

greater awareness of the principles of proper and healthy eating, achieved through the processing of accessible and useful information from online content.

Thus, we note that Generations X, Y and Z have different food preferences, but common features in the formation of their diets. For example, the awareness of all three generations of the health and environmental benefits of plant-based food has formed their tendency to increase consumption of plant-based food: fruits, vegetables, and herbs.

In addition, all these generations prefer products with a “clean label”, without the addition of artificial colours and preservatives. This indicates that all of these generations want to be healthy through healthy eating.

REFERENCES

1. United Nations. (2021). World Population Prospects 2019. URL: <https://population.un.org/wpp/> (дата звернення 27.03.2023)
2. Euromonitor International. (2018). Health and Wellness Food and Beverages: Organic and Natural Trends Worldwide. URL: <https://blog.euromonitor.com/health-and-wellness-food-and-beverages-organic-and-natural-trends-worldwide/> (дата звернення 27.03.2023)
3. Mintel. (2019). Protein: A Powerful Trend in Food and Drink. URL: <https://www.mintel.com/press-centre/food-and-drink/protein-a-powerful-trend-in-food-and-drink> (дата звернення 27.03.2023)
4. Technomic. (2020). Gen Z Emerging. URL: <https://www.technomic.com/reports/gen-z-emerging> (дата звернення 27.03.2023)

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STEAM-EDUCATION IS A PROMISING AREA FOR THE DEVELOPMENT OF ENGINEERING AND TECHNICAL SCIENCES

Our world is becoming faster, more intense, high-tech and non-standard every day. The new challenges of a dynamic world pose difficult tasks for education: learning should be more interesting than other hobbies, knowledge should be practical and meet modern requirements, learning should be in an interesting form and should have a logical conclusion with obtaining a good job. Over the past few years, many different teaching methods have been developed, among which STEAM-education is one of the most effective.

STEAM-education is a system of education that stimulates the acquisition of knowledge and skills in technological scientific fields. This education is aimed at supporting creativity and innovative skills. The concept of STEM encompasses Science, Technology, Engineering and Mathematics and refers to educational programmes and professions that integrate knowledge and skills in these fields. STEM often involves reinforcing technical disciplines with humanities. The logical step was an attempt to implement such an association, to add the creative aspect of personal development to the purely technical concept of STEM. This is how systems emerged where art is present alongside science, technology, engineering and mathematics – the STEAM methodology. STEAM promotes the development of important attributes and skills: comprehensive understanding of problems; creative thinking; engineering approach; critical thinking, understanding and application of the scientific method; understanding of the basics of design. STEAM makes it possible to attach meanings to numbers and facts, without which it is difficult for a person to perceive information of various levels of abstraction for a long time, be it mathematical formulas, physical or chemical.

The acronym STEM was coined in 2001 by researchers at the US National Science Foundation to describe a trend in educational and professional fields. In Ukraine, the concept of the development of STEM-education was approved by the decree of the Cabinet of Ministers of Ukraine in 2020. Why is STEM/STEAM-education so relevant? The transition to European-level innovative education involves training a new generation of specialists capable of modern social mobility and mastering advanced technologies. Under the current conditions in Ukraine, the following are in demand: IT specialists, programmers, engineers, high-tech professionals, bio- and nanotechnology specialists. The urgent problem of engineering and technical sciences is the need for comprehensive training of specialists in various educational fields of natural sciences, engineering, technology and programming, areas covered by STEM-education [2].

The introduction of STEM-education will change our country's economy, making it more innovative and competitive. According to some estimates, involving

only 1% of the population in STEM professions increases the country's GDP by \$50 billion. And the need for STEAM specialists is growing 2 times faster than in other professions, because STEAM develops abilities for research, analytical work, experimentation and critical thinking [3].

An urgent problem for Ukraine in the teaching of engineering and technical disciplines is the introduction of elements of STEAM-education. Now there are many questions that need to be solved as a priority: updating the regulatory and legal framework; creation of a network of regional STEAM-centers (laboratories); development of scientific and methodological support and special teaching aids, training of scientific and pedagogical workers capable of realizing the tasks of STEM-education. This approach to education requires the formation of research competence in students: the ability to make independent observations, investigations, experiments, which primarily involves the ability to observe facts and events, independently formulate a research problem, express hypotheses, determine methods of testing hypotheses, determine regularities, determine methods of confirmation or refutation of hypotheses, draw conclusions. The successful development of STEM-education is carried out through cooperation in the learning and teaching process between pedagogical teams and external participants, such as higher educational institutions, academic research institutions, research laboratories, science museums, nature centers, enterprises, business structures, public and other organizations.

From the experience of the best national and world educational practices in STEM-education, the following modern forms of work are proposed: work on joint projects in a team; creation of own projects; debate clubs; hackathons; webinars; trainings; presentations. Working with STEAM-projects helps to integrate knowledge of informatics, physics, biology, engineering and technical sciences with modern societal problems and allows you to independently find and propose the latest solution [1, p. 28-31].

Is the future in creativity? The new approach is not exclusive: it is not the prerogative of "technology", "mathematics", "science" and "engineering". STEAM can be found in every aspect of life. The methodology can be applied to

almost any engineering and technical discipline. STEAM is a tool that helps students take the first step towards understanding the complexity of the world and realising the multilevel connections between different aspects of life.

REFERENCES

1. Patrykeyeva O. STEAM-education: conditions of implementation in educational institutions of Ukraine. *Education Management*. 2017. №1. P. 28-31
2. State Scientific Institution Institute for Modernisation of Education Content [Electronic resource]. – Access mode: <https://imzo.gov.ua/>
3. STEAM-education: an innovative scientific and technical system of education [Electronic resource]. – Access mode: <http://ippo.kubg.edu.ua/content/11373>

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DESIGN AND REUSE CYCLES

Environmental product design begins by eliminating environmentally troublesome materials. For instance, plated-metal parts are “designed out” to eliminate the potential hazards of plating, or the metal is coated in other ways. Paint and coating formulas now rarely use mercury fungicides or lead. Whenever possible, water-based paints eliminate the evaporation of organic solvents. The best way to handle hazardous waste is to have none. Design for disassembly (DFD) promotes remanufacturing and recycling. A well-publicized DFD automobile is BMW’s Z1 sportster. It uses pop-on, pop-off fasteners and thermoplastic parts, which can be recycled, in place of thermosets, which cannot. By contrast, the low recycle value of Japanese auto design and lower scrap-iron prices have recently driven Japanese “car cannibalizers” out of business [2].

BMW’s Z1 design extends the basic concept of Saturn. The cars’ underbodies have detachable plastic panels. A Saturn rammed by a pickup truck recently demonstrated an advantage of the design for repair. The body panels were removed, the underframe straightened, and the same panels remounted. Having a large number of parts obviously adds time to both assembly and disassembly. Well-