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“Play to Lead” board game as a potential intervention to promote entrepreneurship competences and servant leadership skills in European adolescents

Flavia Bonaiuto¹, Paola Perucchin², Valerio Placidi^{3,8,9,*}, Silvia Faggioli⁴, Ana Barroca⁵,
Celine Ferot⁶, Lea Netz⁷, Mei Xie³, Marino Bonaiuto³

¹ *Universitas Mercatorum, Roma, Italy*

² *Università di Roma Tre, Roma, Italy*

³ *Sapienza Università di Roma, Roma, Italy*

⁴ *IIS Aldini Valeriani, Bologna, Italy*

⁵ *Scholé, Porto, Portugal*

⁶ *University College Lillebaelt, Odense, Denmark*

⁷ *Tabasalu Gymnasium, Tabasalu, Estonia.*

⁸ *School of Advanced Studies, University of Camerino, Camerino, Italy*

⁹ *CLN2S@Sapienza, Center for Life Nano- & Neuro-Science, Italian Institute of Technology, Rome*

Abstract

Gaming encourages active learning settings that create interest and motivation, develop the awareness of engagement and improve various skills. There is a dearth of literature on how to nurture young leaders or entrepreneurs. “Play to Lead” is a self-designed board game in which students play as a team to win the bridge pieces. The present research sought to explore the beneficial influence of board game participation (i.e., Play to Lead) on entrepreneurship competences and servant leadership among compulsory schooling students in four different European countries (i.e., Denmark, Estonia, Italy and Portugal).

A total of 373 adolescents participated in the experimental study and they finished a questionnaire containing the measurements of EntreComp and servant leadership dimensions. The scores of participants in the experimental group before their game participation were compared with their scores after the game participation, and the scores of participants in the control group (without any exposure to the game). Multi-varied analyses and binary logistic regression were conducted to verify the hypotheses of the research in the sample and sub-samples divided by country and age.

This instructional instrument received overall favorable feedback from participants (both students and teachers) in terms of “game satisfaction” and “game comprehension”. And results revealed that the experimental group, in comparison to the control group, ameliorated in dimensions of servant leadership’s “Forgiveness and Courage”; EntreComp’s “Ideas and Opportunities” as well as “Into Action”, as a function of country and age. Replication in diverse samples of adolescents is required to confirm that the present results are not sample specific. The present study, on the whole, is the first one to demonstrate the possible utility of a board game to promote entrepreneurship competences and servant leadership skills in mandatory schooling adolescents, with implications for education policymakers and curriculum designers.

Keywords: EntreComp, Entrepreneurship, Board Game, Servant Leadership, Adolescents

*Corresponding author.

Valerio Placidi
Department of Psychology, Sapienza
Università di Roma, Roma, Italy
Address: Via dei Marsi 78, 00185,
Roma, RM
E-mail: valerio.placidi@unicam.it
(V. Placidi)

Introduction

There has been a growing interest in entrepreneurship education for adolescents in elementary and lower secondary schools over the past several decades (Huber et al., 2014), since the ability to exercise entrepreneurial skills and take initiative is increasingly seen as a crucial competence for all individuals, given the rapid pace of change and instability in society (Deuchar, 2006; Neck & Greene, 2011). Typical entrepreneurial skills and abilities, such as creativity, proactivity, and a sense of initiative, are now seen as significant competences, and it is therefore never too early to develop the “soft” entrepreneurial competences, which are well aligned with adolescents’ learning processes (Pepin, 2012). Despite the significance of entrepreneurship education, relatively few empirical studies have been conducted at the primary school level (Huber et al., 2014), with some scholars arguing that it may be challenging to convey the topic’s importance to adolescents who are far from the job market.

Leadership is often seen as a complicated, multi-component advanced competency rather than a set personality trait. And leadership is seen as a dynamic procedure that may be created via suitable interventions in this definition (Sisk, 1993).

Children of various ages can all assume leadership positions and schools are often the first organizational experience for many children and adolescents, where they learn about corporate culture and organizational roles (Montgomery & Kehoe, 2015). However, research on leadership development has primarily concentrated on adult leadership, and there is a void in the literature on adolescent leadership experiences (Whitehead, 2009). Servant leadership is a leadership style in which the leader first serves others as a servant, and distributes knowledge and authority by prioritizing the needs of others and creating an atmosphere conducive to the development of followers (Sousa & Van Dierendonck, 2017). This leadership style’s education is critical for adolescents because it builds a sense of connectedness among students, improves the ability for supportive collegiality, and creates a holistic learning environment (Jackson, 2008).

Entrepreneurial skills and servant leadership are closely intertwined, as leadership is a critical skill for successful businesses (Hood & Young, 1993). Both servant leadership and entrepreneurial leadership have been found to influence the organizational commitment and creative behavior of individuals

Tab. 1. Different Models of Entrepreneurship Competences based on the EntreComp Framework

Bacigalupo et al. (2016)	Armuña et al. (2020)	The Authors
Ideas and Opportunities	Ideas and Opportunities	Ideas and Opportunities
(1) spotting opportunities	(1) spotting opportunities	(1) spotting opportunities
(2) creativity	(2) creativity	(2) creativity
(3) vision	(3) vision	(3) valuing ideas
(4) valuing ideas	(4) valuing ideas	(4) ethical and sustainable thinking
(5) ethical and sustainable thinking	(5) ethical and sustainable thinking	
Resources	Personal Resources	Resources
(6) self-awareness and self-efficacy	(6) self-efficacy	(5) self-awareness and self-efficacy
(7) motivation and perseverance	(7) motivation, perseverance	(6) motivation and perseverance
(8) mobilizing resources	(8) mobility resources	(7) mobilizing others
(9) financial and economic literacy	(9) leadership skills	
(10) mobilizing others	(10) communication skills	
	(11) multidisciplinary skills	
	Specific Knowledge	
	(12) digital know how	
	(13) legal know how	
	(14) financial and economic know how	
Into Action	Into Action	Into Action
(11) taking the initiative	(15) development of new products and services	(8) planning and management
(12) planning and management	(16) defining priorities and action plans	(9) coping with uncertainty, ambiguity, and risk
(13) coping with uncertainty, ambiguity, and risk	(17) making decisions dealing with uncertainty, ambiguity, and risks	(10) working with others
(14) working with others	(18) networking skills	
(15) learning through experience	(19) team working	
	(20) problem solving skills	
	(21) learn by doing	
	(22) learn from mistakes	

Note. EntreComp = entrepreneurship competences; the differences between the model we used and those used by other scholars are highlighted in bold.

(Newman et al., 2018), and people's servant leadership and entrepreneurial values are related to their emotional intelligence (Miao et al., 2021). Leadership skills are included as one of the personal resources that comprise entrepreneurship competences in the model of Armuña et al. (2020). In response to Karagianni and Jude Montgomery's (2018) call to understand leadership development among adolescents, the current study investigates how the board game "Play to Lead" can promote the development of entrepreneurship and servant leadership in mandatory schooling students.

Theoretical Background

Entrepreneurship Competences

The European Council defined entrepreneurship competences as a collection of abilities to shape society via value creation on a social, cultural, or financial level (Arenal et al., 2021), with entrepreneurship as one of the eight essential competences required for a knowledge-based society (European Council, 2006). The EntreComp model (Bacigalupo et al., 2016) posits 15 competences that together form the ability to convert ideas into action. However, the model of Armuña et al. (2020) amended and added competences to the EntreComp framework that have varied perspectives. In the present study, we only selected ten competences out of our research interest (see Table 1), as well as feasibility concerns (e.g., questionnaire length and fatigue), and eliminated those that may be out of reach for most adolescents, such as "Vision (working towards your vision of the future)" and "Financial and Economic Literacy (working towards your vision of the future)". All in all, the EntreComp framework may be used to map current needs, establish relationships with various skills, adapt and develop new curricula, construct competency-based selection models, uncover team strengths, and verify skills gained via a learning experience (López-Núñez et al., 2022).

Servant Leadership

Servant leadership, first introduced by Greenleaf (1977), is a style of leadership that underlines the responsibility of leaders to respect, defend, appreciate, and empower their followers based on their personal values (Russell, 2001). Furthermore, servant leadership is a multifaceted concept that contributes significantly to understanding in-role performance, organizational citizenship behavior, and organizational commitment at the individual level (Bobbio et al., 2012). Servant leadership also emphasizes the ability to reorient the concern of followers toward other people in the organization and the larger community (Eva et al., 2019). Van Dierendonck created the Servant Leadership Survey (SLS; Van Dierendonck & Nuijten, 2011), a psychometrically sound measure covering the essential features of servant leadership. The SLS is an eight-dimensional, 30-item scale that includes "empowerment", "accountability", "standing back", "humility", "authenticity", "courage", "forgiveness" and "stewardship". This measure emphasizes that servant leaders empower and develop others, are willing to step back and let others shine, hold followers accountable for their work, are willing to let the past

be the past, are willing to take risks, are willing to demonstrate what they stand for, are open to learning and willing to admit mistakes, and work for the good of the whole (Van Dierendonck et al., 2017).

The Current Study

The use of board games as a means to facilitate learning is a well-established practice (Gray et al., 1998), especially in primary education where games can enhance academic motivation (Kuo & Hsu, 2020). Previous research has shown that board games may provide an autonomous learning environment that supports role-playing for experiential learning, goal-oriented motivation, learning of procedural rules and social skills via player interaction (Cheng et al., 2020; Noda et al., 2019; Wu & Lee, 2015). And the use of board games for teaching has been found to be effective for a variety of subjects, such as medical and chemical education (Bochennek et al., 2007; da Silva Júnior et al., 2020). However, so far, the extent to which board games can promote leadership and entrepreneurship competences has not yet been fully explored. To address the gap, the current study aims to investigate the potential of the board game "Play to Lead" to foster the development of entrepreneurship competences and servant leadership skills among adolescents, two dimensions considered essential for education towards sustainable development. We administered the game to students from four different European countries (Denmark, Estonia, Italy, and Portugal) and measured their EntreComp competences and servant leadership skills before and after game participation. Additionally, we assessed the students' game satisfaction and comprehension using self-reports and teachers' hetero reports.

The study developed three hypotheses to test the effectiveness of the "Play to Lead" board game intervention:

Hypothesis 1 (H1). The participants would significantly improve their scores regarding the three EntreComp dimensions after the game intervention.

Hypothesis 2 (H2). The participants would show significant improvement in all eight dimensions of servant leadership after the game intervention.

Hypothesis 3 (H3). There would be a significantly positive correlation of both game satisfaction and game comprehension with both EntreComp and servant leadership among the participants.

Methods

Participants

A total of 222 participants (138 males, 82 females, 1 non-binary, and 1 unknown), with a mean age of 12.72 ($SD = 2.04$), were recruited from five educational institutions across four European countries, including 128 Italians, 54 Estonians, 24 Danes, and 16 Portuguese. The participants' school grades ranged from 1st grade to 10th grade, with 163 students attending elementary school, 35 attending middle school, and

24 attending high school. Additionally, 16 teachers, including 11 females and 5 males, with a mean age of 42.54 ($SD = 10.64$) from the same educational institutions were recruited.

Instruments

Two questionnaires were developed for this study, one for the students and one for the teachers, following the methodological suggestions for the sound development of short forms (Smith et al., 2000), and picked a few items (with the greatest factor loading and the highest item-total correlation) from multiple-item scales. To ensure the clarity and validity of the questionnaire items, we implemented a rigorous review process. Three researchers with expertise in skill education independently reviewed the questionnaire. Additionally, we conducted a pilot survey involving ten students from the same school who were not part of the main study. This approach aimed to minimize any potential issues related to students' comprehension of the questionnaires, the translation process (from English into Danish, Estonian, Italian, and Portuguese), and the overall investigation procedures. During the pilot survey, the respondents were specifically asked to provide feedback on the content and wording of the items. Their comments were carefully analyzed, and minor refinements were made based on their input. Fortunately, no significant complications or problems arose during the pilot study, and no items were removed from the final questionnaire.

The student questionnaire consisted of the following five parts:

- a) A revised EntreComp questionnaire consisting of 14 items based on the framework of Bacigalupo et al. (2016), only including the 10 sub-dimensions under the 3 dimensions as stated above, namely, 4 items for *Ideas and Opportunities* (e.g., "I am able to recognize the potential of an idea and to judge its social, cultural, and economic value"), 7 items for *Resources* (e.g., "I am able to effectively communicate, persuade, negotiate") and 3 items for *Into Action* (e.g., "I am able to set goals, priorities, and action plans"). The responses were rated on a 4-point Likert scale ranging from "never", "sometimes", "often" to "always". Higher scores indicate a higher level of entrepreneurship competences. Appendix A provides a detailed list of the items.
- b) An adapted version of the Servant Leadership Survey (Van Dierendonck & Nuijten, 2011) selecting just one item for each of the eight servant leadership dimensions. Thus it was comprised of 8 items. The original scale was demonstrated to be valid cross-culturally (Van Dierendonck & Nuijten, 2011; Van Dierendonck et al., 2017). The example item is "The leader encourages others to come up with new ideas", and a 4-point Likert scale (ranging from "never" to "always") was adopted for response ratings. It's important to note that the 7th item was reverse scored. Higher scores indicate a greater knowledge of servant leadership characteristics. Appendix B provides a detailed list of the items.
- c) Three items and one open question concerning "game satisfaction" (e.g. "I like the game."). These items help to determine if the game was engaging and enjoyable for the participants, which may be a contributing factor in their

development of entrepreneurship competences and servant leadership skills.

- d) Four items and two open questions related to "game comprehension" (e.g. "I understand the game's instructions."). These items help to determine if participants understood the rules and objectives of the game, which is crucial for their engagement and enjoyment of the game. The scales in (c) and (d) were self-developed, and as such, their expert validity was initially evaluated by a panel of three experts prior to administration. And the items in (c) and (d) were not included in the pre-game questionnaire to ensure that participants' responses were not influenced by their prior knowledge or assumptions about the game. A 4-point Likert scale (ranging from "not at all" to "completely") was implemented for responding to the two scales.

The teacher questionnaire, on the other hand, was composed of: three items and one open question concerning "game satisfaction" of students (e.g. "The students like the game"); and four items and two open questions related to "game comprehension" of students (e.g. "The students understand the game's instructions"). The questionnaire was designed to identify the discrepancies or gaps between the students' and teachers' perceptions regarding the game's satisfaction and comprehension, and engagement, which can be helpful in developing more effective interventions to promote entrepreneurship competences and servant leadership skills in compulsory schooling adolescents.

Procedure

The study was carried out over a span of five months, from November 2019 to March 2020. Teachers from participating classes sent a letter to parents, requesting their consent for their children's participation and explaining the nature of the project.

The procedure began with the students filling out the questionnaires in the classroom, a process that typically took between 5 to 8 minutes. After this, the teacher introduced the "Play to Lead" game, providing a thorough explanation of the rules.

The "Play to Lead" board game is devised to foster both intra-group collaboration and inter-group competition. Players are divided into two teams, with each team consisting of 3 to 5 members. The game's objective is for a team to be the first to build a twelve-piece bridge to Mongolia, with pieces collected by correctly answering specific questions. The game concludes when a team successfully completes the bridge and is declared the winner. There is no predefined time limit, allowing participants the flexibility to play at their own pace. Various roles are assigned to the players, including a team-elected leader, a saboteur, and a collector. The game includes rolling dice to move players on the board and drawing cards upon landing on specific, numbered squares. These cards can be of different types, such as question cards (for collecting bridge pieces), "Do You Know" cards, and event cards. A simplified version of the game, with only the "leader" role and question cards, was utilized for younger students aged 6 to 10.

We did not examine differences among measured variables between winning and losing teams, as the game is designed to be balanced and competitive, and the outcome (winning or losing) doesn't necessarily reflect inherent disparities among the teams. Rather, outcomes are more likely influenced by strategy, collaboration, and decision-making within each game session. By engaging learners in interactions and requiring them to adapt their thoughts and actions during the game, it promotes the development of several targeted skills, including negotiation and social skills, thereby enhancing leadership and entrepreneurship competences.

Upon the completion of the game, students then proceeded to fill out the questionnaires again. Concurrently, the teachers completed a separate questionnaire.

Data Analysis

The data were analyzed using the Statistical Package for Social Sciences program, version 27.0 IBM SPSS Statistics, and the results of the Shapiro-Wilk test for normality indicated that all data were normally distributed, supporting the use of parametric statistical analyses. To test the first two hypotheses, we employed a paired-samples t-test to determine whether there were any significant changes in the scores for EntreComp and

servant leadership after the game. Furthermore, we examined the third hypothesis by conducting Pearson correlation analyses to explore the relationship between students' game satisfaction and comprehension, and their entrepreneurship competences and servant leadership scores. Additionally, we conducted descriptive and narrative analyses on the students' and teachers' opinions of the "Play to Lead" game, so as to provide a comprehensive understanding of students' experiences and perspectives regarding the game, further informing the effectiveness and potential improvements of the intervention.

Results

Student Questionnaire Results

Because of the voluntary nature of the research, some participants chose to withdraw before completion or failed to fully respond to all items, thereby creating incomplete data sets. To address this issue, we examined the skewness of item-level data from different variables. Subsequently, we employed both the mean and median imputation methods to fill in the missing values. The scale reliability, mean, and standard deviation for each measure at the two time points are given in

Tab. 2. Scale Reliability (Cronbach's Alpha), Mean, and Standard Deviation for Each Measure at Time 1 and Time 2

Measure	Time 1 (N = 222)			Time 2 (N = 222)		
	M	SD	Cronbach's α	M	SD	Cronbach's α
EntreComp	2.80	0.44	.82	2.85	0.41	.80
Servant Leadership	2.67	0.33	.27	2.60	0.41	.54
Game Satisfaction	-	-	-	3.22	0.69	.80
Game Comprehension	-	-	-	3.06	0.62	.65

Note. *EntreComp* = entrepreneurship competences.

Tab. 3. The Paired-Samples T-Test

	Paired Differences					
	M	SD	t	df	p	Cohen's d
EntreComp (1) before - after	-0.014	.746	-.270	221	.787	-0.018
EntreComp (2) before - after	-.081	.814	-1.484	221	.139	-0.100
EntreComp (3) before - after	-.122	.778	-2.330	221	.021*	-0.156
EntreComp (4) before - after	-.036	.772	-.696	221	.487	-0.047
EntreComp (5) before - after	.009	.835	.161	221	.872	0.011
EntreComp (6) before - after	-.032	.874	-.538	221	.591	-0.036
EntreComp (7) before - after	-.068	.882	-1.141	221	.255	-0.077
EntreComp (8) before - after	-.027	.946	-.426	221	.671	-0.029
EntreComp (9) before - after	-.158	.876	-2.682	221	.008**	-0.180
EntreComp (10) before - after	.068	.851	1.183	221	.238	0.079
EntreComp (11) before - after	-.090	.883	-1.521	221	.130	-0.102
EntreComp (12) before - after	-.036	.974	-.551	221	.582	-0.037
EntreComp (13) before - after	-.126	.899	-2.091	221	.038*	-0.140
EntreComp (14) before - after	.041	.831	.727	221	.468	0.049
Servant Leadership (1) before - after	.216	.823	3.915	221	<.001**	0.263
Servant Leadership (2) before - after	.072	.986	1.089	221	.277	0.073
Servant Leadership (3) before - after	-.099	.823	-1.793	221	.074	-0.120
Servant Leadership (4) before - after	.050	.820	.901	221	.369	0.060
Servant Leadership (5) before - after	.072	.879	1.221	221	.223	0.082
Servant Leadership (6) before - after	-.036	.829	-.648	221	.518	-0.043
Servant Leadership (7) before - after	.081	.873	1.383	221	.168	0.093
Servant Leadership (8) before - after	.171	.871	2.930	221	.004*	0.197

Note. * $p < .05$. ** $p < .01$. *EntreComp* = Entrepreneurship Competences.

Table 2. Cronbach's alpha values for EntreComp at time 1 and time 2 were .82 and .80 respectively, indicating a good level of reliability. However, the Cronbach's alpha values for Servant Leadership at time 1 and time 2 were only .27 and .54, which were relatively low and unexpected.

As shown in Table 3, the results of the paired-sample t-tests indicated that the participants' scores exhibited significant improvement in only three items of EntreComp's "Ideas and Opportunities" and "Into Action" dimensions following the game intervention. These findings suggest that the participants enhanced their competence "to work together and co-operate with others, solving conflicts and facing up", "to handle fast-moving situations flexibly", and "to explore innovative approaches by combining knowledge and resources to achieve valuable effects", partly verifying H1. Notably, the eight dimensions of servant leadership did not show significant improvement following the game intervention, rejecting our H2.

Pearson correlation analysis indicated that game satisfaction and comprehension scores were positively associated with the scores of post EntreComp, but were not associated with the scores of post servant leadership (refer to Table 4 for detailed correlations).

Tab. 4. The Correlation between the Study Variables

Measure	1	2	3	4
Post EntreComp	—			
Post Leadership	.452**	—		
Game Satisfaction	.231**	.130	—	
Game Comprehension	.231**	.111	.612**	—

Note. * $p < .05$. ** $p < .01$.

The qualitative analysis of the game comprehension and game satisfaction dimensions is presented below. Regarding the first open question ("Please describe what you liked most while playing the game"), most of the students reported enjoying the opportunity to play and collaborate with their classmates, learn about other countries, and answer the challenging questions. In particular, the questions (reported by 22% of the students) and the teamwork (reported by 26% of the students) were the most enjoyable aspects of the Italian sample. Portuguese students appreciated the difficulty of the game (38% of the students) and found it very enjoyable (31% of the students). Danish students reported a liking for teamwork (21% of the students).

Concerning the second open question ("Please describe what you learned from the game"), the majority of the students reported learning about the traditions and cultures of other countries (especially Mongolia, the country represented in the game scenario), teamwork and English language skills. Among Italian students, learning about Mongolian culture was the most common answer (33% of the students). Learning about other countries was also frequently reported by Portuguese (44%) and Danish students (29%). For Estonian participants, learning to work with classmates was the most typical response (20%).

As for the third open question ("Please describe what you would change in the game"), the main suggestions were to change some of the rules (13%), to have a bigger board (5%), to translate the questions from English to the students' native language (6%), and to include questions about more countries rather than just about Mongolia (5%).

Teacher Questionnaire Results

The results showed that according to the teachers' reports, the students were satisfied with the game ($M = 3.27$, $SD = 0.47$) and demonstrated fair comprehension of it ($M = 3.34$, $SD = 0.38$). In relation to the first open question ("Please describe what you think the players liked most while playing the game"), specifically, the teachers reported that students enjoyed the "teamwork" aspect (44%) and "the opportunity to learn about other countries" (38%). Additionally, the game's strategy (13%) and design (25%) were also mentioned as liked elements. For what concerns the second open question ("Please describe what you think the players learned from the game, according to you"), the teachers believed that students learned from the game, teamwork and collaboration were the most common answers (75%), followed by respect for rules and leadership (31%) and increased knowledge about other cultures (44%). As for the last open question ("Please describe what you would change in the game"), some teachers suggested modifying aspects such as the game instructions (6%), the length of the game (6%), the roles assigned to students (13%), the difficulty of the questions (6%), and adding more material on servant leadership (6%). However, half of the teachers reported that the game was complete as it is, and no changes were necessary. Overall, these findings suggest that in the teachers' eyes, the game was well-received by students and contributed to promoting their entrepreneurship competences and servant leadership skills.

Discussion

The European Council deems entrepreneurial competences important for fostering welfare and economic viability, and human capital development tools include empowering people with entrepreneurship education, an entrepreneurial mentality, and entrepreneurial behaviors (European Council, 2006). However, a lack of shared vision and practice development in the usage of EntreComp might limit the framework's effective application. To promote the effective adoption and adaption of policy-driven frameworks, policymakers, educators, trainers, and other stakeholders require further support and direction in boosting their learning process on both micro- and macro-level education design (Seikkula-Leino et al., 2021). The goal of the present study was to evaluate the efficacy of the "Play to Lead" game as a promoter of entrepreneurship competences and servant leadership in a crucial individual's development stage.

The findings of our study partly confirmed the first hypothesis, as we observed a significant increase in some scores of EntreComp competence dimensions ("Ideas and Opportunities", "Into Action") in students who participated in the game session, although the effect could vary as a function of both country and age. This suggests that the "Play to Lead" board game was effective in improving certain entrepreneurship competences in students. One possible reason for this improvement is that the game required players to work together to achieve a common goal, which can foster collaboration and teamwork skills. By working with others,

students can learn to manage conflicts, solve problems, and face challenges in a collaborative manner, which are all essential skills in entrepreneurship. Moreover, the game's emphasis on collecting bridge pieces by answering questions and using knowledge and resources to achieve valuable effects can promote innovative thinking and problem-solving skills. This approach can help students to develop critical thinking skills and apply knowledge in a practical setting. Our findings are consistent with previous research that has demonstrated the effectiveness of different learning instruments in the development of the EntreComp competence dimensions, particularly "Ideas and Opportunities" (Iglesias-Sánchez et al., 2019). This suggests that the "Play to Lead" board game can be a valuable tool for promoting entrepreneurship competences in students.

On the other hand, the results of our study revealed that the game intervention did not lead to a significant improvement in the eight servant leadership skills of students, rejecting our H2. There could be multiple reasons for this outcome. It is possible that the participants may have had prior experience or exposure to the concepts of servant leadership, and therefore, the game intervention may not have added much to their existing knowledge and skills. It is also possible that the measurements used in the study may not have been sensitive enough to capture changes in the participants' servant leadership skills, and hence, more fine-grained measures may be needed in future studies. Actually, this finding is consistent with previous research that suggests that a one-time intervention may not be sufficient to significantly impact complex constructs such as servant leadership (Ehrhart, 2004; Liden et al., 2008). Additionally, previous research has highlighted the importance of the context in which servant leadership is developed. For example, it has been suggested that servant leadership is more likely to be developed in organizations that prioritize servant leadership values and practices (Liden et al., 2014). In contrast, a school setting may not be as conducive to the development of servant leadership as an organizational setting. Therefore, it is possible that the limited impact of the game on servant leadership skills could be attributed to the context in which it was implemented. The development of the leadership concept and skills in youth is a gradual process, in which different aspects reach maturation at different times (Conner & Strobel, 2007), and future research could explore the impact of longer-term interventions that target multiple dimensions of servant leadership in a school setting.

Importantly, our third hypothesis was partially confirmed regarding the significant correlation between game satisfaction, game comprehension, and EntreComp. However, we did not find a significant association between game satisfaction, game comprehension, and servant leadership. This result can be explained based on previous research consistently demonstrating that enjoyment and engagement with a game can positively impact learning and competence development (Hainey et al., 2011; Lin et al., 2019; Sousa & Rocha, 2019). It suggests that two crucial factors should be considered to effectively utilize game-based interventions for enhancing students' different competences. Firstly, students' enjoyment and satisfaction with the game can have a positive impact on their learning and competence development (Hainey et al., 2011; Lin et al., 2019; Sousa & Rocha, 2019). Therefore, it

is crucial to ensure that the game is engaging and appealing to the students. Secondly, students need to have a clear understanding of the game rules to fully benefit from the learning experience. To achieve this, it is recommended that teachers provide clear instructions and guidance to students before and during the game session (Becker, 2007). Although we did not find a significant association between game satisfaction, game comprehension, and servant leadership, we believe this could be attributed to the low reliability of the scale used in this study. Additionally, assessing the real skill development in children can be challenging, and there may be other complex factors involved in the cultivation of student servant leadership skills through games, in addition to game satisfaction and game comprehension.

Through narrative analysis, the study also reported the suggestions made by students and teachers regarding changes that could be made to the game. Students, in general, advocated for modifications to the rules and language used in the game, while most teachers suggested changes related to the length of the game, roles, and game introduction. Overall, the game was found to be satisfactory for both students and teachers, although there is room for improvement in its structure.

While the results concerning servant leadership were less than ideal, the study provides evidence that the "Play to Lead" game can effectively enhance entrepreneurial mindset and competences among compulsory schooling students. These findings align with previous research on the gamification of the learning process and its potential to foster entrepreneurship education in students (Noda et al., 2019; Zulfiqar et al., 2019). Furthermore, the study reinforces the significance of utilizing board games as educational tools for students at various stages of their academic journeys (Bochennek et al., 2007).

Limitations

Our study was characterized by several limitations. Firstly, the methodology employed was relatively simple, comprising only pre- and post-tests after a single intervention, using paired sample t-tests and Pearson correlation. A mixed research methodology could have provided a richer understanding of the relationships between variables by incorporating data collected through observation and semi-structured group interviews throughout all game sessions. Additionally, we did not establish a control group in our study, which could have offered a more robust understanding of the intervention's effects by providing a basis for comparison. Moreover, our sample, consisting of students from four countries, was unevenly distributed across the countries, which may have impacted the results. Future studies with larger and more diverse samples across various contexts are needed to further validate the effectiveness of the game intervention in promoting entrepreneurship competences and servant leadership. Our study also did not take into account crucial factors such as the participant's role, the number of players in the game and team, and the outcome of the game. As a result, we were unable to assess participants' understanding of their role and examine the specific influence it had on their perception of leadership. Notably, many of the results obtained were not as ideal as we would have hoped. For instance, the Cronbach's

alpha coefficient of our servant leadership scale was remarkably low, and we did not observe a significant increase in servant leadership before and after the game. This limitation places severe restrictions on statistical justifications and the generalization of the study. Furthermore, our study only included a single board game intervention, and future studies could explore the potential effects of repeated game interventions or longer-term interventions on students' development of entrepreneurship competences and servant leadership skills. Despite these limitations, our study provides preliminary insights into the potential effectiveness of the game intervention in promoting the development of entrepreneurship competences and servant leadership skills in compulsory schooling students.

Conclusion

As interest in entrepreneurship and leadership education has expanded significantly over the last several decades, it is crucial that we comprehend the varying impacts that diverse games (as teaching tools) have on students' entrepreneurship and leadership development. The board game "Play to Lead" was applied to a sample of European students in this study, and the results indicated some positive effects of participating in one game session in promoting entrepreneurship competences. However, the students' servant leadership dimensions did not exhibit a significant improvement, suggesting that enhancing their leadership skills is a complex and long-term process that may require a more comprehensive intervention. Additionally, the game comprehension and satisfaction of the students were identified as important mechanisms in the process. However, our study had some limitations, including the use of a relatively simple methodology, uneven distribution of the sample across four countries, and a single intervention. Future research with larger and more diverse samples, as well as more sophisticated statistical techniques, could further validate the effectiveness of the game intervention in promoting entrepreneurship competences and servant leadership skills in compulsory school students. Nonetheless, policy-makers and school reformers who seek to promote students' skill development can consider introducing similar games.

Conflict of interest

The authors declare that they have no competing interests.

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Ethical approval

The ethical approval was granted by the EC Erasmus+ "Play to Lead" (2018-1-DK01-KA201-047082) consortium and by

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Author Contributions

Flavia Bonaiuto and Marino Bonaiuto: Conceptualization. Paola Perucchini: Methodology. Valerio Placidi: Methodology, Data Analysis, Writing. Silvia Faggioli, Ana Barroca, Celine Ferot, Lea Netz: Data collection. Mei Xie: Data Analysis, Writing, Review and editing.

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14. to achieve long-term individual and group aims, being resilient under pressure and temporary failure

Appendix B

The Adapted Version of the Servant Leadership Survey

Please indicate how you think A LEADER of a group is, in general:

1. The leader encourages others to come up with new ideas.
2. The leader holds the other ones responsible for the work they carry out.
3. The leader keeps himself/herself in the background and gives credits to others.
4. The leader learns from the different views and opinions of others.
5. The leader shows his/her true feelings to his/her staff.
6. The leader takes risks and does what needs to be done in his/her view.
7. The leader keeps criticizing people for the mistakes they have made in their work (reverse scored).
8. The leader emphasizes the societal responsibility of the teamwork.

Appendix A

The Revised EntreComp Questionnaire

Please, answer how many times You are able, in general:

1. to inspire, enthuse, get others on board, get support
2. to set goals, priorities, action plans
3. to work together and co-operate with others, solving conflicts and facing up to competition positively
4. to effectively communicate, persuade, negotiate
5. to identify and assess individual and group strengths and weaknesses
6. to recognize the potential of an idea and to judge its social, cultural, economic value
7. to act responsibly assessing goals, ideas, actions sustainability on the community, society, market, environment
8. to influence the course of events, despite of temporary failures to hand fast-moving situations flexibly
9. to reflect on own needs, aspirations and wants
10. to identify and seize opportunities, needs, challenges, thanks to new connections among ideas
11. to pay attention to body language, managing one's own fears
12. to explore innovative approaches, by combining knowledge and resources
13. to achieve valuable effects to be determined to run ideas into action, remaining patient and keeping trying