impact of technostress on role stress and productivity. J. Manag. Inf. Syst. 24 (1), 301–328.
The Royal Society, 2019. Investing in UK R&D. Available at: https://royalsociety.org/-/media/policy/projects/investing-in-uk-r-and-d/2019/investing-in-UK-r-and-d-may-2019.pdf.
Wang, K., Tu, Q., Shu, Q., 2008. Technostress under different organizational environments: an empirical investigation. Comput. Hum. Behav. 24, 3002–3013.
Yang, C.C., Fan, C.W., Chen, K.M., Hsu, S.C., Chien, C.L., 2018. As a happy kindergarten teacher: the mediating effect of happiness between role stress and turnover intention. Asia Pac. Educ. Res. 27 (6), 431–440.
Yang, R.J., 2017. Techno-stress of teachers: An empirical investigation from China, in *3rd International Conference on Education and Social Development*, 444–448.

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