

ORIGINAL RESEARCH ARTICLE

The mediating role of technostress in the relationship between social outcome expectations and teacher satisfaction: evidence from the COVID-19 pandemic in music education

Ferdinando Toscano^{a*}, Teresa Galanti^b, Veronica Giffi^b, Teresa Di Fiore^b, Michela Cortini^b and Stefania Fantinelli^c

^aDepartment of Psychology 'Renzo Canestrari', Alma Mater Studiorum University of Bologna, Bologna, Italy; ^bDepartment of Psychological, Humanistic and Territorial Sciences, University 'Gabriele d'Annunzio' of Chieti-Pescara, Chieti, Italy; ^cDepartment of Humanities, Literature, Cultural Heritage, Education Sciences, University of Foggia, Foggia, Italy

(Received 5 May 2023; Revised: 30 August 2023; Accepted: 10 October 2023;

Published: 29 January 2024)

The COVID-19 pandemic has prompted significant changes in education, including a widespread transition from traditional, in-person instruction to online learning, which has also affected music conservatories. This study investigates the relationship between social outcome expectations and teacher satisfaction with remote education (SRE) among conservatory music professors during the pandemic. Rooted in the Social Cognitive Theory (SCT), the study examines whether technostress mediates this relationship and whether the intention to use information and communication technology (ICT) moderates it. A cross-sectional survey was conducted among 108 Italian conservatory teachers through an online self-report questionnaire. The results indicate a negative indirect effect of social outcome expectations on teacher satisfaction through technostress. However, surprisingly, the direct effect was positive and stronger. The study suggests that social expectations lead to technostress. Still, they also present an opportunity for music educators to embrace the challenge of remote education and increase their satisfaction with it.

Keywords: social outcome expectations; technostress; satisfaction with remote education; music education; COVID-19 challenges

Introduction

In the early months of 2020, the world underwent a drastic transformation in personal and professional lives due to the COVID-19 pandemic. Lockdown measures imposed by governments worldwide led to increased levels of stress and isolation for many individuals, particularly families who were confined to their homes together, leading to fatigue and frustration (Di Fiore et al., 2021; Mazza et al., 2020; Toscano & Zappalà, 2020; Xiao et al., 2021). During the lockdown periods, homes became the primary location for work and educational activities (Sulla et al., 2022;

*Corresponding author. Email: ferdinando.toscano@unibo.it

Toscano & Zappalà, 2021; Xiao et al., 2021). In response to the pandemic, individuals turned to technology to improve connectivity among humans (Esposito et al., 2021).

The sudden shift to remote learning significantly impacted the education sector, with students and teachers adapting to online teaching abruptly (Sulla et al., 2022). While several studies have focused on the effects of remote learning on traditional academic institutions, such as schools and universities (Şenel & Şenel, 2021; Serhan, 2020), less attention has been given to the implications of this shift on individuals' mental and emotional well-being in other types of educational institutions, such as music conservatories. However, music education is an essential part of cultural heritage, and a significant form of human expression that, at least in Italy, was also affected by the sudden transition to online learning.

Music education is a unique field that traditionally emphasizes hands-on and experiential learning to promote performing, listening, and creating skills (Bohak Adam & Metljak, 2022). Prior to the COVID-19 pandemic, digital technology in music education was primarily used for simulations or web browsing (Gorgoretti, 2019). However, the pandemic disrupted this paradigm, forcing music educators to reinvent their teaching methods by transitioning to distance learning. Unfortunately, many were unprepared to adapt, lacked digital skills, and missed training opportunities (Calderón-Garrido et al., 2021; Galanti et al., 2023). While a recent survey showed that learners were generally satisfied with distance learning due to innovative digital creative activities and the provision of music theory through technology (Hash, 2021), music educators reported reduced quality of musical experience compared to face-to-face teaching (Shaw & Mayo, 2022).

Studies conducted during the initial phase of the pandemic among music professors revealed a decline in teaching efficiency and personal well-being (Cheng & Lam, 2021; Miksza et al., 2022; Shaw & Mayo, 2022). Although previous research has explored differences in coping strategies toward distance learning in music teachers based on individual characteristics (Bohak Adam & Metljak, 2022), there is a lack of research on the social perspective of music teachers regarding their outcomes and the role it plays in their technology-related stress and satisfaction toward online teaching. Anyway, as Salanova and colleagues have found about information and communication technology (ICT) related stress of employees, people working through ICT who experience more social support are less fatigued although feeling more inefficacy (Salanova et al., 2013). As these authors stated, 'failure to cope with ICT, and the ensuing associated, need to be supported socially' (Salanova et al., 2013, p. 13). Therefore, we believe it is necessary to examine how music teachers' beliefs about the social outcomes of their behaviour in remote education influence their experience of technostress and how this relationship can affect their satisfaction with remote education (SRE).

Before the pandemic, research had already demonstrated the negative impact of technology-induced stress on teachers' job satisfaction (Al-Ansari & Alshare, 2019; Estrada-Muñoz et al., 2020; Tarafdar et al., 2007). However, the relationship between social outcome expectations and SRE, especially in a COVID-19 context, has never been investigated among music educators. For this reason, our study, based on the Social Cognitive Theory (SCT) (Bandura, 1982, 2001), aims to understand better the factors that influence music teachers' experience of remote education, specifically regarding the social outcomes expectations (SOEs) that music educators expect from their behaviour.

Particularly, in this study, we aim to demonstrate that music educators' SOEs are negatively related to their SRE, both directly and indirectly, through increased technostress. Moreover, we endeavour to ascertain whether their interest in using ICT

can mitigate the relationship between social outcome expectations and the perceived burden of technostress.

By unearthing these associations, our research delves deeper into how external pressures interact with stress induced by technology, thereby providing insights into the implementation of psychological theories within the educational technology landscape. Furthermore, this study aspires to provide insights to inform the development of interventions aimed at enhancing music educators' well-being and fostering the adoption of effective remote teaching methodologies. The following paragraph of this study expounds upon the research model underpinning our investigation.

Research model and hypotheses

The theoretical underpinnings of our research model are rooted in Bandura's SCT (Bandura, 1982, 2001). This theory posits that individuals' beliefs concerning their capacity to execute tasks and their expectations regarding the consequences of their actions wield significant influence over their behaviour and, ultimately, their well-being. SCT's social dimension emphasizes that individuals' beliefs about their capabilities and anticipated outcomes are not formed in isolation, but they are woven into the fabric of social contexts, such as interactions with colleagues and students. As such, our investigation explores how music educators' expectations of recognition and esteem from colleagues, arising from their utilization of ICT, are related with their experiences of ICT-induced stress. Moreover, we explore how these expectations link to their satisfaction with ICT-based teaching. SOEs are individuals' beliefs and expectations that their engaging in activities in a social context will result in specific outcomes related to relationships and thoughts by others (Wright et al., 2013). In the context of music education, where collaborative dynamics and interpersonal interactions are paramount, social outcome expectations take on a significant role. Music educators grapple with the pressure to align their actions with the perceived expectations of their students and colleagues. This pressure emerges from the belief that their behaviours and instructional choices will influence not only the students' learning experiences but also their colleagues' perceptions of their teaching effectiveness.

In music education settings, educators may feel a profound responsibility to cater to their students' learning needs, ensure their musical growth, and facilitate engaging and productive instructional experiences (Krause & Davidson, 2018). The perceived evaluation that music educators might sense from their colleagues, who gauge teaching effectiveness, plays a pivotal role in shaping these social outcome expectations. Consequently, educators navigate a complex terrain where their instructional choices are not solely driven by pedagogical considerations but are also intertwined with the interpersonal implications of their decisions.

This dynamic gives rise to social outcome expectations that may encompass both motivational and stress-inducing facets. On one hand, these expectations serve as a driving force, propelling educators to continuously enhance their teaching methods and prioritize their students' growth. On the other hand, the weight of these expectations, particularly in the context of remote education catalysed by the COVID-19 pandemic, can amplify feelings of stress. Educators find themselves grappling with the task of adapting their teaching techniques to suit an unfamiliar digital environment while simultaneously striving to fulfil the anticipated outcomes of their students and colleagues. In the context under examination, the latter statement appears more relevant and aligned with the subject matter. The COVID-19 pandemic forced many

educators, including music teachers, to transition to remote teaching and learning, increasing the use of digital technology. While technology can bring many benefits to education, such as improved access to information, it can also create new sources of stress for teachers and educators (Koner et al., 2023). During the pandemic, teachers had to constantly adapt to new technologies and keep up with changing trends (Myry et al., 2022), with the risk of experiencing anxiety about the reliability and functionality of technology tools (Jelińska & Paradowski, 2021). In addition, teachers may have felt overwhelmed by the amount of information and data that technology generates.

The adverse effects of technology use can lead to technostress (Tarafdar et al., 2007), a type of stress that arises from using technology, creating feelings of anxiety, burnout, and decreased job satisfaction. Technostress can be caused by various factors, such as the complexity of technology, the pace of technological change, the pressure to be constantly connected and responsive, and the potential for technology to replace traditional human tasks or interactions (Camacho & Barrios, 2022; Tarafdar et al., 2007).

The issue of technostress is particularly relevant in the field of education, where the integration of technology into teaching and learning has become increasingly important (Aktan & Toraman, 2022; Nang et al., 2022). However, the impact of digital technology and its role on job satisfaction, or SRE, of people engaged in remote music education during the COVID-19 pandemic still needs to be explored.

In this study, we posit that music teachers' social outcome expectations affect their experience of technostress, which in turn impacts their SRE during the pandemic. In particular, we posit that if a professor has high social outcome expectations for their remote teaching behaviour, such as being perceived as an effective instructor by their colleagues, also considering the performative nature of their job, they may experience higher levels of technostress and lower levels of satisfaction.

For this reason, we posit that:

H1: In music educators, there is a positive relationship between social outcome expectations and SRE during the pandemic.

H2: In music educators, the relationship between social outcome expectations and SRE during the pandemic is mediated by technostress.

Furthermore, we believe it is essential to consider music educators' intention to use technology. Previous evidence has shown that individuals who were interested in using ICT, measured through the expected easiness and usefulness of technologies, were less susceptible to the negative effects of remote work during the COVID-19 pandemic (Donati et al., 2021). This is not a new phenomenon; previous evidence also confirms the relevance of such a perspective when studying technostress (Salanova et al., 2013).

Social outcome expectations are more likely to induce technostress in music educators due to the unexpected challenges brought by the COVID-19 pandemic. On the other side, as said before, they may also act as a motivational factor in specific music educators who are more prone and familiar with the use of technology. This phenomenon finds alignment with Bandura's SCT (Bandura, 1982, 2001) and its adoption in social contexts (Wright et al., 2013), which underscore the reciprocal relationship between personal agency and external influences. Educators' self-beliefs and disposition toward technology intersect with the social dynamics of expectation, shaping their responses to challenges and opportunities also in a positive way. Therefore, we want to consider music educators' intention in using ICT as a buffer in the relationship between social outcome expectations and perceived technostress.

So, finally, we suppose that the role of social expectations on technostress may be less strong in individuals more interested in using ICT and stronger in individuals less interested in using ICT. For this reason, we then posit that:

H3: Music educators' intention to use ICT negatively moderates the relationship between social outcome experiences and perceived technostress.

Figure 1 depicts the moderated mediation model integrating the relationships elucidated in this paragraph.

Method

Participants and procedures

Between December 2020 and February 2021, a survey was conducted among professors of Italian music conservatories to investigate their experiences with remote education during the COVID-19 pandemic. The survey was administered online using the Google Forms platform, and participants were invited to complete it on a voluntary basis. All responses were anonymous, and participants were not rewarded for their participation. Informed consent was obtained from all respondents in accordance with the Declaration of Helsinki, and ethical guidelines for social research were followed.

A total of 108 music teachers participated in the study, including 47 females (43.5%) and 61 males (56.5%) from 33 Italian conservatories. Most participants (68.5%) were aged between 46 and 60, while 20.4% were over 60% and 11.1% were under 45. The average tenure of participants was 21.30 years (SD = 11.39).

It is important to underscore that this study embraced a quantitative cross-sectional research design. Although this approach does not provide a longitudinal perspective on changes or developments over time, it offers a snapshot view of participants' experiences and responses during a specific timeframe, facilitating the exploration of relationships among variables at a given time.

Measures

The study used several scales to measure the study variables. Unless otherwise specified, all measures were evaluated using a five-point Likert scale (1 = 'Strongly disagree' to 5 = 'Strongly agree').

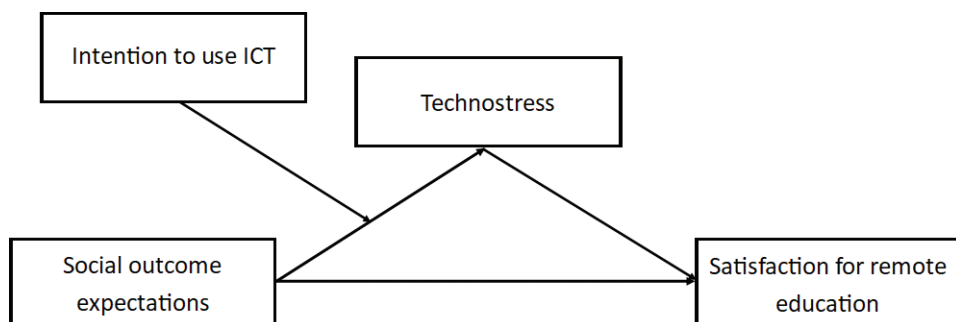


Figure 1. Research model.

SOEs were measured through the 3-item scale of the Italian version of the Intra-personal Technology Integration Scale (Niederhauser & Perkmen, 2008), adapted by Benigno et al. (2013), which measure the expectations of recognition and respect from colleagues deriving from the use of ICT. An example of items is: 'If I continue to use educational technologies effectively in the classroom, this will increase my colleagues' esteem for me'. Cronbach's Alpha in this study was 0.81.

Technostress, in its techno-complexity dimension, was measured with the Italian version of the subscale of the Technostress Creators Scale, edited by Molino et al. (2020), and consisting of four items. This dimension accounts for the complexity of ICT to make users feel inadequate concerning their skills. An example of an item is: 'I don't know enough about technology to handle my work satisfactorily'. Cronbach's Alpha in this study was 0.89.

Teachers' SRE was measured with an ad-hoc developed two-item scale with a 7-point Likert scale ranging from 'Not at all' to 'Very much' (Cronbach Alpha of 0.89). An example of an item is: 'How satisfied are you overall with online teaching?'

In this study, socio-demographic variables, such as age, sex, and tenure, were considered control variables, as literature recognizes them as possible confounders in the relationships under study (Bianchi & Caso, 2021; Bohak Adam & Metljak, 2022).

Data analysis

Before testing the study model, we ensured the measures' validity and reliability according to recent methodology guidelines (Hair et al., 2018). Initially, we conducted two Confirmatory Factor Analyses (CFA) to compare a one-factor model, where all study items were grouped, with a four-factor model, where each item was grouped according to its expected factor. We then assessed the validity and reliability of the scales by calculating the Average Variance Extracted (AVE) values, Maximum Shared Variance (MSV) values, and the square root of AVEs compared to correlations between variables for validity and Composite Reliability (CR) and Cronbach's alpha for reliability. We used Gaskin's Master Validity Plugin for AMOS (Gaskin et al., 2019) to conduct most of these analyses. Next, we computed descriptive statistics, such as the mean and standard deviation for each scale, assessed the data's normality using skewness and kurtosis values, and conducted bivariate correlation analyses to examine the relationships between different scales. Finally, we tested the study model using Model 7 of the PROCESS Macro for SPSS. Before computing the model, we centered its variables. We utilized SPSS 26 and AMOS 22 for all analyses.

Results

Validity and reliability of the scales

To evaluate the validity and reliability of the measures used in this study, we first conducted two CFAs. The CFAs were used to compare the fit of a one-factor model, where all items were grouped, to a four-factor model, where each item was expected to load onto its corresponding factor. The aim of this test was to test whether the proposed factors represent unique constructs that can be clearly differentiated from each other. The results of the CFAs showed that the four-factor model fit the data well ($\chi^2 = 164.50$; degrees of freedom (df) = 84; chi-square/df = 1.96; comparative fit index (CFI) = 0.93; incremental fit index (IFI) = 0.93; root mean square error of approximation

(RMSEA) = 0.09; standardized root mean square residual (SRMR) = 0.07), whereas the one-factor model fit poorly ($\chi^2 = 515.42$; $df = 90$; $\chi^2/df = 5.73$; CFI = 0.61; IFI = 0.62; RMSEA = 0.21; SRMR = 0.16). The minimum item saturation in the four-factor model was 0.65, indicating good factor loadings.

The assessment of the validity and reliability of the scales continued with the computation of the AVE, MSV, CR and Cronbach’s alpha values and with the comparison between the square root of AVEs and the correlations between variables. Table 1 provides information on these analyses, all of which, without exception, confirmed the validity and reliability of the scales.

Descriptive statistics

After conducting validity and reliability tests, we calculated descriptive statistics and bivariate correlations for each study scale, including control variables. Additionally, we evaluated the normality of the data by examining the skewness and kurtosis values for each scale. The results showed that the skewness and kurtosis values for all variables were within the acceptable range of ± 2 , indicating that the distribution of characteristics across the variables were within the parameters of normality. Table 2 presents the results of these analyses.

Model testing

After the mentioned analyses, we computed the model test to evaluate whether the results supported our hypothesized model. While calculating the model, we controlled for age, gender, and tenure. The model results, depicted in Figure 2, show that social outcome expectations were positively related to technostress ($\beta = 0.24$, $p = 0.05$, 95%

Table 1. Measures for the assessment of reliability and validity of the scales.

Variable	Alpha	CR	MSV	AVE	\sqrt{AVE}	2	3	4
1. Social outcome expectations	0.80	0.82	0.55	0.60	0.78	0.74**	0.00	0.59**
2. Intention to use ICT	0.91	0.91	0.56	0.63	0.79		-0.27*	0.75**
3. Technostress	0.89	0.89	0.07	0.68	0.82			-0.24*
4. Satisfaction with remote education	0.89	0.89	0.56	0.81	0.90			

Note: * $p < 0.05$, ** $p < 0.01$.

Table 2. Means, Standard Deviations, and correlations between the study variables.

Variable	Mean	SD	2	3	4	5	6	7
1. Social outcome expectations	2.26	0.85	0.66**	-0.02	0.51**	0.17	-0.13	-0.03
2. Intention to use ICT	3.03	1.07		-0.27**	0.64**	0.16	0.00	-0.06
3. Technostress	2.32	1.00			-0.25**	0.13	-0.22*	0.24*
4. Satisfaction with remote education	3.51	1.74				0.09	-0.02	-0.05
5. Age range	3.09	0.56					0.11	0.62**
6. Gender (0 = Female; 1 = Male)	0.56	0.50						0.09
7. Tenure	21.30	11.39						

Note: * $p < 0.05$, ** $p < 0.01$.

CI [0.01, 0.47]) and, contrarily to expectations, also positively related to SRE ($\beta = 0.49$; $p < 0.001$, 95% CI [0.32, 0.66]; *H1 partially supported*). Technostress was negatively related to SRE ($\beta = -0.25$, $p = 0.01$, 95% CI [-0.42, -0.08]). The supposed interaction between SOEs and intention to use ICT was supported ($\beta = -0.20$, $p = 0.03$, 95% CI [-0.38, -0.02]; *H3 supported*). Figure 3 shows this interaction. Among the control variables, only gender was significantly related to technostress ($\beta = -0.44$, $p = 0.02$, 95% CI [-0.80, -0.07]). No control variable was significantly related to SRE.

The conditional effects of SOEs on SRE through technostress at different values of intention to use ICT were also examined. The results suggest that the indirect effect of SOEs on SRE through technostress was significant when the intention to use ICT was considered at -1 SD (standardized point estimate = -0.11, 95% CI [-0.28, -0.01]).

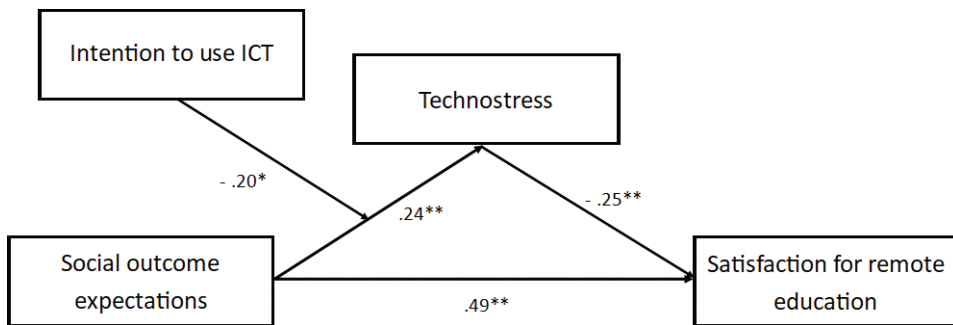


Figure 2. Model results.

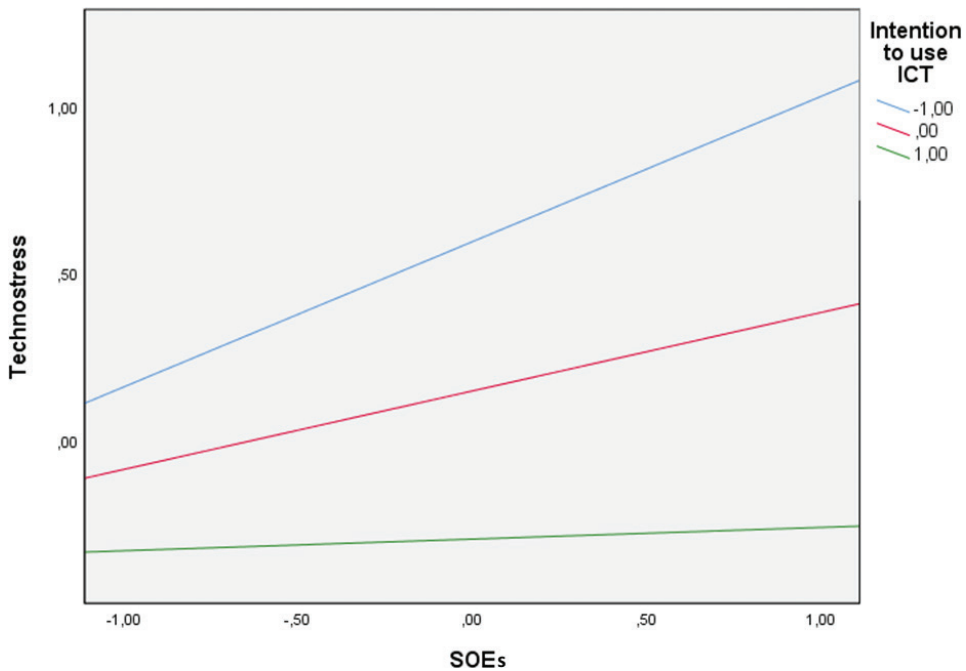


Figure 3. Moderating effect of intention to use ICT in the relationship between SOEs and technostress.

At the same time, this effect became not significant in the proximity of average values of intention to use ICT (standardized point estimate = -0.06, 95% CI [-0.17, 0.00]) and was further confirmed to be not significant when the intention to use was considered at +1 SD (standardized point estimate = 0.01, 95% CI [-0.10, 0.05]). Despite these indirect effects, which makes hypotheses 2 mostly supported, the stronger and positive direct relationship between these variables makes the total effect of SOEs on SRE of positive and significant nature in all cases.

Discussion

In this study, framed in the SCT (Bandura, 2001), we investigated the relationship between social outcome expectations and SRE from a social and technostress-based perspective in the context of music educators during the COVID-19 pandemic. The results showed that music educators' social outcome expectations related positively to their technostress, framed in its component of complexity caused by the use of technology. In addition, they showed that, while technostress had a negative relationship to teachers' satisfaction, social outcome expectations were instead, unexpectedly, positively associated with SRE. Moderation analysis showed that the positive effect of music educators' social expectations on technostress was stronger when the intention to use ICT was lower. At the same time, this effect was nullified when the intention to use ICT was medium to high. A similar mechanism occurred for the negative indirect effect of social expectations on satisfaction with teachers' remote education through technostress, which vanished at higher values of intention to use ICT.

Based on the results, two main conclusions can be drawn. Firstly, the study demonstrates that social expectations significantly shape both technostress and satisfaction in remote education. These findings align with the divergent perspectives on the benefits and drawbacks of remote work experience (De Vincenzi et al., 2022; Ferrara et al., 2022; Toscano et al., 2022; Uroková, 2020), highlighting the ambivalent nature of the emergency context in which remote education was implemented in Italian conservatories. Although the sudden shift to remote education did not allow for adequate preparation, adaptation, and practical implementation, it presented an opportunity for progress in the world of work. On the one hand, this shift increased the risk of technostress caused by the pressure to meet social outcome expectations. On the other hand, social outcome expectations also unexpectedly contributed to increased SRE. This may be because they stimulated educators to adapt to the situation and find ways to improve their teaching methods. The unexpected result of increased SRE may also be attributed to the challenge and stimulation of adapting to a new and rapidly changing environment. The need to meet social outcome expectations may have motivated educators to be creative and resourceful in finding new ways to teach and engage with their students. This may have led to a sense of accomplishment and satisfaction in overcoming the difficulties associated with remote education and improving educator skills. Therefore, while the emergency context was not ideal, it may have presented an opportunity for growth and development for individual educators and the field of education as a whole, as indicated by a recent study on remote education. From the perspective of educators themselves, remote education amplifies the sharing and accessibility of instructional materials, stimulates student engagement, elevates the quality of learning outcomes, streamlines course coordination, fosters the refinement of teaching and assessment techniques, and grants both students and teachers the liberty of temporal and spatial independence (Kallunki et al., 2023).

The second possible consideration is related to the observation that the negative effect of social outcome expectations on technostress was no longer present among music professors who were willing to use ICT. This suggests that a positive attitude toward technology and a willingness to embrace it as a tool for teaching can mitigate the negative impact of social expectations on well-being, acting as a protection against the negative impact of social expectations on educators' satisfaction with remote work education. Social expectations can create pressure and stress, especially when individuals feel they cannot meet those expectations. This can lead to negative feelings, such as anxiety, guilt, shame, and self-doubt, negatively impacting well-being. This observation highlights the importance of promoting a positive attitude toward technology among educators and providing adequate training and support to use it effectively. This can help reduce the negative impact of social expectations and technostress and enhance remote education's overall effectiveness and satisfaction.

In light of the theory of SCT (Bandura, 2001), this study's results emphasize the importance of individuals' expectations regarding the outcomes of their actions in impacting their behaviour and well-being. Furthermore, the study extends previous research on the role of social aspects in using ICTs (Salanova et al., 2013), finding that intention to use them has positive effects and can prevent distortions in terms of insurgent technostress. Finally, and maybe more importantly, this study also shows that social outcome expectations themselves can create the right challenges through which even the abrupt shift to this new way of working can determine, after a reasonable effort and in a population able to adapt, a reason for becoming satisfied with the outcomes achieved. We find our conclusions entirely in line with those posed by Schunk (2012), who underlined that expectancies help people determine the best course of action to reach their goals. However, this consideration also highlights the importance of providing adequate social support to educators who may struggle to cope with the demands of using new technologies.

Practical implications

Based on the findings of this study, several practical implications can be drawn for music educators and institutions implementing remote education, especially during emergency contexts like the COVID-19 pandemic. Firstly, it is essential to recognize the importance of social outcome expectations in shaping both technostress and satisfaction in remote education. Music educators need to understand social expectations' role in their well-being and effectiveness as educators. Thus, institutions should create a supportive environment where educators can openly discuss and manage their expectations, share their experiences, and receive guidance and support on how to cope with the demands of remote education. This may be a suggestion that can be extended to all educational institutions. In moments of shared expectations among colleagues, it is reasonable to think that this comparison helps to determine common standards of teaching and to align on teaching and assessment procedures. In addition, it is likely that the more one knows about colleagues' work, the better one can also smooth out educational programs, identifying unaddressed topics and eliminating overlaps. Furthermore, institutions should provide adequate training and support to educators to use technology effectively. It is crucial to promote a positive attitude toward technology and encourage educators to embrace it as a tool for teaching. This can help reduce technostress' negative impact

and enhance overall satisfaction and effectiveness in remote education. In addition, distance learning, especially through the use of technology, lends itself particularly well to music education in academia. This form of education is characterized by a significant number of students who are geographically dispersed due to their origins or work commitments at performance venues. In addition, the nature of music education, which is closely related to the realm of sounds, is strongly supported by the multimedia capabilities of technological instruments. In some cases, the use of computer tools becomes necessary because of specific musical directions, which can be further enriched through the wider use of these technologies. All interventions that can enhance the use of ICT by conservatory professors are therefore to be welcomed and supported, for their own well-being but also for the benefits to teaching activities.

Study limitations and future research

Although we have tried to offer an overview of the role of technostress as a mechanism linking social expectations and satisfaction of a particular and understudied population, such as that of music teachers, our study has several limitations. Among them, we recognize the cross-sectional design of this research, which does not allow for determining causal relationships, and the adoption of a convenience sample, which impedes us from generalizing our results.

In addition to methodological issues, we also recognize the lack of consideration of some variables of great interest for the studied field, such as other dimensions of technostress or classically conceptualized stress, as well as an assessment of digital skills measuring the degree of mastery of ICT instruments and not the mere interest in them. We also point out that, given that the literature indicates a gap between students' perceptions and those of music teachers, the inclusion of the degree of student satisfaction with music education may have impeded us in this study and help in future to draw broader conclusions. While we acknowledge these limitations of our study, we nonetheless believe these are inputs to be treasured for future research.

Conclusion

This study is the first known one to explore the relationship between social outcome expectations and SRE in the context of music educators during the COVID-19 pandemic. The goal was to determine the impact of social outcome expectations on technostress and well-being. The results demonstrated that social outcome expectations significantly shaped both technostress and satisfaction in remote education. While social outcome expectations may have contributed to the emergence of technostress, the study unexpectedly found that they also increased SRE. This may be because educators were motivated to adapt and find new teaching methods in response to the challenges presented by remote education. The study emphasizes the importance of promoting a positive attitude toward technology among educators and providing adequate training and support to mitigate the negative impact of social expectations and technostress. Overall, the findings underscore the significance of individuals' expectations regarding the outcomes of their actions in impacting their behaviour and well-being. Additionally, the study highlights the need for social support to help educators adapt to new technologies.

Ethics statement

This research fully respects the Declaration of Helsinki. All ethical guidelines on research were followed. The authors declare no conflict of interest.

Conflict of interest and funding

We acknowledge the support provided by the Italian Ministry of University and Research through the National Operational Program (PON) on innovation and green topics (Actions IV and VI) for funding the research work of Dr. Teresa Galanti and Dr. Stefania Fantinelli. The authors received no specific funding for this particular study. The authors declare no conflict of interest.

References

- Aktan, O. & Toraman, Ç. (2022). The relationship between Technostress levels and job satisfaction of Teachers within the COVID-19 period. *Education and Information Technologies*, 27(7), 10429–10453. <https://doi.org/10.1007/s10639-022-11027-2>
- Al-Ansari, M. A. & Alshare, K. (2019). The impact of technostress components on the employees satisfaction and perceived performance. *Journal of Global Information Management*, 27(3), 65–86. <https://doi.org/10.4018/JGIM.2019070104>
- Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, 37(2), 122–147. <https://doi.org/10.1037/0003-066X.37.2.122>
- Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology*, 52(1), 1–26. <https://doi.org/10.1146/annurev.psych.52.1.1>
- Benigno, V. et al. (2013). Adattamento italiano della Intrapersonal Technology Integration Scale, uno strumento per misurare gli atteggiamenti degli insegnanti nei confronti delle TIC. *Giornale Italiano Di Psicologia*, 40(4), 815–838. <https://doi.org/10.1421/76948>
- Bianchi, M. & Caso, D. (2021). Distance learning during Covid-19 pandemic: Italian teachers' well-being and the role of age on ICT adoption. *Statistica Applicata*, 33(2), 177–198. <https://doi.org/10.26398/IJAS.0033-010>
- Bohak Adam, T. & Metljak, M. (2022). Experiences in distance education and practical use of ICT during the COVID-19 epidemic of Slovenian primary school music teachers with different professional experiences. *Social Sciences & Humanities Open*, 5(1), 100246. <https://doi.org/10.1016/j.ssaho.2021.100246>
- Calderón-Garrido, D., Gustems-Carnicer, J. & Faure-Carvalho, A. (2021). Adaptations in conservatories and music schools in Spain during the covid-19 pandemic. *International Journal of Instruction*, 14(4), 451–462. <https://doi.org/10.29333/iji.2021.14427a>
- Camacho, S. & Barrios, A. (2022). Teleworking and technostress: Early consequences of a COVID-19 lockdown. *Cognition, Technology and Work*, 1, 3. <https://doi.org/10.1007/s10111-022-00693-4>
- Cheng, L. & Lam, C. Y. (2021). The worst is yet to come: The psychological impact of COVID-19 on Hong Kong music teachers. *Music Education Research*, 23(2), 211–224. <https://doi.org/10.1080/14613808.2021.1906215>
- Donati, S. et al. (2021). Not all remote workers are similar: Technology acceptance, remote work beliefs, and wellbeing of remote workers during the second wave of the COVID-19 pandemic. *International Journal of Environmental Research and Public Health*, 18(22), 12095. <https://doi.org/10.3390/ijerph182212095>
- Espósito, C. et al. (2021). Well-being and the COVID-19 pandemic. *European Psychologist*, 26(4), 285–297. <https://doi.org/10.1027/1016-9040/a000468>

- Estrada-Muñoz, C. et al. (2020). Teacher technostress in the Chilean school system. *International Journal of Environmental Research and Public Health*, 17(15), 1–17. <https://doi.org/10.3390/ijerph17155280>
- Ferrara, B. et al. (2022). An evidence-based systematic review. *International Journal of Environmental Research and Public Health*, 19(19), 12373. <https://doi.org/10.3390/ijerph191912373>
- De Vincenzi, C. et al. (2022). Consequences of COVID-19 on employees in remote working: Challenges, risks and opportunities an evidence-based literature review. *International Journal of Environmental Research and Public Health*, 19(18), 11672. <https://doi.org/10.3390/ijerph191811672>
- Di Fiore, T. et al. (2021). Le sfide alla salute psicofisica delle famiglie italiane nel periodo dell'emergenza Covid-19: Uno studio pilota sull'impatto del burnout genitoriale in diverse categorie professionali. *Quaderni ACP*, 28(1), 21–25. <https://doi.org/10.53141/qacp.2021.21-24>
- Galanti, T. et al. (2023). Digital transformation: Inevitable change or sizable opportunity? The strategic role of HR management in industry 4.0. *Administrative Sciences*, 13(2), 30. <https://doi.org/10.3390/admsci13020030>
- Gaskin, J., James, M. & Lim, J. (2019). *Master validity tool*. AMOS Plugin In: Gaskination's StatWiki. Retrieved from <https://statwiki.gaskination.com/index.php/Plugins>
- Gorgoretti, B. (2019). The use of technology in music education in, north Cyprus according to student music teachers. *South African Journal of Education*, 39(1), 1–10. <https://doi.org/10.15700/saje.v39n1a1436>
- Hair, J. et al. (2018). *Multivariate data analysis: A global perspective* (vol. 8, 8th ed.). Upper Saddle River, NJ: Pearson Education.
- Hash, P. M. (2021). Remote learning in school bands during the COVID-19 shutdown. *Journal of Research in Music Education*, 68(4), 381–397. <https://doi.org/10.1177/0022429420967008>
- Jelińska, M. & Paradowski, M. B. (2021). Teachers' perception of student coping with emergency remote instruction during the COVID-19 pandemic: The relative impact of educator demographics and professional adaptation and adjustment. *Frontiers in Psychology*, 12, 648443. <https://doi.org/10.3389/fpsyg.2021.648443>
- Kallunki, V. et al. (2023). Comparison of voluntary and forced digital leaps in higher education – Teachers' experiences of the added value of using digital tools in teaching and learning. *Education and Information Technologies*, 28, 10005–10030. <https://doi.org/10.1007/s10639-022-11559-7>
- Koner, K., Potter-Gee, J., & Borden, B. (2023). Female music educators' stress and well-being in the height of a global pandemic in the United States. *International Journal of Music Education*, 71(1–4), 5–21. <https://doi.org/10.1177/02557614231163329>
- Krause, A. E. & Davidson, J. W. (2018). Effective educational strategies to promote life-long musical investment: Perceptions of educators. *Frontiers in Psychology*, 9, 1977. <https://doi.org/10.3389/fpsyg.2018.01977>
- Mazza, C. et al. (2020). A nationwide survey of psychological distress among Italian people during the COVID-19 pandemic: Immediate psychological responses and associated factors. *International Journal of Environmental Research and Public Health*, 17(9), 3165. <https://doi.org/10.3390/ijerph17093165>
- Mikszá, P. et al. (2022). The well-being of music educators during the pandemic Spring of 2020. *Psychology of Music*, 50(4), 1152–1168. <https://doi.org/10.1177/03057356211042086>
- Molino, M. et al. (2020). Wellbeing costs of technology use during Covid-19 remote working: An investigation using the Italian translation of the technostress creators scale. *Sustainability*, 12(15), 5911. <https://doi.org/10.3390/SU12155911>
- Myry, L. et al. (2022). COVID-19 accelerating academic teachers' digital competence in distance teaching. *Frontiers in Education*, 7, 770094. <https://doi.org/10.3389/feduc.2022.770094>

- Nang, A. F. M., Maat, S. M. & Mahmud, M. S. (2022). Teacher technostress and coping mechanisms during Covid-19 pandemic: A systematic review. *Pegeg Journal of Education and Instruction*, 12(2), 200–212. <https://doi.org/10.47750/pegegog.12.02.20>
- Niederhauser, D. S. & Perkmen, S., 2008. Validation of the intrapersonal technology integration scale: Assessing the influence of intrapersonal factors that influence technology integration. *Computers in the Schools*, 25(1–2), 98–111. <https://doi.org/10.1080/07380560802157956>
- Salanova, M., Llorens, S., & Cifre, E. (2013). The dark side of technologies: Technostress among users of information and communication technologies. *International Journal of Psychology*, 48(3), 422–436. <https://doi.org/10.1080/00207594.2012.680460>
- Schunk, D. H. (2012). *Learning theories: An educational perspective* (6th ed.). Boston, MA: Pearson.
- Şenel, S. & Şenel, H. C. (2021). Remote assessment in higher education during COVID-19 pandemic. *International Journal of Assessment Tools in Education*, 8(2), 181–199. <https://doi.org/10.21449/ijate.820140>
- Serhan, D. (2020). Transitioning from face-to-face to remote learning: Students' attitudes and perceptions of using Zoom during COVID-19 pandemic. *International Journal of Technology in Education and Science*, 4(4), 335–342. <https://doi.org/10.46328/ijtes.v4i4.148>
- Shaw, R. D., & Mayo, W. (2022). Music education and distance learning during COVID-19: A survey. *Arts Education Policy Review*, 123(3), 143–152. <https://doi.org/10.1080/10632913.2021.1931597>
- Sulla, F. et al. (2022). Teachers' emotions, technostress, and burnout in distance learning during the COVID-19 pandemic. *CEUR Workshop Proceedings*, 3265, 1–13.
- Tarafdar, M. et al. (2007). The impact of technostress on role stress and productivity. *Journal of Management Information Systems*, 24(1), 301–328. <https://doi.org/10.2753/MIS0742-1222240109>
- Toscano, F. & Zappalà, S. (2020). Social isolation and stress as predictors of productivity perception and remote work satisfaction during the COVID-19 pandemic: The role of concern about the virus in a moderated double mediation. *Sustainability*, 12(23), 9804. <https://doi.org/10.3390/su12239804>
- Toscano, F. & Zappalà, S. (2021). Overall job performance, remote work engagement, living with children, and remote work productivity during the COVID-19 pandemic: A mediated moderation model. *European Journal of Psychology Open*, 80(3), 133–142. <https://doi.org/10.1024/2673-8627/a000015>
- Toscano, F., Zappalà, S. & Galanti, T. (2022). Is a good boss always a Plus? LMX, family–work conflict, and remote working satisfaction during the COVID-19 pandemic. *Social Sciences*, 11(6), 248. <https://doi.org/10.3390/socsci11060248>
- UroKOVA, S. B. Q. (2020). Advantages and disadvantages of online education. *Theoretical & Applied Science*, 89(9), 34–37. <https://doi.org/10.15863/tas.2020.09.89.9>
- Wright, S. L., Wright, D. A., & Jenkins-Guarnieri, M. A. (2013). Development of the social efficacy and social outcome expectations scale. *Measurement and Evaluation in Counseling and Development*, 46(3), 218–231. <https://doi.org/10.1177/0748175613484042>
- Xiao, Y. et al. (2021). Impacts of working from home during COVID-19 pandemic on physical and mental well-being of office workstation users. *Journal of Occupational & Environmental Medicine*, 63(3), 181–190. <https://doi.org/10.1097/JOM.0000000000002097>