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Entrepreneurship education 2-in-1: Helping young Bulgarians become more entrepreneurial in a 10-month parallel-group randomized trial

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Abstract

Entrepreneurship education can help young people escape unemployment. It is often delivered through education programs or experiential learning. There is limited knowledge of the effect of those two approaches when applied as part of a single integrated innovative intervention. Our research aimed to address this gap in a parallel-group randomized trial. The Social Cognitive Theory underpinned our study method. The impact of our two-component program on 34 young participants aged 18 to 25, 16 intervention and 18 control, was assessed over a 10-month pilot. ANCOVA analyses were performed to examine separately for changes in the Intervention participants' entrepreneurial intention and self-efficacy (across six sub-dimensions) relative to the Control group. Our results showed a statistically significant impact on the male participants only. They were delivered by the experiential learning component of our intervention. Effects were observed on all measures except for two sub-dimensions, coping with unexpected challenges and developing critical human resources. Our article contributes to the discussions on entrepreneurship programs' effectiveness and the value of researching gender in that context, providing evidence in support of using experiential learning. It further underlines the importance of understanding the environment, where programs are delivered, particularly about external influences participants might be subjected to. At the same time, we acknowledge the challenges of generalizing our contribution due to our study being a trial with a limited number of participants. To further support our conclusions, we recommend replicating the study with larger samples and/or in different environments.

Keywords: Bulgaria, Entrepreneurship education, Entrepreneurial intention, Entrepreneurial self-efficacy, Experiential learning, Social cognitive theory, Young people

Introduction

In the European Union (EU) of the 21st Century, young people aged 18–24 years are at the highest risk (30.7%) of social exclusion or poverty (e.g., they cannot afford a washing machine, a car or a telephone) (European Commission, 2018). This undesirable social status is often the result of unemployment (European Commission, 2018). The risk of unemployment is 15% for young people, more than double the overall rate (European

Commission, 2019). Entrepreneurship education is often pointed at as a possible first step for them to gain employment (Dvouletý et al., 2018; European Commission, 2017; Newman et al., 2019). Education systems focus strategically on entrepreneurship education to improve employment outcomes for young people around the globe (Quality Assurance Agency for Higher Education, 2018). Researchers and practitioners provide support by informing educational policies on what to target to increase its potential for high impact while fostering sustainable economic development (Vankov et al., 2022). They believe that economic recovery and growth, together with healthier, sustainable communities, can be promoted through youth entrepreneurship (Apostolopoulos et al., 2018; Barrett, 2016).

For many of those researchers, youth entrepreneurship starts with a university education (Aga, 2023; Pacheco & Franco, 2023). As a result, exploring it in higher education settings is often the subject of systematic research interest (Carpenter & Wilson, 2022; de Sousa et al., 2022). Identifying both positive and negative results in their systematic review, de Sousa et al. (2022) observed that more than 80% of research reports focus on the university population. Carpenter and Wilson (2022) go a step further in discussing the limitations and the quality of entrepreneurial research. The authors see the limited use of robust experiential designs and underdescribed interventions as a source of common methodological weaknesses. Carpenter and Wilson (2022) identify the lack of randomized controlled trials as a reason for low confidence in researchers' claims. The focus on entrepreneurial education happening on university campuses, in combination with those known limitations, leaves a vast area of opportunities underexplored. As a result, some researchers look in that direction, recognizing the potential of educating young entrepreneurs outside the universities (Biney, 2023). Not-for-profit organizations, particularly those active in youth work, are seen as suitable places for entrepreneurial learning and youth entrepreneurship to take place (European Commission, 2017). Youth workers offer an untapped source for developing much-needed resources for youngsters through youth activities (Arnkil, 2015). Those activities enable potential young entrepreneurs to act upon and turn their ideas into value in a supportive environment (Arnkil, 2015). Furthermore, such an environment can additionally foster social innovation. Thus, the topic of understanding the effects of creating social innovation through youth entrepreneurship outside formal education settings could be of high importance to inform future efforts.

Social innovation is a novel way of performing an activity, including business activity, focusing more on the broader social benefit than on generating profit (Thomsen et al., 2021). It can be a catalyst for solving multiple issues simultaneously (Mair & Martí, 2006). Social innovation does not necessarily happen due to an entrepreneurial motive but very often does so (Thomsen et al., 2021). To provide the basis for such innovation, social entrepreneurship rethinks, questions and challenges standard business and management practices (Mair & Martí, 2006). Social entrepreneurship is a comparatively new field that attracts increasing attention (García-Jurado et al., 2021). Its purpose is to create innovative, sustainable business models that deliver positive social change (Murray et al., 2010). In Europe, social entrepreneurship is seen as being for the benefit of both the society as a whole and the citizens individually (Douglas, 2015). While not-for-profit organizations might not see themselves as carriers of such

entrepreneurially generated benefits (Thomsen et al., 2021), society sees them as such (European Commission, 2017). Nevertheless, the predominant focus of the entrepreneurship literature being universities (Aga, 2023; Carpenter & Wilson, 2022; de Sousa et al., 2022), not-for-profit organizations remain an under-researched niche in the field, leaving a notable gap we addressed with the current article. With such an organization as an implementing medium, our study was designed with the intent to empirically explore entrepreneurship education's effect while delivering social innovation through social entrepreneurship. In a 10-month parallel-group randomized trial, we uncovered statistically significant effects on the male study participants only in respect to their entrepreneurial intention and self-efficacy. Those effects were delivered by the experiential learning component of our intervention and are described in our Results section. Before presenting them, we describe in detail our theoretically informed design and intervention, avoiding the methodological weaknesses identified by Carpenter and Wilson (2022). Our presentation is furthered by an in-depth discussion and informative conclusion about our empirical findings.

Empirical entrepreneurship research typically focuses either on high-income countries, such as the United States of America (Ferguson, 2018; Rodriguez & Lieber, 2020), Canada (Pepin & St-Jean, 2019), Germany (Santini et al., 2020), Portugal (Pinho et al., 2019) and the Netherlands (Oosterbeek et al., 2010), or on low-income ones, such as Lesotho (Berry et al., 2013), Nigeria (Bano, 2018), and Uganda (Alzua et al., 2020). Empirical studies from middle-income countries are rarer. They are in a very limited number for Bulgaria, a gap the current article addresses, although entrepreneurship in the country has been revived following the political changes in the late 80s of the last century (Hristova, 2019). Bulgaria's EU membership can be seen as a catalyzing factor in this process (Hristova, 2019). Nevertheless, some challenges are also identified, such as low investments in education and mismatch with labor market needs (Hristova, 2019). Despite the challenges, individual efforts attempt to replicate successful entrepreneurship education models in Bulgaria (Todorov & Papazov, 2009). Those models are typically hosted by large universities and aim at know-how transfer, coaching enterprises and training potential entrepreneurs (Todorov & Papazov, 2009; Todorova, 2020). Some efforts are implemented for a robust analysis of the impact of such entrepreneurship education models (Todorova, 2020). Initial results might be considered promising (Todorova, 2020). The author reports an increased interest towards self-employment and entrepreneurship with no significant differences across studied universities. Results at the secondary school level are somewhat different (Cardoso et al., 2018). Although entrepreneurship feasibility was found to be affected by entrepreneurship education, there was no effect on entrepreneurial intention (Cardoso et al., 2018). Cardoso et al. (2018) saw the out-of-school entrepreneurial experience as being more successful in influencing entrepreneurship desirability as a career. Their findings supported the choice of entrepreneurship education model applied in the current study. Overall, its aim was to examine whether an entrepreneurship education intervention targeting Bulgarian young people, utilizing an education program and experiential learning as complementary tools, impacted the participants' entrepreneurial self-efficacy and intention. Thus, in the context of Bulgaria being one of the poorest, also largely under-researched EU member states, to help advance the knowledge around assisting young people to become

self-employed through entrepreneurship education outside the formal education system, the current study's purpose was threefold:

1. Advance the understanding of the benefits of using entrepreneurship education programs and experiential entrepreneurship learning together,
2. Explore those benefits in the context of delivering social innovation through social entrepreneurship in non-formal educational settings, and
3. Understand the delivery particularities of this social innovation in one of the least researched middle-income countries, Bulgaria.

Literature review

There is ample guidance on delivering entrepreneurial education (Bacigalupo et al., 2016), including in various settings (McCallum et al., 2018). Such guidance provides a solid basis for implementations and the subsequent study of their effect. As a result, the link between entrepreneurial education and salient beliefs, such as intention to be entrepreneurial and self-efficacy, or one's perception of own capacity to achieve outcomes (Newman et al., 2019), are readily established (Aga, 2023; Anwar et al., 2022; Global Entrepreneurship Monitor, 2022). Consequently, researchers identified success characteristics attributable to entrepreneurial education (Hardie et al., 2022). Regardless of understanding what might be needed for entrepreneurship education to deliver results (Hardie et al., 2022), applying it in practice does not necessarily yield consistent results. In turn, we provide examples in support of this observation.

When Aljaouni et al. (2020) studied the effect of their education program, they discovered a decrease in entrepreneurial intention along with an increase in entrepreneurial awareness and no impact on beliefs. The authors employed an ex-post design underpinned by the Theory of Planned Behaviour (Ajzen, 1991) to a sample of 1630 secondary school students in urban Jordan. With a large sample size and sufficiently well-explained intervention, Aljaouni et al. (2020) addressed some concerns raised by Carpenter and Wilson (2022). They also used a control group to arrive at their findings. However, their experiential design would have been much more robust if ex-ante surveys had been collected, too. Such data would have fleshed the results further, controlling for pre-existing levels. In addition, the sample seems convenient, while randomization would have improved the credibility of the results. Nevertheless, Aljaouni et al. (2020) results found support in Oosterbeek et al. (2010). Oosterbeek et al. (2010) employed a randomized control trial design, again in urban formal education settings, but in the Netherlands. With a sound methodology in a smaller sample of 250, the authors provided a detailed explanation of their intervention (Junior Achievement Young Enterprise), empirical strategy and their data collection, which covered 114 items. Thus, the obtained results bore high credibility, although in essence Oosterbeek et al. (2010) found a negative effect on intention and a null impact on skills. The authors suggested more program variants be studied to understand its potential better. Such a recommendation was supported by the work of Bjorvatn et al. (2020), who employed television in place of in-person instruction. Although Bjorvatn et al. (2020) were not able to influence skills either, the authors found a positive impact on intention in a sample of 2132 secondary school students. Their well-described and methodologically sound quasi-experiment with treatment

and control groups in semi urban Tanzania supported taking a broader view on how to design entrepreneurial interventions. Nevertheless, Bjorvatn et al. (2020) challenged the ultimate utility of their intervention by revealing that despite positively impacting intention no increase in business ownership was observed. Another study in Tanzania discovered the opposite to Bjorvatn et al. (2020), i.e., no significant change in intention but a positive one in skills (Krause et al., 2016). Krause et al. (2016) employed ex-ante/ex-post design to understand the impact of a community-based entrepreneurship program on a sample of 434 marginalized youth. Reporting strong positive intervention effects on intermediate employment outcomes, the authors endorsed non-experimental evaluation methods. Such an endorsement, however, supported Carpenter and Wilson (2022) observations of weaker designs being present in the literature. Further evidence about the existence of insufficiently strong designs was that none of the studies reviewed so far utilized a theory to ground their methodology but Aljaouni et al. (2020). Another theory-based study was implemented by Grewe and Brahm (2020), who grounded their work in the Experiential Learning Theory (Kolb, 2014). Using validated, psychometrically sound instruments from a novel entrepreneurial competence framework, Grewe and Brahm (2020) studied 100 German pupils and found significant improvements in cognitive skills but null results in non-cognitive ones. The authors highlighted the value of hands-on entrepreneurial learning, and the particular benefit of young people being involved in running mini-companies. Overall, the available research did not appear to offer a recipe for the success of entrepreneurial education interventions, neither it is possible to generalize findings, regardless of sample sizes and methodologies. Nevertheless, this literature review further exposes the research gap, originating in the fact that such interventions predominantly happen in formal education environment (Carpenter & Wilson, 2022; de Sousa et al., 2022).

Despite the implicit value in learning about any research results (negative, null and positive), it seems the entrepreneurial community more readily welcomes studies with positive findings. One such study reported a positive impact on all studied measures (skills, intention and beliefs) (Athayde, 2009). At the same time, Athayde (2009) study is both similar and different from the studies reviewed above. The author studied 276 secondary school students in the United Kingdom (UK) in a longitudinal randomized control trial. Nevertheless, no robust theoretical grounding was reported, providing some further support for Carpenter and Wilson (2022) concerns. Such lack of theoretical grounding makes it harder to justify why specific measures were researched, a research gap we contribute to addressing in the Theoretical framework section below.

Regardless of the measures researchers attempt to influence through entrepreneurship education, their effort generally comes in two forms, education programs and experiential learning. Education programs are the first and more common way to teach entrepreneurship. As discussed in the Introduction, they are often delivered in the context of business curricula (European Commission, 2017; Liu, 2021; Valerio et al., 2014). Outside formal education, non-formal one also gains traction (UNESCO Institute for Statistics, 2012). Regardless of their form, such programs focus on developing various skills (cognitive and non-cognitive), beliefs or intentions. In addition to the variety of their focus, entrepreneurship education programs were shown above to deliver mixed results. To sum up, such results can be positive, neutral or even negative (Aljaouni et al., 2020;

Bjorvatn et al., 2020; Grewe & Brahm, 2020; Krause et al., 2016; Oosterbeek et al., 2010). Furthermore, in different settings, the same entrepreneurship program can deliver different results, as programs based on the Junior Achievement Young Enterprise mini-company program did in Israel (Bergman et al., 2011), the Netherlands (Oosterbeek et al., 2010), Portugal (do Paço & Palinhas, 2011), Sweden (Elert et al., 2015), and the UK (Athayde, 2012). In Israel, the program did not affect the participants' entrepreneurial self-efficacy and knowledge (Bergman et al., 2011). In the Netherlands, it did not affect students' self-assessed entrepreneurial skills but produced negative results on entrepreneurial intention (Oosterbeek et al., 2010). In Portugal, its aim, i.e., transmission of knowledge, was considered achieved given the number of correct answers increased (do Paço & Palinhas, 2011). In Sweden, participants in the program increased the long-term probability of starting a company and entrepreneurial outcomes (Elert et al., 2015). In the UK, the participation positively impacted the young people's enterprise potential, a result moderated by the type of school attended, socio-economic background, ethnicity, and gender (Athayde, 2012). Although the different countries of implementation may raise questions around whether culture determined the different results, the study designs offered some similarities to suggest comparison is possible. One study used quasi-experiential design (Bergman et al., 2011), two were randomized controlled trials (Athayde, 2012; Oosterbeek et al., 2010), and two were quantitative comparisons (do Paço & Palinhas, 2011; Elert et al., 2015). The sample sizes also seemed to be large enough to support the robustness of the findings. Oosterbeek et al. (2010) studied the smallest sample of 250 young people, Bergman et al. (2011)—266, Athayde (2012)—276, do Paço and Palinhas (2011)—620, and Elert et al. (2015)—211,754. It has to be noted that Elert et al. (2015) accessed census data, following up program graduates up to 16 year post-graduation and matching them with a similar group that did not undertake the program. Despite those positive aspects of the studies, though they still suffered from the already identified limitations that all of them utilized formal education settings and neither of them grounded their methodology in a suitable theory.

Some studies extended their methodology to consider gender, uncovering gender effects in their results (Athayde, 2012; Turner & Lapan, 2005). Others did not (Athayde, 2009; Bergman et al., 2011; Bjorvatn et al., 2020). For example, Athayde (2012) showed that their program resulted in significantly higher attitude scores for the male participants. Other gender effects were observed in career preference, with males and females opting for entirely different careers (Turner & Lapan, 2005). Different from Athayde (2012) and Turner and Lapan (2005), and despite the positive impact across all measures, Athayde (2009) did not observe gender effects. Similarly, there was no gender effect when Bergman et al. (2011) program failed to significantly influence its participants' entrepreneurial self-efficacy and knowledge. After studying ambition index, Bjorvatn et al. (2020) also reported significant effects regardless of gender. At the same time, the authors did not find such results in the mindset and knowledge of their participants, only a hint about a link between being more entrepreneurial and risk-taking in females (Bjorvatn et al., 2020).

Outside education programs, experiential learning is the second way to teach entrepreneurship (Douglas, 2015). This approach allows participants to observe to learn or to engage directly in entrepreneurial activity (Hockerts, 2018). For example, Noyes (2018)

suggests prototyping as an experiential learning approach would allow direct engagement with a target market. The author sees prototyping as an opportunity for demand identification and evaluation. As a result, learners should be able to develop ideas and test them to address market needs (Noyes, 2018). While both education programs and experiential learning have been researched (Douglas, 2015; Thomsen et al., 2021; Valerio et al., 2014) and are sometimes compared (Thomsen et al., 2021), there is not much evidence about how the two complement each other. Thus, little is known whether there is value in implementing the two approaches as part of mixed entrepreneurship education intervention, a gap this article aimed to address. To bridge this gap, we hypothesized that in a randomized trial:

1. After each component of a mixed entrepreneurship education intervention and the intervention as a whole, the Intervention participants would report significantly greater entrepreneurial intention and entrepreneurial self-efficacy than the Control group (H1).
2. Gender will be a significant moderator in the cases of entrepreneurial self-efficacy and entrepreneurial intention (H2).

In line with those two hypotheses, we sought to answer the following research questions (RQ):

1. RQ1. What was the overall impact of a mixed entrepreneurship education intervention on the study participants?
2. RQ2. What was the impact of using entrepreneurship education programs only on the study participants?
3. RQ3. What was the impact of using experiential entrepreneurship learning only on the study participants?
4. RQ4. What was the role of gender in the intervention?

Theoretical framework

To explore entrepreneurship, researchers may focus on learning what determines entrepreneurs. The Social Cognitive Theory (SCT) (Bandura, 1986) provides a useful model for understanding human behaviour. It has been previously applied in entrepreneurial studies (e.g. Athayde, 2012; Heinrichs, 2016; Ho et al., 2018). In SCT, humans are shaped by their environment, personality and behaviour (Bandura, 1986). The key construct of the theory is self-efficacy, or how much people believe they can achieve goals. According to the SCT, self-efficacy (entrepreneurial self-efficacy (ESE) in entrepreneurship research) is developed through learning, which can be both observational (education) or applied (experimental).

ESE is people's belief in their capacity to achieve entrepreneurial outcomes (Newman et al., 2019). It can be uni- or multi-dimensional. For example, De Noble et al. (1999) SCT-tailored scale consists of six sub-dimensions to reflect multiple entrepreneurial requirements. It covers opportunity recognition (developing new product and market opportunities) and vision (defining core purpose), assesses abilities to innovate (building an innovative environment) and raise capital (initiating investor

relationships), and looks into resilience (coping with unexpected challenges) and leadership skills (developing critical human resources) (De Noble et al., 1999). By developing ESE, entrepreneurship education indirectly and directly tackles unemployment (Dvouletý et al., 2018; European Commission, 2017; Newman et al., 2019). For example, an alternative to unemployment is starting a new business, which is challenging and requires the ability to meet dynamic demands (Al-Qadasi et al., 2021). Entrepreneurship education supports the development of skills to thrive in such a unique environment (Al-Qadasi et al., 2021). With employment being a significant factor in determining economic well-being, researchers argue that ESE also indirectly influences poverty (Morris et al., 2018). ESE has been shown to significantly predict entrepreneurial intention (Aga, 2023; Vankov et al., 2022). Through entrepreneurial intention, ESE influences entrepreneurial behaviour (Chen et al., 1998; Schlaegel & Koenig, 2014). Intention is also known to be the most significant predictor of behaviour (Ajzen, 1991). The theoretical significance of ESE and entrepreneurial intention and their strong links with future behaviour determined the focus of our investigation. By measuring those two constructs and determining the effect of an entrepreneurship education intervention on them, we contribute to the broad discussion, both theoretical and practical, around the benefits of entrepreneurship education.

Using SCT as a theoretical framework in entrepreneurship education intervention studies, Heinrichs (2016) reported a statistically significant effect of their entrepreneurship education course on the participants' ESE, with females showing impressive improvements in their results. Similarly, Athayde (2012) identified their entrepreneurship program's significant impact on the participants' attitudes to enterprising. Underpinned by SCT, Ho et al. (2018) provided further evidence of the theory's utility in investigating entrepreneurship education's impact on the measures of interest to the current study, i.e., ESE. The authors showed a significant effect on their participants' ESE. Thus, SCT was considered suitable to underpin our work.

Methods

This section outlines the SCT-grounded method utilized in conducting the study, starting with the research design, followed by participants' information and data collection procedure. Subsequently, we explain in detail our entrepreneurship education intervention and the reliability and validity of our instruments. Finally, we discuss our data analysis.

Research design

This study was conducted as a parallel-group randomized trial, seamlessly integrated into participants' regular lifestyles. All recruited participants underwent the completion of three surveys at different timepoints. Subsequently to their recruitment and the completion of the first of the three surveys, participants were randomly allocated to either the Intervention group or the Control group. Given that all participants were aged 18 or 19, studying in the final year of their secondary education with no career experience, the two groups were considered of similar composition post assignment.

Participants' information and data collection procedure

The current study recruited young participants through an open call between the 13th and 18th of October 2021: Time 1 (T1, before the education program delivery). The call was published on the Facebook page of the not-for-profit organizations, which hosted the entrepreneurship education intervention. Information was also distributed through printed flyers and verbally to eligible young people. To participate, a young person had to be aged 18 to 25 with a sufficient command of English language to be able to actively participate in the entrepreneurship education program. All participants were required to provide implied consent. It was considered provided after the study information was presented to a participant and they completed a survey. Each participant generated their anonymous identifier. Participants were suggested to use their day of birth, first name first letter, family name first letter and mobile number last two digits (for example, 15HT99) to generate it.

The same survey was completed by the recruited participants at T1, at Time 2 (T2, after education program delivery and before experimental learning), and at Time 3 (T3, after experimental learning). T2 data were collected between the 28th of October and the 08th of November 2021. T3 data were collected between the 01st and 13th of July 2022. The collected surveys were 40 at T1, 39 at T2 and 37 at T3. Using the anonymous identifiers, data from 34 (a 15% dropout rate) participants were reliably linked across the three timepoints ($Mage = 18.5$, $SD = 1.33$, 16 Intervention (10 males) and 18 Control (9 females)). Importantly, the Control group did not partake in the intervention at any point during the study. At the same time, the Intervention group was subjected to a mixed entrepreneurship education intervention with two complementary tools: an education program and experiential learning.

Entrepreneurship education intervention

The entrepreneurship education program used in the current study consisted of two modules, Spark and Fuel (for details, see Additional file 1). The study Intervention participants followed the two modules between T1 and T2 (late October 2021) in real-time through Zoom. The Intervention group participants rated very high the delivered entrepreneurship education program. The young people were asked whether they enjoyed the training and would recommend it. On a scale from "Strongly disagree" (1) to "Strongly agree" (5), Spark was rated 4.94 ($SD = 0.25$), and Fuel was rated 4.88 ($SD = 0.34$).

During their studies, the participants identified the following social problem: Contemporary children lead unhealthy lives. The Intervention participants' idea was to help children stay healthy and active, a particularly challenging task in the light of the COVID pandemic. They saw children as preferring video games instead of moving and playing outside. They believed children prefer social media instead of meeting their friends in person. The young participants considered the problem a trend but also a habit within a behavioral pattern out of convenience but also out of a lack of an alternative, particularly in the presence of COVID restrictions. Their proposed solution was to establish a contemporary dance studio, seeing it as their first step in social entrepreneurship. The young entrepreneurs designed the studio for children from 5 to 10 years (see Fig. 1). In their city, there was no such initiative. At the same time,



Fig. 1 Contemporary dancing studio banner

they believed many children could not find themselves in sports. Thus, they offered those children a viable alternative to screen time: a way to develop themselves as individuals without being deprived of movement. Furthermore, they considered the dances to help participants express their emotions and feelings right when and where they are, in the company of their friends. Following the completion of Fuel, the young entrepreneurs had to deliver their prototype (i.e., contemporary dance studio) to the public. As a result of this endeavor, they piloted the idea and gained the opportunity to face real-life start-up challenges.

The region the study participants live in (Northwest Bulgaria) is recognized to be the poorest in the EU (European Commission, 2018). Thus, they considered that not many people could afford to pay full fees. For this reason, they set low monthly fees, so that people in financial difficulties would not struggle to pay them. As a result, they believed they offered the opportunity to as many people in their city as possible, making themselves useful to their community. Their prototype started working on the 7th of February 2022, with a young girl from the group being the contracted tutor. Another young person secured a part-time job. On the 16th of April 2022, the dance studio had its first official event, participation in a charity concert. To further promote the prototype as part of their experiential learning, the study participants were tasked with organizing a large-scale youth event. The purpose of the event was to enable receiving direct public feedback. The event occurred on the 6th of June 2022 at the Vidin Drama Theater.

Reliability and validity of the instruments

ESE, or people's belief they can achieve entrepreneurial outcomes, can be measured through multiple scales (Newman et al., 2019). However, Bandura (1986) recommends using domain-specific measures. For the current study, we chose De Noble et al. (1999) 22-item multi-dimensional scale. Newman et al. (2019) identified 19

studies leveraging the De Noble et al. (1999) scale, which supported using it in our research. To measure entrepreneurial intention, we used a scale developed based on the entrepreneurial implementation intention model (Gollwitzer & Sheeran, 2006) as applied by Ismail (2017).

An online survey with three sections appearing in a fixed order was used to collect data from the study participants. The first section contained demographic variables: gender (0=female/1=male) and age (in years). The second section measured ESE on a five-point scale ranging from "Strongly disagree" (1) to "Strongly agree" (5). It contained the six sub-dimensions mentioned earlier: developing new product and market opportunities (7 items, sample item: I can identify new areas for potential growth.), building an innovative environment (4 items, sample item: I can form partner or alliance relationship with others.), initiating investor relationships (3 items, sample item: I can identify potential sources of funding for investment.), defining core purpose (3 items, sample item: I can articulate vision and values of the organization.), coping with unexpected challenges (3 items, sample item: I can persist in the face of adversity.), and developing critical human resources (3 items, sample item: I can recruit and train key employees.) (De Noble et al., 1999). The third section measured entrepreneurial intention through five items (sample item: How likely is it that you will pursue a career as an entrepreneur within next 6 months?), adapted from Ismail (2017). Internal consistency was tested for all ESE subscales: developing new product and market opportunities (T1 $\alpha=0.88$, T2 $\alpha=0.87$, T3 $\alpha=0.94$), building an innovative environment (T1 $\alpha=0.65$, T2 $\alpha=0.79$, T3 $\alpha=0.89$), initiating investor relationships (T1 $\alpha=0.66$, T2 $\alpha=0.71$, T3 $\alpha=0.80$), defining core purpose (T1 $\alpha=0.46$, T2 $\alpha=0.81$, T3 $\alpha=0.87$), coping with unexpected challenges (T1 $\alpha=0.58$, T2 $\alpha=0.81$, T3 $\alpha=0.86$), developing critical human resources (T1 $\alpha=0.60$, T2 $\alpha=0.73$, T3 $\alpha=0.93$), and entrepreneurial intention (T1 $\alpha=0.76$, T2 $\alpha=0.81$, T3 $\alpha=0.89$). The data showed increasing internal consistency over time with values getting higher and typically above the generally accepted Cronbach's α limit of 0.70 (DeVellis, 2016). After examining internal consistency, entrepreneurial intention and ESE items were averaged to calculate single values for each measure.

Statistical analysis

SPSS Statistics 27 was used to process the data from the surveys. Initially, we performed a preliminary one-way between-groups multivariate analysis of variance (MANOVA) to determine whether there were any significant differences at T1 between the Intervention and the Control participants. The independent variable (IV) was the group condition, so Intervention or Control. The dependent variables (DVs) were ESE and entrepreneurial intention. The test showed no significant pre-existing difference between the two groups (Wilks' Lambda = 0.84, $F(2, 31) = 2.88$, $p = 0.07$, $\eta^2 = 0.157$).

Normality of the DVs was assessed statistically (skewness and kurtosis), with all values being within the generally accepted range ($-2; 2$) (Tabachnick & Fidell, 2007). A non-normal distribution was indicated by the Shapiro–Wilk test ($p < 0.001$) only for three measures at T2: coping with unexpected challenges, defining core purpose, and initiating investor relationships. Examined histograms, Q–Q plots, and boxplot outliers suggested normality. Overall, we considered normality assumptions were sufficiently met to perform a series of parametric tests to analyze effects within the current study.

Means and standard deviations (descriptive statistics) were examined for all DVs, i.e., ESE, its sub-dimensions and entrepreneurial intention, at T1, T2 and T3. Along with their significance levels, Pearson's r correlation coefficients were calculated to provide initial information about the DVs' interrelationships. The T1, T2 and T3 ESE overall scores and entrepreneurial intention Pearson's r correlations and means with standard deviations are presented in Table 1. It is noticeable that the values are higher at T2 than at T1, which shows that after the education program, the young people, on average, were both intending to be more entrepreneurial and confident they could achieve it. ESE at T3 is lower than at T2, while entrepreneurial intention retains its score. While both values are still higher than at T1, the lower ESE might be due to the gained experience during the experiential learning. Such learning can often be a good reality check.

Another interesting observation is that ESE and entrepreneurial intention exhibited strong significant correlations at each timepoint. The strongest observed correlation was at T3 between ESE and entrepreneurial intention ($r=0.72$, $p<0.001$). However, correlations generally seemed to lose strength and significance between measures from different time periods. Over time, correlations became weaker and less significant.

Results

We evaluated our mixed entrepreneurship education intervention as a whole and each of its two components, i.e., education program and experiential learning, separately. Effects were sought in ESE, its sub-dimensions and entrepreneurial intention.

First, we used one-way analyses of covariance (ANCOVA) tests to seek an answer for RQ1, or how using entrepreneurship education programs and experiential entrepreneurship learning together impacted the study participants. The group condition, Control and Intervention, was the fixed factor IV. The covariates to control for pre-existing conditions within the two groups were ESE, developing new product and market opportunities, building an innovative environment, initiating investor relationships, defining core purpose, coping with unexpected challenges, developing critical human resources, and entrepreneurial intention (measured at T1). No statistically significant results were identified (see Table 2).

Then, by adding gender as a second fixed factor, we applied two-way ANCOVA tests to assess for RQ4. Thus, we examined whether gender moderated our results. Statistically significant interactions between the two fixed factors were revealed for all measures

Table 1 Means, standard deviations and bivariate correlations ($n=34$)

	Construct	Scale range (min/max)	Mean (SD)	1	2	3	4	5	6
T1	1. ESE	1–5	3.66 (0.55)	–	0.54**	0.34*	0.06	0.28	0.20
	2. Entrepreneurial intention	1–5	3.28 (0.86)		–	0.16	0.23	0.06	0.13
T2	3. ESE	1–5	4.29 (0.60)			–	0.50**	0.21	0.34*
	4. Entrepreneurial intention	1–5	4.08 (0.79)				–	0.08	0.27
T3	5. ESE	1–5	4.14 (0.68)					–	0.72**
	6. Entrepreneurial intention	1–5	4.08 (0.79)						–

*Correlation is significant at the 0.05 level (2-tailed)

**Correlation is significant at the 0.01 level (2-tailed)

Table 2 ANCOVAs on T3 measures adjusted for T1 values ($n = 34$)

Measure	Effect of the intervention			Interaction between group and gender		
	$F(1, 32)$	p	ηp^2	$F(3, 30)$	p	ηp^2
T3 ESE	1.61	0.214	0.049	5.53	0.026	0.160
T3 Developing new product and market opportunities	3.05	0.090	0.090	4.78	0.037	0.141
T3 Building an innovative environment	1.55	0.223	0.048	7.57	0.010	0.207
T3 Initiating investor relationships	0.09	0.769	0.003	4.99	0.033	0.147
T3 Defining core purpose	1.65	0.209	0.050	4.51	0.042	0.135
T3 Coping with unexpected challenges	1.16	0.290	0.036	4.00	0.055	0.121
T3 Developing critical human resources	2.59	0.118	0.077	2.69	0.112	0.085
T3 Entrepreneurial intention	0.24	0.627	0.008	9.78	0.004	0.252

Table 3 Mean scores on each measure at T1, T2 and T3 for the Intervention and the Control group split by gender ($n = 34$)

Measure	T1	T2	T3	T1	T2	T3
	Males ($n = 10$)			Females ($n = 6$)		
ESE	3.92	4.44	4.38	3.56	4.23	4.24
Developing new product and market opportunities	3.73	4.51	4.40	3.41	4.41	4.31
Building an innovative environment	4.15	4.55	4.40	4.04	4.50	4.25
Initiating investor relationships	3.97	4.60	4.33	3.39	4.11	4.11
Defining core purpose	4.07	4.20	4.50	3.56	4.17	4.17
Coping with unexpected challenges	4.07	4.37	4.40	3.56	4.22	4.22
Developing critical human resources	3.57	4.40	4.23	3.44	4.00	4.39
Entrepreneurial intention	3.18	3.94	4.52	3.07	3.60	3.50
Measure	T1	T2	T3	T1	T2	T3
	Males ($n = 9$)			Females ($n = 9$)		
ESE	3.74	4.42	3.57	3.35	4.03	4.36
Developing new product and market opportunities	3.60	4.29	3.51	3.35	4.08	4.35
Building an innovative environment	3.97	4.22	3.50	3.47	3.94	4.25
Initiating investor relationships	3.44	4.40	3.63	3.11	4.19	4.48
Defining core purpose	3.85	4.67	3.70	3.41	3.96	4.33
Coping with unexpected challenges	3.82	4.48	3.67	3.33	4.11	4.41
Developing critical human resources	3.74	4.48	3.40	3.44	3.89	4.33
Entrepreneurial intention	3.44	4.40	3.76	3.36	4.22	4.31

but coping with unexpected challenges and developing critical human resources (see Table 2). The lack of significant main effects for either group condition or gender suggested that males and females responded differently to our intervention. These results partially supported H1. H1 predicted that after the intervention as a whole, the Intervention participants would report significantly greater entrepreneurial intention and ESE as a whole and on each sub-dimension in comparison with the Control group. This hypothesis was found to be true for the male participants, excluding the two ESE sub-dimensions coping with unexpected challenges and developing critical human resources (see Table 3).

Table 4 ANCOVAs on T2 measures adjusted for T1 values ($n = 34$)

Measure	Effect of the intervention			Interaction between group and gender		
	$F(1, 32)$	p	ηp^2	$F(3, 30)$	p	ηp^2
T2 ESE	0.05	0.824	0.002	0.20	0.661	0.007
T2 Developing new product and market opportunities	1.47	0.234	0.045	0.06	0.808	0.002
T2 Building an innovative environment	1.50	0.230	0.046	< 0.01	0.952	< 0.001
T2 Initiating investor relationships	< 0.01	0.995	< 0.001	0.25	0.619	0.009
T2 Defining core purpose	0.05	0.825	0.002	0.23	0.635	0.008
T2 Coping with unexpected challenges	0.73	0.400	0.023	1.62	0.213	0.053
T2 Developing critical human resources	0.09	0.761	0.003	0.13	0.717	0.005
T2 Entrepreneurial intention	2.93	0.097	0.086	0.085	0.773	0.003

Table 5 ANCOVAs on T3 measures adjusted for T2 values ($n = 34$)

Measure	Effect of the intervention			Interaction between group and gender		
	$F(1, 32)$	p	ηp^2	$F(3, 30)$	p	ηp^2
T3 ESE	2.13	0.155	0.064	5.83	0.022	0.167
T3 Developing new product and market opportunities	2.00	0.168	0.061	6.08	0.020	0.173
T3 Building an innovative environment	1.69	0.203	0.052	4.78	0.037	0.141
T3 Initiating investor relationships	0.35	0.558	0.011	5.21	0.030	0.152
T3 Defining core purpose	2.26	0.143	0.068	4.47	0.043	0.134
T3 Coping with unexpected challenges	1.57	0.217	0.049	5.26	0.029	0.154
T3 Developing critical human resources	2.54	0.121	0.076	2.48	0.126	0.079
T3 Entrepreneurial intention	0.90	0.349	0.028	10.00	0.004	0.256

Subsequently, we wanted to see which of the two components of our intervention, i.e., the education program and the experiential learning, or both of them, contributed to the overall result. We followed the same procedure as above. First, we used one-way ANCOVA tests to assess RQ2 and look at how the education program alone impacted the study participants. With the same IV and covariates as above, no significant difference was found between the Control and Intervention groups on any of the measures. Gender effects were not observed either (see Table 4). These results did not support H1, which predicted that after the entrepreneurial education as a component of the intervention, the Intervention participants would report significantly greater entrepreneurial intention and ESE as a whole and on each sub-dimension in comparison with the Control group. Neither had they supported H2, which predicted gender as a significant moderator.

Finally, following the above procedure but using T2 scores as covariates, we used one-way ANCOVA tests to assess RQ3 or to explore whether experiential entrepreneurship learning only impacted the study participants. Similarly, we used two-way ANCOVAs to assess for RQ4 on gender effects at T3 (see Table 5). Table 5 reveals that after adjusting for T2 scores, the experimental learning did not have a significant effect on the Intervention group as a whole. However, after gender was introduced in

the analyses, significant interaction effects were revealed for all measures but developing critical human resources. Further investigation showed that neither of the main effects (for group condition and gender) was statistically significant. Such a result suggested that males and females responded differently to experiential learning (see Table 3). These results partially supported H1, which predicted that after the experiential entrepreneurial learning component of the intervention, the Intervention participants would report significantly greater entrepreneurial intention and ESE as a whole and on each sub-dimension compared with the Control group. However, the data confirmed H1 only in the case of the male participants. As a result, we found support for H2, which predicted gender as a significant moderator.

Discussion

This research assessed whether entrepreneurial intention, ESE as a whole and its sub-dimensions separately (De Noble et al., 1999) changed as a result of a mixed entrepreneurship education intervention, utilizing an education program and experiential learning as complementary tools. Our study took place between October 2021 and July 2022, or for a total of 10 months. It first investigated whether, after each component of the mixed entrepreneurship education intervention and after the intervention as a whole, the Intervention participants would report significantly greater scores on the assessed measures than the Control group (H1). Then, we tested whether the results were moderated by gender (H2). Data from 34 young Bulgarians were used to investigate the two hypotheses. We answered four research questions in our analysis.

Findings

We admit that our findings were simultaneously expected and unexpected. They were expected in the sense that such a comprehensive mixed entrepreneurial intervention was intended to produce statistically significant positive results. At the same time, they were unexpected, because the overall expectation was that each of the two components of the intervention would contribute to those results and all measures would be positively impacted. In a nutshell, we found partial support for H1 in that only the experiential entrepreneurial learning component of the intervention significantly impacted the assessed measures, which resulted in the whole intervention having a significant effect. We also found support for H2 in that those measures were significantly impacted only in the male participants. As a consequence of this finding, new research questions can be formulated, such as "What entrepreneurial intervention would significantly influence both males and females?" In turn, we provide a detailed analysis of how our expectations materialized in relation to each of the current RQs.

By answering RQ1, we looked at the aggregate effect of our intervention on the involved participants. Through one-way ANCOVAs, we investigated the start-to-end impact for 10 months between the first and the last survey. There was a statistically significant difference between the Intervention and the Control group on neither entrepreneurial intention nor ESE or its sub-dimensions. These results are similar to the findings of Aljaouni et al. (2020), Krause et al. (2016) and Oosterbeek et al. (2010), who did not uncover positive impacts either, and contrary to other researchers, who reported benefits from their interventions (Bjorvatn et al., 2020). Particularly for Bulgaria, our results

support previous findings of no effect on entrepreneurial intention (Cardoso et al., 2018). Although we deployed an out-of-school entrepreneurship program, it seemed it was not successful in influencing entrepreneurship desirability, i.e., entrepreneurial intention, as Cardoso et al. (2018) suggested. At the same time, our further analysis showed a statistically significant influence of gender, which again was in line with some previous researchers (Athayde, 2012; Turner & Lapan, 2005; Vankov et al., 2022) but not with others (Athayde, 2009; Bergman et al., 2011).

In our particular case and contributing to answering RQ4, similar to Athayde (2012), we showed a statistically significant impact on the male participants. By exploring the mean scores for males and females from the Intervention and the Control group separately, we saw notable differences between T3 and T1. In the Intervention group, the females seemed to have started from a lower baseline than the males. During the intervention, the scores of both genders had increased, with the females retaining somewhat lower scores, particularly in the case of entrepreneurial intention. In the Control group, though, the situation seemed very different. While the scores of the female Control group participants had increased to values comparable to those of the female Intervention group participants, this was not true for the males. The male Control group participants retained scores similar to what they had at baseline. Thus, it can be argued that besides our intervention, there was some general influence over time, which affected the female Control group but not the male one. Those results supported previous findings that entrepreneurship education impacts females and males differently (Athayde, 2012; Turner & Lapan, 2005). Our further analysis provided suggestions for when this general external influence might have occurred. To uncover those insights, we examined separately the effects of the education program and the experiential learning that constituted our intervention. In other words, we looked at the effects at T2 as compared to T1 and at T3 as compared to T2.

To examine the impact of our education program and answer RQ2, we performed another set of analyses following the same established procedure. These analyses found no effects on the examined measures, supporting some previous research findings (Aljaouni et al., 2020; Krause et al., 2016; Oosterbeek et al., 2010) and not supporting others (Heinrichs, 2016; Ho et al., 2018). Similarly, we did not find any gender effects, which again finds support in some previous research (Athayde, 2009; Bergman et al., 2011; Bjorvatn et al., 2020) but not in other (Athayde, 2012; Heinrichs, 2016), where gender effects are reported. A closer examination of mean values showed that between T1 and T2, the scores of all participants, Intervention and Control, males and females, increased comparably. Thus, such an increase could not be assigned to the education program to which the Intervention group was subjected. We can speculate that whatever the general external influence was at this time, it affected equally males and females and led them to elevate their self-reported ESE and entrepreneurial intention.

While answering RQ3, we found the effect of experiential learning on the measures was the same as the education programs. Our analyses did not reveal a significant impact as a whole. However, when gender was explored, significant differences emerged for the male participants, supporting Athayde (2012) and contrary to Heinrichs (2016). Heinrichs (2016) reported an impact on females and not on males. Zooming in on the data revealed both males and females from the Intervention group retained, on average,

their scores between T2 and T3. The same observation was valid for the female Control group participants. However, the male Control group participants recorded a substantial drop in their scores, bringing their values roughly to T1 levels. Thus, it could be argued that whatever the general external influence was, its effect wore off for the male Control group participants but not for the female ones. While we did not observe notable increases in the Intervention group scores as a result of the experiential learning, we could also argue that the experiential learning might have helped the male Intervention group participants retain their higher scores for the period of our intervention. A further question is whether they would have been able to retain these higher scores if they did not acquire the underlying knowledge through participating in the initial entrepreneurship education program. It is possible that the male Control group participants' scores fell because they did not have the knowledge to maintain the effect of the unknown general external influence. As per our data, the female Control group participants did not need it to sustain the effect.

While effects are shown to transpire differently for the two genders, intragender observations also provide valuable insights. Scores on ESE and its sub-dimensions seem to move in parallel for the different sub-groups of participants. This is not the case for entrepreneurial intention. After the education program, the female Intervention group's entrepreneurial intention increased much less than the male one, which is consistent with Athayde (2012). Then, it further reduced after the experiential learning. For the male Intervention group, it increased even further. This means that females were generally less convinced that they wanted to become entrepreneurs, a notion maintained throughout the intervention, which may also be linked to their risk-taking, as suggested by Bjorvatn et al. (2020). At the same time, males' enthusiasm seemed to have improved with every opportunity they were given. Such an argument would support the notion that gender might significantly moderate the desire to run a business, contrary to Athayde (2012) and Obschonka et al. (2014). It also supported Turner and Lapan (2005) in their proposal that males and females tend to opt for different careers. With this argument, we contributed to the broader discussion around gender in entrepreneurship and related research.

Although it seems unwarranted to claim that our research findings can be generalized to other contexts or settings, our methodology can. We have used a freely available entrepreneurship education program that can be followed anywhere in the world. We also supported young people in a way it could be done in any context. Thus, our methodology is entirely transferable, which is an implication of this study of potential significance to stakeholders. To investigate whether transferring our methodology would yield consistent or inconsistent results in different contexts or settings, similar to the Junior Achievement Young Enterprise program (see Literature review), we propose the following future research questions (FRQ):

1. FRQ1. What is the overall impact of a mixed entrepreneurship education intervention on the study participants in culturally different contexts, such as Asian, African or Latin-American?
2. FRQ2. How different are the results for the study participants from using entrepreneurship education programs only and experiential entrepreneurship learning only?

3. FRQ3. What is the difference in the intervention impact on males and females?

Strengths

To the best of our knowledge, our study was the first to assess a mixed entrepreneurship education intervention, utilizing an education program and experiential learning as complementary tools. We collected participants' data at three timepoints: before the education program delivery, after the education program delivery and before the experimental learning, and after the experimental learning. Another strength of our study was the establishment of a Control group to account for any general influence. As a result, we could eliminate potential bias, which led to some interesting findings explored in the subsection above. Those findings were enabled by a gender-balanced sample (15 females, 19 males), a further strength of our work.

Regardless of our findings around theoretical constructs and gender effects, our study provided support for several broader concepts. First, it showed the value of engaging directly in entrepreneurial activity to learn, as suggested by Hockerts (2018). During our study, the participants identified demand and directly engaged with a target market. They used a prototype approach to develop their idea and put it to work to address a market need, as suggested by Noyes (2018). Second, our research used youth activities to empower young entrepreneurs to turn their ideas into value, as suggested by Arnkil (2015). And third, the young entrepreneurs used social innovation to focus their "business" activity on the broader social benefit, as suggested by Mair and Martí (2006) and Thomsen et al. (2021). Finally, our empirical entrepreneurship research took place in Bulgaria, a country typically overlooked when exploring youth entrepreneurship, and added helpful insights to the limited available knowledge (Cardoso et al., 2018; Todorova, 2020).

Limitations

Self-reports are known to carry bias. To minimize bias, we anonymized data collection. Thus, we believe that no pressure was applied to the participants to provide socially acceptable answers. Furthermore, social acceptability does not seem to be an issue in entrepreneurship research. A more notable limitation of our research is the sample size. We analyzed data from 34 participants, a 15% dropout from the initial sample. Although such sample sizes are not untypical, particularly in settings outside the formal education, they tend to be at the lower end of the spectrum. Comparable samples can be found in research in both high- and low-income countries (Berry et al., 2013; Ferguson, 2018; Pinho et al., 2019; Santini et al., 2020). However, such studies often focus on vulnerable participants (Berry et al., 2013; Ferguson, 2018; Santini et al., 2020), which justifies the smaller samples. Given the Northwest region of Bulgaria is recognized as the poorest EU region (European Commission, 2018), the young people living there can be considered disadvantaged and vulnerable. In addition, small sample sizes are typical for pilot case studies, as in Pinho et al. (2019). Thus, we consider our sample a good starting point for an innovative intervention, combining two entrepreneurial learning approaches (education program and experiential learning) over 10 months.

Conclusion

Our research assessed whether an innovative intervention, combining education program and experiential learning, helped increase self-reported scores on ESE, including six sub-dimensions, and entrepreneurial intention, over 10 months. To the best of our knowledge, this article presents the first investigation of such delivery of a two-component entrepreneurship intervention. Our participants were aged 18 to 19. They were split into an Intervention and a Control group as a consequence of our parallel-group randomized trial design. This research design helped us address the largest research gap we identified, namely, that little is known about whether there is value in implementing the two approaches as part of mixed entrepreneurship education intervention. Our study examined an education program and experiential learning as complementary tools and how they impacted the participants' ESE and entrepreneurial intention. In addition, we implemented this mixed entrepreneurship education intervention targeting Bulgarian young people and addressed a second identified gap, namely, the very limited number of studies focused on Bulgaria. We also implemented the intervention in non-formal settings, i.e., outside the formal educational system, and addressed a third gap, namely, that entrepreneurship interventions predominantly happen in formal education environment. Finally, we informed our investigation in SCT, thus addressing a last research gap in that many interventions lack theoretical grounding.

Theoretical implications

Our study has several theoretical implications within the SCT. First, we found a statistically significant positive effect of our intervention on the male participants on entrepreneurial intention and ESE, in general, and on four of its six sub-dimensions. Thus, we can assume that we may have succeeded in providing them with opportunities, such as the acquisition and practice of entrepreneurial skills, feedback and support. By promoting such opportunities, entrepreneurship interventions, such as ours, can motivate young people to engage in entrepreneurship. The influence and the resulting opportunities seem to have been delivered through the experiential learning component of our intervention. As a result, secondly, we have found support for the importance of observational learning, where individuals acquire their new entrepreneurship knowledge, skills, and behaviors by observing and modelling others. And third, our intervention motivated the young entrepreneurs to work as a team, thus, providing each other with social support. According to SCT, social support may shape entrepreneurial behavior and foster intentions. Our intervention created a supportive environment, where the participants worked together with their peers and dedicated youth workers.

Managerial implications

Not-for-profit stakeholders and policymakers can integrate our findings into their programs to encourage youth entrepreneurship. Our results can help them improve entrepreneurship program delivery in different settings while expanding local,

national and international guidelines. As a result, they will be able to enhance the skills and capabilities of young entrepreneurs, equipping them with the knowledge and tools necessary to start and manage successful ventures, ultimately avoiding social exclusion or poverty.

Ideas for future research

Future research may focus on better understanding the external influences accompanying program delivery to improve positive potential. Such influences can profoundly affect program delivery, as shown by our article. Furthermore, future studies building on our results might consider replicating our methodology with a larger sample or in different geographic or cultural environments. As we investigated the impact of technology-delivered education as part of our intervention, future research may investigate the impact of other emerging technologies on entrepreneurial intention and ESE. Artificial intelligence is one such technology that has been gaining popularity lately. Researchers may explore how it can be integrated into new business ventures. We also explored social innovation as part of our intervention. Other researchers may want to assess the economic value generated by social innovations and how it impacts sustainable development and inclusive growth. Last but not least, we implemented our parallel-group randomized trial in an under-researched middle-income country, Bulgaria. Each country has its specific entrepreneurial ecosystem. Future research may examine how the availability of resources, networks, mentorship, and supportive policies influences the growth and resilience of such entrepreneurial ecosystems.

Abbreviations

ANCOVA	Analyses of covariance
DV	Dependent variable
ESE	Entrepreneurial self-efficacy
EU	European Union
IV	Independent variable
MANOVA	Multivariate analysis of variance
RQ	Research question
SCT	Social Cognitive Theory
T1	Time 1
T2	Time 2
UK	United Kingdom

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s13731-023-00331-x>.

Additional file 1. Appendix 1.

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Author contributions

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Availability of data and materials

The data sets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations**Ethics approval**

Approval was obtained from the ethics committee of the YES project. The procedures used in this study adhere to the tenets of the Declaration of Helsinki.

Competing interests

We declare no potential conflicts of interest with respect to the research, authorship, and publication of this article.

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