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Supporting Engineering Degree Student Wellbeing with Compulsory Lessons on Stress Management

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Abstract: In this paper, we present findings from the evaluation of compulsory lessons on stress management at an engineering school in Spain. Both a face-to-face and an online lesson were integrated into a credit-bearing course for first-year university students. A pre-post survey study was conducted (n = 54). Results indicate that the lessons fostered more positive stress mindsets among students. Findings also suggest that students increased their proficiency in contemplating the topic of academic stress and in understanding the active role they can play in managing stress.

Keywords: Stress Mindsets, Stress Management, Student Wellbeing

1. Introduction

Teaching university students about stress and coping strategies can benefit their learning (Vogel & Schwabe, 2016). Moreover, learning to manage academic stress can carryover outside of academics and improve overall student wellbeing (Ebrahimi *et al*., 2019). This paper presents an evaluation of a stress management intervention centered on self-efficacy theory (Bandura, 1977). The intervention was integrated into a compulsory course for university students and aims to demonstrate an approach through which universities can address the need to support healthy coping in university (Böke *et al.*, 2019).

2. Methodology

A mixed methods design within a design-based research methodology was used as the educational intervention has been iterated upon across 4 academic years.

2.1 Participants

54 first-year students from a university in Spain responded to pre and post surveys (female = 17, male = 37, M_{age} = 18.17, *SD* = 1.71) in the 2022-23 academic year. All were enrolled in a compulsory general studies course that is part of an engineering degree programme.

2.2 Data Collection and Analysis

Data was collected in pre- and post-surveys using the Stress Mindset Measure (SMM), a closed-ended question ('Did you know that UPF offers a psychological support service?') and an optional open-ended question ('In what ways can the university better support students in coping with academic stress?'). UPF is an abbreviation of the university in which the study took place. Additional questions appeared in the surveys but are not reported in this paper. SMM is an 8-item measure (see Table 1) that assesses the extent to which an individual believes that the effects of stress are debilitating or enhancing. Items are rated on a 5-point scale (0 = strongly disagree to 4 = strongly agree). Scores are determined by reverse scoring

four negative items (indicated by an *) and then taking the mean of all items. Scores (above 2) represent a stress-is-enhancing mindset whereas lower scores represent a stress-is-debilitating mindset (Crum *et al*., 2017). All surveys were Google Forms either in English (*n* = 20) or Spanish (*n* = 34). The survey language was determined by the line of studies respondents were enrolled in as the university offers distinct English and Spanish/Catalan lines of studies. Responses were excluded from students that did not complete both pre and post surveys or had completed the surveys incorrectly. Quantitative data was analyzed using Excel. Thematic analysis was used for qualitative data.

2.3 Procedure

In week 1 of a 10-week general studies course, students completed the pre-survey at the onset of a 2-hour face-to-face class on stress management. The post-survey was assigned as an online task posted to the course learning management system (Moodle) at the end of the trimester, 8 weeks after the pre-survey. The compulsory lessons included the week 1 face-to-face class and an online lesson. The face-to-face class introduced students to concepts related to the science of stress (human stress response, stress mindsets) and evidence-based self-regulation techniques such as cognitive reappraisal and breathing techniques. The online lesson took place 5 weeks later. It required students to complete two units of an online course on the science of stress (https://tidex.upf.edu/courses/course-v1:Spotlighters+SP1+2021_1/). The first unit was on how lifestyle choices affect one's stress response. For the second unit, students were able to select from 5 available units. Upon completing a unit, students responded to reflective questions ('How has your knowledge about stress changed? How can you apply what you learned? What did you agree or disagree with?', 'How useful do you think it is for students to learn the content of this unit?'). Open educational resources (OER) created in European projects (Spotlighters, BEAM) were used to produce the lessons.

3. Results and Conclusions

3.1 Student Beliefs about Stress

The average SMM score from the pre-survey was 1.47 (*SD* = .63) out of 4 indicating that overall respondents held stress-is-debilitating mindsets. The average SMM average score on the post-survey increased to 2.06 (*SD* = .65). SMM scores had increased significantly from pre to post; $t(54) = 30.45$, $p < .0001$. Table 1 presents the number of students agreeing/strongly agreeing with each SMM statement to highlight the effects of the intervention – and to help identify areas to focus on in improving the intervention in the future.

Table 1. *Count of Students Agreeing or Strongly Agreeing with Belief Statements about Stress*

Statement	$n_{\text{-pre}}$	$n_{\text{-post}}$	pre-post (%)
*The effects of stress are negative and should be avoided.	25	12	-13 (-52)
*Experiencing stress depletes my health and vitality.	40	28	-12 (-30)
*Experiencing stress inhibits my learning and growth.	20	15	-5 (-25)
*Experiencing stress debilitates my performance and productivity.	22	19	-3 (-13.6)
Experiencing stress facilitates my learning and growth.	12	27	15 (125)
Experiencing stress enhances my performance and productivity.	16	30	14 (87.5)
Experiencing stress improves my health and vitality.	0	3	3 (NA)
The effects of stress are positive and should be utilized.	2	24	22 (1,100)

These findings are in line with previous studies that have found that exposing students to different beliefs about stress (i.e., the enhancing properties of stress) can lead to a shift in their stress mindsets and better help them benefit from challenging situations (Crum *et al.*, 2017; Beardsley *et al.*, 2021). As seen in Table 1, the biggest changes are found in items related to perceiving stress in a positive manner as many students had a limited understanding of the human stress response and the role it plays in preparing oneself to face challenges.

3.2 University Support to Help Students Cope with Academic Stress

From pre- to post-survey, students marked being more aware that the university offered a psychological support service (pre = 51.2%, post = 75.9%). In relation to the question about how the university can better support students in coping with academic stress, more students responded in the post survey ($n_{\text{-pre}}$ = 16, $n_{\text{-post}}$ = 34) and responses were more elaborated with a higher average word count: $M_{\text{-pre}}$ = 11.87 words (*SD* = 9.74), $M_{\text{-post}}$ = 21.97 words (*SD* = 22.03). A thematic analysis identified two primary themes: (1) accommodate us – which reflects students suggesting adjustments be made for them (e.g., Being flexible with classwork delivery dates), (2) help us learn – which reflects students suggesting being taught how to improve (e.g., With classes focused on stress and anxiety). Identified subthemes are shown in Table 2. In total, the pre-survey generated 16 categorisations and the post-survey 40. The coding of responses suggests that students became more aware of the help available to them outside the classroom (e.g., psychological support services: Pre = 0, Post = 17.5%) and better understood the potential role they could play in managing their academic stress (e.g., help us learn: Pre = 12.5%, Post = 35%; stress management: Pre = 6.25%, Post = 27.5%).

Table 2. *Theme Categorizations of Responses related to University Support for Students*

Theme	Subtheme	Pre-survey (%)	Post-survey (%)
Accommodate us		13 (81.25)	25 (62.5)
	Teacher support	9 (56.25)	7 (17.5)
	Lesson design/content	4 (25)	11 (27.5)
	Psychological support services	0	7 (17.5)
Help us learn		2 (12.5)	14 (35)
	Self-management	1 (6.25)	3 (7.5)
	Stress management	1 (6.25)	11 (27.5)
Other	(i.e., Not sure)	1 (6.25)	1 (2.5)

Results suggest that students may have acquired a greater proficiency in contemplating the topic of academic stress and understanding the active role they can play in managing stress. However, this study has limitations due to the nature of the sample (opportunity sample) and small sample size. All in all, these findings demonstrate a reusable approach, based on OER, through which universities can address the need to support healthy coping in university.

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References

Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. *Psychological Review*, *84*(2), 191.

Beardsley, M., Vujovic, M., & Portero-Tresserra, M. (2021). Evaluating an intervention to improve university student stress mindsets and self-management skills. *Revista del Congrés Internacional de Docència Universitària i Innovació (CIDUI)*, (5).

Böke, B. N., Mills, D. J., Mettler, J., & Heath, N. L. (2019). Stress and coping patterns of university students. *Journal of College Student Development*, *60*(1), 85-103.

Ebrahimi, O. V., Pallesen, S., Kenter, R. M., & Nordgreen, T. (2019). Psychological interventions for the fear of public speaking: A meta-analysis. *Frontiers in Psychology*, *10*, 488.

Crum, A. J., Akinola, M., Martin, A., & Fath, S. (2017). The role of stress mindset in shaping cognitive, emotional, and physiological responses to challenging and threatening stress. *Anxiety, Stress, & Coping*, *30*(4), 379-395

Vogel, S., & Schwabe, L. (2016). Learning and memory under stress: implications for the classroom. *NPJ Science of Learning*, *1*(1), 1-10.