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DEVELOPING STARTUP THINKING AMONG GENERAL SECONDARY SCHOOL STUDENTS: A PEDAGOGICAL MODEL FOR PROMOTING YOUTH ENTREPRENEURSHIP

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Abstract: The development of entrepreneurial competencies among school students has become an important educational priority in response to technological advancement, changing labour markets, and the growing demand for innovative problem-solving skills. Traditional school education often emphasizes the acquisition of theoretical knowledge, whereas entrepreneurial activity requires learners to identify real-world problems, generate creative ideas, evaluate opportunities, manage resources, and transform ideas into practical solutions. This article examines the pedagogical foundations of developing startup thinking among general secondary school students and proposes a structured model for promoting youth entrepreneurship. The study employs theoretical analysis, comparative examination of educational approaches, synthesis of relevant scholarly literature, and pedagogical modelling. The proposed model integrates five interrelated components: motivational and value-based development, entrepreneurial knowledge, creative and critical thinking, practical project implementation, and reflective assessment. Particular attention is given to project-based learning, design thinking, collaborative problem-solving, mentorship, and school-based startup initiatives. The article argues that entrepreneurship education should not be limited to teaching business terminology or profit-oriented activities. Instead, it should cultivate initiative, responsibility, adaptability, financial awareness, and the ability to create sustainable solutions to social and economic challenges. The proposed model provides a conceptual foundation for integrating entrepreneurship education into the curriculum and extracurricular activities of general secondary schools.

Keywords: startup thinking, youth entrepreneurship, secondary education, entrepreneurial competence, project-based learning, innovative education, business planning, financial literacy.

1. Introduction

Contemporary education is expected to prepare students not only to acquire knowledge but also to apply it creatively in unfamiliar situations. Economic transformation, digitalisation, environmental challenges, and the emergence of new professional fields have increased the importance of initiative, independent decision-making, and entrepreneurial competence. Within this context, the development of startup thinking among general secondary school students represents a promising direction for educational innovation. Startup thinking can be understood as an approach to identifying problems, developing innovative ideas, testing possible solutions, learning from feedback, and improving initial concepts through experimentation. Unlike conventional classroom activities that may focus primarily on reproducing established information, startup-oriented learning encourages students to explore opportunities, formulate hypotheses, collaborate with others, and evaluate the practical value of their ideas.

The development of entrepreneurial thinking during school years is particularly important because adolescence provides opportunities to cultivate independence, creativity, communication

skills, and a sense of personal responsibility. When students are encouraged to investigate problems in their schools and communities, they can begin to understand how knowledge acquired in mathematics, technology, languages, natural sciences, and social studies can be applied to practical challenges. However, introducing entrepreneurship education into general secondary schools requires more than organising occasional business competitions. Students need a coherent pedagogical environment in which they can progress from recognising problems to generating ideas, preparing simplified business plans, developing prototypes, presenting projects, and evaluating their results. Teachers also require appropriate methodological guidance to support this process without turning educational projects into excessively commercial activities.

The purpose of this article is to substantiate a pedagogical model for developing startup thinking among general secondary school students and promoting youth entrepreneurship through practice-oriented educational activities. The research objectives are to clarify the educational significance of startup thinking, identify pedagogical approaches that support entrepreneurial competence, determine the principal components of a school-based entrepreneurship model, and formulate recommendations for implementing the proposed model in general secondary education. The central proposition of the article is that startup thinking can be developed more systematically when entrepreneurial knowledge is combined with creative problem-solving, collaborative project work, financial literacy, mentorship, and continuous reflection.

2. Literature Review and Theoretical Foundations

Entrepreneurship education has gradually expanded from teaching students how to establish and manage businesses towards developing a broader set of transferable competencies. These competencies include recognising opportunities, taking initiative, managing uncertainty, mobilising resources, communicating ideas, and creating value for individuals and communities. The European Commission's EntreComp framework, developed by Bacigalupo et al. (2016), conceptualises entrepreneurship as a competence that can be developed through education and lifelong learning. The framework groups entrepreneurial competence into three interconnected areas: ideas and opportunities, resources, and action. This perspective is relevant to school education because it connects creative thinking with resource management and the practical implementation of ideas.

The theoretical contribution of entrepreneurship education also draws on experiential learning. Kolb (1984) explains learning as a process involving experience, reflection, conceptual understanding, and experimentation. Applied to startup education, this perspective suggests that students should not merely study the characteristics of successful entrepreneurs. They should also engage in practical activities, analyse the outcomes of their decisions, and revise their approaches when difficulties arise. Project-based learning provides another important pedagogical foundation. Through sustained projects, students investigate meaningful questions, apply knowledge from different disciplines, collaborate with peers, and produce tangible outcomes. Startup-oriented projects can strengthen the connection between school learning and everyday life by requiring students to identify a problem and develop a feasible solution. Design thinking further supports this process by emphasising an understanding of users' needs before selecting a solution. Students can learn to observe a problem, interview potential users, define the underlying need, generate alternatives, construct a simple prototype, and obtain feedback. This approach helps prevent a common weakness in student entrepreneurship projects: beginning with a product idea without first establishing whether the idea addresses a genuine need.

3. Materials and Methods

This article is based on a theoretical and conceptual research design. Its methodological foundation consists of scholarly literature analysis, comparison of educational approaches,

conceptual synthesis, and pedagogical modelling. First, literature analysis was used to examine major perspectives on entrepreneurship education, experiential learning, entrepreneurial competence, and practice-oriented pedagogy. Second, comparative analysis was applied to identify the complementary contributions of project-based learning, design thinking, collaborative learning, and financial education. Third, conceptual synthesis was used to organise the identified principles into an integrated educational framework. Finally, pedagogical modelling was employed to define the structural components, implementation stages, expected learning outcomes, and assessment indicators of the proposed model. The model was designed for general secondary school settings in which students may differ in age, prior knowledge, access to technology, and experience with entrepreneurial activities. Accordingly, its implementation is intended to be flexible and adaptable to different school environments. The article does not report the results of a completed intervention or a controlled empirical experiment. Therefore, the model should be understood as a theoretically grounded proposal requiring subsequent practical validation.

4. Results: A Pedagogical Model for Developing Startup Thinking

The principal conceptual outcome of the study is a pedagogical model that connects the development of startup thinking with the systematic promotion of youth entrepreneurship. The proposed model comprises five interconnected components: motivational and value-based development, entrepreneurial knowledge, creative and analytical thinking, practical project implementation, and reflective assessment.

4.1. Motivational and Value-Based Component

The first component aims to develop students' interest in innovation and their willingness to take initiative. Entrepreneurial learning is more meaningful when students understand that entrepreneurship is not restricted to establishing a company or earning profit. It can also involve identifying unmet needs and creating useful solutions for the school or local community. Teachers can strengthen motivation by presenting age-appropriate examples of student initiatives, discussing local challenges, and encouraging learners to suggest improvements to familiar situations. Students might explore ways to reduce food waste in school cafeterias, reuse educational materials, improve recycling practices, or create accessible digital resources for younger learners.

The primary objective is to help students recognise themselves as active participants in problem-solving rather than passive recipients of information.

4.2. Entrepreneurial Knowledge Component

The second component provides students with foundational knowledge required to understand how an idea can be transformed into a feasible project. Relevant learning areas include identifying target users, understanding customer needs, estimating basic costs, distinguishing revenue from profit, preparing a simple budget, allocating resources, and presenting a value proposition. Students should also become familiar with ethical business practices, responsible communication, intellectual property, environmental sustainability, and the responsible use of digital technologies. Business planning should be introduced through accessible tasks rather than complex financial documentation. For example, students can estimate the materials required for a handmade product, calculate its approximate cost, compare alternative production methods, and explain who might benefit from the product.

4.3. Creative and Analytical Thinking Component

Startup thinking depends on the ability to identify meaningful problems and generate more than one possible solution. This component combines creativity with critical evaluation.

Students can begin by observing everyday difficulties, gathering information, discussing possible causes, and defining a specific problem. Brainstorming, mind mapping, structured

questioning, and design-thinking exercises can help them generate alternative solutions. The subsequent evaluation stage encourages students to compare their ideas according to usefulness, feasibility, affordability, accessibility, and environmental impact. Rather than accepting the first proposal, learners should justify their choices using evidence and feedback. For instance, a group developing an environmentally friendly school supply should examine whether the proposed material is available, whether the product is durable, how much it might cost, and whether it genuinely reduces waste. This component develops the connection between imagination and evidence-based reasoning.

4.4. Practical Project Implementation Component

The fourth component translates knowledge and ideas into practical activity. Students work individually or in small groups to develop a startup-oriented project that addresses a clearly defined need.

The process may involve the following stages:

Identifying a problem within the school or community.
Investigating the needs of potential users.
Generating and comparing possible solutions.
Selecting an idea and defining its expected value.
Preparing a simplified business or project plan.
Developing a prototype, demonstration, or minimum viable solution.
Presenting the project to classmates, teachers, parents, or invited mentors.
Collecting feedback and improving the initial proposal.

A minimum viable solution in a school context does not have to be a commercial product. It may be a paper prototype, a digital mock-up, a demonstration model, a service concept, or a small-scale environmental initiative. Teachers should provide guidance while allowing students to make meaningful decisions. Mistakes should be treated as opportunities for analysis and improvement, provided that activities remain safe, ethical, and appropriate for students' ages.

4.5. Reflective Assessment Component

The final component evaluates both the quality of the project and the development of entrepreneurial competencies.

Assessment should not depend exclusively on whether a project generates revenue or wins a competition. Such criteria could disadvantage students with fewer financial resources and discourage experimentation. A broader assessment framework should consider the relevance of the identified problem, originality of the proposed solution, quality of evidence, feasibility of the plan, collaboration, financial reasoning, communication, ethical awareness, and responsiveness to feedback. Students can maintain project portfolios containing their initial ideas, research notes, sketches, budgets, prototype versions, presentation materials, and reflections. Comparing early drafts with revised versions can help learners recognise their progress and understand the value of iterative improvement.

Self-assessment, peer assessment, teacher feedback, and mentor observations can be combined to provide a more comprehensive picture of learning.

5. Implementation Mechanism of the Proposed Model

The model can be implemented through an organised sequence of educational activities extending across a school term or academic year. The precise duration should depend on students' ages, curriculum requirements, and available resources.

The first stage involves preparation. Teachers introduce the concept of entrepreneurship, discuss local problems, establish collaborative groups, and identify the resources available for project work.

The second stage focuses on exploration and idea generation. Students observe their surroundings, investigate problems, collect basic information, and develop possible solutions. Teachers encourage learners to distinguish between assumptions and evidence.

The third stage involves planning. Each group identifies its target users, formulates a value proposition, estimates basic costs, considers potential limitations, and prepares a project outline. The emphasis remains on educational understanding rather than the production of a commercially sophisticated business plan.

The fourth stage consists of prototyping and testing. Students create an initial version of their solution, present it to potential users, collect feedback, and make improvements. Schools can organise project workshops, innovation days, or startup exhibitions to support this stage.

The fifth stage involves presentation and reflection. Students explain the problem they addressed, the reasoning behind their solution, the resources required, the feedback received, and the changes made during development. Teachers assess both the final output and the learning process.

These stages form a continuous cycle rather than a strictly linear sequence. Feedback obtained during testing may require students to reconsider their original problem definition, revise their budgets, or develop a different solution. Successful implementation also requires cooperation between teachers, school administrators, parents, local entrepreneurs, higher education institutions, and community organisations. External partners can provide practical insights, mentorship, and opportunities for students to observe how ideas are developed in real-world settings.

6. Discussion

The proposed model positions startup thinking as a multidimensional educational competence rather than a narrow form of business training. Its central contribution is the integration of motivation, knowledge, creative reasoning, practical experimentation, and reflection into a single pedagogical framework. One important implication is the need to connect entrepreneurial activities with existing school subjects. Mathematics can support budgeting and numerical reasoning; technology lessons can facilitate prototyping; language education can strengthen pitching and communication; environmental education can generate sustainability-oriented projects; and social studies can help students understand community needs. This interdisciplinary approach can make entrepreneurial learning more accessible because students do not need to acquire an entirely separate body of knowledge before beginning a project. Instead, they learn to apply familiar concepts in unfamiliar contexts.

Another implication concerns the role of the teacher. In a startup-oriented classroom, the teacher acts not only as an information provider but also as a facilitator who helps students formulate questions, evaluate evidence, manage collaboration, and reflect on mistakes. This role requires appropriate professional development and access to practical teaching resources. The model also highlights the importance of equity. Schools differ in their access to computers, laboratories, funding, and external mentors. Therefore, entrepreneurship education should not depend on expensive equipment or students' personal financial contributions. Low-cost materials, community-based challenges, paper prototypes, and freely available digital tools can provide meaningful learning opportunities.

Conclusion

Developing startup thinking among general secondary school students offers an opportunity to connect theoretical learning with creativity, initiative, and practical problem-solving. Entrepreneurship education can help learners understand how ideas emerge from real needs, how resources can be managed responsibly, and how solutions can be tested and improved through feedback. This article has proposed a pedagogical model comprising five interconnected components: motivational and value-based development, entrepreneurial knowledge, creative and analytical thinking, practical project implementation, and reflective assessment. The model combines project-based learning, design thinking, collaborative activity, basic business planning, and mentorship within an adaptable educational process.

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