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ECOSYSTEM ELEMENTS IN INNOVATIVE PEDAGOGY IN ISRAEL

ЭЛЕМЕНТЫ ЭКОСИСТЕМЫ В ИННОВАЦИОННОЙ ПЕДАГОГИКЕ В ИЗРАИЛЕ

**BLAGORAZUMNAYA Olga⁴, PhD. of economic sciences, Associate Professor,
Free International University of Moldova, Chisinau
(ORCID 0000-0001-6791-5481)**

**ISRAELI Milana⁵, PhD. of economic sciences, Academic member,
Gordon Academic College, Haifa, Israel
(ORCID 0000-0002-3033-754X)**

**БЛАГОРАЗУМНАЯ Ольга, доктор экономических наук, доцент,
Международный Независимый Университет Молдовы, Кишинэу
(ORCID 0000-0001-6791-5481)**

**ИЗРАЕЛИ Милана, доктор экономических наук,
Академический колледж Гордон, Хайфа, Израиль
(ORCID 0000-0002-3033-754X)**

Annotation: This article delves into the inventive strategies employed by Israel's education system to champion innovative pedagogy and how these strategies can lead to noteworthy advancements in the realm of teaching and learning. The authors emphasize the growing awareness of the necessity for forward-thinking approaches to education that can nurture creativity, critical thinking, and problem-solving abilities, preparing students to tackle the demands of the contemporary world. Israel has established itself as a global trailblazer in education innovation, largely due to its robust innovation ecosystem, rendering it an ideal subject for examining how innovative pedagogy can be cultivated through such an ecosystem. The Israeli Ministry of Education has introduced a variety of initiatives with the objective of promoting innovative pedagogy within schools. These initiatives encompass teacher professional development, funding for innovative projects, and the integration of digital technologies to enhance teaching and learning. Furthermore, research has demonstrated that the creation of an innovation ecosystem can wield a significant influence on the promotion of innovative pedagogy, leading to heightened student engagement, elevated academic accomplishments, and a greater sense of ownership in the learning process. The article concludes by advocating for teacher training in innovative pedagogies and a wider embrace of these educational approaches.

Аннотация: В этой статье рассматриваются стратегии решения изобретательских задач, используемые израильской системой образования для продвижения инновационной педагогики, а также то, как эти стратегии могут привести к заметным достижениям в сфере преподавания и обучения. Авторы подчеркивают растущее осознание необходимости дальновидных подходов к образованию, которые могут развивать творческие способности, критическое мышление и способности к решению проблем, готовя учащихся к решению требований современного мира. Израиль зарекомендовал себя как глобальный новатор в сфере образовательных инноваций, во многом благодаря своей мощной инновационной экосистеме, что делает его идеальным объектом для изучения того, как инновационная педагогика может развиваться посредством такой экосистемы. Министерство образования Израиля представило ряд инициатив с целью продвижения инновационной педагогики в школах. Эти инициативы включают профессиональное развитие учителей, финансирование инновационных проектов и интеграцию цифровых технологий для

⁴ blagorazumnaya@yandex.ru

⁵ milanaisraeli@gmail.com

улучшения преподавания и обучения. Кроме того, исследования показали, что создание инновационной экосистемы может оказать значительное влияние на продвижение инновационной педагогики, что приведет к повышению вовлеченности студентов, повышению академических достижений и большему чувству ответственности за процесс обучения. В заключение авторы статьи выступают за подготовку учителей в области инновационной педагогики и более широкое использование этих образовательных подходов.

Keywords: *ecosystem innovative pedagogy, innovative approaches, education, future-oriented pedagogy.*

Ключевые слова: *экосистема, инновационная педагогика, инновационные подходы, образование, ориентированная на будущее педагогика.*

Introduction

The ever-evolving developments across various domains worldwide have a direct impact on the realm of education. Adapting educational approach to align with forthcoming trends is crucial in nurturing students to become flexible, adaptable, self-reliant learners, and empowering them with the essential skills for success in a dynamic world. This article seeks to showcase efforts dedicated to advancing innovative teaching methods in Israel. These initiatives comprise contributions from within Israel's educational system as well as external entities, entrepreneurs, and external corporations.

The central focus of this article is to delve into how Israel's education system's pioneering strategies can foster innovative teaching methods. It seeks to investigate how a culture of innovation within the realm of education leads to substantial improvements in teaching and learning. The driving force behind this theme is the growing recognition of the imperative for inventive educational approaches that can effectively respond to the swiftly changing global landscape. Conventional educational models often fall short in equipping students for the complexities of the contemporary world, underscoring the increasing demand for fresh methods that can nurture creativity, critical thinking, and problem-solving skills.

The justification for this theme stems from Israel's emergence as a global frontrunner in education innovation, bolstered by its robust innovation ecosystem. By scrutinizing the Israeli experience, we can gain valuable insights into how an innovation ecosystem can propel innovative pedagogy and precipitate significant advancements in education. At its core, the problem to be addressed is the necessity for innovative education approaches capable of addressing the contemporary challenges. This article endeavors to examine the present status of innovation and inventive teaching strategies in Israel, shining a spotlight on some of the successful programs and methodologies that have been put into practice.

Materials and methods of research

There are many approaches and research methods that can be used to study the elements of an innovative teaching ecosystem. The authors used a mixed method to study the interactions between teaching practices and ecosystem elements. Data collection included both qualitative and quantitative methods. Semi-structured interviews were conducted with teachers from various educational institutions to obtain qualitative information about their innovative teaching practices. These interviews were transcribed and analyzed using thematic content analysis. The authors used case study methodology to delve deeper into specific pedagogical innovations at individual institutions. The case studies provided rich contextual information and detailed understanding of ecosystem influences on innovation pedagogy.

Results and considerations

In recent times, innovation has gained significant prominence within the field of education, and this attention is well-founded. Innovative pedagogy, characterized by teaching methods that prioritize creativity, critical thinking, and problem-solving, has demonstrated its ability to enhance student engagement, motivation, and academic performance. Israel has emerged as a pioneer in the development and implementation of inventive teaching strategies.

Israel boasts a flourishing ecosystem of innovation in education, with a particular emphasis on technology and entrepreneurship. This ecosystem encompasses a diverse array of participants, including startups, investors, government agencies, and academic institutions, all collaborating to foster innovation within the educational sphere. A pivotal aspect of this ecosystem revolves around the robust support for startups and entrepreneurs operating in the education sector. Israel hosts a substantial number of EdTech startups, which receive backing from various incubators and accelerators. These organizations provide invaluable guidance, financial support, and additional resources to aid entrepreneurs in bringing their concepts to fruition.

Another crucial element of Israel's innovation ecosystem is the strong partnership between the academic and industrial sectors. Israeli universities maintain robust connections with private enterprises, a collaboration that has significantly contributed to the cultivation of an innovative and entrepreneurial culture. Furthermore, many universities have established specialized research centers and programs that concentrate on EdTech and other inventive methods for education.

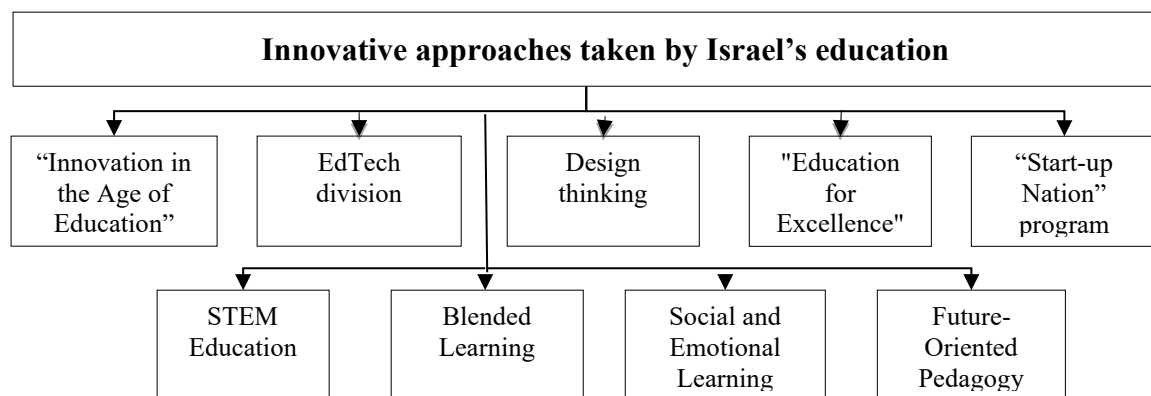


Figure 1. The initiatives that show innovative approaches taken by Israel's education system [elaborate based on 7]

In the accompanying figure, the authors have succinctly outlined the initiatives that illustrate the innovative approaches embraced by Israel's education system.

The Israeli government has played a pivotal role in nurturing the innovative education ecosystem. The authors investigated the mechanisms and actions in place in Israel to encourage educational programs and endeavors designed to address future challenges. Here is a list of the diverse projects that have been established in Israel with the objective of fostering inventive teaching methods:

The Israeli Ministry of Education has initiated a program titled "Education in the Age of Innovation" with the objective of advancing inventive teaching methods in schools. This program encompasses various endeavors, including professional development for educators, financial support for innovative projects, and the incorporation of digital technologies to facilitate teaching and learning. "Education in the Age of Innovation" is a comprehensive initiative in Israel aimed at reshaping the educational system by integrating innovative technologies and pedagogical approaches. Its primary goal is to equip students with the competencies and knowledge essential for thriving in an ever-evolving world. The program was launched through the collaborative efforts of Israel's

Ministry of Education and the National Digital Israel Initiative. It operates on the fundamental tenets of "future-oriented pedagogy," emphasizing critical thinking, creativity, collaboration, and communication skills. The program strives to enhance students' digital literacy, encourage innovation and entrepreneurship, and foster a culture of lifelong learning.

A pivotal component of this program is the utilization of cutting-edge technologies such as virtual and augmented reality, coding, and robotics, seamlessly integrated into the curriculum to amplify learning outcomes and boost student engagement. "Education in the Age of Innovation" has been implemented across schools throughout Israel, with several studies and reports highlighting its effectiveness. One study demonstrated that the program positively influenced teachers' attitudes towards technology integration and contributed to the enhancement of their pedagogical skills [2]. In sum, the "Education in the Age of Innovation" program signifies a notable shift towards a more innovative and forward-looking education system in Israel.

Another initiative, backed by the education system, is known as the EdTech division [4]. In the context of Israel's education, the EdTech division pertains to the incorporation of technology into the educational process to enhance the quality of learning. Its primary focus revolves around the creation and implementation of digital tools and solutions with the aim of improving teaching and learning outcomes, expanding educational access, and elevating the overall learning experience. The division collaborates closely with educational institutions, educators, and students to identify their requirements and devise inventive solutions to address the challenges they encounter. The leadership of the EdTech division in Israel rests with the Ministry of Education, which has established a variety of initiatives and programs designed to support the integration of technology in education [12]. These initiatives encompass the Digital Israel program, which seeks to equip every student with a digital device and internet access, and the Digital Leaders program, which trains educators to become experts in educational technology and provides them with continuous professional development.

Another educational approach extensively utilized in Israel, both among educational staff and in classrooms, is Design Thinking. Design thinking is a problem-solving methodology that centers around the needs of individuals and has been progressively integrated into education in recent years. Within the Israeli context, design thinking serves as an innovative method to stimulate creativity and innovation in education. Its application in education spans various domains, including curriculum development, teacher training, and the design of physical learning environments. For instance, in Israel, design thinking has been harnessed to devise novel teaching techniques, craft inventive learning spaces, and cultivate collaboration and teamwork among students [11].

One of the most triumphant initiatives within Israel's education system is the "Education for Excellence" program [2]. This program is designed to enhance academic performance and cultivate leadership abilities in students hailing from disadvantaged backgrounds. It extends additional support and resources to students, including tutoring, mentoring, and summer camps, with the aim of assisting them in achieving academic success.

Moreover, Israel has established multiple initiatives aimed at nurturing innovation and entrepreneurial spirit in students. For instance, the "Start-Up Nation" program offers financial support and resources to high school students interested in creating their tech startups [10]. The objective of this program is to instill an entrepreneurial mindset in students and provide them with valuable skills in both business and technology.

Israel places a strong emphasis on science, technology, engineering, and mathematics (STEM) education, which has played a pivotal role in driving its innovative teaching methodologies. STEM education has been proven to equip students with the competencies required for the contemporary workforce, and Israel acknowledges the significance of this [5].

Another educational method that amalgamates conventional in-person classroom instruction with online learning activities is known as Blended Learning. Blended Learning is regarded as a means to enrich the educational experience for students and enhance their learning outcomes [8]. By

fusing traditional face-to-face teaching with online resources and tools, students can partake in a more personalized and adaptable learning journey tailored to their specific needs [9]. One of the primary advantages of Blended Learning in Israel is its capacity to overcome certain limitations associated with conventional classroom instruction, such as restricted class sizes and scheduling conflicts. With online learning integrated, students gain access to course materials at their own pace and on a schedule that suits them, all while retaining the opportunity to engage in discussions and interact with their peers and instructors during in-person class sessions.

Israel exemplifies Blended Learning through institutions like the Open University of Israel, which offers a diverse array of online courses and degree programs, and the virtual school under the purview of the Israeli Ministry of Education, providing K-12 students with online learning opportunities.

Nonetheless, there remains a pressing need for teacher training in technology utilization and for schools to allocate adequate resources to support this approach. The incorporation of technology in the classroom is a challenge confronted by many educational institutions globally.

To address the emotional well-being of students, Israel has introduced a program grounded in social-emotional learning (SEL). In recent times, Israel has made substantial efforts to develop SEL programs aimed at bolstering student welfare and mental health [6]. SEL programs are designed to impart skills like self-awareness, self-regulation, and empathy to students, enabling them to manage their emotions and cultivate positive relationships with others.

The potential advantages of SEL programs are considerable, as they can enhance academic performance, diminish behavioral issues, and encourage positive social conduct. Nonetheless, implementing SEL programs can pose challenges, given their requirement for substantial resources and teacher training.

Israel has also introduced numerous initiatives to stimulate innovation and entrepreneurship among students. For instance, the "Start-Up Nation" program extends funding and resources to high school students keen on establishing their tech start-ups. This program is geared towards nurturing an entrepreneurial mindset in students, equipping them with valuable skills in both business and technology. The cultivation of innovation and entrepreneurship stands as a pivotal element in promoting inventive pedagogy within Israel. By forging networks of organizations and individuals collaborating to encourage innovation and entrepreneurship, Israeli educators can play a crucial role in ensuring that their students are well-prepared to excel in the swiftly evolving 21st-century world.

An integral aspect of innovative pedagogy revolves around comprehending and applying the principles of future-oriented pedagogy. Future-oriented pedagogy represents an educational approach developed by the Experiments and Initiatives Research and Development (R&D) Division of the Israeli Ministry of Education. This method is rooted in the notion that education should ready students for the future, rather than solely delving into the past. It embodies a forward-looking perspective that underscores creativity, innovation, and problem-solving abilities.

The core tenets of future-oriented pedagogy encompass: personalization, collaboration, informalization, glocalization, adaptivity, and self-integration.

Personalization involves the tailoring of educational resources to align with the unique requirements, ambitions, and circumstances of the learner.

Collaboration entails the process in which individuals collaborate to attain a common objective, enhancing the effectiveness of learning and facilitating a better comprehension of the intricate and ever-changing reality.

Informalization pertains to the occurrence of human activities carried out outside the formal confines of organizations and institutions, giving rise to fresh opportunities for learning and action. However, the challenge lies in society's recognition of the knowledge, experience, skills, and accomplishments acquired through informal pursuits.

Glocalization represents the fusion of global and local skills, identity, and awareness within the learner, striking a harmonious equilibrium that enables them to function and thrive in both realms concurrently. By employing integrative, well-balanced, and resourceful local strategies, the disparities between the global and local dimensions can be alleviated. Implementing the concept of glocalization in education can empower learners to effectively navigate and excel in both the global and local spheres. It motivates them to find the optimal equilibrium point that suits the evolving reality while exposing them to broader geographical and cultural contexts, prompting them to tackle challenging conflicts. The modern era is marked by swift and intricate transformations that pose an unprecedented challenge for individuals, organizations, and nations striving to adapt.

The inherent value of the adaptivity principle lies in its capacity to shape and apply a desired future in response to the ever-changing reality, thereby preserving organizational or personal relevance. In the realm of education, adaptivity enhances the ability of learners and systems to adjust, act, and succeed in a dynamic reality. The capability to learn and teach in preparation for an uncertain and enigmatic future is a challenge that necessitates addressing two tiers of uncertainty stemming from the intricacies of modern reality and its volatility.

The self-integration principle, denoting comprehensive self-development, equips the learner to navigate the mutable reality by providing them with a personal compass and identity. Concentrating on acquiring pertinent personal attitudes and attributes that bolster effective adaptation, such as self-assurance, personal drive, and authenticity, proves more effective than focusing solely on the acquisition of generic skills.

These principles of future-oriented pedagogy align seamlessly with the innovative teaching approaches prevalent in Israel, which equally underscore the significance of personalized learning, collaboration, project-based learning, and technology-enhanced education. By integrating these principles into their instructional methods, Israeli educators can furnish students with the competencies and knowledge necessary to thrive in the swiftly evolving 21st-century world.

The innovation ecosystem in Israel has played a pivotal role in advancing innovative pedagogy within education. This innovation ecosystem encompasses a network of organizations and individuals collaborating to promote innovation and entrepreneurship. In the educational context, such an innovation ecosystem comprises educational institutions, universities, technology firms, and other entities working collectively to foster inventive teaching methodologies.

Despite the success of numerous innovative teaching strategies in Israel, there remain challenges to be addressed. One of the primary challenges is the educational achievement gap between students from varying socio-economic backgrounds. While programs like "Education for Excellence" have made significant strides in reducing this gap, there is still more work to be done to ensure that all students have equal access to high-quality education.

Another hurdle lies in the integration of technology within the classroom. Although many schools have embraced blended learning models, there remains a necessity for teacher training in technology utilization and for schools to allocate adequate resources to facilitate this approach.

Peering into the future, there exists substantial potential for further innovations in Israeli education. As the nation maintains its commitment to STEM education and invests in social and emotional learning, it's likely that new programs and methodologies will be developed to bolster these areas [3]. Moreover, in light of the significance underscored by the COVID-19 pandemic regarding remote learning, there are foreseeable opportunities for the enhancement and refinement of online learning tools and resources [1].

Innovation and inventive teaching strategies stand as pivotal catalysts in the evolution of contemporary educational systems. Israel has led the way in this domain, introducing successful programs and methodologies that have enriched student learning outcomes. While challenges persist, the potential for further innovation in Israeli education is substantial. As the nation continues to invest in STEM education, social and emotional learning, and technology within classrooms, one can

anticipate the emergence of fresh programs and approaches designed to support these areas, ultimately benefiting both students and the broader community.

As previously discussed, several key principles rooted in future-oriented pedagogy are integral in promoting innovative pedagogy. Among these principles, collaboration stands out as the most pivotal component within the innovation ecosystem.

Conclusions

Innovative pedagogy stands as a vital necessity in preparing students for the challenges posed by the 21st century. By constructing an innovation ecosystem within the realm of education, we can establish a nurturing framework that empowers both teachers and students to explore novel ideas and experiment with fresh teaching and learning methods. This, in turn, holds the potential to elevate student engagement, motivation, and academic accomplishments, fostering a culture of innovation that will yield lasting benefits for our schools and communities in the years ahead.

The Israeli Ministry of Education, the Israel Innovation Authority, and non-profit organizations have all played substantial roles in cultivating a culture of innovation in the sphere of education. Through the development of groundbreaking technologies, the adoption of design thinking frameworks, and the provision of resources and support for educators, Israel has risen as a global trailblazer in the field of education innovation. The triumph of Israel's innovation ecosystem serves as a valuable model for other nations striving to champion innovative pedagogy within their education systems. By investing in innovation and offering support to teachers and organizations dedicated to forging innovative teaching and learning approaches, countries can establish an innovation ecosystem that propels remarkable progress in education.

Challenges persist along the path to establishing an optimal innovative pedagogy. Nonetheless, extensive endeavors are underway in collaboration with educational institutions, governmental entities, entrepreneurs, and external corporations, all aimed at furnishing students with the skills essential for thriving and succeeding in an evolving reality.

To conclude, this article underscores the ongoing efforts directed at forging innovative pedagogy grounded in critical thinking tools, cutting-edge technologies, numerous programs, collaborations, and entrepreneurship. Israel remains in a developmental phase, with the innovative pedagogy sector still in the process of exploration and enhancement. Nevertheless, there exists a discernible eagerness and commitment to advance in this direction and deliver the most fitting response in accordance with forthcoming trends, chiefly through the vehicle of future-oriented pedagogy.

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