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‘PROOF OF CONCEPT’ STUDY REPORT

Multimodal Approach for Social-emotional learning in HEI

Partners

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Megállapodás száma: **2021-1-CY01-KA220-HED-000023329**

TABLE OF CONTENTS

SUMMARY

The Mash Up 'n HEI project investigated the feasibility and effectiveness of music-enhanced social-emotional learning (SEL) interventions in higher education across four European universities. The initiative aimed to enhance emotional awareness, resilience, and student well-being through a multimodal approach combining cognitive-behavioral techniques with music-based activities.

Key Findings:

- High Student Acceptance: Students found the programs relevant, engaging, and personally beneficial. Satisfaction scores were consistently above average (M = 4.0+ on a 5-point scale).
- Positive Emotional Impact: Participants reported enhanced emotional skills, including greater confidence in managing stress and increased belief in the usefulness of negative emotions.
- Role of Music: Music facilitated emotional reflection and group cohesion, supporting the integration of diverse learners, including those with social or learning challenges.
- App Usability: The digital platform had moderate acceptance; many students preferred face-to-face delivery formats, citing issues with tech fatigue and language barriers.
- Trainer Feedback: Instructors appreciated the engagement fostered by music but requested clearer guidance and greater flexibility in content delivery.

Policy & Practice Implications:

- Embed short SEL modules in university curricula, especially in transition years.
- Support delivery through counseling services or elective workshops.
- Consider inclusive strategies for neurodiverse students.
- Use digital tools as optional supplements, not core delivery platforms.

ΠΕΡΙΛΗΨΗ

Το έργο Mash Up 'n HEI διερεύνησε τη σκοπιμότητα και αποτελεσματικότητα παρεμβάσεων κοινωνικοσυναισθηματικής μάθησης (SEL) ενισχυμένων με μουσική μεθοδολογία στην τριτοβάθμια εκπαίδευση σε τέσσερα ευρωπαϊκά πανεπιστήμια. Στόχος ήταν η ενίσχυση της συναισθηματικής επίγνωσης, της ανθεκτικότητας και της ευημερίας των φοιτητών.

Κύρια Συμπεράσματα:

- Υψηλή Αποδοχή από τους Φοιτητές: Οι συμμετέχοντες αξιολόγησαν θετικά την εμπειρία, με υψηλές βαθμολογίες σε ικανοποίηση και σχετικότητα (M = 4.0+).
- Συναισθηματικά Οφέλη: Παρατηρήθηκε αύξηση στις δεξιότητες αυτορρύθμισης και θετικότερη στάση απέναντι στα αρνητικά συναισθήματα.
- Ο Ρόλος της Μουσικής: Η μουσική ενίσχυσε την ενσυναίσθηση και τη συνοχή της ομάδας, διευκολύνοντας την ένταξη φοιτητών με μαθησιακές ή κοινωνικές δυσκολίες.
- Ψηφιακή Πλατφόρμα: Μέτρια αποδοχή – οι φοιτητές προτίμησαν τις δια ζώσης συνεδρίες, επικαλούμενοι κόπωση από την τεχνολογία και γλωσσικούς περιορισμούς.
- Απόψεις Εκπαιδευτών: Θετική αξιολόγηση για τη μουσική, αλλά ανάγκη για καθοδήγηση και μεγαλύτερη ευελιξία στο περιεχόμενο.

Προτάσεις Πολιτικής:

- Ενσωμάτωση σύντομων SEL ενοτήτων στο πρόγραμμα σπουδών.
- Παροχή μέσω συμβουλευτικών υπηρεσιών ή επιλεγόμενων σεμιναρίων.
- Συμπερίληψη φοιτητών με νευροαναπτυξιακές ιδιαιτερότητες.
- Χρήση ψηφιακών εργαλείων ως προαιρετικά υποστηρικτικά μέσα.

SAMENVATTING

Het Mash Up 'n HEI-project onderzocht de haalbaarheid en effectiviteit van sociaal-emotioneel leren (SEL) met muzikale elementen in het hoger onderwijs aan vier Europese universiteiten. Het doel was het bevorderen van emotioneel bewustzijn, veerkracht en welzijn van studenten via een multimodale aanpak die cognitief-gedragsmatige technieken combineert met muziekgebaseerde activiteiten.

Belangrijkste Bevindingen:

- Hoge Acceptatie door Studenten: Studenten vonden het programma boeiend, relevant en persoonlijk waardevol. De tevredenheidsscores lagen consequent boven het gemiddelde (M = 4.0+ op een schaal van 5).
- Positieve Emotionele Impact: Deelnemers rapporteerden verbeterde emotionele vaardigheden, meer zelfvertrouwen in stressmanagement en een sterkere overtuiging in de waarde van negatieve emoties.
- De Rol van Muziek: Muziek stimuleerde emotionele reflectie en groepscohesie, wat vooral gunstig was voor studenten met leer- of sociale uitdagingen.
- Gebruiksvriendelijkheid van de App: De digitale component werd matig gewaardeerd; veel studenten gaven de voorkeur aan fysieke bijeenkomsten, met name vanwege digitale vermoeidheid en taalbarrières.
- Feedback van Trainers: Trainers waardeerden de betrokkenheid die muziek teweegbracht, maar gaven aan behoefte te hebben aan duidelijkere richtlijnen en meer flexibiliteit in de uitvoering.

Beleidsaanbevelingen:

- Integreer korte SEL-modules in het curriculum, vooral in overgangsjaren.
- Faciliteer de uitvoering via studentenbegeleidingsdiensten of als keuzevakken/workshops.
- Ontwikkel inclusieve benaderingen voor neurodiverse studenten.
- Gebruik digitale middelen aanvullend, niet als primaire leermethode.

ÖSSZEFOGLALÓ

A Mash Up 'n HEI projekt négy európai egyetemen vizsgálta a zenével kiegészített szocioemocionális tanulás (SEL) bevezethetőségét és hatékonyságát a felsőoktatásban. A cél az érzelmi tudatosság, a reziliencia és a hallgatók jólétének javítása volt, kognitív-viselkedésterápia és zenei elemek kombinálásával.

Fő Eredmények:

- Magas Hallgatói Elfogadás: A résztvevők élvezetesnek és hasznosnak találták a képzést (átlagpontszám 4 felett 5-ös skálán).
- Érzelmi Fejlődés: Nőtt a stresszkezelési bizalom és pozitívabbá vált a negatív érzelmek hasznosságának megítélése.
- A Zene Szerepe: A zene segítette az érzelmi reflexiót és a csoportkohézió kialakulását, elősegítve a tanulási vagy társas nehézségekkel küzdő hallgatók bevonását.
- Applikáció Használhatóság: Közepes szintű elfogadás – sokan előnyben részesítették a személyes jelenléttel zajló órákat a digitális formával szemben.
- Oktatói Visszajelzés: A zenei elemeket pozitívan értékelték, de nagyobb rugalmasságot és részletesebb útmutatást kértek.

Politikai és Gyakorlati Ajánlások:

- Rövid SEL modulok integrálása a felsőoktatás tantervébe.
- Megvalósítás egyetemi tanácsadói szolgálatokon vagy választható workshopokon keresztül.
- Neurodiverz hallgatók számára inkluzív stratégiák alkalmazása.
- Digitális eszközök használata kiegészítő, nem elsődleges módszerként.

INTRODUCTION

The transition to higher education (HE) represents a significant developmental shift for young adults as they navigate independence, face academic pressures, and build new social connections. These challenges often surpass their existing psychosocial coping mechanisms, increasing vulnerability to mental health issues (Parker et al., 2004). Research shows that difficulties in emotional adaptation are linked to heightened mental health concerns among students (Acharya, Jin, & Collins, 2018; Watkins, Hunt, & Eisenberg, 2012). For instance, limited emotional clarity has been associated with impulsive behavior (Miller & Racine, 2022), whereas cognitive reappraisal is positively linked to resilience (Thomas & Zolkoski, 2020). Emotional distress often leads to procrastination, which hampers academic progress (Schuenemann et al., 2022), while psychosocial skills training, such as stress reduction programs, improves mental health and reduces procrastination (Yusufov et al., 2019; Schuenemann et al., 2022).

Despite the benefits of mental health services, traditional university counseling centers face barriers such as limited capacity, reactive focus on disorders, and high resource demands (Sauer-Zavala et al., 2021). In response, the emphasis is shifting toward universal mental health promotion and prevention programs (MPPPs) that are integrated into academic curricula and aim to build psychosocial skills across the student body (Conley & Durlak, 2017).

These MPPPs show promising outcomes, particularly when delivered through structured class-based programs (Conley, Durlak, & Dickson, 2013), supervised skill practice (Conley, Durlak, & Kirsch, 2015), and digital formats (Worsley, Pennington, & Corcoran, 2022). Meta-analyses highlight cognitive-behavioral therapy (CBT) and mindfulness-based interventions as effective components of such programs (Worsley et al., 2022).

More recently, research has explored the implementation of transdiagnostic, skills-based interventions like the Unified Protocol (UP), which targets core emotional vulnerabilities across mental health conditions (Barlow et al., 2018). These programs focus on Emotion Regulation (ER) as a transversal skill and show mixed results: while some studies indicate mental health benefits (Castro-Camacho, Díaz, & Barbosa, 2022), others do not (Sauer-Zavala et al., 2021), highlighting the need for further investigation.

Accessibility and inclusivity remain pressing issues in universal interventions. Standard program delivery often assumes high cognitive and language abilities, which may disadvantage students with learning differences. To address this, researchers are exploring arts-based methodologies, particularly music, as inclusive tools that resonate with diverse learners (De Witte et al., 2020; McFerran, 2010). Music has been shown to enhance treatment engagement and emotion regulation, reduce stress, and support mental health (Koelsch, 2020; Randall, Rickard, & Vella-Brodrick, 2014; Thomson et al., 2014). It also enables culturally relevant, non-stigmatizing learning experiences (Rodwin et al., 2022).

The Mash-Up N' HEI project

Building on this, the Mash-Up N' HEI project, a collaboration among four European universities, is developing music-enhanced ER modules that integrate clinical psychology and music therapy. These modules aim to make emotional skill development more accessible, particularly for students with learning challenges, by leveraging the empowering and socially integrative qualities of music (Volgsten, 2012). The initial phase of the project focuses on assessing the cultural relevance and feasibility of the intervention, laying the foundation for future evaluations of its impact on mental health and academic success.

CASE STUDY 1: UNIVERSITY OF CYPRUS

Method

Study Design

Three studies aimed to test the training content, assess its strengths and limitations, and guide revisions in both the instructional methods and the program components. Different variations in course delivery were intentionally implemented across multiple university courses to explore the most effective methods of implementation.

The results from these stages informed the development of best practices and highlighted actionable areas for improvement. Study 1, also included a fidelity check by an external expert to verify that the intervention was delivered as intended, ensuring consistency with the planned protocol. This process helped confirm that any observed effects were attributable to the intervention itself, not variations in its implementation, and supported the accuracy, replicability, and scalability of the study Table 1 outlines the specific methodological features employed at each stage.

Table 1. Methodological Elements for Studies

Step	Method of Delivery	Language	Design	Acceptability / Preliminary Effectiveness	Participants
Study 1	MS, MS, MS, MS, MS	EN	RCT 2 groups between subjects	ACC, EFF	INS, STU
Study 2	MS, MS, MS, MS, MS	GR	1 group within subjects	ACC, EFF	INS, STU
Study 3	—, —, M, M, —	GR	1 group within subjects	ACC	INS, STU

Notes:
Method of Delivery: MS = Music and Standard, M = Music only, S = Standard only
Language: EN = English, GR = Greek
Acceptability / Preliminary Effectiveness: ACC = Acceptability, EFF = Effectiveness
Participants: INS = Instructors, STU = Students, EXP = Expert

Qualitative Feedback And Measures

Instructor Interviews: Semi-structured interviews (totaling four hours) were conducted with instructors at the end of each pilot phase to assess their understanding and perception of the music-based program. Interviews were held individually and in groups via Microsoft Teams, addressing the applicability, feasibility, and student responses to the intervention.

Acceptability Questionnaire: After the course, participants completed an adapted acceptability and satisfaction questionnaire (Hallis et al., 2017; Al-Fraihat et al., 2020; Bruijns et al., 2022; Tucker et al., 2022). This 20-item survey measured course experience, satisfaction, and perceived challenges/enablers. Students also responded to open-ended questions about personal growth, delivery preferences, and suggestions for improvement.

Preliminary Effectiveness Evaluation: Two tools were used to assess the program's preliminary effectiveness:

Emotion Beliefs Questionnaire (EBQ; Becerra, Preece, & Gross, 2020): A 16-item self-report instrument measuring beliefs regarding the controllability and usefulness of both positive and negative emotions. The Greek-translated version of the EBQ showed strong internal consistency (Cronbach's α = .88).

Depression Anxiety Stress Scales (DASS-21; Henry & Crawford, 2005): This measure evaluates symptoms of depression, anxiety, and stress using a 21-item, 4-point Likert scale. The Greek adaptation of the DASS-21 has demonstrated strong internal consistency and validity (Pezirkianidis et al., 2018).

The App Usability Scale (AUS): It is a self-report instrument designed to assess users' perceptions of an application's usability. Drawing inspiration from the System Usability Scale (SUS) developed by Brooke (1995), the AUS comprises 10 items rated on a 5-point Likert scale, evaluating aspects such as ease of use, complexity, and user confidence. The total score provides an overall measure of the application's usability, facilitating comparisons across different user groups and applications.

The Learning Difficulties Screening Questionnaire (LDSQ; Glenn et al. 1997): This is a validated self-report instrument designed to identify university students who may have learning disabilities. Comprising 8 items rated on a 5-point Likert scale, it assesses self-perceived difficulties across various academic tasks.

Implementation Procedure

The training was embedded into elective psychology courses. Instructors briefed students about the study during the initial class and obtained informed consent for research participation. Students completed the questionnaires at the start and end of the semester. The course was led by academic staff experienced in experiential learning and supervised weekly by project PIs (a music therapist and clinical psychologist). Support was also provided via email as needed.

Data Analysis Strategy

To ensure a comprehensive understanding of the findings, data were analyzed using a two-step approach.

Step 1 involved analyzing the full dataset in a non-randomized form, including all participants who completed the intervention across the different pilot phases. This broader analysis was conducted to explore general trends and patterns of effectiveness and acceptability, especially given the limited sample size in the randomized subsample. Additionally, disaggregated analysis was performed based on self-reported learning difficulties to examine whether participants with different levels of difficulties experienced the training and digital materials differently. Participants were grouped into low, medium, and high difficulty levels based on scores from a validated learning difficulties screening measure, and group comparisons were conducted on both training acceptability and app usability scores.

Step 2 focused exclusively on participants from Study One, where a randomized controlled trial (RCT) design was employed to compare outcomes between the music-based and standard intervention groups. This allowed for a more controlled examination of group differences, though interpretation was cautious due to the smaller sample size.

The methods and results for each analytical step are presented separately in order to clarify the rationale, procedures, and findings specific to each analytical lens.

Qualitative Data: Thematic analysis was conducted (Braun & Clarke, 2006) to derive themes from interview transcripts. A second researcher validated the themes and coding to ensure reliability.

Quantitative Data: JASP (version 18) was used for analysis.

Step 1: Non-parametric Wilcoxon signed-rank tests were applied due to normality violations. One-sample tests evaluated whether training acceptability ratings and app usability deviated from the neutral point. In addition, a one-way ANOVA was conducted to explore differences in training acceptability and app usability across different learning difficulty levels.

Step 2: A series of paired t-tests (based on assumptions) were used to assess within-group and between-group differences from pre to post for: ERBS variables, EBQ variables, AAQ, PsyFlex, PMH, and DASS-21. Post-only comparisons/independent t-tests were used to compare post-intervention scores between the two groups on: General Acceptability and its subdomains (Complexity, Effectiveness, Novelty, Compatibility, Self-efficacy, Benefits, and Motivation).

Step 1

Participants and Demographics

Step 1 involved three distinct student cohorts (studies 1-3), and five university instructors. A total of 95 undergraduate students from the University of Cyprus took part. Participants included 22 men and 73 women, aged between 18 and 42 years (M = 21.12, SD = 3.70). Only students who completed the full course and both the pre- and post-intervention assessments were included in the final analyses. Participants were recruited from various psychology electives and represented all academic years. Demographic details, including gender, year of study, age, and academic background, are summarized in Table 2.

Table 2. Demographic characteristics per sample

	Study 1 (N=26)	Study 2 (N=56)	Study 3 (N=13)	Total (N=95)
Gender				
Women (%)	22 (30)	38 (52)	13 (18)	22
Men (%)	4 (18)	18 (82)	0	73
Study year				
1st (%)	4 (20)	9 (45)	7 (35)	20
2nd (%)	8 (36)	11(50)	3 (14)	22
3rd (%)	12 (39)	18 (58)	1 (3)	31
4th (%)	2 (9)	18 (82)	2 (9)	22
*Participation Rate %**	46	71	9	/

*Participation Rate= Number of students participated in each course/Total number of students enrolled in each course

Results

Qualitative Insights

Study 1: Students appreciated the practical and applicable nature of the skills learned, noting benefits for emotional awareness and personal development. Many reported increased confidences in managing stress and applying skills to everyday challenges. They valued the reflective, experiential nature of the training and highlighted exercises such as breathing and emotion regulation techniques as particularly impactful.

Instructor Feedback: Instructors expressed initial concerns about incorporating music but observed increased student engagement and group cohesion. They reported that music activities encouraged emotional reflection and created a positive learning climate. They requested clearer implementation instructions, better theoretical support, and a more diverse selection of songs.

Challenges: Key challenges included integrating the intervention within a packed curriculum, variability in facilitator expertise with music, and the time-intensive nature of the program. Facilitators also noted the importance of cultural sensitivity and relevance when delivering the training.

Studies 2 and 3: Participants found the music-based program engaging and relevant, with many indicating that it enhanced their emotional and academic growth. While most appreciated the use of music, a few noted it could be distracting. Students suggested expanding the program with more art-based methods, outdoor sessions, guest speakers, and digital tools for independent practice.

Student Acceptance and preliminary effectiveness

Acceptability scores ranged from 3.15 to 4.96 (Table 3), indicating high satisfaction across measures such as course enjoyment, usefulness, relevance, and self-efficacy.

Notably, students reported a significant improvement in their belief in the usefulness of negative emotions ($Z = 3.09$, $p = .002$). There were no significant changes in beliefs about emotional controllability or in stress and anxiety levels (Table 4).

Table 3. Means and Standard deviations for acceptance measure	
Item	**M (SD)**
The course met my needs overall.	4.15 (.83)**
Overall, I enjoyed the course.	4.41 (.77)**
Overall, I was satisfied with the course.	4.40 (.80)**
I had enough time to complete the course.	4.24 (.82)**
The length of each session within the course was appropriate.	4.11 (.91)**
Complexity	
I found the sessions easy to follow.	4.35 (.85)**
Overall, I was able to do the homework assignments in between course sessions.	4.30 (.80)**
I found the course confusing[i]	1.85 (.95)**
The course used interesting and appropriate delivery methods (e.g., animation, video, audio, text, simulation, etc.)	4.39 (.79)**
Perceived effectiveness	
The course increased my knowledge about emotion regulation skills.	4.28 (.77)**
The homework assignments helped facilitate my learning	3.92 (.95)**
Overall, I understood the techniques and concepts that were taught.	4.34 (.66)**
Content novelty	
The course content was new to me.	3.81 (1.16)**
Compatibility	
What was taught was relevant to me.	4.12 (.80)**
Self-efficacy	
The course has helped me deal more effectively with daily issues.	4.96 (.85)**
I am likely to continue to use the techniques learnt in the long term.	4.06 (.85)**
Perceived benefits	
Overall, I have been using what I have been taught in my every-day life.	3.78 (.88)**
Future students would benefit from this course being integrated into the curriculum.	4.41 (.71)**
Motivation	
I had a positive attitude toward having the course.	4.41 (.75)**
My interest in learning about soft skills increased as a result of the course.	4.04 (.90)**
My interest in self-development increased as a result of the course.	4.18 (.84)**
Notes: Items' scale: 5 = strongly agree, 4 = agree, 3 = neutral, 2 = disagree, and 1 = strongly disagree [i] = reverse item **p<.001	

Table 4. Pre-post comparisons on preliminary effectiveness scales		
Subscale	**Pre M (SD)**	**Post M (SD)**
EBQ		
Negative-Controllability	7.87 (4.83)	7.43 (4.78)
Positive-Controllability	8.63 (5.08)	8.68 (5.49)
Negative-Usefulness	9.25 (5.91)**	7.76 (5.04)**
Positive-Usefulness	5.11 (3.51)	5.28 (4.02)
General-Controllability	16.51 (9.42)	16.12 (10)
General-Usefulness	14.36 (8.61)	13.04 (8.31)
Total scale	30.86 (17.32)	29.16 (17.59)
DASS 21		
Stress	6.52 (5.56)	6.68 (5.13)
Anxiety	4.66 (5.19)	5.11 (5.23)
Notes: **p<.001		

App Usability

The present analysis involved a single cohort of undergraduate students at University of Cyprus, totaling 74 participants. All participants were currently enrolled in academic programs at the time of using the digital format of the training (mobile app). The sample included individuals aged between 19 and 50 years (M = 21.52, SD = 3.77), with representation across multiple academic years and study programs. Participants were recruited from various disciplines, including Computer Science, Psychology, English Studies, Accounting, and Business Administration, ensuring a diverse and representative student sample.

To determine whether participants rated the app's usability above a neutral level, a one-sample t-test was conducted comparing total usability scores (based on the 10-item App Usability Scale) against the scale midpoint of 30. The results indicated a statistically significant difference, $t(69) = 6.90$, $p < .001$, suggesting that users found the app to be significantly more usable than neutral.

The mean usability score was 36.60 (SD = 8.00, N = 70), indicating generally favorable perceptions of the application's usability.

Perceptions by Learning Difficulty Levels

To better understand how students with varying levels of self-reported learning difficulties experienced the training and digital materials, we conducted an additional analysis.

Participants (N = 178) were categorized into three groups—Low, Medium, and High—based on their total scores on the LDSQ scale (Learning Difficulties).

Training Acceptability

A one-way ANOVA showed no significant difference in training acceptability scores across the three learning difficulty groups, $F(2, 175) = 0.76$, $p = .47$.

- Low LD group: M = 91.71, SD = 13.00
- Medium LD group: M = 91.12, SD = 11.42
- High LD group: M = 89.00, SD = 12.17

All three groups reported high levels of satisfaction with the training, suggesting it effectively addressed student needs regardless of learning difficulty level.

App Usability

A one-way ANOVA also revealed no significant differences in app usability scores between the groups, $F(2, 175) = 0.57$, $p = .57$.

- Low LD group: M = 16.49, SD = 13.83
- Medium LD group: M = 16.02, SD = 14.17
- High LD group: M = 18.71, SD = 14.26

All groups reported generally positive usability ratings, indicating that the app was perceived as accessible and easy to use across different levels of learning difficulties.

Step 2

PARTICIPANTS AND DEMOGRAPHICS

Descriptive statistics were used to assess group comparability. The MS group (n = 14) had a mean age of 19.29 years (SD = 5.78), and the SM group (n = 12) had a mean age of 19.54 years (SD = 1.16). Gender composition was similar across groups, with the majority identifying as female.

Most participants were first-year undergraduate students in Psychology or related fields, and distributions across student status and study year were uniform. No significant demographic differences were observed between the groups.

STUDENT ACCEPTANCE AND QUANTITATIVE RESULTS

A series of paired-sample t-tests were conducted to evaluate the effect of the interventions on psychological measures from pre- to post-intervention. No statistically significant changes were observed in the overall sample or within individual groups (MS and SM) across the main variables.

For example, ERBS Emotion Constraint scores showed no significant change in the overall sample, $t(25) = 0.80$, $p = .434$. Within the MS group, the mean difference was 0.09, $p = .616$, while the SM group showed a non-significant decrease, $M_{diff} = -0.32$, $p = .105$. Similarly, for ERBS Regulation Worth, no significant changes were observed in the overall sample, $t(25) = 0.75$, $p = .458$, nor within the MS ($p = .374$) or SM ($p = 1.000$) groups.

Across all remaining variables—including the EBQ subscales, AAQ, PsyFlex, PMH, and DASS-21 subscales—no significant pre-post changes were detected, with p-values exceeding the .05 threshold.

Post-Only Comparisons Between Groups

Independent-samples t-tests (Welch's t-tests) were performed to compare group differences on acceptability and feasibility ratings, measured only at post-intervention. The results indicated no statistically significant differences between the MS and SM groups across all dimensions:

General Acceptability: $t(24) = 0.30$, $p = .767$

Complexity: $t(24) = -0.82$, $p = .421$

Effectiveness: $t(24) = 0.13$, $p = .895$

Novelty: $t(24) = -0.50$, $p = .619$

Compatibility: $t(24) = 0.25$, $p = .807$

These results suggest that both interventions were perceived similarly by participants in terms of engagement, usefulness, and innovation.

FIDELITY CHECK

To ensure procedural fidelity and adherence to the intervention protocols, two randomly selected video-recorded sessions per intervention group (MS and SM) were independently evaluated by an external expert. The fidelity check aimed to assess whether the sessions were implemented as planned and in accordance with the training manual.

The external monitor evaluated sessions using a structured checklist that addressed research procedures, ethics, data collection, and training implementation standards. The fidelity review confirmed that:

- All sessions followed the approved protocol and received ethical approval from the local bioethics committee (approval number ΕΕΒΚ ΕΠ 2023.01.47).
- Informed consent was appropriately obtained from participants before the study and during each recorded session.
- Data collection instruments were established and psychometrically sound, with the exception of one acceptability scale, which was qualitative in nature.
- Researchers conducting the sessions were adequately trained to apply the protocol and to use the assessment tools effectively.
- All data were collected in appropriate settings, securely stored using encrypted systems, and anonymized following GDPR standards.
- Data will be retained for five years in secure storage and subject to approved destruction protocols.

The evaluator found no deviations from the intended procedures and reported a high degree of fidelity across both groups. This external validation supports the internal consistency and reliability of the study's implementation.

CASE STUDY 2: VRIJE UNIVERSITEIT AMSTERDAM

Method

Study designs

Study 1. A first study involved a randomized controlled trial in which students were randomly assigned to either traditional or multimodal training of socioemotional skills.

Study 2. A second study involved a single arm (pre-post) study in which all students participated in multimodal training of socioemotional skills.

Participants

In total, two independent student samples (N=35 in total, 32 female, age range: 18-23, M_{age} = 19.77, SD_{age} = 1.21) and four teaching instructors participated in this study. Only participants who completed the training and the pre- and post-training questionnaires in full were included in the analysis.

Study 1. Fifty-five students signed up for the training, of which 32 agreed to participate in the research study, and completed the pre-measures. Before the start of the training, 7 students decided to not participate. Consequently, sample 1 included 25 second-year Health Sciences students who participated in the RCT, of which 12 students participated in the traditional training, and 13 students in the multimodal training. Seventeen participants completed the training without participating in the research.

Study 2. Fifteen students signed up for the training and completed the pre-measures. During the training, 5 students decided to no longer participate. Consequently, sample 2 included 10 students, of which 9 first-year Biomedical Sciences students and 1 first-year Computer Sciences student. Table 5 summarizes the demographics of both samples.

Table 5. Demographics of both samples			
	Study 1 (RCT) (N=25)	Study 2 (single arm) (N=10)	Total (N=35)
Age			
Mean	20.20	18.70	19.77
SD	1.00	1.06	1.21
Range	19-23	18-21	18-23
Gender			
Women (%)	24 (0.96)	8 (0.80)	32
Men (%)	1 (0.04)	2 (0.20)	3
Study year			
1st (%)	10 (100)	0 (0)	10
2nd (%)	25 (100)	0 (0)	25
Study program			
Health Sciences (%)	25 (100)	0 (0)	25
Biomedical Sciences (%)	0 (0)	9 (90)	9
Computer Sciences (%)	0 (0)	1 (10)	1

Training

Study 1. The socio-emotional skills training was announced as an elective training during the course 'Study and Career' in the second year of the Bachelor Health Sciences, to which students could subscribe voluntarily. Additionally, participants could choose to participate in the research. Participants were invited to four sessions of 1 hour 45 minutes in the period of April to May 2024. The workshop was delivered on campus. The workshop instructors were junior lecturers with relevant experience in teaching life skills workshops, and life skills related experiential learning activities. Upon completion, participants received a certificate of attendance (N=42), and those who additionally completed the pre- and post-measures of the research, received a voucher of 20 euro (N=25).

Study 2. The socio-emotional skills training was announced as an elective training during the Multiplier Event of the project as part of the course 'Introduction to Biomedical Sciences' in the first year of the Bachelor Biomedical Sciences, to which students could subscribe voluntarily. Participants were invited to four 1.5-hour sessions, on Monday evenings, after class (17:30-19:00), from November 6 to December 4, 2024. The workshop was delivered in an online format. The workshop instructor was a member of the academic staff with relevant experience in teaching life skills workshops, and life skills related experiential learning activities. Upon completion, participants received a certificate of attendance.

Measures (same for Study 1 and 2)

Acceptability

Acceptability questionnaire: At post-intervention, all participants completed a training satisfaction/acceptability questionnaire (adaptation of Hallis, et al. 2017, Al-Fraihat et al. 2020, Bruijns et al. 2022, and Tucker et al., 2022). The questionnaires consisted of twenty questions relating to their experience, satisfaction, and the challenges/enablers associated with design and implementation of the course. In addition to the questionnaire, feedback from the students was collected through three open-ended questions: "How 'effective' would you consider this course in increasing your perceived personal growth? In what ways? "What are your thoughts on having additional personal development courses for your academic training?", and "How do you think this content could be delivered differently to make it more useful (using technology or other methodologies)?". These questions invited them to reflect on their participation, the possible impact on their academic and personal lives.

Preliminary effectiveness

The preliminary effectiveness focused on several key outcomes, including beliefs about emotions and mental health outcomes.

Emotion Beliefs Questionnaire (EBQ; Becerra, Preece, & Gross, 2020). The EBQ (Becerra, Preece, & Gross, 2020) is a 16-item self-report measure of beliefs about emotions. Based on Ford and Gross's (2019) theoretical framework, the EBQ assesses two main categories of beliefs about emotions: beliefs about the controllability of emotions and beliefs about the usefulness of emotions. These beliefs are assessed for negative emotions and positive emotions. Four subscale scores and three composite scores can be derived from the measure, with higher scores indicating more maladaptive beliefs about emotions (i.e., stronger beliefs that emotions are uncontrollable and useless). The scale has demonstrated good concurrent validity (EBQ scores correlated significantly in expected ways with various scores from other measures of beliefs about emotions), as well as validity and internal consistency in its initial validation (α = .88; Becerra, Preece, & Gross, 2020).

Depression Anxiety Stress Scales (DASS-21; Henry, & Crawford, 2005) is a general mental health tool consisting of three scales (7 items per scale) measuring states of depression, anxiety and stress on a 4 point Likert scale (0 'almost always' to 4 'never'). Higher scores indicate more symptoms. The DASS-21 subscales show good internal consistency (Cronbach's α = 0.81-0.88) and satisfactory internal consistency (a=.083-.085).

Data analyses

Studies 1 and 2. The data were analysed by using Jamovi (version 2.6.25). One-sample Wilcoxon signed-rank tests were performed to assess whether acceptability items and compound scores (at an ordinal level) significantly differed from the midpoint of the scale (3=neutral).

Study 1. To test for significant interactions in emotion beliefs (EBQ), depression, anxiety and stress (DASS) between time (pre vs. post) and condition (traditional vs. multimodal training) a repeated-measures ANOVA was performed. In case of non-significant interaction effects, the main effect of time (pre vs. post) over conditions was interpreted. Additionally, to compare effects of time (pre vs. post) for each condition, post-hoc Tukey contrasts were performed.

Study 2. To test for significant differences in time (pre vs. post training) in emotion beliefs (EBQ), depression, anxiety and stress (DASS), paired samples tests were performed.

Results

Acceptability

Acceptability scores ranged from 2.9 to 4.54. Acceptability results are summarized in Table 6. Across studies, all acceptability scores were significantly different from neutral (for all $p<0.001$).

Table 6. Acceptability

	Study	Training	Mean	SD
General Acceptability	**RCT**	**Music**	4.08	0.413
		Traditional	4.05	0.271
	single arm	**Music**	3.84	0.263
The course met my needs overall.	**RCT**	**Music**	3.77	0.599
		Traditional	3.75	0.452
	single arm	**Music**	3.4	0.516
Overall, I enjoyed the course.	**RCT**	**Music**	4.15	0.555
		Traditional	4.17	0.389
	single arm	**Music**	3.8	0.632
Overall, I was satisfied with the course.	**RCT**	**Music**	3.77	0.599
		Traditional	4.08	0.289

	single arm	**Music**	3.9	0.568
I had enough time to complete the course.	**RCT**	**Music**	4.15	0.801
		Traditional	4.25	0.866
	single arm	**Music**	4.3	0.483
The length of each session within the course was appropriate.	**RCT**	**Music**	4.54	0.519
		Traditional	4	0.426
	single arm	**Music**	3.8	0.632
Complexity	**RCT**	**Music**	3.5	0.27
		Traditional	3.48	0.249
	single arm	**Music**	3.45	0.405
I found the sessions easy to follow.	**RCT**	**Music**	4.08	0.494
		Traditional	4.42	0.669
	single arm	**Music**	4.5	0.707
Overall, I was able to do the homework assignments in between course sessions.	**RCT**	**Music**	4	0.913
		Traditional	4.17	0.835
	single arm	**Music**	3.9	0.994
I found the course confusing[i]	**RCT**	**Music**	1.92	0.277
		Traditional	1.67	0.492
	single arm	**Music**	1.8	0.632
The course used interesting and appropriate delivery methods (e.g., animation, video, audio, text, simulation, etc.)	**RCT**	**Music**	4	0.577
		Traditional	3.67	0.651
	single arm	**Music**	3.6	0.699
Perceived Effectiveness	**RCT**	**Music**	3.64	0.396
		Traditional	3.75	0.251
	single arm	**Music**	3.73	0.699
The course increased my knowledge about emotion regulation skills.	**RCT**	**Music**	3.85	0.689
		Traditional	4.08	0.669
	single arm	**Music**	3.8	1.135
The homework assignments helped facilitate my learning. (No homework assignments were given in the RCT study)	**RCT**	**Music**	2.77	0.725
		Traditional	2.92	0.515
	single arm	**Music**	3.2	0.919
Overall, I understood the techniques and concepts that were taught.	**RCT**	**Music**	4.31	0.48
		Traditional	4.25	0.452
	single arm	**Music**	4.2	0.632
Novelty: The course content was new to me.	**RCT**	**Music**	3.92	0.641
		Traditional	3.83	0.835

	single arm	**Music**	2.9	1.37
Compatibility: What was taught was relevant to me.	**RCT**	**Music**	3.77	0.832
		Traditional	4.08	0.515
	single arm	**Music**	3.5	0.707
Self-efficacy	**RCT**	**Music**	3.42	0.813
		Traditional	3.67	0.685
	single arm	**Music**	3.4	0.843
The course has helped me deal more effectively with daily issues.	**RCT**	**Music**	3.38	0.768
		Traditional	3.42	0.669
	single arm	**Music**	3.3	0.823
I am likely to continue to use the techniques learnt in the long term.	**RCT**	**Music**	3.46	0.967
		Traditional	3.92	0.793
	single arm	**Music**	3.5	0.972
Perceived Benefits	**RCT**	**Music**	3.35	0.718
		Traditional	3.63	0.608
	single arm	**Music**	3.3	0.632
Overall, I have been using what I have been taught in my every-day life.	**RCT**	**Music**	3.23	0.832
		Traditional	3.42	0.669
	single arm	**Music**	3.1	0.738
Future students would benefit from this course being integrated into the curriculum.	**RCT**	**Music**	3.46	0.967
		Traditional	3.83	0.718
	single arm	**Music**	3.5	0.707
Motivation	**RCT**	**Music**	3.74	0.53
		Traditional	3.61	0.664
	single arm	**Music**	3.77	0.473
I had a positive attitude toward having the course.	**RCT**	**Music**	4.08	0.494
		Traditional	4.17	0.577
	single arm	**Music**	4	0.471
My interest in learning about soft skills increased as a result of the course.	**RCT**	**Music**	3.38	0.768
		Traditional	3.25	0.866
	single arm	**Music**	3.7	0.823
My interest in self-development increased as a result of the course.	**RCT**	**Music**	3.77	0.725
		Traditional	3.42	0.9
	single arm	**Music**	3.6	0.699

Notes: Item scale: 5 = strongly agree, 4 = agree, 3 = neutral, 2 = disagree, and 1 = strongly disagree

[i] = reverse item

PRELIMINARY EFFECTIVENESS

Tables 7 and 8 present means and standard deviations for all subscales of the EBQ and DASS-21, respectively.

Emotion beliefs

Study 1. No significant interactions were found between time and condition for any EBQ (sub)scores (all $p \geq 0.05$, Table 7). Main effects comparing EBQ (sub)scores across traditional and multimodal training showed significantly higher (maladaptive beliefs of) positive controllability, negative usefulness, general controllability before training compared to after (Table 7).

Study 2. No significant differences were found comparing emotion beliefs (all EBQ (sub)scores) before and after training (all $p \geq 0.05$, Table 7).

Depression, anxiety and stress

Study 1. No significant interactions were found between time and condition for depression, anxiety and stress (all $p \geq 0.05$, Table 8). Main effects comparing depression, anxiety and stress across traditional and multimodal training showed significantly lower stress and anxiety after training compared to before (Table 8). No significant differences in depression were observed (all $p \geq 0.05$, Table 8).

Study 2. No significant differences were found comparing depression, anxiety and stress before and after training (all $p \geq 0.05$, Table 8).

Table 7. Means and SDs for EBQ (sub)scales											
								comparison pre-post#		interaction pre-post by condition	main effect pre-post^
			PRE			POST					
	Study	Condition	Mean	SD		Mean	SD	p		p	p
EBQ_Negative-Controllability	RCT	Music	9.31	2.72		8.54	2.26	0.715	*	0.985	0.159
		Traditional	9	3.59		8.25	3.7	0.753	*		
	single arm	Music	11.4	3.41		10.6	2.88	0.411			
EBQ_Positive-Controllability	RCT	Music	10	2.89		8.92	2.99	0.415	*	0.361	0.005
		Traditional	11.08	3.09		9.08	3.45	0.047	*		
	single arm	Music	12.1	2.81		11.1	2.51	0.096			
EBQ_Negative-Usefulness	RCT	Music	10.54	2.33		8.77	3	0.306	*	0.784	0.011
		Traditional	11.17	3.43		9	3.59	0.183	*		
	single arm	Music	11	4.22		10.3	4.19	0.678			
EBQ_Positive-Usefulness	RCT	Music	6.77	2.2		6.69	2.84	1	*	0.814	0.931
		Traditional	6.42	2.15		6.58	2.47	0.996	*		
	single arm	Music	6.9	2.23		8	3.68	0.385			
EBQ_General-Controllability	RCT	Music	19.31	5.14		17.46	4.75	0.466	*	0.621	0.018
		Traditional	20.08	6.05		17.33	6.98	0.178	*		
	single arm	Music	23.5	5.93		21.7	4.9	0.162			
EBQ_General-Usefulness	RCT	Music	17.31	4.13		15.46	5.47	0.588	*	0.942	0.079
		Traditional	17.58	4.58		15.58	5.52	0.556	*		
	single arm	Music	17.9	5.13		18.3	7.2	0.883			
EBQ_Total	RCT	Music	36.62	7.39		32.92	7.85	0.356	*	0.742	0.014
		Traditional	37.67	9.55		32.92	11.56	0.19	*		
	single arm	Music	41.4	9.14		40	10.64	0.713			

Note. ^main effect of time (pre vs. post) across condition (traditional and music-based training), #effect of time (pre vs. post) for each condition separately (traditional vs. music-based training, *p-values are Tukey-corrected.

Table 8. Means and SDs for DASS-21 subscales												
									comparison pre-post[#]		interaction pre-post by condition	main effect pre-post^
			PRE			POST						
	Study	Condition	Mean	SD		Mean	SD		p		p	p
DASS21 - Stress	RCT	Music	16.46	6.59		12.15	6.66		0.067	*	0.789	0.003
		Traditional	12.5	5.66		8.83	4.93		0.169	*		
	single arm	Music	12.4	6.79		16.4	9.51		0.05			
DASS21 - Anxiety	RCT	Music	10.15	7.72		5.85	4.93		0.056	*	0.207	0.022
		Traditional	6.5	6.16		5.17	6.18		0.85	*		
	single arm	Music	8	6.04		9.6	10.1		0.475			
DASS21 - Depression	RCT	Music	7.69	5.59		5.23	5.07		0.242	*	0.086	0.385
		Traditional	2.67	2.46		3.5	4.6		0.922	*		
	single arm	Music	10	9.43		12.8	11.9		0.373			

Note. ^main effect of time (pre vs. post) across condition (traditional and music-based training), [#]effect of time (pre vs. post) for each condition separately (traditional vs. music-based training, *p-values are Tukey-corrected

CASE STUDY 3: EÖTVÖS LORÁND TUDOMÁNYEGYETEM

Method

Participants

The final study was carried out in the 2024/25 autumn semester, offering a 5-session extracurricular training for students of Eötvös Loránd Science University/ELTE. The program was advertised through the counselling and inclusion support departments of ELTE and the Higher Education Counselling Association. Participants were randomly assigned to one of the two intervention protocols (music and non-music) led by expert instructors from ELTE's counselling department. A total of ca. 15.000 emails was sent out to potential participants of which 30 filled out the necessary online application form. Unfortunately, only 10 of them completed at least 4 of the five sessions (women = 7 men = 4 age range: 18-28 Mage=22,2 SDage = 3,29) 6 in the music and 4 in the non-music group. All participants were required to answer a set of questions including age, gender, education level, academic field, previous history / previous use of mental health services and the presence of learning disabilities. The demographic characteristics and distribution of the participants including age, gender, year of study and primary major are shown in Table 9.

Table 9. Demographic characteristics per sample			
	Music group	Non-music group	Total
	(N=6)	(N=4)	(N=10)
Gender			
Women (%)	4 (66)	3 (75%)	7 (70%)
Men (%)	2 (33)	1 (25%)	3 (30%)
Study year			
BA 1st (%)	2 (33)	2 (50)	4 (40)
BA 2nd (%)	1 (16)	0	1 (10)
BA 3rd (%)	1 (16)	2 (50)	3 (30)
MA (%)	2 (33)	0	2 (20)
Program			
Economics (%)	3 (50)	0	3 (30)
Sociology (%)	1 (16)	0	1 (10)
Psychology (%)	1 (16)	1 (25)	2 (20)
Recreation and lifestyle (%)	1 (16)	0	0
English Studies (%)	0	1 (25)	1 (10)
IT (%)	0	1 (25)	1 (10)
Education (%)	0	1 (25)	1 (10)
English Studies (%)	0	1 (25)	1 (10)

Five participants (50%) reported having at least one kind of learning difficulty in areas including listening, attention and memory. Six had received treatment for emotional problems in the past, 3 of them at the time of the training.

Students were given the University Student Learning Disabilities Questionnaire (Glenn et al., 1997) for dimensional assessment of learning difficulties. Descriptive statistics of the USLD scores are shown in Table 10. A series of 1-sample t-tests showed that while our sample's overall value (M=2,1 SD=1,35) did not significantly differ from the reference reported for non-LD students (M=2 SD=0,4) by Glenn et al. (1997) there were 4 participants (40%) who showed significantly higher scores ranging from 2,75 to 3,38 not significantly differing from the reference value for the LD students (M=2,8, SD=0,6). There was also a difference in mean USLD scores between the two groups, with the non-music group (M = 24,75, SD = 3,2) showing higher levels of learning disabilities than the music group (M = 11,67, SD =2,58); t(8) = 7,16, p <,001.

Table 10. Mean and standard deviation of USLD scores

Participant	M (SD)
1	2,75 (1,39)
2	3,375 (1,41)
3	3,5 (1,41)
4	2,75 (1,91)
5	1,5 (0,53)**
6	1,125 (0,35)**
7	1,125 (0,35)**
8	2 (0,93)*
9	1,5 (0,76)*
10	1,5 (0,76)*
Total	2,11 (1,35)

Note. Significance refers to deviation from LD students' reference scores (Student's 1-sample t-tests)

*p<.05 **p<.001

Measures

Qualitative feedback from instructors

Semi-structured interviews. Semi-structured interviews were conducted with both instructors involved in the study. The questions focused on the trainers' experiences applying the music and the non-music protocols to the groups, key elements of the training activities, and challenges in delivering them. Trainers also provided insights on group dynamics and their possible relation to the activities.

Acceptability questionnaire: During the last session all participants completed a course satisfaction/acceptability questionnaire (adaptation of Hallis, et al. 2017, Al-Fraihat et al. 2020, Bruijns et al. 2022, and Tucker et al., 2022). The questionnaires consisted of twenty questions relating to their experience, satisfaction, and the challenges/enablers associated with the design and implementation of the course. In addition to the questionnaire, feedback from the students was collected through three open-ended questions: "How 'effective' would you consider this course in increasing your perceived personal growth? In what ways? "What are your thoughts on having additional personal development courses for your academic training?", and "How do you think this content could be delivered differently to make it more useful (using technology or other methodologies)?". These questions invited them to reflect on their participation and the possible impact on their academic and personal lives.

Procedure

The training was carried out at the Institute of Psychology of the Faculty of Education and Psychology, Eötvös Loránd University Budapest, Hungary as an extracurricular activity. Students participated voluntarily first by indicating their interest in advance through an online application form and reading the information about the course

emphasizing that there is no prior musical background required. The instructors informed the students during the first session about the goals of the study and the contents and structure of the following sessions. Their written consent was gathered and they were asked to fill out the required questionnaires at the first and last training sessions. The sessions were delivered by two professional trainers from ELTE's counselling department. They received weekly supervision and additional support throughout the training when needed.

Data analyses

Qualitative data. The researchers reviewed two sources of qualitative data: feedback from the instructors and the participants' answers to four open-ended questions of the Acceptability questionnaire. Typical recurring and salient themes.

Quantitative Data. Quantitative data were analysed using JASP (version 18). Student's One-sample Wilcoxon signed-rank tests (because the normality assumption was violated) were performed to assess whether acceptability ratings significantly differed from the midpoint of the scale (3=neutral) for each group.

Results

Qualitative Data

Feedback from trainers

General feedback on the training

Initially, our trainers had several questions about the implementation of the protocol, particularly the musical elements, which are not part of the traditional counselling toolkit. Our trainer who led the music group expressed concerns about these activities as she did

not have a high level of formal musical training, but eventually found that this was not a barrier for her.

"*I thought it would be a problem because I'm not a professional musician, I just do music as a hobby and it's very important in my life, but I've never led music sessions. It was nice to find that my natural musicality was enough to carry out the activities I had planned. I was also afraid that the participants would not like the songwriting activity, but to my surprise, it was one of their favourites, they were able to get involved and had a lot of fun doing it*."

The Cognitive Behavioral Therapy-based (CBT) psychoeducation and activities that formed the basis of the training were not alien to any of our trainers, who were comfortable with both CBT concepts and group techniques. The non-music group facilitator encountered challenges with time management. Without the musical activities, she felt that the CBT material was short, and at times she found it difficult to fill the time. However, the fact that there were fewer participants in the non-music group may have contributed to this, so less time was taken to share experiences. The trainer also reported that she would have liked to include some of the group exercises she often used, but did not do so in order to follow the protocol.

"*Especially during the breathing exercise session, I felt that some more activities were needed to fill the time available. I would have liked to do some more of the exercises with the participants that I regularly use in my groups, but I had to keep to the protocol because of the research. One or two more group formation exercises would be useful*."

The role of music

An important feedback is that while the trainer leading the non-music group expressed her need for more group cohesion exercises, the trainer leading the music group did not feel the lack of them.

"*Listening and playing music together helped us a lot to become a real group. The boundaries between the participants dissolved very quickly. Already in the second session, I felt that participants were able to share important topics, even painful difficulties, while others tried to connect and help with empathy and feedback. This was clearly due to the presence of music*."

The music group trainer found the protocol's musical activities very useful. The impact was particularly strong in terms of forming the group and increasing cohesion and deeper connection. It was also considered effective in making the themes of the CBT-based psychoeducational material more understandable and relatable for the participants.

"*Some psychological concepts that were new to the participants became more understandable by being introduced through a musical exercise. For example, writing and performing a song together was very exciting and memorable for them. The students were very enthusiastic about it. It brought a bit of humor and laughter to an otherwise difficult to understand topic [cognitive distortions], which can also sometimes bring painful feelings*."

Composition of the groups

The trainers verbally reported back, which was also confirmed by the quantitative analysis, that a significant proportion of participants had some kind of learning difficulty or mental health challenge. Many indicated that they had problems with anxiety, emotional regulation, time management and specific cognitive domains (e.g. memory, reading) in their lives. Despite this, few of the participants indicated that they had a diagnosis. The feedback from the trainer of the music group was particularly interesting.

"*Many of the students also experienced difficulties in their social life. They seemed to have trouble in social situations, and understanding their own and other people's emotions. As I got to know them, it seemed to me - of course, this is just a subjective opinion - that there might be autistic traits behind their problems*."

This feedback was also valuable in the sense that, in addition to people with learning difficulties, it seems that the appeal of our social-emotional learning training could make the programme attractive to those who have difficulties, particularly in the areas of mentalisation and social interaction. Since we did not anticipate the presence of this population when designing the test battery, we did not use any measures that would have focused specifically on these areas. For this reason, we are not able to provide a more accurate picture of these difficulties, but it is valuable feedback for the future that even students on the autistic spectrum may benefit from training.

Using the mobile app

In both groups, there was general feedback that learners were reluctant to use the mobile app for the training. Although participants were enthusiastic and engaged with the training, trainers encountered strong resistance when they were asked to use the app between sessions. The majority of students reported back that as they already struggle in their personal lives to use digital devices less, which are often addictive, they would prefer to participate only offline.

"*It was very surprising how strongly they resisted using mobile apps. Some of them were specifically using non-smartphones with traditional push buttons to keep themselves away from addictive social media*."

The surprising resistance of the students may be partly explained by the fact that the Hungarian translation of the app was not available at the time of the training, so they were expected to use it in English. However, university students typically have no problem using a simple English-language application, so this was probably less of a factor. Although this is not a generalisable result due to the size of the groups, it is possible that students with learning difficulties are indeed not attracted to the digital platform.

The role of personal contact

In line with the participants' feedback, the two experts agreed that the strongest impact factor of the training was the social experience. Many of the participants had not previously been able to talk in such depth about their difficulties with others who were experiencing similar problems. This kind of community allowed them to share their problems and find common support.

"*Sometimes it was quite touching to see how they connected. Even in one of the first sessions, one of them burst into tears when talking about her difficulties. It was wonderful to have such trust in each other. Towards the end, they developed a habit of hugging each other at the end of the sessions. Even though it went beyond the boundaries of the usual group counselling, I didn't intervene because it seemed very important to them*."

Indeed, the consensus among trainers and participants seems to suggest that perhaps the most important feature of the sessions is their ability to create community among learners and to facilitate the sharing of their difficulties. This is an important lesson for the future, that one of the keys to the effectiveness of training is personal contact and community, which musical activities are particularly well able to foster.

Challenges and applicability in a university context

According to the trainers' feedback, it would be useful to integrate the training in some form into university education, as even for students without learning difficulties, there are positive benefits in terms of more subtle recognition and management of their own emotions and higher levels of social competence. The CBT system provides an easy-to-understand and practical framework for development. However, they questioned how it could be integrated into university education.

"*It would clearly be useful to integrate these skills into university life. I don't know however which course could devote 5 sessions to this. I also don't know how well a teacher could run it, but I think it could be done. It could certainly be incorporated into the work of the counselling centre to have a group with 5 sessions. We would be very open to that in the future*."

From their point of view, the experts mainly indicated that they could see the training integrated into the work of the counselling centre in the usual group framework, but they did not exclude the possibility of integrating it into university teaching in some curricular form.

Students' feedback (Acceptability questionnaire, open-ended questions)

Impact of the training programme on personal growth

Participants reported an unanimously positive attitude regarding the effectiveness of the training programme. In particular, the usefulness of techniques learned throughout the course, such as breathing and relaxation techniques, were highlighted as something central to the long-term effectiveness of the programme. One student even suggested that

"*All students in high school and university should be taught this!*"

substantiated by the positive changes they experienced:

"*I started meditating, relaxing more, started using the implementation of the cognitive-behavioural model, exchanging my cognitive biases in written form to adaptive thoughts, observing myself from an outside perspective*."

Views on additional personal development courses in academic training

Regarding the introduction of similar additional personal development courses into academic training, participants again responded overwhelmingly positively. The many

challenges university students face and the transitional period between secondary education and higher education in the first year of university studies were highlighted as reasons for the usefulness and necessity of such personal development courses. Two students also mentioned the importance of the interpersonal "upholding powers" of the group setting.

"*The group can help us a lot to realise that we are not alone and that we all have similar problems*."

"*I would support it, maybe even with the group "going deeper"*."

Format of delivery of the training programme

Feedback concerning the form of delivery of the programme primarily focused on the importance of a group setting, ideally a small group with live sessions. Students considered the sense of community in the group to be particularly beneficial, one student also mentioned the role of trainers.

"*I think that it is perfectly enough that we work together in a group setting with a leader*."

One participant suggested that the content could also be delivered differently, instead in handouts.

"*I think it would be better to hand out, for example in Hungarian and paper-based format, self-help educational material about this*."

The advantage of receiving handouts was also mentioned by another participant.

"[…] *it was good that we were sometimes given a printout or two of the class material, this helped us to recall what we had learned/reviewed in class*."

Mobile application

Opinions about the mobile application were rather mixed among participants. Three out of nine responses suggested that they used the application rarely or not at all. Despite little usage, one of these students mentioned a benefit of the application.

"[…] *it was great for practicing and refreshing what I learned on the occasions*."

The majority of responses were focused on highlighting the benefits of in-person sessions over using the mobile application, with students showing a strong preference for a mainly live educational setting. In particular, a student suggested having the mobile application only as a supplement to the live group sessions.

Other than the above-mentioned points, one student provided feedback on the features of the application.

"*It's good, but it's not better than face-to-face. It can be used, but it's dry*."

Quantitative data

Students' Acceptance

Students' acceptability scores from the two groups combined ranged between 3.6 and 4.8, showing a generally high level of acceptance, satisfaction and enjoyment, summarized in Table 11. Students found the activities easy to follow, motivating and useful in achieving their goals. This generally positive attitude is consistent with the trainers' feedback and participants' responses to the open-ended questions.

Table 11. Means and Standard deviations for acceptance measure	
Item	**M (SD)**
The course met my needs overall.	4,60 (0,52)
Overall, I enjoyed the course.	4,80 (0,42)
Overall, I was satisfied with the course.	4,60 (0,52)
I had enough time to complete the course.	4,30 (1,06)
The length of each session within the course was appropriate.	4,80 (0,42)
Complexity	
I found the sessions easy to follow.	4,80 (0,42)
Overall, I was able to do the homework assignments in between course sessions.	3,60 (0,97)
I found the course confusing[i]	1,30 (0,48)
The course used interesting and appropriate delivery methods (e.g., animation, video, audio, text, simulation, etc.)	4,40 (0,97)
Perceived effectiveness	
The course increased my knowledge about emotion regulation skills.	4,70 (0,48)
The homework assignments helped facilitate my learning	3,60 (0,84)
Overall, I understood the techniques and concepts that were taught.	4,80 (0,42)
Content novelty	
The course content was new to me.	3,60 (0,70)
Compatibility	
What was taught was relevant to me.	4,60 (0,70)
Self-efficacy	
The course has helped me deal more effectively with daily issues.	4,60 (0,52)
I am likely to continue to use the techniques learnt in the long term.	4,50 (0,71)
Perceived benefits	
Overall, I have been using what I have been taught in my every-day life.	4,60 (0,52)
Future students would benefit from this course being integrated into the curriculum.	4,60 (0,52)
Motivation	
I had a positive attitude toward having the course.	4,80 (0,42)
My interest in learning about soft skills increased as a result of the course.	4,20 (0,79)
My interest in self-development increased as a result of the course.	4,50 (0,53)
Notes: Items' scale: 5 = strongly agree, 4 = agree, 3 = neutral, 2 = disagree, and 1 = strongly disagree [i] = reverse item **p<.001	

CASE STUDY 4: PANEPISTIMIO KRITIS

Method

Participants

A total of 37 undergraduate students from the Panepistimio Kritis (University of Crete) participated in steps 2-4. Thirty-one participants (men = 5, women = 26, age range: 19-57, Mage = 23.5 SDage = 8.42) completed the entire course study, as well as pre- and post-course questionnaires and were, therefore, included in the analysis.

Measures

Acceptability questionnaire

At post-intervention, all participants completed a course satisfaction/acceptability questionnaire (adaptation of Hallis, et al. 2017, Al-Fraihat et al. 2020, Bruijns et al. 2022, and Tucker et al., 2022). The questionnaires consisted of twenty questions relating to their experience, satisfaction, and the challenges/enablers associated with design and implementation of the course. In addition to the questionnaire, feedback from the students was collected through three open-ended questions: "How 'effective' would you consider this course in increasing your perceived personal growth? In what ways? "What are your thoughts on having additional personal development courses for your academic training?", and "How do you think this content could be delivered differently to make it more useful (using technology or other methodologies)?". These questions invited them to reflect on their participation, the possible impact on their academic and personal lives.

Preliminary effectiveness

The preliminary effectiveness focused on several key outcomes, including beliefs about emotions and mental health outcomes.

Emotion Beliefs Questionnaire (EBQ; Becerra, Preece, & Gross, 2020). The EBQ (Becerra, Preece, & Gross, 2020) is a 16-item self-report measure of beliefs about emotions. Based on Ford and Gross's (2019) theoretical framework, the EBQ assesses two main categories of beliefs about emotions: beliefs about the controllability of emotions and beliefs about the usefulness of emotions. These beliefs are assessed for negative emotions and positive emotions. Four subscale scores and three composite scores are designed to be derived from the measure, with higher scores indicating more maladaptive beliefs about emotions (i.e., stronger beliefs that emotions are uncontrollable and useless). The scale has demonstrated good concurrent validity (EBQ scores correlated significantly in expected ways with various scores from other measures of beliefs about emotions), as well as validity and internal consistency in its initial validation (α = .88; Becerra, Preece, & Gross, 2020). For administration in step 3, the measures were front and back-translated in Greek by two bilingual psychologists.

Depression Anxiety Stress Scales (DASS-21; Henry, & Crawford, 2005) is a general mental health tool consisting of three scales (7 items per scale) measuring states of depression, anxiety and stress on a 4 point Likert scale (0 'almost always' to 4 'never'). Higher scores indicating a greater number of symptoms. The DASS-21 subscales show satisfactory internal consistency (a=.083-. 085) and validity indexes in the Greek speaking adult population (Pezirkianidis, et al. 2018).

Procedure

The learning content was integrated into the official program of studies of the Department of Psychology of the University of Crete in the form of an elective undergraduate course entitled "*School Environment and Mental Health*." The course, which is offered to undergraduate psychology students during the 5th semester, aims to familiarize them with current trends and approaches to prevention and intervention within the school community. Additionally, it emphasizes factors that contribute to the promotion of children's mental health and well-being. Through experiential learning and by linking theory, research, and practice, students gain an understanding of the importance of implementing social and emotional learning activities in schools. During the first-class meeting, the instructor informed students that one of the course's purposes was to pilot new learning content. Students were asked to voluntarily consent to participate in the research component of the course, which aimed to support its further development. Specifically, they were invited to take part in a study that involved completing questionnaires during the first and last weeks of the course. It was emphasized that no formal music education or background was required for participation. Furthermore, students who chose to participate and completed the activities every week, would receive an extra grade for their effort at the end of the course. Upon completion of the course, those who had voluntarily consented to participate in the research were asked to fill out an acceptability questionnaire. The course was delivered by a faculty member of the Department of Psychology at the University of Crete, who has relevant expertise in School Psychology, extensive experience in conducting experiential learning activities, and a background in implementing prevention and intervention programs within school communities.

Data analyses

Quantitative Data: The data were analyzed by using SPSS (version 25). Paired T-tests comparing pre- and post-intervention measures were used.

Results

Students' Acceptance

Acceptability results are summarized in Table 12. Overall, the results show general student acceptability for the course, although results for novelty and complexity were slightly lower. All means are statistically different from the neutral point of the scale ($p<.001$ for all variables except novelty, $p=.003$).

Table 12. Acceptability

Variable	Mean	Std. Deviation
General Acceptability	4.42	0.55
Complexity	3.8	0.41
Effectiveness	4.39	0.58
Novelty	3.69	1.03
Compatibility	4.06	0.95
Self-efficacy	4.02	0.81
Benefits	4.16	0.6
Motivation	4.29	0.77
Notes: Items' scale: 5 = strongly agree, 4 = agree, 3 = neutral, 2 = disagree, and 1 = strongly disagree		

Preliminary effectiveness

Table 13 presents means and standard deviations for all subscales, as well as the results of paired t-tests comparing pre- and post-intervention measures for various variables. The paired t-test examines whether there is a significant difference between the two time points (pre and post). A significance level of 0.05 was used for interpretation.

Table 13. Pre-post comparisons on preliminary effectiveness scales

Variable	Pre M (SD)	Post M (SD)	T-Statistic	P-Value
EBQ				
Negative-Controllability	7.23 (2.94)	6.29 (1.79)	1.52	.140
Positive-Controllability	8.55 (4.24)	7.16 (2.92)	1.8	.082
Negative-Usefulness	8.29 (3.76)	6.35 (2.36)	2.46	.020
Positive-Usefulness	5.55 (2.63)	5.42 (2.13)	0.19	.850
General-Controllability	15.77 (6.3)	13.45 (4.14)	1.98	.057
General-Usefulness	13.84 (5.76)	11.77 (4.02)	1.56	.130
Total Scale	29.61 (10.48)	25.23 (7.08)	1.99	.056
DASS21				
Stress	12.77 (8.98)	12.52 (8.37)	0.14	.893
Anxiety	7.29 (7.79)	7.68 (6.89)	-0.22	.824
Depression	7.35 (8.59)	7.1 (6.73)	0.15	.878

The results indicate the following findings:

- **EBQ Negative-Usefulness** showed a statistically significant decrease from pre to post ($p = 0.020$), showing that the intervention led to lower endorsement of the uselessness of negative emotions.
- **EBQ General-Controllability** approached significance ($p = 0.057$), suggesting a lower endorsement of the uncontrollability of emotions.
- Other measures did not show statistically significant differences ($p > 0.05$).

Overall, the results suggest that the aspect of perceived usefulness of negative emotions changed significantly over time, while changes in controllability, stress, anxiety and depression were not statistically significant.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The findings from this series of studies provide converging evidence that multimodal, music-based psychoeducational programs can be both acceptable and beneficial for university students. Across studies, students consistently reported high levels of satisfaction, enjoyment, and perceived relevance of the course content. Emotional awareness, personal development, and stress management emerged as prominent areas of perceived growth, particularly when experiential and reflective exercises such as breathing, emotion regulation, and songwriting were integrated into the curriculum.

Importantly, qualitative feedback revealed that the group context fostered social connection, empathy, and emotional openness, with musical activities acting as a catalyst for group cohesion. Instructors noted the transformative role of music in deepening emotional engagement and overcoming initial resistance or lack of musical training. However, challenges such as program length, integration into rigid university schedules, and varying facilitator expertise were also highlighted.

Quantitative findings indicated modest yet meaningful improvements in students' beliefs about the usefulness of negative emotions, while effects on emotional controllability, stress, anxiety, and depression were non-significant. Mobile app components of the training were generally rated as usable, though several students expressed preference for face-to-face interactions and paper-based materials, particularly those who self-identified as managing digital overuse.

Policy Implications

Curriculum Integration with Flexibility:

Emotional literacy and self-regulation training can benefit a wide range of students, including those facing mental health or social-cognitive challenges. Higher education institutions should consider incorporating brief but impactful modules (e.g., 4–6 sessions) into existing curricula, especially in transition years (e.g., first year of undergraduate studies). Flexibility in delivery—such as options for live, app-based, and print formats—should be maintained to accommodate different student preferences and needs.

Counseling Center Implementation:

As integration into formal curricula may be logistically challenging, university counseling services may offer these programs in group formats. Facilitators can be trained to lead music-based sessions even without extensive musical background, provided they receive proper orientation.

Inclusive Design for Neurodivergent Populations:

Anecdotal feedback suggested that students with social or cognitive difficulties, potentially including undiagnosed autism spectrum traits, may particularly benefit from this kind of intervention. Future programs should consider inclusive design features and include assessments that better capture social-cognitive profiles.

Digital Tools as Supplementary, Not Primary, Mode:

While mobile apps can support learning, they should not replace in-person interaction. App-based components should be optional or complementary, particularly in culturally diverse or tech-fatigued populations.

Recommendations for Future Research

- Longitudinal Studies: Examine long-term effects on emotional regulation, academic performance, and mental health using follow-up assessments beyond immediate post-intervention.

- Controlled Trials with Larger and Diverse Samples: Include more robust sampling across faculties and universities to strengthen external validity.
- Mechanisms of Change: Explore how specific components (e.g., group cohesion, music activities, peer interactions) contribute to observed outcomes.
- Neurodiversity Lens: Systematically assess the program's impact on students with neurodevelopmental or learning difficulties using tailored measures.
- Technology Integration Research: Investigate how digital formats can be adapted to maximize usability and engagement, particularly for students with aversion to screen-based learning.

ETHICAL CONSIDERATIONS

All participating universities obtained ethical approval from their respective local ethics committees. The study was registered with ClinicalTrials.gov (Identifier: NCT05746234). All procedures conducted were in accordance with the ethical standards of the institutional and/or national research committees, as well as with the principles outlined in the 1964 Declaration of Helsinki and its subsequent amendments or equivalent ethical guidelines.

Participants were thoroughly informed about the aims and objectives of the study and were assured of their right to withdraw from participation at any point without consequence. Written informed consent was obtained from all individuals prior to their inclusion in the study.

Anonymized data will be made available upon reasonable request from the corresponding author. The authors intend to disseminate the findings of this study through publication in peer-reviewed international scientific journals.

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COMPETING INTERESTS

None Declared.

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