Unveiling the Power of Constructivist Pedagogy in Entrepreneurship Education for Early Adolescents*

*Janez Gorenc, Alenka Slavec Gomezel, Blaž Zupan***

Abstract

The study investigates early adolescents' perceptions of entrepreneurial learning in primary school entrepreneurship education programs through a social constructivist learning theory lens. Qualitative data from semi-structured focus group interviews with 11–14-year-old pupils, teachers, and principals across 12 schools revealed that specific pedagogical methods effectively enhance competence dimensions like *working with others* or *mobilising resources*. However, *financial and economic literacy* or *valuing ideas* showed less improvement. A supportive school environment proved crucial for engagement and learning. The study provides insights into how constructivist pedagogy impacts entrepreneurial learning in early adolescents, offering valuable perspectives on effective entrepreneurship education for young learners.

Keywords: Entrepreneurship education, primary school, entrepreneurship competence, social constructivist learning theory, learning process, constructivist pedagogy.
JEL Codes: A21, L26, I21

1. Introduction

The global proliferation of entrepreneurship education (EE) programs (Brüne & Lutz, 2020) has led to the widespread endorsement of constructivist pedagogy as the most effective approach in this field (Bell & Bell, 2020; Cocieru et al., 2020). Constructivist pedagogy facilitates entrepreneurial learning through learning by doing (Oe & Tanaka, 2023). Teachers versed in constructivist pedagogy utilise various pedagogical methods like scaffolding techniques or knowledge convey while avoiding traditional instruction methods like lectures or testing (Moberg, 2014; Oe & Tanaka, 2023). Constructivist pedagogy is highly suitable for early adolescents as it positively affects motivation and learning

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(Moberg, 2014), allowing children to learn through experience, play, and games (Huber et al., 2014; Löbler, 2006).

Early adolescents, typically aged 10–14 (Brüne & Lutz, 2020; Jardim et al., 2023), have been identified as the group that benefits most from EE programs and frequently participates in them (Barba-Sánchez & Atienza-Sahuquillo, 2016; Garcia-Rodriguez et al., 2019; Jardim et al., 2023). Although it seems early adolescents are not as savvy at learning different types of competence as their older counterparts (Sagone et al., 2020), they benefit significantly from the fact that they do not seem to be fazed so quickly by crises as older adolescents (Stepánková et al., 2023). Crises, or discontinuous events common in EE programs and entrepreneurship in general, facilitate entrepreneurial learning (Cope, 2003; Jardim et al., 2023). Furthermore, early adolescents benefit significantly from peer interactions, particularly with friends, during teamwork activities commonly featured in EE programs (Huber et al., 2014; Yang et al., 2021). On top of that, early adolescence is a period in life when a trusting relationship with a non-parent adult is crucial for the pupils' class performance and learning (Feldlaufer et al., 1988). In EE programs, teachers fulfil the role of a trusted non-parent adult. Consequently, early adolescents tend to form stronger attachments to their teachers than their older peers, underscoring the critical importance of the pedagogical methods employed in these programs (Spiekerman & Rose, 2024).

Despite this, few studies investigate the specific pedagogical methods employed in EE programs for early adolescents and how each method correlates with perceived learning of particular dimensions of entrepreneurship competence (EC). The proliferation of primary school EE programs underscores the need for a comprehensive pedagogical framework to guide entrepreneurship teachers in their quest to mould future entrepreneurs (Bell & Bell, 2020).

The present study aims to investigate specific pedagogical methods used in EE programs for early adolescents and how these methods assist the participants in learning particular EC dimensions. Specifically, it applies social constructivist learning theory to elucidate the entrepreneurial learning process in early adolescents, as perceived by the pupils and their teachers.

2. Theoretical background and research questions

2.1 Social constructivist learning theory

Multiple learning theories can be applied to explain how participants in EE programs acquire knowledge and skills. Human capital theory, for instance, focuses on developing knowledge and skills – collectively termed human capital – which enables individuals to advance economically, socially, and in other aspects of life (Martin et al., 2013). The social learning theory, as defined

by Bandura (1977), posits that learning primarily occurs through observation, imitation, and modelling of others' behaviour. The effectiveness of the learning process is influenced by the individual's self-efficacy beliefs and behavioural responses (Bandura, 1977).

The social constructivist learning theory, proposed by Lev Vygotsky in 1968, emphasises that individuals develop their knowledge and comprehension through their prior experiences and present social interactions. The process supports cognitive and emotional growth, which are intrinsically connected to the learning process (Vygotsky, 1978). Social constructivist learning theory proposes that learners will transition back and forth between three zones. These are the zones where they learn independently or with peers, learn only in case a teacher guides them, and cannot learn despite a teacher's guidance (Vygotsky, 1978, p. 86). The second zone means that when the learner falls short on previous experience or is cognitively not yet adequately developed to conceive specific new knowledge, a knowledgeable other – in EE, this is the teacher – facilitates the acquisition of new knowledge, skills, attitude, or experience with appropriate pedagogical methods (Bauman & Lucy, 2021). Vygotsky (1978) theorised that such interaction between the learner and knowledgeable others occurs in the second zone, termed the zone of proximal development (ZPD). The social constructivist learning theory, incorporating ZDP, is particularly effective in explaining the learning process in EE programs for early adolescents. Teachers apply constructivist pedagogical methods when the pupils are within their ZDP, meaning they lack the prior experience, knowledge, skills, and attitudes necessary to resolve the problems they have encountered independently (Bell & Bell, 2020; Tenney-Soeiro & Sieplinga, 2021).

2.2 Constructivist pedagogical methods

Constructivist pedagogical methods promote learning by doing, teamwork, and peer learning (Cocieru et al., 2020). According to Chernikova et al. (2020), constructivist pedagogy uses scaffolding techniques, such as guiding with questions, coaching, or hints, instead of traditional instruction. Knowledge convey is also an essential instrument of guidance used when scaffolding techniques are insufficient. Knowledge convey can be treated as conventional guided instruction because it provides final answers to the task the pupils are trying to complete. However, knowledge is only conveyed to the pupils when they need that exact knowledge and skills, not sooner (Chernikova et al., 2020).

2.3 Early adolescents and entrepreneurship education

Early adolescence marks a critical period of an individual's life during which career aspirations begin to take shape (Lazarides et al., 2020). This age group's cognitive and emotional developmental stages differ markedly from those of

older adolescents and young adults. In addition to their sprouting career aspirations (Lazarides et al., 2020), early adolescents form powerful attachments to their closest friends and their teachers (Ratelle et al., 2023), and they are more resilient to stress than their older counterparts (Stepánková et al., 2023).

Primary schools often introduce early adolescents to EE programs, which are highly practice-based. Some focus on soft skills, such as understanding the world of work, creative thinking, problem-solving, or taking responsibility (Chojak, 2024; Jardim et al., 2023). Others are sandbox versions of real entrepreneurship and are more business-oriented, employing activities to further entrepreneurial knowledge and skills, such as product development, financial calculations, marketing, establishing and liquidating a company, or planning and management of the company (Bergman et al., 2011; Huber et al., 2014). Participants in these EE programs face a variety of tasks, decisions, and uncertainties similar to those encountered by real entrepreneurs but without the vast material risks, stress, and responsibility involved (Brüne & Lutz, 2020; Hytti & O'Gorman, 2004). All the studied EE programs utilised constructivist pedagogical methods.

For instance, Huber et al. (2014) described the learning outcomes of the Dutch 5-day BizWorld program, which led participants through establishing and running a company. Pupils wrote job applications, created company logos, manufactured, marketed, and sold products, handled the finances, and competed with other pupil firms. The EE program was practice-based, and pupils learned from experience and failure. BizWorld advanced the participants' learning of EC dimensions, such as risk-taking, creativity, self-efficacy, and persistence. (Huber et al., 2014). Similarly, Garcia-Rodriguez et al. (2019) described the Spanish *Enterprise at School* (Spanish: *Emprender en la Escuela, ELE*) EE program for early adolescents that employed constructivist pedagogical methods. The participants were tasked with forming and managing a school cooperative, designing, manufacturing, and selling different products at a fair. ELE was designed to improve soft skills, such as creativity, leadership, and a sense of achievement.

In addition to employing appropriate pedagogical methods, a supportive school environment is essential for the pupils to learn new knowledge and skills and develop positive attitudes. A supportive environment encompasses respectful relationships among pupils, teachers, and school management, a reward system for outstanding achievements, and a commitment from the school management to facilitate the teachers' participation in relevant training programs. Research indicates these factors significantly contribute to positive entrepreneurial learning (Huber & Helm, 2020; Hytti & O'Gorman, 2004).

2.4 Entrepreneurship competence and EntreComp

In primary school EE programs, EC is often the most highly sought-after learning outcome (Armuña et al., 2020; Huber et al., 2014; Hytti & O'Gorman, 2004). Competence is usually defined as a task-specific amalgam of appropriate knowledge, skills, and attitudes necessary for performing the given task successfully (Baartman & de Bruijn, 2011). Thus, EC represents the knowledge, skills, and attitudes essential for any individual to perform entrepreneurship-related tasks with a favourable outcome. In Europe, the European Commission has designed the EntreComp: the Entrepreneurship Competence Framework, a configuration of 15 dimensions distributed into three clusters (Bacigalupo et al., 2016). EntreComp encompasses the following dimensions: *creativity, spotting opportunities*, *vision*, *valuing ideas*, and *ethical and sustainable thinking* from the 'Ideas and opportunities' cluster, *motivation and perseverance*, *mobilising resources*, *mobilising others*, *self-awareness and self-efficacy* and *financial and economic literacy* from the 'Resources' cluster, and *planning and management*, *taking the initiative*, *coping with ambiguity, uncertainty & risk*, *learning through experience*, and *working with others* from the 'Into action' cluster. Each EC dimension is described on eight levels of mastery, from Level 1, 'Discover', with descriptors like "I can find opportunities to help others" or "I can assemble objects that create value for others" to Level 8, "Transform", with descriptors like "I can show different audiences the benefits of my vision during turbulent times" or "I can judge a possible opportunity as an investor." Published in 2016, EntreComp has become one of the main instruments for describing EC or measuring and understanding entrepreneurial learning at primary (Floris & Pillitu, 2019), secondary (Jardim et al., 2021; Moberg, 2021), or tertiary EE programs (Armuña et al., 2020; Czyzewska & Mroczek, 2020). The EC dimensions outlined in the EntreComp framework encompass knowledge, skills, and attitudes that can be developed through the 'learning through entrepreneurship' process, which involves learning by doing and learning from experience and failure (Bell & Bell, 2020).

2.5 Research questions

A literature review highlights the opportunity to investigate the individual pedagogical methods teachers in EE programs for early adolescents employ within the early adolescents' ZPD. Additionally, there is potential to explore the supportive measures schools can implement and the impact of these factors on the early adolescents' perceived entrepreneurial learning. Given the unique characteristics distinguishing early adolescents from their older peers, investigating the entrepreneurial learning processes within ZDP for this age group is particularly important. Thus, the study addressed three research questions:

Research question 1: *Identify which specific pedagogical methods the EEP teachers used to enhance pupils' entrepreneurial learning when the latter did not know how to proceed;*

Research question 2: *Investigate in which EC dimensions pupils exhibited positive entrepreneurial learning outcomes after teachers had employed specific pedagogical methods;*

Research question 3: *Determine how a supportive school environment enhances the pupils' entrepreneurial learning.*

3. Methods

3.1 Sample

The present study uses qualitative data to gain insight into the interactions between the perceived pupils' entrepreneurial learning process and the specific constructivist pedagogical methods that the teachers employed to assist the early adolescents' entrepreneurial learning process within their ZPD. The data were obtained through semi-structured interviews with pupils, teachers, and principals or assistant principals. Therefore, the sample comprised the teachers who had received specific training in using constructivist pedagogical methods in EE, as well as early adolescent pupils who voluntarily participated in EE programs and perceived that they had acquired specific dimensions of EC through their teachers' application of appropriate constructivist pedagogical methods (SPIRIT Slovenija, 2019). The interviewed principals endorsed and supported the EE program in their schools.

Overall, over 30 primary school teachers were emailed directly or through business incubators requesting an interview with them and the pupils participating in the teachers' EE programs. Of these, 15 teachers from 12 primary schools responded positively to the interview request. Regarding experience with teaching in EE programs, 14 teachers were women with, on average, 4.6 years of experience working as teachers of EE. The teachers who agreed to participate also asked the pupils participating in their EE programs to partake in the interviews.

Altogether, 39 pupils from all 12 schools decided to participate in the research, of whom 21 were girls and 18 were boys. The pupils were 11–14 years old. On average, they were 13.4 years old and went to 6th, 7th, 8th, and 9th class in Slovenian primary education, which lasts nine years and encompasses ages 6–15 years old. Specifically, the girls were 11 to 14 years old, with an average age of 13.2 years, and the boys were 12–14 years old, with an average age of 13.5 years. The pupils with one or two years of experience with work in EE programs counted 23 individuals or 59 % of the sample, of whom 13 were girls and 10 were boys. The experienced pupils came from 6 schools where the teacher had

more than five years of EE program teaching experience. Finally, four of the pupils' parents owned a business.

In addition to the teachers and pupils, principals of 12 schools were asked for an interview, and five principals or assistant principals from four schools responded positively to the interview request, of whom four were women and one was a man. Regarding experience, two women had more than ten years of experience with principalship and two women and one man had less than three years of experience.

3.2 Entrepreneurship education programs

All the interviewed pupils were, at the time of the interview, participating in entrepreneurship activities that were part of the afterschool *creativity, entrepreneurship, and innovation* program in the academic year 2021–2022. The EE programs lasting from October to May were designed to teach the participants the 15 dimensions of EC defined in EntreComp through a school-level business experience in which the pupils and teachers participated. Specifically, pupils achieved entrepreneurial learning by developing rudimentary business models for their business ideas and presenting them at a competition in which all but four pupils participated. In the afterschool EE activities, pupils, working in teams, first identified opportunities for business ideas, researched the market by interviewing potential customers and reliable informants, outlined the existing competition, prototyped a sustainable solution and tested it with prospective customers. The development of business models also involved running and managing the entrepreneurial activities within the team, learning from experience and failures, recognising possible risks, calculating the finances, identifying appropriate sales and marketing channels, and projecting a vision for future development (SPIRIT Slovenija, 2019).

Teachers leading EE programs had to attend a hands-on 16-hour training course or a three-day startup weekend where teachers would develop their EC (SPIRIT Slovenija, 2016). The training was also designed to equip the EE teachers with appropriate constructivist pedagogical methods they could later employ in their EE programs.

3.3 Interviews

Pupils were interviewed alone or in a focus group, and the teachers were interviewed alone in all but one instance. Altogether, 13 interviews were conducted with the pupils; on average, the number of pupils in the focus group interview groups was 3. The interviews lasted anywhere from 20 to 60 minutes. The interviews with pupils and teachers centred around topics such as the routine

and activities in the EE program, the teaching methods utilised, and the interviewees' perception of the pupils' entrepreneurial learning.

Pupils were interviewed explicitly about their perception of how they acquired EC and the pedagogical methods employed by their teachers. The teachers were interviewed regarding their perceptions of the pupils' work and achievements, the observations of the pupils' learning of EC, and their pedagogical methods. When discussing the pedagogical methods employed and the EC the pupils had learned, interviewees were prompted with questions like "What did you learn most?" or "What did that look like?" This approach aligns with recommendations in the literature (Oe & Tanaka, 2023; Sommarström et al., 2020). In specific cases, when the pupils discussed challenges with particular entrepreneurial knowledge that they had encountered, they were asked more detailed questions, for instance, "How did you calculate the finances?" or "How did the teacher help with the finances?"

Similarly, the teachers were asked specific questions, such as "How did you help the pupils with finances?" if the occasion arose. However, pupils and teachers were mostly encouraged to formulate responses themselves and describe the specific EC dimensions they believed the pupils had developed. Overall, interview questions were carefully crafted to avoid leading the interviewees towards a particular answer. For instance, the teachers were never prompted to describe predefined methods employed in their EE programs. Also, answers from pupils were never elicited with questions like "How much financial literacy did you learn?" or "How well did you learn to value ideas?" This approach effectively minimised the potential for interviewees, whether teachers or pupils, to feel pressured into giving answers that aligned with the interviewer's expectations (Fylan, 2005; Wengraf, 2001, p. 126).

Furthermore, to prevent any bias in responses, teachers were never present in the same room during pupil interviews, and vice-versa, as recommended (Paul-Binyamin & Potchter, 2020), except in one instance involving two pupils. Interviews with principals primarily focused on the school environment and their perspectives on EE programs in their schools and the participating teachers and pupils. Questions posed to them included, "Can you describe what it was like when your teams participated in competitions?" or "How extensively did you discuss the EE program with the teacher in charge?" As recommended in the literature, the principals were never present during interviews with teachers or pupils, or vice-versa, to maintain impartiality and minimise any potential pressure on interviewees (Paul-Binyamin & Potchter, 2020).

3.4 Data Analysis

The interviews were recorded and transcribed verbatim. Data coding was conducted using a blended approach, combining theory-driven deductive methods

and data-driven inductive approaches (Flick, 2018, p. 258). Data were initially uploaded into the MAXQDA 2022 statistical software and organised into three categories: *pupils*, *teachers*, and *principals*. Deductive coding followed, which involved creating codes for distinct dimensions of EC and pedagogical methods teachers used. Examples of predefined codes for pedagogical methods included *guiding with questions*, *whiteboard*, or *knowledge convey* (Chernikova et al., 2020; Cocieru et al., 2020). Codes describing EC that the pupils could learn with teacher guidance included *spotting opportunities*, *creativity*, *motivation and perseverance*, and *financial and economic literacy* (Armuña et al., 2020; Bacigalupo et al., 2016). The pupil and teacher interviews were equipped with deductive codes to compare responses and identify similarities. Following deductive coding, an inductive coding phase was conducted to identify emerging themes in the data. Examples of codes generated through inductive coding included *peer feedback*, *little support from parents*, or *teachers lack skills and experience*. Throughout this process, all the codes were continuously refined and iterated upon, with frequent reference to relevant literature (Blenker et al., 2014).

Code co-occurrence analysis was conducted to explore relationships between different themes and to assess connections between pedagogical methods and entrepreneurial learning outcomes. For instance, the study inspected how frequently codes indicating pupils' gaps in the required entrepreneurial knowledge co-occurred with codes representing the distinct pedagogical methods employed by teachers. Additionally, co-occurrences between codes indicating pedagogical methods and perceptions of entrepreneurial learning were analysed to determine potential correlations. The code co-occurrence analysis followed the methodology outlined by Oe and Tanaka (2023), where all code co-occurrences were examined within the context of two consecutive paragraphs in the interviews. Interviews with principals were analysed separately, following established procedures (Flick, 2018; Yin, 2018) to assess the impact of the school environment on entrepreneurial learning outcomes.

Data triangulation across multiple sources was utilised to enhance the validity of the findings. Information gathered from pupils' interviews was triangulated with teacher interviews to verify consistency and alignment between what pupils reported about their learning experiences and the teachers' perspectives. Similarly, the teachers' accounts of their pedagogical methods were cross-referenced with pupils' descriptions to ensure mutual agreement on the methods used. Furthermore, teachers' perspectives were compared with the principals' statements regarding a supportive school environment to validate the aspects of the school environment that are advantageous for fostering entrepreneurial learning. This triangulation approach helped ensure the study findings' reliability and credibility.

4. Results

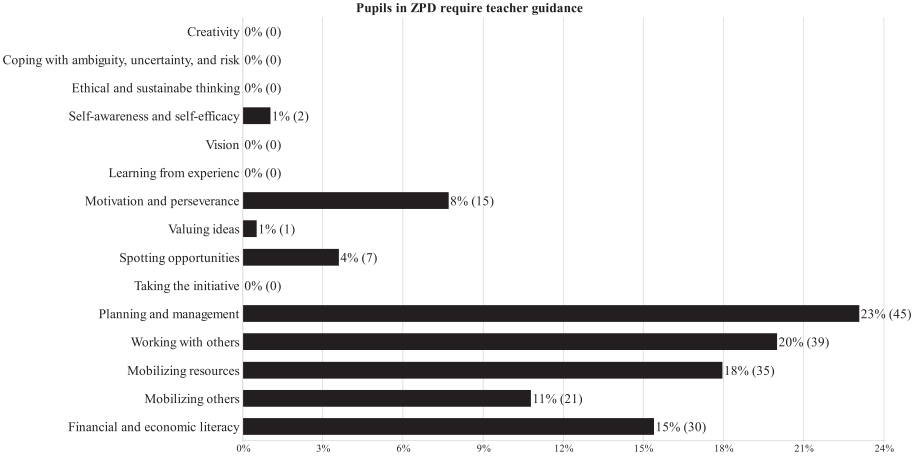
Overall, 107 codes were created, of which eight were thematic top-level codes encompassing several codes. Examples of thematic top-level codes were *pupils exhibit learning* or *teachers' pedagogical methods*. The thematic top-level codes are depicted in Table 1.

Table 1: Thematic top-level codes

Top-level Code System
Coping with difficulties – exogenous factors
Describing pupils' work on the entrepreneurship project
Pupils describe reasons for joining
Pupils in ZPD require teacher guidance for specific EC dimensions
Pupils attended event for promotion of entrepreneurship
Pupils exhibit learning of entrepreneurship competence
Teacher pedagogical methods

The pupils often encountered challenges they did not possess the necessary EC to resolve and required assistance from the teacher. The challenges the pupils could not settle without the teachers' aid were, for instance, *planning and management* or *working with others*. The frequency of occasions when the pupils lacked knowledge of specific EC dimensions and required the teachers' interventions is depicted in Figure 1.

Figure 1: Pupils are in ZPD and require teacher guidance for specific EC dimensions



All the challenges the pupils encountered in ZPD provided opportunities for the teacher to facilitate the pupils' learning through constructivist pedagogical methods. The findings indicate that teachers predominantly employed scaffold-

ing techniques to support the pupils' learning process. Specifically, the teachers most frequently used *coaching and hints* to facilitate pupils' learning without telling them the solution. Besides *coaching and hints*, the teacher used words of *encouragement* or *guidance with questions*. However, even more frequently than scaffolding techniques, the teacher employed *knowledge convey* and *direct involvement*, taking on one of the jobs in the team. The most commonly used pedagogical methods can be seen in Figure 2.

Following the teachers' implementation of constructivist pedagogical methods, the pupils frequently demonstrated or reported enhanced mastery of specific dimensions of EC. For instance, improvements in *working with others* are often noted. Additionally, there were observable advancements in the pupils' capacity in *learning through experience* and *mobilising others*, as well as in *mobilising resources* or *taking the initiative*. Figure 3 illustrates the frequency with which the pupils' perceived improvements in these dimensions of EC were reported.

Code co-occurrence analysis was conducted following the sequence outlined in the social constructivist learning theory. Initially, codes denoting entrepreneurial activities were matched with codes indicating gaps in the knowledge of EC. This analysis helped identify the specific activities during which the indicated knowledge gaps emerged most frequently. Next, codes denoting knowledge gaps and codes representing teachers' pedagogical methods were examined. This analysis aimed to determine which pedagogical methods teachers employed to address and support the pupils' learning needs in EC. Finally, code co-occurrences were explored between pedagogical methods and pupils' perceptions of their entrepreneurial learning outcomes.

Figure 2: Teacher pedagogical methods used in EE programs

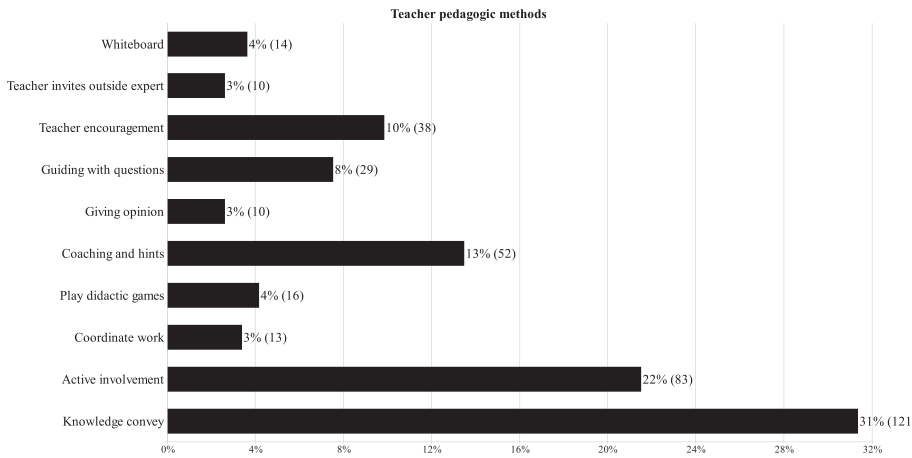


Table 2: Code co-occurrences for encountered knowledge gaps and activity when knowledge gaps occurred

Activity Knowledge gaps	Pupils follow teacher's guidance	Pupils do independent work	Pupils making a mistake	Development of business model	Pupils' idea for solution	Iteration of business model	SUM
Motivation and perseverance	0	4	3	2	2	0	11
Spotting opportunities	2	4	0	2	0	0	8
Planning and management	4	6	0	10	6	0	26
Working with others	4	4	0	12	0	0	20
Mobilising resources	4	4	0	4	10	4	26
Mobilising others	4	4	0	8	0	0	16
Financial and economic literacy	3	4	2	13	0	0	22
SUM	21	30	5	51	18	4	129

Table 3: Which pedagogical methods did teachers employ to support pupils in alleviating knowledge gaps within their ZPD

Pedagogical method Knowledge gaps	White-board	Design thinking	Teacher encouragement	Guiding with questions	Giving opinion	Coaching and hints	Coordinate work	Active involvement	Knowledge convey	Outside expert helps with instruction	SUM
Self-awareness and self-efficacy	0	0	2	0	0	0	0	2	0	0	4
Motivation and perseverance	0	0	0	0	2	2	0	0	6	0	10
Spotting opportunities	0	2	3	0	0	2	2	3	2	0	14
Planning and management	2	2	4	2	2	2	0	3	23	2	42
Working with others	0	4	4	0	0	7	0	4	17	8	44
Mobilising resources	5	5	4	0	5	7	2	6	9	3	46
Mobilising others	0	6	5	2	0	0	2	9	16	0	40
Financial and economic literacy	0	2	0	6	0	2	0	9	5	5	29
SUM	7	21	22	10	9	22	6	36	78	18	229

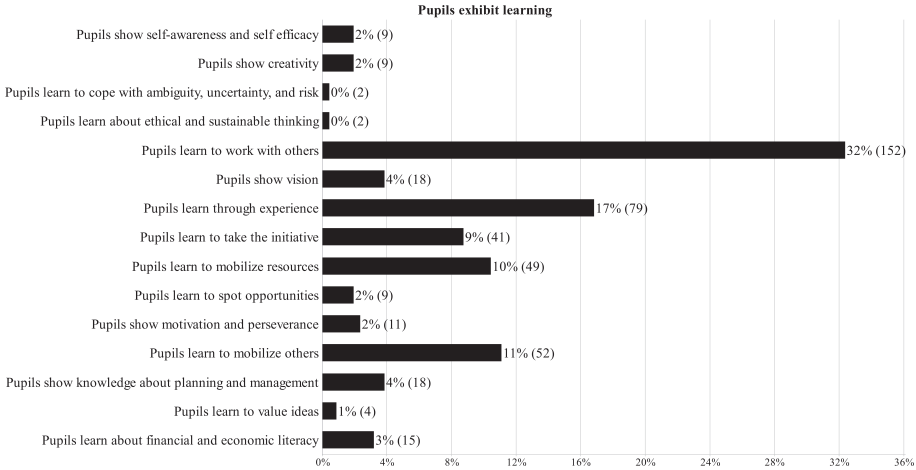
Table 4: What knowledge did pupils demonstrate after the teachers intervened with pedagogical methods

Pedagogical method Demonstrated knowledge	White-board	Design thinking	Teacher encour-agement	Guiding with ques-tions	Giving opinion	Coach-ing and hints	Play di-dactic games	Coordi-nate work	Active involve-ment	Knowl-edge convey	Outside expert helps with in-struction	SUM
Self-awareness and self-efficacy	3	0	2	0	0	0	0	0	0	0	0	5
Creativity	2	2	0	0	0	2	0	0	0	0	0	6
Ethical thinking and sustainability	2	0	0	0	0	2	0	0	0	0	0	4
Working with others	7	11	9	8	7	10	2	2	27	53	2	138
Vision	0	2	0	0	0	0	0	0	0	4	0	6
Learning through ex-perience	4	6	6	2	0	5	2	2	8	12	13	60
Taking the initiative	0	2	4	4	2	6	0	0	7	4	9	38
Mobilising resources	3	7	0	0	0	6	0	5	5	10	7	43
Motivation and per-severance	2	0	2	2	0	2	0	0	0	2	0	10
Mobilising others	0	9	4	0	0	4	0	0	11	20	11	59
Planning and man-agement	0	0	0	0	0	0	0	0	2	2	0	4
Financial and econo-mic literacy	0	0	0	2	0	0	0	2	4	0	0	8
SUM	23	39	27	18	9	37	4	11	64	107	42	381

Note: Tables 2, 3, and 4 only feature the EC the pupils mentioned as having problems understanding or having mastered. The tables do not feature the EC that the pupils never once mentioned.

Therefore, across two consecutive paragraphs, the pupils frequently mentioned gaps in their understanding of EC, particularly in *financial and economic literacy* and *working with others*. These gaps were notably recognised when pupils were tasked with developing business models without direct teacher guidance. Table 2 illustrates the code co-occurrences representing knowledge gaps and the specific entrepreneurial activities during which the gaps emerged. The table details the number of interviews where each co-occurrence was observed.

Figure 3: Pupils exhibit learning of entrepreneurship competence



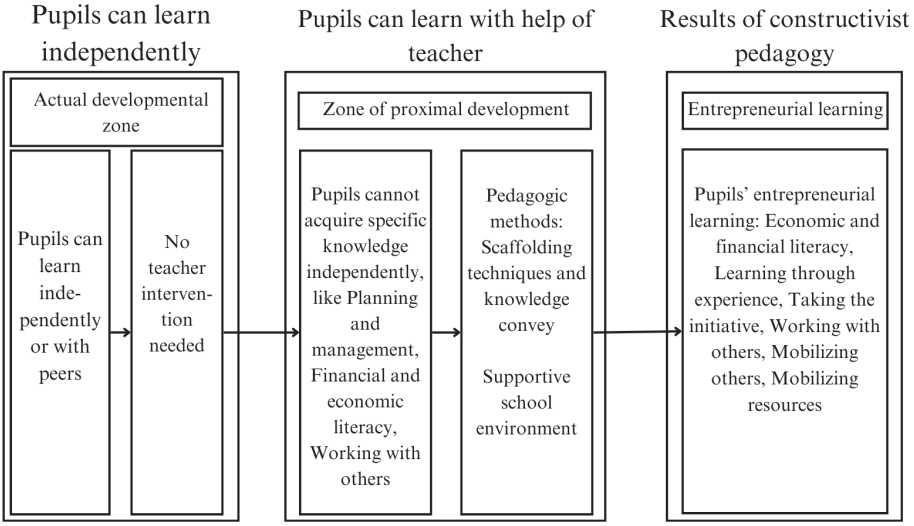
To facilitate learning within ZPD, teachers frequently utilised scaffolding techniques, knowledge convey, and active involvement. Among these methods, *knowledge convey* was the most extensively employed, significantly bolstering pupils' understanding of *planning and management*, *working with others*, or *mobilising others*. Table 3 illustrates the frequency of interviews where these co-occurrences were observed, highlighting the effectiveness of knowledge convey in supporting pupils' development in these dimensions of EC.

Research question 2 examines which dimensions of EC were reported to have developed for the pupils following the teachers' application of various constructivist pedagogical methods. Pupils demonstrated varying levels of entrepreneurial knowledge. Methods such as *knowledge convey*, *active involvement* or *coordination of work* appeared particularly effective, as they provided direct answers to pupils' questions rather than just hints or more questions. *Knowledge convey* proved most effective in enabling the pupils to learn the dimensions of EC, like *working with others*, *mobilising others*, and *learning from experience*. The teachers' *active involvement* was most frequently associated with developing the dimensions of *working with others* and *mobilising others*. Scaffolding techniques like *coaching and hints* or *guiding with questions* were also mentioned

in connection with entrepreneurial learning, particularly with the dimensions of *working with others*, *learning through experience*, or *taking the initiative*. Table 4 illustrates these relationships with the frequency of interviews where these co-occurrences were identified.

Based on the code analysis findings, the present study proposes a teaching and learning framework presented in Figure 4. The framework illustrates the relationships between dimensions of EC where pupils can independently acquire knowledge, the dimensions where teacher assistance is necessary due to knowledge gaps, the pedagogical methods teachers employ to enhance pupils' learning, and the resultant entrepreneurial learning. Initially, pupils operate in their actual developmental zone (Vygotsky, 1978), where they can acquire learning independently. However, teacher guidance becomes essential when the pupils encounter knowledge gaps that exceed their current capabilities. When these gaps fall within the pupils' ZPD, the teachers can effectively support the pupils' learning through the appropriate pedagogical methods. (Cocieru et al., 2020; Vygotsky, 1978).

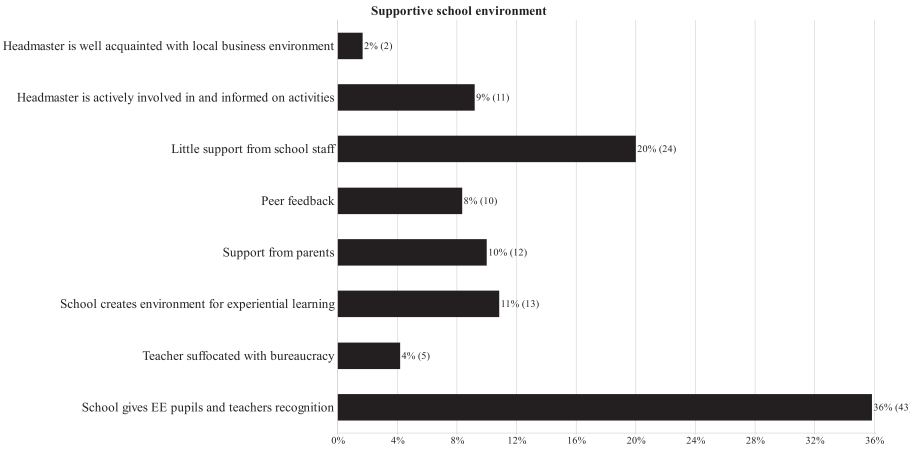
Figure 4: Teaching and learning framework based on social constructivist learning theory (Vygotsky, 1978)



Research question 3 explores how a supportive school environment sustains entrepreneurial learning. Codes representing a supportive school environment were benchmarked against codes related to entrepreneurial learning, revealing two significant factors that were particularly conducive to learning: *school gives EE pupils and teachers recognition* and *support from parents*. The pupils frequently reported improvements in the dimensions of *working with others* and *learning*

through experience when they felt supported by the school. However, not all the pupils experienced consistent support within their school environment. For instance, some pupils or teachers mentioned *little support from school staff*, while *peer feedback* was often described as hostile and derisive. Although parents mainly provided support, there were instances where they expressed concerns that the pupils should prioritise traditional academic subjects over entrepreneurship. The perceived elements of a supportive school environment and instances of insufficient support are depicted in Figure 5.

Figure 5: Supportive school environment



5. Discussion

This research enhances the understanding of social constructivist learning theory by elucidating the dynamics of EC development in early adolescents participating in EE programs. Moreover, it identifies the pedagogical approaches that appear most effective in fostering the participants' learning.

5.1 Theoretical implications

The study illuminates the entrepreneurial learning process among early adolescents in EE programs, focusing on applying the ZDP concept. The results demonstrate that when early adolescents encounter challenges beyond their current knowledge base, such as applying *financial and economic literacy* to define their prospective businesses' costs and revenue streams, they fall within their ZDP. In these instances, the teacher's intervention becomes crucial in acquiring the necessary knowledge and skills. The dynamic illustrates the practical application of social constructivist learning theory in EE for this age group. Rather than delivering traditional lectures on accounting and business finances, teachers

guide students through targeted questions to provide just-in-time information, aligning with pedagogical methods, like scaffolding techniques or knowledge convey within the pupils' ZDP.

On the other hand, the findings also imply developmental limitations in the early adolescents' ability to fully grasp concepts like uncertainty, ambiguity, and risk or idea valuation, for instance, due to their lack of life experience. This insight contributes to a nuanced understanding of the role of scaffolding techniques and knowledge convey within the pupils' ZPD and the boundaries thereof. The study extends social constructivist learning theory principles to EE programs, reaffirming that early adolescents acquire new knowledge, skills, and attitudes most effectively when guided by the appropriate pedagogical methods within their ZDP. The study further highlights the crucial role of constructivist pedagogical methods like scaffolding techniques and the more traditional knowledge convey and active participation, accompanied by classroom setting and teamwork, in facilitating entrepreneurial learning at this developmental stage. Thus, the study enhances the understanding of the entrepreneurial learning process for early adolescents through the lens of the social constructivist learning theory. Significantly, it extends the framework by highlighting the critical role of a supportive school environment. This insight underscores the holistic nature of EE, where pedagogical approaches, developmental considerations, and environmental factors need to converge to facilitate entrepreneurial learning.

Moreover, the study proposes a teaching and learning framework for primary school EE rooted in the social constructivist learning theory (Bell & Bell, 2020; Cocieru et al., 2020). Derived from rigorous qualitative data analysis (Flick, 2018, p. 7), this framework is specifically tailored to the early adolescent population. The study thus advances the discourse on EC development in primary school EE by holistically addressing contributing factors, including pedagogical methods and institutional support structures. Furthermore, the research also enriches the broader understanding of learning processes through the lens of social constructivist learning theory, offering insights extending beyond EE's realm.

5.2 Practical implications

Beyond theoretical implications, the study also offers practical implications for EE teachers and principals. Research suggests that constructivist pedagogy holds much promise for EE programs and has demonstrated positive outcomes. Specifically, in primary school, early adolescents exhibit enthusiasm for collaborative teamwork and do not hesitate to seek assistance from individuals outside their immediate environment to help with their work. They also enjoy tackling challenges and exploring new materials and digital applications to build prototypes. However, successful implementation relies on skilled teachers who can guide the pupils using appropriate pedagogical methods. Despite potential

variations in outcomes, teachers are encouraged to engage early adolescents in constructivist pedagogical approaches whenever possible. Such an approach might sometimes involve active intervention by teachers in the pupils' work to facilitate the learning process, even if the final results may differ from expectations.

Also, in EE programs, the emphasis is frequently on developing all dimensions of EC equally. In this context, teachers should pay particular attention to EC dimensions such as *financial and economic literacy*, *coping with ambiguity, uncertainty, and risk*, or *valuing ideas*. These dimensions might not immediately appeal to the participating pupils. However, the present study demonstrated that while the pupils did recognise the importance of the mentioned topics, especially when preparing for entrepreneurship competitions, they did not prominently discuss the given dimensions when reflecting on their learning experiences. This finding did not diverge from expectations based on previous research (Czyzewska & Mroczek, 2020; Huber et al., 2014). The identified gap could be successfully addressed by introducing simplified and gamified versions of the economic themes that the pupils did not grasp as thoroughly. The dimensions that pupils did not learn well align with EC dimensions that have posed challenges to pupils and students in other comparable EE programs (Huber et al., 2014; Oosterbeek et al., 2010). Consequently, policymakers should prioritise teacher EE training in constructivist pedagogy, which has positively affected the learning process in EE programs for early adolescents.

Finally, school environments have a discernible impact on the success of learning EC and achieving entrepreneurial learning outcomes among the participating pupils. The support provided by the school leadership, staff, and parents significantly contributes to this success. Negative feedback from peers does not play a pivotal role in the pupils' learning process. Even when faced with such feedback, participants remain motivated and resilient, motivated by the EE program. The pupils' enthusiasm for collaborative teamwork outweighs any deterrent effect of negative and derisive peer comments from non-participating pupils. While peers do influence initial application decisions and are essential for the learning environment, the present study suggests that the derisive remarks about the participating pupils' work do not overwhelmingly hinder or demotivate the participants (Barba-Sánchez & Atienza-Sahuquillo, 2016; Cocieru et al., 2020; Huber & Helm, 2020).

5.3 Limitations and future research

Certain limitations have been identified in this study. First, the authors possess no knowledge of the actual level of training and experience each of the teachers participating in the study possessed. Different levels of training could lead to teachers using different pedagogical methods and, consequently, varying levels

of success in the pupils' learning. Future researchers are advised to measure the teachers' training, experience, and background before the interviews commence. Second, while the teachers and pupils did describe the pedagogical methods used and the perceived learning that took place, there is a high probability of self-perception, and, likely, the descriptions are not an unbiased reflection of what indeed transpired in the EE programs. Also, the interviewer encouraged pupils to choose their most important perceived learning outcomes for themselves, which might have led the pupils and teachers to avoid talking about EC dimensions that have been learned but were not found to be highly important and were thus omitted from the discourse. Such an interviewing strategy might have led to important information being neglected. Future researchers could spend more time within the classroom spaces where the EE programs were being held or accompany the pupils on their excursions outside of the classroom and take notes of the occurrences rather than rely on the testimonies of the participants. Apart from direct and long-term observations, future researchers should use a mixed methods approach with a PRE and POST quantitative exploration of the learned EC dimensions measured with Likert-scale questionnaires.

Such an approach would enable the researcher to triangulate the outcomes of the qualitative and quantitative findings and render the study outcomes more reliable. Third, the pupils who participated in the EE programs did so of their own volition, which means there could have been some self-selection bias present. Future researchers could use an experimental design, picking the participants randomly and measuring the EC development of the participating and control groups to see if there is a difference in the level of EC improvement between the two groups. Fourth, the pupils, teachers, and principals partaking in the research were all from Slovenia, which can be perceived as a weakness for their similar cultural, social, and educational backgrounds, thus limiting the possibility of different background-based outcomes. Future researchers could utilise international networks like the Danube Cup as an opportunity to extend their research to other countries in future collaborations. Lastly, the teachers in the EE programs used only constructivist pedagogical methods, with teamwork being prevalent, but they employed no frontal teaching of specific EC dimensions like financial and economic literacy and deployed no traditional in-class testing. Such an approach might have led participants overwhelmingly to demonstrate the development of some non-economic dimensions, like *working with others,* but not of the more economic ones, like *financial and economic literacy*. Future researchers should create a control group where the participants would be taught only with traditional instruction. Then, the researchers might survey both groups using mixed methods to determine which pedagogical methods were more successful at achieving successful entrepreneurial learning outcomes.

6. Conclusion

The present study's findings underscore the significant potential of constructivist pedagogical methods in enhancing EC among early adolescents. Educators can better equip young learners with essential entrepreneurial skills by fostering an environment where students actively engage in hands-on learning through experience and failure. The role of the teacher emerged as pivotal in guiding pupils through complex concepts within their ZPD. This finding highlights the importance of targeted teacher training programs emphasising constructivist approaches, ensuring educators are well-prepared to facilitate effective entrepreneurial learning.

Moreover, the study revealed a distinct preference among pupils for collaborative activities and resource mobilisation, suggesting that these areas may be particularly fruitful for further pedagogical development. Conversely, the relatively lower emphasis on financial literacy and idea valuation indicates a need for more engaging and accessible methods to teach these critical economic concepts. Future researchers are recommended to explore innovative ways to integrate these dimensions into EE programs, potentially through gamification or other interactive approaches.

The implications of this research extend beyond the classroom, providing valuable insights for policymakers and educational program developers. By adopting constructivist methods and focusing on comprehensive teacher training, educational institutions can create a more supportive and effective learning environment that nurtures the entrepreneurial capabilities of young learners. Such an approach can, in turn, contribute to a more entrepreneurial society equipped to meet future challenges with creativity and resilience.

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