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STEAM APPROACH WITH A SICKLE VITAL SKILLS FORMATION: THEORY, PRACTICE AND UZBEKISTAN IN THE CONTEXT OPPORTUNITIES

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Abstract: This scientific in the article modern education paradigm important field - science, technology, engineering, art and mathematics integrated without of the STEAM approach to education theoretical-methodological basics and his/her students' 21st century life skills skills in formation The importance of the study is studied. international and national literature systematic analysis STEAM critical and creative thinking, complex problems solution to do, effectively cooperation and flexibility such as main competencies in development role scientific based on The article describes the STEAM approach Uzbekistan education in institutions current of reaching methodical model offer is done, its practical application for recommendations working Research results STEAM not only academic knowledge, but vital success for necessary was complex personal qualities in development effective pedagogical platform that shows.

Key Keywords: STEAM education, life skills, competence based approach, interdisciplinary integration, project based on learning, constructive pedagogy, Uzbekistan education.

Introduction

The problem relevance. Modern society " fourth" industry so- called "revolution" the period from the beginning is forgiving, in this artificial intellect, great data, robotics and biotechnology of life all to the fields enter In this situation education tasks fundamentally changing, not only traditional knowledge to occupy, perhaps complicated and fast variable in the world successful to live for necessary was complex skills - life competencies formation priority importance profession is doing. World Economic Forum (2023) reports stating that the future five year inside labor in the market the most much needed skills between analytical thinking, creativity, flexibility, failure study and technological literacy It stands. Exactly. this in the situation STEM (Science, Technology, Engineering, Mathematics) and from it advanced STEAM (Science, Technology, Engineering, Arts, Mathematics) approach globalization period education the most promising from directions to one is spinning.

Research problem. Uzbekistan Republic President Sh.M. Mirziyoyev's "Education" field further develop measures in the resolution "On" (2023) school education quality increase, students practical skills with arm and their innovative abilities develop priority task as However, the traditional education styles often sciences separate study, theory from practice distance and creativity restriction such as shortcomings save As a result, students many in cases theoretical to knowledge has even though they are real vital problems solution in doing I will use not getting problem Mayjud

The research The goal of the STEAM approach is theoretical-methodological aspects analysis so that it students vital skills in formation role determination and Uzbekistan education to the conditions suitable methodological model proposal to be

The research tasks:

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1. STEAM education evolution and theoretical the basics international in context analysis to do;
2. 21st century vital skills classification and their STEAM approach through develop mechanisms study;
3. STEAM- based of teaching methodical structure working exit;
4. In Uzbekistan STEAM current in the making opportunities and obstacles to determine;
5. Uzbekistan education institutions for practical recommendations system offer to be

The research novelty and theoretical importance: In the study first times Uzbekistan education context STEAM approach for vital skills formation to the tool rotating whole develop a methodological model International experiments local cultural, pedagogical and organizational conditions into account taken without customized.

Practical importance: Work results school teachers, methodologists, education managers and politicians for To STEAM based lessons planning and in the transfer manual task transition, also education policy working on the way out scientific basis to be possible.

Research methodology

This in research complex methodological approach used, then following methods integrated:

Research design. Research mixture design based on take went, then good quality and quantitative analysis methods combination applied. Main attention good quality to analysis aimed at although, there is statistic information and research results quantitative also in terms of It was released.

Data collection methods:

- **Systematic literature Systematic Literature Review: 85** international studies published between 2010 and 2023 and local scientific article, monograph, dissertation, conference materials and times documents selectively taken, analyzed was done.
- **Documents analysis to do (Document Analysis):** Uzbekistan " Education " of the Republic "about" The law, " New Uzbekistan Progress Strategy ", Uzbekistan Republic People education of the ministry software documents deep studied.
- **Comparative analysis (Comparative Analysis):** USA, Finland, Singapore, South Korea and Uzbekistan To STEAM related education policies and practices compared.
- **Logical Logical Construction:** STEAM approach theoretical basics logical in the system built.

Data analysis to do methods:

- **Content Content Analysis:** Home concepts, their mutually relations and research results systematized.
- **Analysis:** Literature from the analysis come came out without main separate topics (themes) taken and analysis was done.
- **Theoretical sample build (Theoretical modeling):** Uzbekistan to the conditions compatible STEAM model working It was released.

The research limitations:

- Local in context empirical research enough not;

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- There is of literature most English in the language to be, Uzbek in the language sources relatively few;
- Pandemic period STEAM online in format done increase experience requires learning, which and separately requires research.

Literature analysis

STEAM education conceptual evolution of the STEM term first times in the 1990s in the USA by the National Science Foundation (NSF) (Sanders, 2009). Initially it was an economic progress and technological competitiveness provision tool as In the early 2000s, Georgette Yakman (2010) introduced the element "arts" adding STEM To STEAM convert the idea previously pushed. Yakman's stating that art not only figurative art, maybe humanitarian sciences, language, culture and creative of the sectors wide circle own inside takes.

Modern researchers STEAM not interdisciplinary, but from sciences (Liao, 2016). In this sciences between traditional borders disappears and knowledge organic accordingly synthesized.

Vital of skills theoretical " The basics of life. "The concept of" life skills" World Health Save Introduced by the World Health Organization (WHO) in the 1990s was originally called "psychosocial" as "abilities" interpretation done. Currently this concept wider in the sense of - person of life different in the fields effective activity to conduct for necessary was cognitive, emotional and practical abilities set as is considered.

The Partnership for 21st Century Skills (P21) is an organization that promotes 21st century skills. following to categories was:

- **Learning and innovation Skills:** Critical thinking, problems solution doing, creativity, innovation, communication, collaboration.
- **Information, media and technology literacy.**
- **Life and career Skills:** Flexibility, initiative, creativity orientation, leadership, cultural competence.

STEAM and vital skills International research STEAM approach following skills in development effective that shows:

Connor and etc. (2015) longitudinal study conducted this showed that in STEAM programs participated students:

- Problems solution 40% higher in making to efficiency achieved;
- Group in projects active participation to grow level 2 times increased;
- Self-esteem assessment and reflection abilities noticeable at the level improved.

Burke (2014) experimental STEAM programs in research students standardized in tests increased results by 15-25%, the most importantly, students to school was interest and motivation sharp increased determined.

Local research. Local research relatively new in stages:

- Kasimova et al. (2020) STEM education in Uzbekistan initial status describe it develop their ways offer did;

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- Yuldashev (2021) in education modern technologies in the context of To STEAM place gave;
- Uzbekistan Republic People education Ministry (2022) first official "STEAM education: directions and opportunities" methodical the manual publication reached.

With this together, local in literature STEAM vital to skills impact according to deep empirical research almost absence determined.

STEAM approach through formable main vital skills analysis

Analytical and critical Analytical & critical thinking. STEAM activities empirical research, data analysis to do, the results interpretation to grow and reasonable conclusions For example, "Urban environment in the" improvement "project students of the air pollution level measurement (science), data on the graph expression (mathematics), pollution sources to identify (technology), a problem solution to do for device design (engineering) and solution aesthetic aspects into account from the processes of (art) They pass. This process every one stage critical requires consideration.

Creativity and Creativity & innovation. Art component STEAM heart is. Robinson (2011) As noted, " Creativity is original and valuable ideas create ability ". In STEAM creativity not only artistic expression, maybe to problems unconventional approach, experiment to do courage and there is from knowledge new combinations create is the ability. In the "Robot Theater " project students the robot programming (technology, engineering), its movements calculation (mathematics), stage design (art) and physics laws into account to obtain (science) through innovative solution they create.

Complex problems solution Complex problem solving. STEAM problems real vital to the context has They will be often clear solution no (ill-structured), many aspect and interdisciplinary requires an approach. For example, "School the kitchen" improvement problem of food chemical composition (chemistry), food value (biology), costs (mathematics, economics), cost of dishes ergonomics (engineering) and of food like the appearance (of art) many aspects own inside Students engineering design through the cycle (identify, design, create, test, improve) problem systematic solution to reach they learn.

Effective cooperation and Collaboration & Communication. Over 80% of STEAM activities team work in the form of take (Morrison, 2006). Different ability, interest and cultural come to go out has was students one project on work via:

- Own ideas clear and reliable expression;
- Others point of view his/her opinion active listen and respect to do;
- Disagreements and conflicts constructive solution to do;
- Purposeful team to compose and role distribution they learn.

Flexibility and adaptability & resilience. True innovations often first in an attempt done the STEAM approach failure of learning natural stage as acceptance does. Dweck (2006) " growth " of to the concept of "growth mindset" suitable STEAM students from failure not afraid of mistakes lesson to take and consistent stay skills The project unsuccessful When finished, students will ask " what wrong " Did you go ?", " this how correction " Is it possible ?" questions through reflection to do they learn.

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Digital digital literacy. Modern STEAM activities programming, 3D modeling, data visualization, robotics and artificial intellect with to work own inside these students not only "consume" technology to do ", maybe to the level of "creating" and "managing" it take comes out.

Uzbekistan education STEAM approach in the system done increase model

Model's theoretical Basics. Proposal the current model is constructivism, active study, project based on education and culturally relevant pedagogy principles the model is based on the strategic plan " Uzbekistan 2030". goals and " New" " Uzbekistan " spirit customized.

Model's structural parts.

A. School level infrastructure:

1. **STEAM centers:** Each in the district at least one, big in cities every STEAM lab for a district.
2. **Equipment:** 3D printers, robotics packages, programming platforms, sensors, design materials.
3. **Digital resources:** Local STEAM platform, virtual labs, Uzbek in the language content.

B. Curriculum and planning:

1. **Integrated program:** Current science programs interdisciplinary dependency principle based on again see exit
2. **STEAM modules:** Traditional to sciences additional accordingly special STEAM modules (2-4 hours per week).
3. **Subject centered approach:** Education year 3-4 main ones during topic (for example, " Smart" city ", " Sustainable village ", " Healthy life ") projects.

C. Teacher preparation:

1. **Step by step base:**

- ✓ Level 1: STEAM Basics according to public online courses;
- ✓ Stage 2: Regional training in the centers practical training;
- ✓ Level 3: Master's degree teachers preparation and they through multiplication

2. **Permanent development:** STEAM communities, mentoring programs, regular workshops.

D. Education process organization:

Example: " Smart " Greenhouse " project (grades 7-8)
1. Problem detection: local vegetable working to release how increase possible ?
2. Research: plants growth, climate, soil conditions (biology, geography).
3. Design: greenhouse model, automatic irrigation system (engineering, technology).
4. Accounting: costs, benefits, resources expenditure (mathematics, economics).
5. Design: greenhouse and of products aesthetic appearance (art, design).
6. Create: 3D model or real prototype to make
7. Testing and improvement: experience transfer, results analysis to do
8. Demonstration and assessment: local farmers, parents in front of presentation.

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E. Evaluation system:

- **Portfolio assessment:** Project journals, video diaries, prototypes.
- **Skills directed Rubrics:** Each vital skill for clear criteria.
- **Self-esteem assessment and mutually assessment:** Reflection and constructive idea exchange.
- **Real world price:** The project practical results and to society impact.

Stepwise current to grow strategy:

- **2024-2025 (pilot phase):** 50 innovative at school test current to grow;
- **2026-2027 (expansion):** All province in the centers schools cover to take;
- **2028-2030 (summary):** Whole country along systematic current to be

Offer being done solutions:

1. **Modeled table:** "STEAM blocks " - per week one day or one how many hour sciences integration for separation
2. **Public-private partnership:** Companies can use STEAM labs in furnishing participation to reach attraction to do
3. **Support schools System:** Each in the area leader schools surrounding to schools resource center become service to do.
4. **Parents with performance:** STEAM importance about regular information to give, open lessons, festivals and exhibitions organization to be
5. **Alternative assessment:** Local STEAM competencies in context assessment tools working exit

Conclusion and offers

Home Conclusions:

1. The STEAM approach is not only sciences integration, but also the vital 21st century skills of formation systematic is a platform.
2. International experience STEAM critical thinking, creativity, problem solving solution to do, cooperation and flexibility such as main competencies effective development shows.
3. In Uzbekistan STEAM current to grow for positive political will, partially infrastructure and teachers to change readiness Mayjud
4. Successful current to grow for systematic approach, step by step done increase and all interested the sides attraction to do necessary.

Practical suggestions:

1. **Legislation at the level of:** "STEAM education about " special" decision acceptance to be done and him/her Uzbekistan's "2030" development to the strategy integration.
2. **Education policy at the level of:** National STEAM standards, curriculum, and teacher preparation standards working exit
3. **School at the level** of: Each STEAM development at school plan working exit and him/her public to the discussion to put
4. **Teachers for:** STEAM permanent professional development system creation, international exchange programs expansion.

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5. **Research direction as:** STEAM Uzbekistan under the circumstances efficiency study for research projects financing.

Future research directions:

1. Uzbekistan in schools STEAM current of reaching far term impact study
2. The STEAM approach different young in groups psychological-pedagogical efficiency to determine.
3. STEAM competencies and labor market requirements between correlation study
4. Village and city in schools STEAM current of reaching to oneself typical features to determine.

The STEAM approach is the future from today of construction pedagogical It is not only students modern to professions prepares, maybe them complicated in the world trail creative, creative and responsible to citizens turns. Uzbekistan STEAM is not only for education quality increase, maybe new the economy building, innovation develop and globalization under the circumstances own instead to find important is a factor. On this path every one step our country to the future investment is considered.

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