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The international evaluation of the digitally-supported pedagogical tool for promoting students' school well-being – a pilot study

Międzynarodowa ewaluacja e-narzędzia pedagogicznego promującego dobrostan szkolny uczniów – badanie wstępne

Abstract: The paper evaluates a pilot study implementation of digitally-supported pedagogical intended to promote students' well-being by developing their social skills. A total of 428 students from nine secondary schools in five European countries (Poland, Italy, Great Britain, Lithuania, and Bulgaria) participated in the pilot study. Eight thematic modules (decision making, coping with anger and aggressiveness, conflict resolution, stress management, self-esteem and self-awareness, collaboration and teamwork skills, empathy, and communication skills) included in the online educational training were evaluated using the Students Satisfaction Questionnaire developed for the study. Each module was assessed in terms of whether the students liked it,

whether they thought it was helpful and whether they would recommend it to their colleagues. Students demonstrated high satisfaction with the tool; however, there were differences between modules (Self-esteem and Stress management were the most appreciated, Communication the least). The student's assessment was influenced by age, gender, and national differences. Digitally-supported school-based programs can promote student subjective well-being; however, the development of such programs should include attractive forms of education for adolescents, addressing their needs and demographic differences. Conclusions from the formative evaluation can be the basis for e-tool improvement and future studies aimed at outcome evaluation.

Keywords: evaluation, international study, pedagogical e-tool, primary school students, social skills, well-being.

Introduction

Childhood and adolescence (10-19 years) constitute a unique period for acquiring socioemotional capabilities, which act as the foundation for health and well-being in later life.

While the meta-construct „well-being” encompasses different aspects of successful and healthy living, subjective well-being is a person's cognitive and affective evaluations of their life, including both emotional reactions and cognitive judgments of satisfaction (Diener et al., 2012). Social and emotional skills development has been identified as a crucial determinant of young people's subjective well-being and as a source of support in achieving positive outcomes in school, work, and life (Durlak et al., 2011).

School is a natural setting for students' well-being strengthening. Childhood experiences play key roles in young people's cognitive, social, and emotional development (Freeman et al., 2009; Wang and Dishion, 2012). There is a large body of evidence that school-based interventions and programs can promote the well-being of adolescents (Dowling and Barry, 2020; Francis et al., 2021; Gigantesco et al., 2015; O'Connor et al., 2018; Taylor et al., 2017; Tennant et al., 2007). The literature suggests that such programs in schools produce long-term benefits, especially if these programs are conducted as part of school activities and adopt a broader approach, namely, by promoting generic psychosocial competence and life skills instead of focusing on specific behavioural problems (Greenberg, 2010; Steward-Brown, 2006; WHO, 2003).

School-based well-being promotion programs should include new technologies where possible. Modern technology has transformed the experience of growing up, so schools and educators should respond to the student's preferences in ways that may be significant for education. For example, such technologies can be implemented inside the school when disseminating life skills programs to support students' well-being (Zadworna-Cieślak and Kosakowska, 2018). School-based programs can easily implement multimedia learning, which occurs when learners construct and coordinate multiple representations (verbal and visual) of the same material (Mas et al., 2003; Wells, Barlow and Stewart-Brown, 2003). The development of well-being promotion programs should also consider sociodemographic and cultural factors (Gigantesco et al., 2019; Goswami, 2014; Graham and Power, 2004; Östlin et al., 2006; Zadworna-Cieślak, 2018; Zadworna et al., 2020). To date, a large body of literature has been devoted to describing the framework of well-being promotion programs, its practical development, implementation, and evaluation (see: Nation et al., 2003; Wells, Barlow and Stewart-Brown, 2003; Cavioni et al., 2020; Barry et al., 2019; Szymańska, 2012; Jones and Bouffard, 2012).

The present study is based on an Erasmus+ Well- School-Tech project (Ref. No. 2016-1-LT01-KA201-023171) for primary and middle secondary school education: KA2 Strategic Partnerships for School. The project was implemented in 2016-2018 as a partnership between five European countries: Bulgaria, Italy, Lithuania, Poland, and the UK. The project's objectives, apart from the exchange of good practices in the school mental well-being management field, were to provide students with attractive tools to improve communication skills and increase self-awareness and problem-solving skills. To make this possible, the project assumed the development of materials based on using new technologies that teachers and professionals could use. Thus, the project aims to provide primary school students with the appropriate skills to monitor and manage their level of mental well-being through developing a digitally-supported pedagogical tool based on good practice and expertise in the field of mental well-being exchanged within the partnership. After conducting the focus group research, a comprehensive picture was obtained of the technological background of the students and their preferences about digital education activities. The study's result has already been published (Gigantesco et al., 2019).

The pedagogical tool was developed to assist teachers and educators in coping with complex school-based problems and promote students' well-being by strengthening emotional and social skills. The good practices

collected in the project research phase were adapted to multimedia resources, including interactive exercises and videos. These materials have been shaped into an online application form: a user-friendly and attractive tool used in the classroom to support health promotion interventions and as homework or assessment of learning objectives. The app is available in all project partners' languages. The students can begin online training within the following eight topics: decision making, coping with anger and aggressiveness, conflict resolution, stress management, self-esteem and self-awareness, collaboration and teamwork skills, empathy, and communication skills. Every topic provides a brief theoretical introduction, intervention (typically videos, questionnaires, quizzes, interactive games, and case studies), and final questions summing up those activities.

The current pilot study was conducted to assess opinions on the acceptability and usefulness of the pedagogical tool described above by students, who are one of the beneficiaries of the e-tool.

According to Gaś (2006, after Sochocki, 2016, p. 68), „evaluation is the systematic gathering of information about a program to make decisions about the future of the program (i.e. continuation, replication, modification, abandonment) possible”. Evaluation allows gaining additional knowledge to assess the quality/value of the program. This knowledge helps make decisions about its further dissemination, development direction, or the introduction of modifications. Data for evaluation are collected using quantitative (questionnaire) and qualitative (e.g. group interviews, observations) methods, and it is good practice to combine them (Borucka and Kehl, 2021). Evaluations of prevention and health promotion programs can be distinguished between the formative and the process evaluation, which is used to monitor and document program implementation, and outcomes evaluation, which include short- and long-term program objectives (O'Connor-Fleming et al., 2006).

During the implementation of the program, the so-called formative evaluation is used to select those activities or solutions used in the program that are assessed as the most appropriate and thus lead to the improvement of the quality of the program. This type of evaluation is to support the program's implementation through ongoing data analysis to possibly correct the observed activities (Korporowicz 1997; Sochocki, 2006, 2016). It is generally used when designing a program, particularly in the pilot stage. Questions about the solutions adopted in the program concern the method, techniques used in the program, duration of the program/individual classes, their adaptation to the capabilities of recipients and implementers, reception by participants/implementers of particular elements of the program, etc. The

formative evaluation results indicate what changes should be made in the final version of the program. At this stage, there is also talk of the process evaluation that documents what has happened during the program's implementation (EMCDDA, 2011). It includes questions about the course of the program implementation: i.e. how many students would recommend the program to their peers and whether the program's content was understandable to its participants.

Formative evaluation ensures that a program or activity is feasible, appropriate, and acceptable before it is fully implemented. It is usually conducted when a new program or activity is being developed or when an existing one is being adapted or modified. This evaluation is precious during developing and implementing new methods, practices, policies, or procedures and for rapid-cycle testing of innovative approaches (Scott et al., 2020).

In turn, the final evaluation of the program evaluation process is the outcome evaluation, which assesses whether and to what extent the intended goals have been achieved (Hawkins, Nederhood, 1994; Sochocki, 2016), or summative evaluation, which "focuses on the analysis of the results or effects of the program through detection of all planned and unplanned consequences that are in the field of analysis. Conclusions [...] are often supplemented with recommendations" (Korporowicz, 1997, p. 279). The questions at this stage relate to the degree of achievement of the program's main objective and specific objectives, i.e. they refer to the expected changes in the program recipients. The current study presents a formative evaluation of the pilot implementation of the pedagogical e-tool.

Aim and research questions

The study aimed to perform a formative evaluation of the pilot implementation of the e-tool.

We aimed to check how students from five different European countries evaluate the e-tool and which modules they value the most. The research was exploratory, and no directional hypotheses were drawn up, but the following questions were formulated:

What is the level of student satisfaction with a particular tool module?

Does the students' opinion on the pedagogical tool differ depending on the gender, age, and nationality of the respondents?

Method

Study design and participants

Data was collected based on an observational cross-sectional design using self-administered questionnaires. In total, 428 students from five European countries participated in the study. Students (and their parents or legal representatives) had previously consented to participate in the entire Well School Tech Erasmus+ project, which concerned e-tool implementation and evaluation. Participation in the study was voluntary and anonymous. The study procedure was performed following the Helsinki Declaration of Human Rights (WMA, 2013) and the ethical codes of the Belmont Report and the Oviedo Convention (2000). The project board approved the study. As the study was of an informative cross-sectional, purely observational nature, no formal ethical approval was required under the countries' legislations.

Procedure

Data were collected between June and October 2018. In line with the project's assumptions, schools of at least medium size (with at least two classes from each level of education) were invited to participate in the project in each country. First, the national project coordinator obtained approval from the school authorities to join the project. Then the coordinator met the class teachers, presented them with the goals and the course of the project, and invited them to participate. The inclusion criteria were the age of the students (from eight to fourteen), nationality according to the country of the study (Bulgarian, Polish, Lithuanian, Italian, and English, respectively), informed consent, and the possibility of conducting a group study (e.g. during school lessons). The application of the class to participate in the project was voluntary, with no benefits or consequences. After obtaining consent to participate in the project and its evaluation from students and their parents or legal representatives, students were first familiarised with the particular modules of the pedagogical tool. After completing the pedagogical tool experiment, the students completed a self-administered anonymous paper-pencil questionnaire. To assure anonymity and confidentiality for student data: (1) each questionnaire was distributed by the study coordinator within an envelope; (2) the students completed the questionnaires and placed them back in the envelope provided; (3) the students then put the envelope with the questionnaire into a transparent drop box, placed in the same, or another, classroom. The completed questionnaires were then returned to the national study coordinator.

The paper-based method of collecting data for evaluating a computer-based tool may seem strange and outdated. However, such a method of collecting data was determined primarily by the technological background of the school where the project and research were carried out. In some schools, the number of multimedia equipment (computers, tablets) was not equal to the number of students who used it. Often, students get acquainted with the e-tool in computer labs, where there is one computer for two or three students. Following the assumptions of the whole project and current study, each student had the opportunity to get acquainted with the entire e-tool individually. However, evaluating each module by a web-based survey would significantly extend the duration of the study. It would most often mean that the school management had to make the computer lab available for a more extended period, which would disrupt the curriculum throughout the school. That is why we decided to use paper versions of evaluation questionnaires.

As described above, the pedagogical e-tool comprises eight modules dedicated to developing different social skills. To approximate the content of the modules in Fig. 1 presents the content of the self-esteem and self-awareness module. After entering the primary data (age, gender, first name), students are redirected to a page where they can choose a module for developing individual interpersonal competencies (self-esteem and self-awareness). The next page briefly introduces individual, interpersonal skills (in this case, self-esteem and self-awareness), and the next is a short introductory task (here is the question: what could improve your self-esteem?). Students receive feedback depending on the selected answer („You did not answer the question correctly. Do not worry! You learn by making mistakes!” or: „Congratulations! You answered the question correctly. Watch the video ...”), and then they are redirected to a subpage where they can watch a movie about the skill being trained. After watching the film, students answer questions about its content and about self-esteem and self-awareness. After completing each activity, students can download their answers/results as a pdf file. Materials collected this way can be the basis for discussion and further reflection.

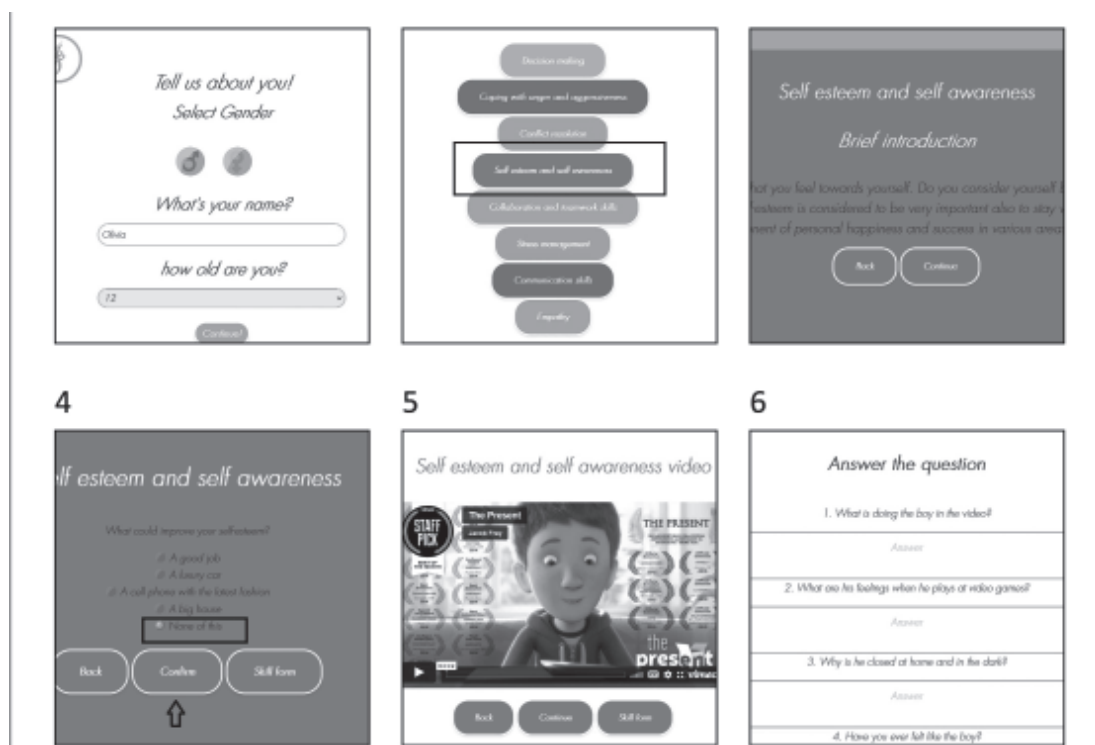


Figure 1. An example of the content of the module devoted to self-esteem and self-awareness

Measure

Students Satisfaction Questionnaire. The questionnaire was designed to gather the students' opinions on the pleasantness and usefulness of the pedagogical e-tool. It consisted of three items (questions) for eight topics, each one related to a module (*viz.* Decision making; coping with anger and aggressiveness; stress management; self-esteem/self-efficacy and self-awareness; collaboration and teamwork skills; empathy; communication skills; conflict resolution). For example, the questions about the self-esteem and self-awareness module were: 1) How much do you like the self-esteem and self-awareness module?, 2) How useful is the self-esteem and self-awareness module for achieving this skill in your real life?, and 3) Would you recommend this module to a friend/classmate to train themselves and learn the self-esteem and self-awareness? The answers were expressed using a five-point Likert scale, from 1 (*very little*) to 5 (*very much*) for the first two questions and from 1 (*not at all*) to 5 (*very much*) for the third one. The results of the student's evaluation of each module were analysed as single answers to each question and as a total score being the sum of the answers to all three questions. Cronbach's alpha reliability coefficients for the total scores of each module were satisfactory in the current study. They amounted to:

0.80 (decision-making module), 0.88 (coping with anger module), 0.89 (stress management module), 0.87 (self-esteem and self-awareness module), 0.89 (collaboration and teamwork module), 0.91 (empathy module), 0.92 (communication skills module), and 0.88 (conflict resolution module). The questionnaire also recorded the students' age, gender, grade, and country of residence.

Data Analysis

Data were analysed using SPSS, version 25. Descriptive statistics were used to describe student demographic characteristics, including frequency, percentage, mean and standard deviation. The chi-square test was then used to estimate the significance of the differences in population distributions. Due to the large student sample size, the distribution's normality was not checked, and parametric tests were conducted based on Central Limit Theorem (CLT). The independent t-test and one-way ANOVA were used to determine differences in evaluating the pedagogical tool among students concerning sociodemographic criteria. The univariate repeated-measures ANOVA (with Bonferroni's *post-hoc* correction) was conducted to assess the differences in mean scores between the eight modules of the tool. Values of $p < 0.05$ were taken as significant.

To establish the sample size for the chi-square test and ANOVA, we performed an a-priori power analysis using G*Power 3.1 software (Faul et al., 2007). With a medium effect size ($\alpha = .05$, a standard power level of .95), a minimum sample size for all analyses was attained (i.e., 220 participants for the chi-square test, 252 for ANOVA with three groups). Post-hoc power analysis revealed an excellent power, close to 1 for all analyses conducted in this study group.

Results

Participants characteristic

This study group included 428 primary or secondary school students¹ from five European countries. Their mean age was 11.9 years (SD = 1.34; min. 8, max. 14). The students differed only in terms of the age range

¹ Although all students represented school grades 5 to 8, it was decided to compare their age based on differences in class levels between countries. Additionally, in the time between the beginning and the end of the presented research, a reform of education was carried out in Poland resulting in the removal of secondary school as an educational level: the pupils instead attended the last grades of primary school. Therefore, it was stated that the students attended primary or secondary schools.

(χ^2 (2, N=428) = 47.528; $p < 0.001$), the smallest being the group of youngest students, i.e. those up to the age of 10 (18%). However, there were no differences in the number of participants in terms of gender (χ^2 (2, N=428) = 0.038; $p < 0.846$), and nationality (χ^2 (4, N=427) = 3.565; $p < 0.468$). A detailed set of results is presented in Table 1.

Table 1. Students' demographic characteristics regarding country of origin

Country		Overall N = 428	Bulgaria n = 99	Poland n = 80	Lithuania n = 80	Italy n = 79	UK n = 90
		n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Gender ^a							
	Male	215 (50.2)	51 (51.5)	33 (41.3)	46 (57.5)	39 (49.4) ^a	46 (51.1)
	Female	211 (49.3)	47 (47.5)	47 (58.8)	34 (42.5)	39 (39.4) ^a	44 (48.9)
Age range, y							
	< 10	77 (18.0)	0 (0)	0 (0)	0 (0)	5 (6.3)	72 (80.0)
	11-12	188 (43.9)	50 (50.5)	43 (53.8)	37 (46.3)	40 (50.6)	18 (20.0)
	13-14	163 (38.1)	49 (49.5)	37 (46.3)	43 (53.8)	34 (43.0)	0 (0)

Note. ^aDue to the missing data, the sum of girls and boys is not equal to 100%

Student evaluation of the tool modules

Student satisfaction (in terms of liking, usefulness, and worth recommending) was compared between countries using the chi-square test. Only the percentages of *satisfying* and *very satisfying* answers were analysed. The results are shown in Tables 2-9.

Table 2. Satisfaction with the Decision-making module in relation to nationality (N=426)*

	Do you like it?	How is it useful?	Would you recommend it?
<i>M (SD)</i>	3.5 (0.8)	3.5 (0.9)	3.4 (1.0)
<i>Mdn</i>	4.0	4.0	4.0
% of very satisfied overall (4 or 5 answer code)	53.8	52.3	52.2
% of very satisfied Bulgaria	66.3	63.3	66.3
% of very satisfied Italy	66.7	60.3	41.8
% of very satisfied Lithuania	26.3	24.0	36.3
% of very satisfied Poland	45.0	55.0	50.0
% of very satisfied UK	61.1	56.7	62.2
χ^2	40.23	33.76	23.22
<i>p</i> -value	<0.001	<0.001	<0.001

Note. *Due to some missing data in the evaluation, there were differences in the number of students assessing selected modules.

χ^2 - chi-square analysis results, M – mean, Mdn – median, SD – standard deviation

Table 3. Satisfaction with the Coping with anger and aggressiveness module in relation to nationality (N=397)*

	Do you like it?	How is it useful?	Would you recommend it?
<i>M (SD)</i>	3.5 (0.9)	3.5 (0.9)	3.4 (1.1)
<i>Mdn</i>	4.0	4.0	4.0
% of very satisfied overall (4 or 5 answer code)	52.1	54.5	54.0
% of very satisfied Bulgaria	38.9	43.1	33.3
% of very satisfied Italy	58.7	66.2	66.2
% of very satisfied Lithuania	40.0	40.0	45.0
% of very satisfied Poland	53.8	55.0	58.8
% of very satisfied UK	66.7	66.7	64.4
χ^2	18.76	20.07	24.12
<i>p</i> -value	<0.01	<0.001	<0.001

Note. *Due to some missing data in the evaluation, there were differences in the number of students assessing selected modules.

χ^2 - chi-square analysis results, M – mean, Mdn – median, SD – standard deviation

Table 4. Satisfaction with the Stress management module in relation to nationality (N=387)*

	Do you like it?	How is it useful?	Would you recommend it?
<i>M (SD)</i>	3.7 (1.0)	3.7 (1.1)	3.7 (1.2)
<i>Mdn</i>	4.0	4.0	4.0
% of very satisfied overall (4 or 5 answer code)	61.5	61.9	64.7
% of very satisfied Bulgaria	47.5	53.2	51.6
% of very satisfied Italy	61.8	56.6	57.9
% of very satisfied Lithuania	75.0	72.5	81.3
% of very satisfied Poland	30.0	35.0	36.3
% of very satisfied UK	86.7	86.7	90.0
χ^2	68.78	54.63	69.35
<i>p</i> -value	<0.001	<0.001	<0.001

Note. *Due to some missing data in the evaluation, there were differences in the number of students assessing selected modules.

χ^2 - chi-square analysis results, M – mean, Mdn – median, SD – standard deviation

Table 5. Satisfaction with the Self-esteem module in relation to nationality (N=406)*

	Do you like it?	How is it useful?	Would you recommend it?
<i>M (SD)</i>	4.1 (0.8)	4.1 (0.8)	4.0 (0.9)
<i>Mdn</i>	4.0	4.0	4.0
% of very satisfied overall (4 or 5 answer code)	80.0	78.1	76.6
% of very satisfied Bulgaria	85.7	83.1	74.0
% of very satisfied Italy	74.0	65.8	65.8
% of very satisfied Lithuania	77.5	78.8	86.3
% of very satisfied Poland	76.3	76.3	66.3
% of very satisfied UK	85.6	85.6	88.9
χ^2	6.03	11.19	21.92
<i>p</i> -value	0.197	<0.05	<0.001

Note. *Due to some missing data in the evaluation, there were differences in the number of students assessing selected modules.

χ^2 - chi-square analysis results, M – mean, Mdn – median, SD – standard deviation

Table 6. Satisfaction with the Collaboration and team work module in relation to nationality ($N=407$)*

	Do you like it?	How is it useful?	Would you recommend it?
<i>M (SD)</i>	3.5 (1.1)	3.4 (1.1)	3.4 (1.1)
<i>Mdn</i>	4.0	4.0	4.0
% of very satisfied overall (4 or 5 answer code)	52.5	51.6	55.7
% of very satisfied Bulgaria	64.6	60.8	60.3
% of very satisfied Italy	55.8	55.1	51.3
% of very satisfied Lithuania	21.3	18.8	36.3
% of very satisfied Poland	61.3	62.5	65.0
% of very satisfied UK	58.9	60.0	64.4
χ^2	40.21	43.96	19.13
<i>p</i> -value	<0.001	<0.001	<0.01

Note. *Due to some missing data in the evaluation, there were differences in the number of students assessing selected modules.

χ^2 - chi-square analysis results, *M* – mean, *Mdn* – median, *SD* – standard deviation

Table 7. Satisfaction with the Empathy module in relation to nationality ($N=384$)*

	Do you like it?	How is it useful?	Would you recommend it?
<i>M (SD)</i>	3.6 (1.1)	3.6 (1.1)	3.5 (1.2)
<i>Mdn</i>	4.0	4.0	4.0
% of very satisfied overall (4 or 5 answer code)	53.6	56.8	57.0
% of very satisfied Bulgaria	60.7	62.3	62.3
% of very satisfied Italy	39.7	38.4	43.8
% of very satisfied Lithuania	37.5	37.5	46.3
% of very satisfied Poland	56.3	61.3	61.3
% of very satisfied UK	72.2	81.1	70.0
χ^2	27.99	45.33	16.43
<i>p</i> -value	<0.001	<0.001	<0.01

Note. *Due to some missing data in the evaluation, there were differences in the number of students assessing selected modules.

χ^2 - chi-square analysis results, *M* – mean, *Mdn* – median, *SD* – standard deviation

Table 8. Satisfaction with the Communication module in relation to nationality ($N=383$)*

	Do you like it?	How is it useful?	Would you recommend it?
<i>M (SD)</i>	3.2 (1.3)	3.1 (1.3)	3.2 (1.3)
Mdn	3.0	3.0	3.0
% of very satisfied overall (4 or 5 answer code)	45.2	43.6	46.0
% of very satisfied Bulgaria	57.4	50.8	65.6
% of very satisfied Italy	37.5	38.9	41.7
% of very satisfied Lithuania	3.8	6.3	16.3
% of very satisfied Poland	71.3	62.5	66.3
% of very satisfied UK	56.7	58.9	44.4
χ^2	87.57	67.50	51.76
<i>p</i> -value	<0.001	<0.001	<0.001

Note. *Due to some missing data in the evaluation, there were differences in the number of students assessing selected modules.

χ^2 - chi-square analysis results, *M* – mean, *Mdn* – median, *SD* – standard deviation

Table 9. Satisfaction with the Conflict resolution module in relation to nationality ($N=376$)*

	Do you like it?	How is it useful?	Would you recommend it?
<i>M (SD)</i>	3.5 (1.0)	3.5 (1.0)	3.4 (1.1)
Mdn	4.0	4.0	3.0
% of very satisfied overall (4 or 5 answer code)	51.1	52.4	49.7
% of very satisfied Bulgaria	51.9	46.3	45.3
% of very satisfied Italy	58.3	58.3	51.4
% of very satisfied Lithuania	27.5	27.5	39.2
% of very satisfied Poland	61.3	63.7	61.3
% of very satisfied UK	56.7	63.3	50.0
χ^2	23.76	30.15	8.23
<i>p</i> -value	<0.001	<0.001	0.084

Note. *Due to some missing data in the evaluation, there were differences in the number of students assessing selected modules.

χ^2 - chi-square analysis results, *M* – mean, *Mdn* – median, *SD* – standard deviation

As indicated in the results, the most widely-appreciated modules were *Self-esteem* (80.0% of very satisfied students) and *Stress management* (61.5%), while the least appreciated was *Communication* (45.2%). The Lithuanian students were the least satisfied with the countries, particularly regarding *Communication*, *Empathy*, *Collaboration and Teamwork*, *Decision making* and *Conflict resolution*. Polish students were less satisfied with *Stress management*, Bulgarian students with *Coping with anger* and Italian students with *Self-esteem* and *Empathy*. *Stress management* was the only module for which the Lithuanian students were the most satisfied. Bulgarian students were the most satisfied with *Decision making*, *Collaboration and Teamwork*, Italian students with *Coping with anger*, and Polish students with *Communication* and *Conflict resolution*. UK students were the most satisfied with four modules: *Coping with anger*, *Stress management*, *Self-esteem* and *Empathy*.

Differences were also observed between countries regarding the usefulness and recommendations of the modules. However, differences also existed between countries regarding the perceived satisfaction, usefulness and recommendations for some modules. For example, although as many as 66.7% of Italian students were very satisfied with the *Decision-making* module, only 60% found it useful, and 41.8% could recommend it. In turn, only 26% of Lithuanian students were satisfied with the *Decision-making* module, the lowest level among the surveyed countries. In comparison, 24% considered it useful, and 36% would recommend it to other users.

The next step checked whether the overall assessment differed between modules. Assuming that the evaluation of individual modules is a consecutive measurement, univariate repeated-measures ANOVA was carried out. The following modules were used as subsequent levels for the factor: *Decision making*, *Coping with anger*, *Stress management*, *Self-Esteem*, *Collaboration and Teamwork*, *Empathy*, *Communication*, and *Conflict resolution*.

As the assumption of sphericity was not met (Mauchly's Test of Sphericity was significant – $p < 0.001$), the Greenhouse-Geisser correction was applied to adjust the degrees of freedom of the repeated measures ANOVA.

The obtained result differed significantly between individual modules, confirmed by Bonferroni's *post hoc* tests ($F(4.977, 1582.771) = 47.278$; $p < 0.001$; $\eta^2 = 0.129$). However, only two evaluations differed significantly from all the other modules: *Self-esteem* was rated the highest, and *Communication* was the lowest of all modules (Fig. 2).

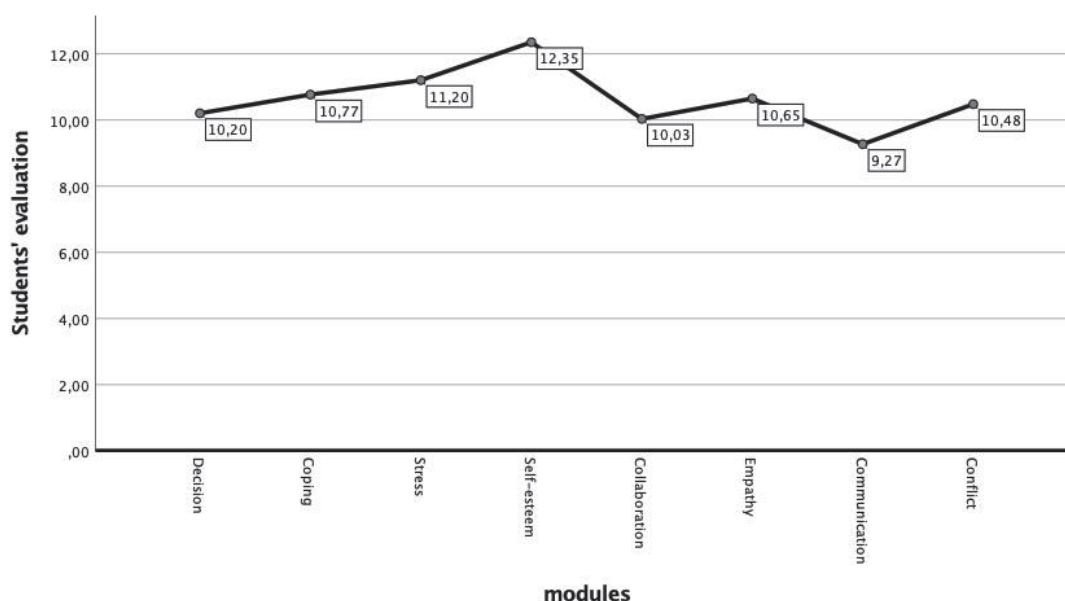


Figure 2. Mean results of the students' evaluation of tool modules

Student evaluation of the pedagogical tool concerning sociodemographic factors

To assess whether the total scores of each module differed in the age and gender of participants, student's t-test and one-way analysis of variance for intergroup comparisons were used. The results are shown in Table 10.

A statistically significant difference in the responses was observed concerning the sex of participants for the *Stress management*, *Self-esteem* and *Empathy* modules: the female students were awarded higher total scores for these modules than the male students. The scores also differed according to participant age for the *Coping with anger*, *Stress management*, *Self-esteem* and *Empathy* modules: in all cases, the youngest students (10 years old and less) had the highest total scores.

Discussion

Our study addressed two research questions, the first of which concerned student satisfaction with the particular modules of the tool to present formative evaluation results. Our findings indicate that although the students appear to be relatively highly satisfied with the tool overall, this score was differentiated by module; in addition, variation existed between students regarding their satisfaction, usefulness, and recommendation scores for some modules. The differences may result from the different methods used and the content of the modules. Higher values were assigned to the *Self-esteem* and *Stress management* modules, based on a video followed by a directed

Table 10. A comparison of the mean for total scores of tool modules regarding age and gender

		Decision making	Coping with anger	Stress management	Self-esteem	Collaboration and team work	Empathy	Communication	Conflict resolution
Gender†	Male	M (SD) 10.4 (2.3)	M (SD) 10.5 (2.8)	M (SD) 10.4 (3.0)	M (SD) 11.9 (2.4)	M (SD) 10.2 (3.1)	M (SD) 10.3 (3.1)	M (SD) 9.5 (3.7)	M (SD) 10.3 (2.9)
	Female	M (SD) 10.5 (2.4)	M (SD) 10.5 (2.7)	M (SD) 11.7 (2.8)	M (SD) 12.8 (2.3)	M (SD) 10.4 (2.9)	M (SD) 11.1 (3.1)	M (SD) 9.4 (3.6)	M (SD) 10.5 (2.8)
t-test		0.376	0.172	4.282**	3.984**	0.633	2.460*	-0.190	0.804
Age range‡	> 10 (1)	M (SD) 10.8 (1.3)	M (SD) 11.3 (1.7)	M (SD) 12.4 (1.9)	M (SD) 12.9 (1.9)	M (SD) 10.6 (2.3)	M (SD) 11.5 (2.0)	M (SD) 9.7 (2.6)	M (SD) 10.9 (2.1)
	11-12 (2)	M (SD) 10.6 (2.4)	M (SD) 10.4 (2.9)	M (SD) 11.1 (2.9)	M (SD) 12.7 (2.2)	M (SD) 10.4 (3.1)	M (SD) 10.9 (3.2)	M (SD) 9.8 (3.7)	M (SD) 10.4 (3.0)
	13-14 (3)	M (SD) 10.2 (2.6)	M (SD) 10.1 (2.9)	M (SD) 10.1 (3.2)	M (SD) 11.7 (2.7)	M (SD) 10.1 (3.2)	M (SD) 10.0 (3.4)	M (SD) 8.9 (3.9)	M (SD) 10.1 (2.9)
F-test		1.892	5.120*	16.080**	8.963**	0.557	7.037*	2.481	2.031

Note. † Independent-samples t-test, ‡ One-way ANOVA.

* indicates $p < .05$; ** indicates $p < .001$;

Post hoc analysis (Games-Howell's test) –statistically significant differences between the following groups:

Coping: 1-2 ($p < 0.01$), 1-3 ($p < 0.001$);

Stress: 1-2 ($p < 0.001$), 1-3 ($p < 0.001$), 2-3 ($p < 0.05$);

Self-esteem: 1-3 ($p < 0.05$), 2-3 ($p < 0.05$);

Empathy: 1-3 ($p < 0.001$), 2-3 ($p < 0.05$).

discussion. In contrast, the lowest value was awarded to the *Communication* module, which was based on an interactive activity in the group (searching for a person corresponding to specific categories). A multimedia approach, i.e. one based on the use of text, graphics, animation, pictures, video, and sound to present information, seems to be the most attractive one for young people and is the recommended base for health promotion interventions (Mas et al., 2003; Wells, Barlow and Stewart-Brown, 2003). While this is a pilot implementation of the e-tool, those results suggest the need for improvement of the form and content of some parts of the program. The second research question concerned the sociodemographic differences associated with the student evaluations (*viz.*, nationality, gender, age). Our research results highlight some age and gender differences in the pedagogical tool assessment. Health-promoting interventions need to address the differences between boys and girls to be effective (Östlin et al., 2006). Women and men are characterised by different biology, social roles, the responsibilities that society assigns to them and their position in the family and community. Similarly, the age and development phase is also essential for promotion interventions. Demographic factors are known to significantly influence lifestyle and, thus, health promotion implementation (Goswami, 2014; Graham and Power, 2004; Östlin et al., 2006; Zadworna et al., 2020).

Some national differences were also identified in the evaluation. Those results are similar to those identified in previous studies, indicating variation between countries regarding student preferences regarding digital interactive education activities for promoting psychological well-being (Gigantesco et al., 2019). Similarly, national differences have also been observed in adolescent well-being levels (Graham and Power, 2004). This result suggests that the demographic and country-specific factors should be carefully considered in the final version of the e-tool.

Nation et al. (2003) propose nine key characteristics of effective prevention programs: comprehensive in nature, varied teaching methods, sufficient dosage, theory-driven, provide opportunities for positive relationships, appropriately timed, socio-culturally relevant, including an outcome evaluation and involving well-trained staff. Wells, Barlow and Stewart-Brown (2003) also reported that programs that adopted a whole school approach were implemented continuously for more than a year and aimed at promoting mental health instead of preventing mental illness, demonstrating positive evidence of effectiveness.

The differences observed at the national level may result from the perceived sociocultural relevance of the tool. Although its design was carried

out by focus group research at the national level, the outcome of the pilot tests is international. As it is possible that sociocultural differences could affect the implementation and evaluation of prevention programs, they should be adapted to the group of participants in the country concerned. Challenges related to the transferability and sustainability across diverse cultural contexts, and their practical implementation, can limit the reach and impact of evidence-based interventions (Szymańska, 2012). Indeed, Jones and Bouffard (2012) indicate that interventions can yield less positive effects when delivered outside of their country of origin, and other studies have noted poorer implementation feasibility and cultural transferability of interventions between countries (Wigelsworth et al., 2016). Furthermore, studies evaluating the implementation and impact of social and emotional life skills interventions have been mainly conducted in the United States, with a relative paucity of intervention development and evaluation in Europe (Durlak et al., 2011; Jones and Bouffard, 2012).

Our findings indicate that although the majority of students were generally satisfied with the tool. However, the potential differences, difficulties, opportunities, and barriers associated with health promotion programs in school settings must be anticipated and addressed before a new program is introduced. While it was a pilot study, the described e-tool should be modified nationally to check its effectiveness in the following outcome evaluation stage. Their implementation needs to be tailored to stakeholders' expectations and adapted to their needs and the available resources (Darlington, Violon and Jourdan, 2018). Our pilot findings will serve as a basis to improve the form, content and implementation of the pedagogical e-tool.

Study limitations

Some limitations of the study should also be noted. First, the study was cross-sectional, and the formative evaluation of the tool was carried out immediately after the pilot implementation of the e-tool. On the one hand, the freshness effect probably allowed the students to effectively recall all the tasks in the e-tool and quickly evaluate them. On the other hand, postponing the study would give students time to reflect on the tasks completed and the conclusions drawn from them, and thus more informed responses to the questions. As this is the first step of evaluation, in the next step, an outcome evaluation should be carried out, which will answer the question of whether the goals of the e-tool - increasing the well-being of students - are being achieved. Second, the selection for the sample was non-probabilistic, so the sample is not representative, which is especially visible in the case of the age

of the students. The majority are students under the age of 12. It is a limitation resulting from selecting students to participate in the project and research. The respondents were chosen as a group (the whole class). In various project countries (including Poland), the age of beginning education ranged from six to seven years. So, while we did not select younger children on purpose, in the end, they make up the majority of the samples. Thus, in further research to evaluate the e-tool, care should be taken to select students from older grades. Third, because teachers will use the e-tool, it is worth supplementing the evaluation study with their opinions, collected based on the homogeneous measure, so that the results can be compared. Such comparison will allow more effective use of the e-tool to develop particular social skills and promote student well-being. Finally, the research should be supplemented with an assessment of the personal resources of individual students; this could be an essential reference criterion for evaluating individual modules by students. Despite those limitations, our findings demonstrate that the pedagogical e-tool offers valuable strategies for promoting well-being in school.

Conclusions and future directions

The strategy adopted for well-being promotion in schools should be implemented in line with the overall trend of rethinking education in the age of technology. Therefore, when developing and implementing programs supporting students' well-being, we recommend reviewing the basic principles of multimedia learning theory. All learners should be provided choices that support different abilities, cognitive styles, and learning preferences. Visual and verbal concepts should be presented in a coordinated manner. Educational technology and health education theory should be drawn on in designing and implementing prevention programs.

Sociodemographic and cultural factors should be carefully considered in implementing and evaluating such programs. They should be tailored to the community and cultural norms of the participants. When evaluating the promotion of school-based programs, it is important to gain feedback from students and teachers in a general school context. In the future study of an outcome evaluation of our e-tool, it is recommended to include the assessment of teachers and the standardised psychometric tests for measuring the outcome variables (before and after the program implementation). The current study described the formative evaluation of the e-tool pilot implementation in an international project. However, after modification and national and demographic adjusting to the recipients' groups, future research should assess how well the social-emotional skills and students' well-being improved.

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