Digital Innovations for Mental Health Support

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Chapter 3 The Resilience Enhancement Programme for Students (REP-S): Evaluating an Online Intervention for Boosting Resilience in Students

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ABSTRACT

The Resilience Enhancement Programme for Students (REP-S) is an intervention that has been designed to boost resilience in students. The current study involved the remote delivery of the REP-S via an online platform to students, and an empirical evaluation of the intervention via a pre-post one-group quantitative design over one month and a post-intervention qualitative element. Fifty-six students from the University of Greenwich qualified for inclusion in the study. Results indicated that perceived stress and trait neuroticism decreased over the month of the study, while resilience increased. Engagement with the intervention also predicted a reduction in neuroticism. Students reported experiencing a complex range of difficulties over the duration of the pandemic and that 80% of participants found the workshop to be effective in addressing these problems. Overall, participants found more positives than negatives in the online delivery of the workshop. If rolled out on a wider basis, the REP-S has the potential to improve wellbeing and mental health across the higher education sector.

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INTRODUCTION

Universities are increasingly recognising that they have a central role in supporting students to develop broad transferrable skills that promote positive wellbeing. This task of actively promoting student wellbeing has been strengthened in importance by the COVID-19 pandemic. Over the duration of the pandemic, students have had to overcome the challenges of studying remotely (Chhetri, 2020), while managing the stress and loneliness stemming from social disconnection from friends, family, tutors and lecturers (Varga et al., 2021). A study conducted on student stress and coping during the pandemic found that 70% of university students reported levels of stress that were disrupting their quality of life, academic progression, and degree attainment (Son et al., 2021). The current study was developed in the context of this environment of heightened study stress; it investigated the efficacy and outcomes of an online resilience intervention within a UK university, aimed at helping students cope with the stressors of university life within the context of the COVID-19 pandemic.

Stress, Mental Health Problems and Resilience in Students

Prior to the pandemic and the stressors that it initiated, stress in students was already at a high level, mainly caused by fears surrounding exams, worries about finances, and by concerns about career prospects (Mental Health Foundation, May 2018). Evidence points to a problem with mental health difficulties in students that has been growing for some years. A report by the Institute of Public Policy Research found that in the UK there has been an increase in mental health problems among young adults from 2003 to 2017 (Thorley, 2017). Moreover, the student population is especially prone to experiencing such problems, having lower levels of wellbeing and life satisfaction than the adult population (Stallman, 2010). Between 2010 and 2015 a dramatic increase of 201% has been observed in drop-out rates amongst students due to mental health problems (Thorley, 2017).

With an increase in mental health disorders, and a decrease in the levels of general wellbeing, mental health services at universities are under pressure. In the last ten years, among higher education counselling services, there has been an increase in demand and also in the severity of the students' presenting conditions (Royal College of Psychiatrists, 2021). Ninety-four percent of higher education institutions in the UK claimed there has been an increase in demand for mental health services, with one in 4 students either using such a service or waiting to do so (Thorley, 2017). Due to the heightened demand, time spent on waiting lists has increased and counselling services can now only provide short-term help for issues such as adverse life events, with more complex interventions being unavailable (Royal College of Psychiatrists, 2021).

A solution for lessening the stress and mental health difficulties that undermine student wellbeing and achievement is cultivating resilience among students (DeRosier et al., 2013). Resilience is the ability to effectively adapt to, and recover from, stressful situations (Smith et al., 2008). In students, this ability predicts higher grades over the course of a year (Allan et al., 2014), and also increased the likelihood of completing a degree (Bleasdale & Humphreys, 2018), life satisfaction (Kjeldstadli et al., 2006) and positive mental health (Hartley, 2011). For example, a study with medical students found that those with low levels of resilience were less satisfied with their lives and with the academic environment, had poorer physical health, worse social relationships and had more negative perceptions of their academic performance (Tempski et al., 2015).

RESILIENCE INTERVENTIONS AND THE CHALLENGE OF ONLINE DELIVERY

There is encouraging evidence that resilience can be enhanced within the student population via training programmes that target skills to help students pre-empt stress or manage its effects when it occurs. Several studies on this have been conducted in the USA. The *Resilience and Coping Intervention* (RCI) is a group-based three-week intervention developed at the University of Missouri. It was evaluated in a randomised control trial (Houston et al., 2017) with 124 undergraduates, randomly assigned to a control or intervention group. After three weeks, intervention participants reported significantly more hope and significantly less stress and depression compared to control participants. Another programme, *Transforming Lives Through Resilience Education* (TLRE), has been developed at the University of Texas. In an evaluation study, the intervention significantly increased self-appraisals of personal growth for the experimental group compared with a control group (Dolbier, Jaggars & Steinhardt, 2009).

These two resilience programmes are based on a cognitive-behavioural approach to resilience-building; however, they do not cover the social and interpersonal skills that are integral to resilience. Workshops that emphasise a purely individualist conception of resilience can promote a socially disconnected approach to coping with stress. This is particularly salient considering that loneliness is an increasing problem for young adults at the current time, and also given that individuals from more collectivist cultures have been shown to place a strong emphasis on the social side of resilience (Buse et al. 2013). We consider social resilience to be essential to resilience training too (Levine, 2003).

The *Resilience Enhancement Programme for Students* (REP-S) was developed by Robinson, Sebah and colleagues following an analysis of what students consider to be their key unmet needs in managing stress (Robinson et al., 2021). It was also influenced by a biopsychosocial theoretical framework for conceiving resilience, which considers three levels of resilience skills: cognitive, social and psychophysiological. Each of these levels contains two workshops:

- Level 1 Cognitive resilience: (a) Goal-setting and Planning, (b) Positive Reframing
- Level 2 Social resilience: (a) Effective Social Support and Help-Seeking, (b) Assertiveness
- Level 3 Psychophysiological resilience: (a) Breathing for Relaxation, (b) Mindfulness

Appendix gives a more detailed overview of the contents of these sessions.

The REP-S project has been shown in previous research to lead to positive change (Robinson et al., 2021). A randomised control trial was conducted with 36 students in the intervention group and 29 in the control group. Over a month, the intervention group significantly decreased in perceived stress and trait neuroticism relative to the control group. Another study looked at the perceived personal significance from 145 different participants. In that evaluation, 88% of participants reported that the intervention had been a positive learning experience, while 85% of participants stated that participating in the workshops would positively benefit their development during university (Robinson et al., 2021).

Such interventions have also been delivered in an online format. One example is a study conducted on college students which found that a self-paced online programme significantly improved participants' resilience and self-esteem while also reducing perceived stress (Roig et al., 2020). Similarly, an online self-guided intervention for nursing students improved resilience, an effect that lasted up to 3 months, along with lessened symptoms of anxiety and depression (Stoliker et al., 2021). However, not all programmes are effective, as a one-hour interactive training for nursing students had no effects on resilience neither online, nor face-to-face (Mayor-Silva et al., 2021). This may have happened because of the brief

nature of the intervention; a systematic review has found that for online delivery, medium-length guided interventions appear to work best (Heber et al., 2017). This suggests that online delivery programmes may work, but only when designed effectively. Moreover, there currently are interventions such as cognitive behavioural therapy for depression (Andersson et al., 2013), or stress management interventions (Wolever et al., 2012) that reach similar levels of effectiveness in both online and traditional formats.

Creating an effective resilience programme for students available online brings a range of benefits. Firstly, heightened resilience not only reduces, but also prevents, the development of mental health problems (Shrivastava & Desousa, 2016), therefore, promoting it could reduce the current strain on mental health services. Online training is in some ways more inclusive and accessible than face-to-face training (Baños et al., 2017). Being made available online means larger numbers of students can easily access the training, while eliminating barriers such as geographical limitations, travel costs or time spent in transit (Ebert et al., 2019). These benefits were supported in a qualitive study where students who participated in an online mental health intervention recognised the flexibility and accessibility of the online programme as useful and important (Irish et al., 2020). Moreover, due to the online nature, such interventions are both suitable and needed for addressing mental health in the context of the COVID-19 pandemic (Rauschenberg et al., 2021).

However, there are also drawbacks of online mental health interventions. Two of the most important ones are high attrition rates, which reached 35% across 70 randomised control trials (Linardon & & Fuller-Tyszkiewicz, 2020), and in a naturalistic setting, low intervention uptake rates (e.g. 8.5%; Lillevoll et al., 2014). These may be explained by the negative views that participants have on the effectiveness of online interventions. In the aforementioned qualitative study by Irish et al. (2020), students revealed their preference for a face-to-face intervention due to it being more personalized, and only viewed the online version as useful as a tool while waiting to get face-to-face therapy (Irish et al., 2020). Such doubtful views regarding the effectiveness have been found in other studies as well (Wallin et al., 2018; Musiat et al., 2014). Nevertheless, this lack of a personalised and interactive approach that raises some concern in participants is not necessarily due to the online nature of the intervention. Face-to-face interventions have been found to be interactive in varying degrees, with the more guided and interactive ones being more effective in reducing stress (Heber et al., 2017). With the help of current technology and software such as Zoom and Microsoft Teams, interventions can be guided by real facilitators in online video environment, which includes break-out rooms for smaller group conversations. However, this approach has been scarcely tested.

Aims, Hypotheses and Research Questions

The aim of the current study was to deliver and evaluate an online version of the REP-S. Our hypothesis was that participation in the online version of the REP-S intervention would lessen perceived stress and neuroticism, while boosting resilience, and that level of engagement would correlate negatively with change in stress and neuroticism, while correlating positively with change in resilience. Furthermore, we predicted that the REP-S would be experienced as a personally significant developmental event for 80%+ of participants. Two additional research questions were posed for the qualitative analysis: Firstly, is this kind of resilience workshop considered to be meeting the needs of students in the context of the COVID-19 pandemic and its impact on studying within higher education? Secondly, how is online delivery of this kind of workshop experienced in terms of perceived positives and negatives relative to face-to-face delivery?

METHOD

Evaluation Design

The intervention was evaluated using a mixed-methods design. Quantitative data were gathered in two phases; Phase 1 was 0-24 hours before the intervention and Phase 2 was 30-35 days after the workshop. Engagement with activities between the two phases was measured at Phase 2 as a potential predictor of change in stress, resilience and neuroticism. Qualitative data on the perceived personal significance of participating in the training were also acquired, which is of complementary benefit to pre-post quantitative data, given that finding statistically significant change does not necessarily equate to the change being experienced by participants as meaningful and worthwhile (Bothe & Richardson, 2011). Qualitative brief text data on (a) the relevance of the intervention to the past year of the pandemic and its effects on studying in higher education and (b) the experience of participating in the workshop via an online delivery platform were also captured.

Participants

56 students participated in the workshop and completed the pre-and-post workshop questionnaires, thus meeting the criterial for inclusion in the final sample. The same sample was 81% female and 19% male. 4% were doing a foundation degree, 33% were first year undergraduates, 17% were second year undergraduates, 17% were third year undergraduates and 30% were postgraduates. The mean age of the sample was 26, with a standard deviation of 8.4. Students were studying on a range of degree subjects including psychology, law, history, criminology, graphic design, mathematics, education, business, midwifery, medical entomology, human resource management, nursing, social work and tourism management.

Measures and Assessments

Perceived Stress Scale (PSS). Extent of perceived life stress was measured by the 10-item version of the Perceived Stress Scale (Cohen et al., 1983). For each item, participants report how often they have been stressed during the past month using a 5-point Likert scale ranging from 0 (never) to 4 (very often). Cronbach's alpha was .88 for the Phase 1 and .86 for Phase 2.

Brief Resilience Scale (BRS). Resilience was measured via the Brief Resilience Scale (Smith et al., 2008). This comprises 6 items, for example "It does not take me long to recover from a stressful event". Items are measured on a 5-point Likert Scale of Strongly Disagree to Strongly Agree. Cronbach's alpha was .87 for Phase 1 and .87 for Phase 2.

The Big Five Inventory (BFI) Neuroticism Scale. The BFI scale for Neuroticism was used to assess the degree to which a person is prone to neuroticism. Items are scored on a 5-point Likert-scale (1-5) from Strongly Disagree to Strongly Agree (John & Srivastava, 1999). The scale ranges from 8 to 40, with higher values indicating more Neuroticism. Cronbach's alpha was .84 for Phase 1 and .83 for Phase 2.

• Engagement with Intervention: To assess engagement with the intervention, in the post-intervention phase, participants were asked to rate how much they have practiced the skills from each of the six workshops via a six-item scale. The exact instructions were as follows: "Please provide information below on how much you have engaged with the resilience techniques that we covered

in the workshop. Please be assured that you will receive your incentive voucher however much or little you engaged with the resilience techniques." The six items were rated on a 3-point scale: "3. I have practised these regularly over the past month / 2. I have practised these occasionally over the past month / 1. I have not practised these at all over the past month". The scale ranges from 6-18, and scores from participants ranged from 8-18, with a mean of 14.3 and a normal distribution.

- **Personal Significance Appraisal:** To assess the perceived personal significance of taking part in the intervention, two items were included in post-intervention assessment that have been used in every study on the REP-S so far: (1) "Participation in the resilience workshop and practice programme has been a positive learning experience for me" and (2) "Participation in the resilience workshop and practice programme has provided me with tools and techniques that I think will positively affect my development as a person during my time at university". Responses were measured on a 5-point Likert Scale from '1 strongly disagree' to '5 strongly agree'.
- Open-Ended Questions: Participants were asked to respond to the following two open-ended questions: (1) "The past year has been one of online learning and remote studying for most students due to the COVID-19 pandemic. Tell us in a few sentences how you personally think that has affected (a) the need for developing resilience in students and (b) for the role that resilience workshops such as the REP-S play in supporting this." (2) "The REP-S was originally devised for face-to-face delivery but has been adapted to be delivered in an online format. Tell us in a few sentences anything about the online format that you think was effective, and/or any ways that you think the online delivery could be improved."

Analysis of Qualitative Data

Qualitative data were analysed using Structured Tabular Thematic Analysis (ST-TA), which is a form of thematic analysis designed for use with brief texts (Robinson, 2021). The method can work with inductive or deductive approaches to thematic analysis; an inductive approach was selected to analyse the question responses, given the exploratory nature of the qualitative element of the study and the lack of precedent for themes. The phases of analysis are as follows: *Phase A - A Priori Theme Selection (only for deductive analyses so not necessary for the current study); Phase B - Deep Immersion in the Data; Phase C - Generating Initial Codes and Themes; Phase D - Tabulating Themes Against Data Segments; Phase E - Checking Inter-analyst Agreement; Phase F - Exploring Theme Frequencies; Phase G: Developing Thematic Maps and Diagrams; Phase H - Producing the Report. Inter-analyst agreement following blind coding of 25 responses to each question was 79% for brief texts provided in response to both questions. Following this, the two analysts discussed the points of difference to ensure thematic agreement of 80%+.*

Procedure

Students at the University of Greenwich were recruited by email. They were sent an email asking if they would like to participate in a resilience training programme and to express an interest by providing details via an online form. They were informed that individuals who completed the research questionnaires and the workshop would receive a £10 Amazon voucher. Students who expressed an interest were then sent dates for 10 workshops along with sign-up forms using Eventbrite. Students who signed up for workshops were sent the pre-workshop questionnaire 24 hours before the workshop day. The workshops were all delivered via Microsoft Teams. A REP-S day consists of six 45-min sessions with breaks in

between and an extended lunch break. Following the day of workshops, students receive emails with homework tasks and reminders every 3 days for 30 days and are asked to practice the techniques regularly for these 30 days. After 30 days, students receive an email with the post-intervention questionnaires and a certificate of completion.

QUANTITATIVE RESULTS

Descriptive Results

In response to the closed questions about the personal significance of participating in the intervention, the frequency of distribution of participant responses is shown in Table 1. In total, 93% agreed or strongly agreed with the statement that the workshop was a positive learning experience, and 90% agreed or strongly agreed with the statement that the workshop will positively affect their development as a person. Therefore, our hypothesis that these questions would receive an 80%+ agreement was supported.

Table 1. Percent of responses to each personal significance question by rating scale point

	"Participation in the resilience workshop and practice programme has been a positive learning experience for me"	"Participation in the resilience workshop and practice programme has provided me with tools and techniques that I think will positively affect my development as a person during my time at university
Strongly agree	74	77
Agree	19	12
Neither agree nor disagree	5	9
Disagree	0	0
Strongly disagree	1	1

Inferential Findings

It was hypothesised that participants would show a drop in perceived stress and neuroticism, along with an increase in self-reported resilience over the 4-week duration of the study. To test this, given that data were normally distributed and assumptions for parametric tests were met, a paired t-test was conducted to compare the pre-intervention mean and the post-intervention mean for the three dependent variables. It was found that, as hypothesised:

- Perceived stress significantly decreased at the mean level from 32.8 to 25.5 (t(53) = 9.02, p < .001)
- Resilience significantly increased at the mean level from 18.7 to 21.2 (t(52) = -4.15, p < .001).
- Trait neuroticism significantly decreased at the mean level from 26.2 to 22.2 (t()53 = 6.87, p<0.001)

Extent of participation in the REP-S varies according to amount of time and commitment that students give to practising the techniques they learn. Therefore, it was predicted that engagement with practicing the activities over the month of the intervention would predict lower stress, lower neuroticism and higher resilience. Engagement with the intervention, as measured by combining self-reported involvement levels with each of the 6 workshop activities over the 4-week period, was negatively correlated with change in perceived stress; this correlation was in the predicted direction but was not significant (r=-.20, p=07). The correlation between engagement and change in resilience was close to zero (r = .01, p=47). The correlation between engagement and change in neuroticism was in the predicted direction and significant (r=-.25, p<0.05). Thus the hypothesis that engagement would predict change in lowering stress and neuroticism, while increasing resilience, was partially supported.

QUALITATIVE RESULTS

A thematic analysis was conducted on the responses to the two open-ended questions asked. The results of these two analyses are presented below.

Part 1: Resilience and the REP-S in the Context of the Pandemic

The first question presented to participants was: "The past year of the pandemic has been one of online learning and remote studying for most students. Tell us in a few sentences how you personally think that has affected (a) the need for developing resilience in students and (b) for the role that resilience workshops such as the REP-S play in supporting this." The four main themes extracted from the 54 responses to this question are shown in Table 2, along with the six subthemes for Theme 1.

Pandemic-Induced Difficulties

85% of participants referred to a range of difficulties in relation to their studies and their life more broadly that had been induced by the COVID-19 pandemic and the social distancing measures taken to mitigate its effects. The most prevalent of these was *Social Disconnection Difficulties*. 30% of the sample included statements coded within this subtheme, such as comments about difficulties communicating with others, a sense of dislocation from university life, feelings of isolation and loneliness, and fears about socialising or meeting people after distancing measures have been released. An example is:

It's been much more difficult to talk to people, most of the time you're not meeting anyone face to face and when you are it's behind a mask.

The second most prevalent category of difficulty was *Online Learning Difficulties*. 20% of participants referred to this, with comments including the challenge of learning new digital skills, problems with lecturers not adapting to online learning platforms, miscommunication between staff and students, handling disruptions and distractions at home while engaging in learning activities and difficulties with concentration. An example is:

The Resilience Enhancement Programme for Students (REP-S)

Table 2. Themes from responses to question about the workshop's role in the context of the pandemic year

Themes (Main Themes Numbered, Subthemes Bulleted)	Frequency of Cases in Which Theme Present (% of Total N=54 in Brackets)
1. Pandemic-induced Difficulties	46 (85%)
A. Social disconnection difficulties	16 (30%)
B. Online learning difficulties	11 (20%)
C. Difficulties with stress levels and mental health	11 (20%)
D. Self-motivation difficulties	9 (17%)
• E. Mental health difficulties	5 (9%)
F. Difficulties due to lack of social support	5 (9%)
2. Less difficulty than normal / a time of positive challenge	3 (6%)
3. Workshop beneficial in improving coping with these difficulties	43 (80%)
4. Perceived importance of having and building resilience in the context of current difficulties	23 (43%)

Students have faced unprecedented challenges this year and the move to online learning caused uncertainty in the following areas: initial frustration at the lack of suitable wifi capabilities, especially with blended learning. Challenges on lecturers reflected in the course management - timing of assignment feedback, increased stress levels - highly recommend an adapted course for lecturers.

The third most prevalent category was *Difficulties with Stress Levels and Mental Health*. This referred to mentions of dealing with the effects of the pandemic and remote studying situation on stress and mental health that were not specific to a particular cause but were a function of the whole situation being experienced as overwhelming. An example:

As this past year involved a lot of things many people and students have never encountered before, I think we all got a bit "stuck", felt hopeless, and thus struggled with a number of things - our mental health being at the center of that.

The fourth most prevalent difficulty theme, mentioned by 17%, was *Self-Motivation Difficulties*, which subsumes all comments about the struggles of motivating oneself, managing time and remaining self-disciplined in a remote working situation. Participants referred to how the structure of attending face-to-face sessions in normal years is essential to motivation, and removing that face-to-face element created a challenge for keeping motivated:

Being on your own and in isolation make it really hard to stay in control and it makes it very easy to become unmotivated.

Finally, 9% referred to *Difficulties due to Lack of Social Support*, which included comments about feeling unsupported and unable to reach out to staff or other students for help, due to the remote studying environment:

Students no longer have the informal contact with other students and tutors this can mean that small issues are not discussed and have the potential to build up and cause stress.

Reaching out for support is more difficult these times when everyone's concern is the pandemic.

Less Difficulty Than Normal / A Time of Positive Challenge

Three participants mentioned that the year of the pandemic had been a time of either lessened stress or one that was predominantly about positive challenge rather than problematic stress. For example:

I think it's been less challenging to have all of my university time at home, because I have been able to manage my time more efficiently. Working from home has meant I don't feel pressure to socialise as I may if I were on campus, as I have a busy lifestyle already, and would find additional pressures unfavourable.

Perceived Importance of Having and Building Resilience in the Context of Current Difficulties

This theme, mentioned by 43% of participants, subsumes all references to the importance of building resilience in the context of having to adapt to the challenges of the pandemic and remote studying. These include mentions of the importance of adaptability, the importance of self-development in difficult times, and so on. For example:

Developing resilience in students to deal with adverse situations is crucial, especially at times like these. In my opinion, the need for skills like resilience has skyrocketed in the past year.

I believe people, and especially students under so much stress as we are, need to be equipped with resilience and positive reframing techniques to push through the challenges and understand our emotions better, so that we can respond and adapt, rather than react and break.

Workshop Beneficial in Improving Coping With These Difficulties

80% of participants stated that they felt that participating in the REP-S was beneficial in helping them handle the complex difficulties and challenges of the pandemic. A number also mentioned that they feel it would be beneficial to make it more widely available. Example quotes that referred to the beneficial nature of the workshop are as follows:

The past year has been, from personal experience, extremely detrimental to student's mental health. The lack of in-person social interactions and lack of job opportunities has made many young adults lose hope for their future. Developing resilience through the REP-S resilience workshops is a great way to offer support and help people build the skills they need to help improve their mental health and gain more confidence in themselves.

Online learning and remote studying have been difficult and I think it made people realise how important good mental health is. Developing resilience in students to deal with adverse situations is crucial,

especially at times like these. In my opinion, the need for skills like resilience has skyrocketed in the past year and having access to workshops like REP-S is invaluable.

Part 2: The Online Delivery of the Rep-S: Evaluative Comments

The second open-ended question participants were asked to respond to was: "The REP-S was originally devised for face-to-face delivery but has been adapted to be delivered in an online format. Tell us in a few sentences anything about the online format that you think was effective, and/or any ways that you think the online delivery could be improved." Table 3 shows the 9 themes extracted from the response data for this question.

Table 3. Themes from responses to question about the online delivery format

Theme	Frequency of Cases in Which Theme Present (% of Total N=53 in Brackets)
1. Online delivery as promoting participation: convenient and accessible	6 (11%)
2. Comfort, engagement and perceived safety of the online environment	11 (21%)
3. Effective communication and interaction facilitated by online delivery	24 (45%)
4. General effectiveness comments	23 (43%)
5. Positive comments about structure, duration and breaks	13 (26%)
6. Structural limitations or issues	7 (13%)
7. Attention difficulties experienced	4 (8%)
8. Communication and interaction difficulties due to online format	8 (15%)
9. More follow-up information needed	2 (4%)

Positive Comment Themes

84% (76/91) of comments about the online format of the workshop were positive. These were categorised into five themes. The first theme, mentioned by 11%, was "Online delivery as promoting participation: convenient and accessible". This included comments about how an online format encourages participation for students who are unable to participate in person and who find the prospect of attending in person to be problematic for a variety of reasons. An example quote within this theme was:

I thought the online delivery was cracking. I personally preferred it; removed a lot of the motivational disincentives to attending, got to do it in a comfortable and safe environment where I wasn't worried about looking silly during power poses or breathing exercises, and found the leaders really compassionate.

The second theme, *Comfort, engagement and perceived safety of the online environment*, mentioned by 21%, pertained to sense of ease and comfort of being at home for the workshop and the sense of not being visible when practicing the breathing exercises and meditation, which helped to overcome self-consciousness. An example quote was:

I think the online format was effective as it was more personal doing the activities like the breathing exercises, for example, from the comfort of my own home.

The third theme – *Effective communication and interaction facilitated by online delivery* – was the most prevalent, with 45% of participants mentioning it. This theme subsumed all comments that related to how online delivery, and the use of breakout rooms, enhanced communication and interaction rather than undermining it. These included the benefits of partial anonymity and turning cameras off.

The way the online workshops were delivered was just as great as face-to-face. We were still able to discuss in small groups and it removed the need to go to university to have them delivered face-to-face. We were still able to interact with each other and learn different opinions.

Being online means that students feel more willing to speak up and share their experiences.

I also enjoyed the breakout rooms and being able to talk to certain individuals from the group in-depth.

43% of participants mentioned "General effectiveness comments". These were non-specific positive evaluations about participation in the workshop that did not give reasons for the evaluation. For example:

I think the full-day workshop was a success despite the online delivery

It was perfect.

26% of participants commented on the positive structure of the event. The day is fairly intensive, with six 45-minute sessions in a day, but a number of participants stated that due to the regular breaks, this was not a problem:

Frequent breaks were good to break up the day to enable more focus and enjoyment of the workshop.

Themes About Problems and Issues

16% (15.91) of comments about the online format of the workshop mentioned perceived problems and issues for improvement. 13% of participants mentioned *Structural Limitations and Issues*. These included the need for additional sessions, being too long, a need for the day to be broken down, more groupwork, and changing breakout rooms to ensure that each breakout room has different people, rather than sample subgroup of participants for each session. For example:

I would like to see more group work during the workshop and if that is possible short 121's with the workshop leader.

8% mentioned *Attention Difficulties Experienced*: the difficulty of paying attention for the duration of the session due to the online format and eye fatigue:

It was effective but very long so easy to get distracted.

Subsumed within the theme of *Communication and interaction difficulties due to online format*, 15% reflected that the online format makes communication more challenging, for example:

The social interaction was nowhere near as great as it could have been when delivering the workshop live, however the knowledge and semi structured flow made it still enjoyable.

Finally, in *More Follow-Up Information Needed*, 4% of participants expressed the view that provision of more info via factsheets or handouts would be beneficial. For example:

I'd have liked to have maybe had a printable worksheet or two based on the content of the presentations, but that's just because I find it more difficult to both pay attention and take full notes when talks are online rather than in person.

DISCUSSION

The aim of the present study was to deliver and evaluate an online version of the REP-S. In line with our predictions, it was found that taking part in the REP-S had beneficial outcomes in terms of decreasing stress and trait neuroticism and increasing resilience. This supports previous randomised control trial research on the REP-S showing that participating in a brief resilience intervention was associated with significantly decreased perceived stress, trait neuroticism and enhanced self-esteem over a period of one month (Robinson et al., 2021). The quantitative findings are also in line with previous studies on other resilience interventions showing an improvement in resilience scores post-intervention in a sample of university students (Steinhardt & Dolbier, 2008) and nurses (Chesak et al., 2015). This further supports the idea of resilience being a malleable trait that can change following intervention activities or selfdevelopment work (Luthar, 2000). The quantitative results showed that there was a significant decrease in perceived stress, lending further support for the role that interventions can play in helping students to effectively lower stress levels, especially within the current rise of psychological stress experienced among this population. While these findings do not have the benefit of being relative to a control group, they are aligned with previous findings, and the change found in neuroticism is contrary to what one would expect of a period of a month without intervention (Cobb-Clark & Schurer, 2012), hence assuming that the change in self-reported neuroticism is a function of participation in the intervention is a justifiable inference.

The qualitative analysis found that students have experienced a range of complex studying-related difficulties due to the pandemic, including those that relate to social disconnection, not feeling supported, feeling demotivated and struggling with online learning. 80% of participants were explicit that the workshop was an important intervention at this time at helped to address the difficulties there were experiencing. Comments on the online format included a range of positives and negatives, with the positives (84% of comments) being far more prevalent reports than negatives (16% of comments).

The workshop is only one part of the intervention. Equally important is the month-long practice period with regular email reminders to instantiate new skills, habits, and ways of coping. The use of follow-up emails during the practice period was perceived positively by participants, supporting previous research indicating the useful role that reminders play (Hudson, Briley, Chopik & Derringer, 2018). Despite the mixed findings in relation to the effectiveness of online interventions (e.g. Mayor-Silva et al., 2021),

the findings from the qualitative accounts in the current study shed light on the importance of creating an effective resilience intervention that is accessible online, with many students suggesting that this is preferable to a face-to-face format. This also highlights the value of including personal significance as an additional source of data, not least because it is now acknowledged as an important complement to statistical significance (Bothe & Richardson, 2011), but also because such interventions such as the REP-S aim to sow seeds of knowledge and awareness for future developments. This is particularly relevant in the context of the current pandemic, where there has been a major shift to online learning and access to resources. Increasing access to online interventions, therefore, can aid in improving technology and digital literacy. Overall, the findings from the quantitative and qualitative data suggest that the workshop was experienced as a generally positive and beneficial experience and that the transfer of the REP-S to an online format was successful. Indeed, the results suggest that online delivery has many benefits to face-to-face delivery and that the relative merits of the two should be the continued focus of research.

Whilst notable changes were found in the direction predicted for pre- and post-intervention self-reported resilience, perceived stress and neuroticism scores, the findings should be reviewed with caution. Due to logistical constraints that pertained to participant access and the restrictions of the COVID-19 pandemic, the design of the current study did not involve a control group. Therefore, mean-level changes in the variables of interest are not indicative of a causal link. Despite this, however, the finding that lower perceived stress and neuroticism correlate with higher intervention engagement over the practice period month is important, as it suggests that a successful outcome from the intervention is a function of how much participants practise the skills and techniques they have learnt through the 4-week practice period. However, although this fits with our prediction, as with the mean-level findings we cannot infer causality from this relationship. It may be that the causal path is at least in part in the other direction; that intervention engagement is prevented by higher levels of stress.

The prediction that trait neuroticism scores would decrease over the course of the intervention was supported in the current study. Such changes would not be expected over the course of a month without an intervention, suggesting that the observed change in mean scores is a direct function of the intervention itself. Indeed, previous research has consistently indicated that neuroticism and resilience are related to affective states, with neuroticism being one of the strongest predictors of negative affect (Howell & Rodzon, 2011). Neuroticism, therefore, is a psychological trait of considerable importance for students in higher education, because it is strongly linked to a number of adverse outcomes and is inversely associated with several positive life outcomes, including self-esteem (Watson, Suls & Haig, 2002) and resilience (Campbell-Sills, Cohan & Stein, 2006). Future research should explore this relationship further with the use of a control group as well as collecting follow-up data at several points in order to examine the long-term efficacy of a brief resilience intervention.

The study has various limitations that call for future research to be addressed. Firstly, the quantitative evaluation was based on self-report data. Getting data from third parties on a person's behaviour, direct behavioural data, of physiological data that is a reliable marker of stress, will be an important addition to this body of research going forward. Secondly, the evaluation was carried out of the course of one month, with a two-phase design. Further research will benefit from follow-up phases that assess whether the changes in stress, resilience and neuroticism are ephemeral or enduring. Thirdly, the design included an intervention group but no control group, as this was not viable within the resource base allocated to the project. The aim in subsequent studies will be to compare change in the intervention group with a control group. Fourthly, the research was conducted at one university, but to establish the generalisability of the intervention's efficacy, research across multiple institutions will need to be conducted. This is

the next step for the REP-S; we are planning implementation and evaluation at universities in the UK, Ireland and India.

In conclusion, the results from the present study have practical implications for the cultivation of resilience via training programmes at higher education institutions. The pre-post quantitative findings, personal significance ratings, and qualitative feedback all point towards wide-ranging benefits of participating in the REP-S, and thus to its potential for wider dissemination. Given the ambiguous previous findings pertaining to remote interventions, the online delivery was surprisingly successful. Our data suggest that this is due in part to the fast-growing digital literacy and familiarity with remote learning technologies that has occurred during the COVID-19 pandemic. The era of online resilience training may have just begun.

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REFERENCES

Allan, J. F., McKenna, J., & Dominey, S. (2014). Degrees of resilience: Profiling psychological resilience and prospective academic achievement in university inductees. *British Journal of Guidance & Counselling*, 42(1), 9–25. doi:10.1080/03069885.2013.793784

Andersson, G., Hesser, H., Veilord, A., Svedling, L., Andersson, F., Sleman, O., Mauritzson, L., Sarkohi, A., Claesson, E., Zetterqvist, V., Lamminen, M., Eriksson, T., & Carlbring, P. (2013). Randomised controlled non-inferiority trial with 3-year follow-up of internet-delivered versus face-to-face group cognitive behavioural therapy for depression. *Journal of Affective Disorders*, *151*(3), 986–994. doi:10.1016/j. jad.2013.08.022 PMID:24035673

Baños, R. M., Etchemendy, E., Mira, A., Riva, G., Gaggioli, A., & Botella, C. (2017). Online positive interventions to promote well-being and resilience in the adolescent population: A narrative review. *Frontiers in Psychiatry*, *8*, 10. doi:10.3389/fpsyt.2017.00010 PMID:28194117

Bleasdale and Humphreys. (2018). *Undergraduate resilience research project*. http://teachingexcellence.leeds.ac.uk/wp-content/uploads/2018/01/LITEbleasdalehumphreys_fullreport_online.pdf

Bothe, A. K., & Richardson, J. D. (2011). Statistical, practical, clinical, and personal significance: Definitions and applications in speech-language pathology. *American Journal of Speech-Language Pathology*, 20(3), 233–242. doi:10.1044/1058-0360(2011/10-0034) PMID:21478279

Buse, N. A., Burker, E. J., & Bernacchio, C. (2013). Cultural variation in resilience as a response to traumatic experience. *Journal of Rehabilitation*, 79(2), 15–23.

Charles, N. E., Strong, S. J., Burns, L. C., Bullerjahn, M. R., & Serafine, K. M. (2021). Increased mood disorder symptoms, perceived stress, and alcohol use among college students during the CO-VID-19 pandemic. *Psychiatry Research*, *296*, 113706. Advance online publication. doi:10.1016/j. psychres.2021.113706 PMID:33482422

Chhetri, C. (2020). "I Lost Track of Things": Student Experiences of Remote Learning in the COVID-19 Pandemic. *Proceedings of the 21st Annual Conference on Information Technology Education*, 314–319. 10.1145/3368308.3415413

Cobb-Clark, D. A., & Schurer, S. (2012). The stability of big-five personality traits. *Economics Letters*, 115(1), 11–15. doi:10.1016/j.econlet.2011.11.015

DeRosier, M. E., Frank, E., Schwartz, V., & Leary, K. A. (2013). The potential role of resilience education for preventing mental health problems for college students. *Psychiatric Annals*, *43*(12), 538–544. doi:10.3928/00485713-20131206-05

Dolbier, C. L., Jaggars, S. S., & Steinhardt, M. A. (2010). Stress-related growth: Pre-intervention correlates and change following a resilience intervention. *Stress and Health*, 26(2), 135–147. doi:10.1002mi.1275

Ebert, D. D., Mortier, P., Kaehlke, F., Bruffaerts, R., Baumeister, H., Auerbach, R. P., Alonso, J., Vilagut, G., Martínez, K. U., Lochner, C., Cuijpers, P., Kuechler, A., Green, J., Hasking, P., Lapsley, C., Sampson, N. A., & Kessler, R. C. (2019). Barriers of mental health treatment utilization among first-year college students: First cross-national results from the WHO World Mental Health International College Student Initiative. *International Journal of Methods in Psychiatric Research*, 28(2), 1–14. doi:10.1002/mpr.1782 PMID:31069905

Hartley, M. T. (2011). Examining the Relationships Between Resilience, Mental Health, and Academic Persistence in Undergraduate College Students. *Journal of American College Health*, *59*(7), 596–604. doi:10.1080/07448481.2010.515632 PMID:21823954

Heber, E., Ebert, D. D., Lehr, D., Cuijpers, P., Berking, M., Nobis, S., & Riper, H. (2017). The Benefit of Web- and Computer-Based Interventions for Stress: A Systematic Review and Meta-Analysis. *Journal of Medical Internet Research*, 19(2), e32. doi:10.2196/jmir.5774 PMID:28213341

Houston, J. B., First, J., Spialek, M. L., Sorenson, M. E., Mills-Sandoval, T., Lockett, M., First, N. L., Nitiéma, P., Allen, S. F., & Pfefferbaum, B. (2017). Randomized controlled trial of the Resilience and Coping Intervention (RCI) with undergraduate university students. *Journal of American College Health*, 65(1), 1–9. doi:10.1080/07448481.2016.1227826 PMID:27559857

Irish, M., Zeiler, M., Kuso, S., Musiat, P., Potterton, R., Wagner, G., Karwautz, A., Waldherr, K., & Schmidt, U. (2020). Students' perceptions of an online mental health intervention: a qualitative interview study. *Neuropsychiatrie: Klinik, Diagnostik, Therapie und Rehabilitation: Organ der Gesellschaft Osterreichischer Nervenarzte und Psychiater*. Advance online publication. doi:10.1007/s40211-020-00383-5

Kjeldstadli, K., Tyssen, R., Finset, A., Hem, E., Gude, T., Gronvold, N. T., Ekeberg, O., & Vaglum, P. (2006). Life satisfaction and resilience in medical school- A six-year longitudinal, nationwide and comparative study. *BMC Medical Education*, *6*(1), 48. doi:10.1186/1472-6920-6-48 PMID:16984638

Levine, S. (2003). Psychological and social aspects of resilience: A synthesis of risks and resources. *Dialogues in Clinical Neuroscience*, *5*(3), 273–280. doi:10.31887/DCNS.2003.5.3levine PMID:22033952

Lillevoll, K. R., Vangberg, H. C., Griffiths, K. M., Waterloo, K., & Eisemann, M. R. (2014). Uptake and adherence of a self-directed internet-based mental health intervention with tailored e-mail reminders in senior high schools in Norway. *BMC Psychiatry*, *14*(14), 14. Advance online publication. doi:10.1186/1471-244X-14-14 PMID:24443820

Linardon, J., & Fuller-Tyszkiewicz, M. (2020). Attrition and adherence in smartphone-delivered interventions for mental health problems: A systematic and meta-analytic review. *Journal of Consulting and Clinical Psychology*, 88(1), 1–13. doi:10.1037/ccp0000459 PMID:31697093

Mayor-Silva, L. I., Romero-Saldaña, M., Moreno-Pimentel, A. G., Álvarez-Melcón, Á., Molina-Luque, R., & Meneses-Monroy, A. (2021). The role of psychological variables in improving resilience: Comparison of an online intervention with a face-to-face intervention. A randomised controlled clinical trial in students of health sciences. *Nurse Education Today*, *99*, 104778. Advance online publication. doi:10.1016/j.nedt.2021.104778 PMID:33540351

Mental Health Foundation. (2018, May). *Stress: Are we coping?* Mental Health Foundation. https://www.mentalhealth.org.uk/sites/default/files/stress-are-we-coping.pdf

Musiat, P., Goldstone, P., & Tarrier, N. (2014). Understanding the acceptability of e-mental health—Attitudes and expectations towards computerised self-help treatments for mental health problems. *BMC Psychiatry*, *14*(109), 109. Advance online publication. doi:10.1186/1471-244X-14-109 PMID:24725765

Rauschenberg, C., Schick, A., Hirjak, D., Seidler, A., Paetzold, I., Apfelbacher, C., Riedel-Heller, S. G., & Reininghaus, U. (2021). Evidence synthesis of digital interventions to mitigate the negative impact of the COVID-19 pandemic on public mental health: Rapid meta-review. *Journal of Medical Internet Research*, 23(3), e23365. Advance online publication. doi:10.2196/23365 PMID:33606657

Robinson, O.C. (2021). Conducting thematic analysis on brief texts: The structured tabular approach. *Qualitative Psychology*. doi:10.1037/qup0000189

Robinson, O. C., Sebah, I., McNay, I., Field, J., Wragg, J., Stevenson, M., & Newton, P. (2021). Evaluating the REP-S brief resilience intervention for students in higher education: A multi-study mixed-methods programme of research. *British Journal of Guidance & Counselling*, 49(5), 672–688. Advance online publication. doi:10.1080/03069885.2021.1888372

Roig, E. A., Mooney, O., Salamanca-Sanabria, A., Lee, C. T., Farrell, S., & Richards, D. (2020). Assessing the efficacy and acceptability of a web-based intervention for resilience among college students: Pilot randomized controlled trial. *JMIR Formative Research*, *4*(11), e20167. Advance online publication. doi:10.2196/20167 PMID:33174530

Royal College of Psychiatrists. (2021). *Mental health of higher education students*. https://www.rcpsych.ac.uk/docs/default-source/improving-care/better-mh-policy/college-reports/college-report-cr166.pdf?s fvrsn=d5fa2c24_2#:~:text=Higher%20education%20may%20offer%20benefits,to%20a%20range%20 of%20possibilities

Shrivastava, A., & Desousa, A. (2016). Resilience: A psychobiological construct for psychiatric disorders. *Indian Journal of Psychiatry*, *58*(1), 38–43. doi:10.4103/0019-5545.174365 PMID:26985103

Smith, B. W., Dalen, J., Wiggins, K., Tooley, E., Christopher, P., & Bernard, J. (2008). The Brief Resilience Scale: Assessing the ability to bounce back. *International Journal of Behavioral Medicine*, *15*(3), 194–200. doi:10.1080/10705500802222972 PMID:18696313

Son, C., Hegde, S., Smith, A., Wang, X., & Sasangohar, F. (2020). Effects of COVID-19 on college students' mental health in the United States: Interview survey study. *Journal of Medical Internet Research*, 22(9), e21279. Advance online publication. doi:10.2196/21279 PMID:32805704

Stallman, H. M. (2010). Psychological distress in university students: A comparison with general population data. *Australian Psychologist*, 45(4), 249–257. doi:10.1080/00050067.2010.482109

Stoliker, B. E., Vaughan, A. D., Collins, J., Black, M., & Anderson, G. S. (2021). Building personal resilience following an online resilience training program for BScN students. *Western Journal of Nursing Research*, *1*. Advance online publication. doi:10.1177/01939459211017240 PMID:33998338

Tempski, P., Santos, I. S., Mayer, F. B., Enns, S. C., Perotta, B., Paro, H. B., Gannam, S., Peleias, M., Garcia, V. L., Baldassin, S., Guimaraes, K. B., Silva, N. R., da Cruz, E. M., Tofoli, L. F., Silveira, P. S., & Martins, M. A. (2015). Relationship among medical student resilience, educational environment and quality of life. *PLoS One*, *10*(6), e0131535. Advance online publication. doi:10.1371/journal.pone.0131535 PMID:26121357

Thorley, C. (2017). *Not by degrees: Improving student mental health in the UK's Universities*. IPPR. https://www.ippr.org/research/publications/not-by-degrees

Varga, T. (2021). Loneliness, worries, anxiety, and precautionary behaviours in response to the COVID-19 pandemic: A longitudinal analysis of 200,000 Western and Northern Europeans. *The Lancet Regional Health – Europe*, 2, 100020. doi:10.1016/j.lanepe.2020.100020

Wallin, E., Maathz, P., Parling, T., & Hursti, T. (2018). Self-stigma and the intention to seek psychological help online compared to face-to-face. *Journal of Clinical Psychology*, 74(7), 1207–1218. doi:10.1002/jclp.22583 PMID:29315545

Wolever, R. Q., Bobinet, K. J., McCabe, K., Mackenzie, E. R., Fekete, E., Kusnick, C. A., & Baime, M. (2012). Effective and viable mind-body stress reduction in the workplace: A randomized controlled trial. *Journal of Occupational Health Psychology*, 17(2), 246–258. doi:10.1037/a0027278 PMID:22352291

APPENDIX

Table 4. The three elements and six workshops of the REP-S

Section	Activity
1. Psychophysiological (mind-body) Resilience	1a. Breathing Techniques Introduction to the physiology of breathing, the effect of breathing on stress and vice versa Introduce and practise three breathing techniques; belly breathing, slow breathing and resistance breathing. Ib. Mindfulness Meditation The background and theory of mindfulness is introduced. A 5-minute mindfulness meditation is done A 5-minute guided relaxation is done Participants get to discuss their experience of the breathing and meditation in break-out rooms
2. Cognitive Resilience	1a. Positive reframing, including reframing beliefs about failure Introduce the distinction between event and interpretation, and introduce common "negative frames" "Frame-flip stories" are introduced and discussed, in which the frame around an event changes over time as outcomes change The concept of fear of failure is defined and its empirical effects presented. Students share the words they associate with failure and create a word cloud. Discussion of how failure can lead to positive change and learning. Failure associations exercise is repeated, focusing on positive words that relate to good outcomes that perceived failure can bring. 1b. Goal Setting and planning Goal mapping: Participants are asked to create a 'mind map' of their goals for the next month. Goal scheduling: Participants are given guidance on how to create a schedule of goals and plans using a timetable or planner to ensure that goals have a clear timeframe and prioritisation SMART goals: The theory of SMART goals is introduced (specific, measurable, attainable, realistic, time-bound) Effective planning: Techniques for positive planning introduced, including using written time-linked checklists and linking plans clearly to goals.
3. Social Resilience	 3a. Effective Help-Seeking A brief discussion on the various forms of help-seeking behaviour and the paradox of help-seeking (people who need help tend not to reach out for it). Exercise: Compose a list of people who might be possible sources of help during their time as a student and another list describing the potential barriers to seeking help and discuss in groups. Discussion of how social media relates to help-seeking; how it can be a source of social support, but also undermine social support. 3b. Assertiveness Theory of assertiveness presented, with examples Assertive body language presented and discussed Good ways of saying "no" presented and discussed A 4-point plan for responding assertively to challenging social situations presented. Two example scenarios are presented for participants to explore possible assertive solution to.
Month of practice	• After the workshop, participants are sent a different email every three days for 30 days, with tips and reminders for practising the techniques they have learnt.