GLOBALIZATION OF EDUCATION: MODERN EXPERIENCE

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Summary

The article deals with the contemporary situation in education sphere in terms of globalization process, describing the key aspects of the globalization of education as well as the main aspects of STEM implementation. The article analyzes the positive sides of educational globalization, the main educational systems that are widely accepted all over the world, the importance and necessity of STEM learning strategy which provides students mainly with an interdisciplinary approach to learning. Both the advantageous and disadvantageous issues of this learning approach are revealed in the article. The peculiarities of STEAM learning method have also been emphasized. In the course of the study, it has been discovered that modern educational system faces lots of challenges and needs to be improved by implementing an interdisciplinary approach to learning such as STEM education. It promotes not only soft skills such as critical thinking, problem solving, higher-order thinking, but also behavioral competencies such as adaptability, cooperation, organization, and responsibility. Modern international educational projects and programs are presented in the article which represent a diverse range of approaches and goals.

Key words: globalization, STEM, educational systems, educational projects.

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1. Introduction

Globalization generally refers to the process of increasing interrelation and interdependence among people, economies, and nations across the world. Currently, the problem of globalization occupies an important place in scientific research. The significance of its study is due, on the one hand, to the growing socio-economic and cultural-political importance of understanding the positive and negative consequences of globalism; on the other hand, to the insufficient scientific development of this issue in specific areas of activity. The study of the advantages and disadvantages of globalization becomes especially relevant in the educational sphere, which is responsible for human development, and at a higher level of generalization – for the formation of human being. Analyzing the diversity of globalization manifestations, it can be noted that its main essential feature is to bring various national ideas and systems under the same institutional rules.

Analysis of current scientific research and publications. It is no coincidence that since the 70–90s of the last century, special attention in the scientific community began to be paid to the study of changes taking place in national educational systems under the influence of globalization processes.

There have been many scholars, educators, critical theorists and researchers who have extensively studied the global context in pedagogical activity. Some of the most well-known and influential scholars in this field are Paulo Freire, Michael Apple, Henry Giroux, Gloria Ladson-Billings, Yrjö Engeström.

Their works present the importance of engaging with students, emphasize the role of education in promoting social justice and human liberation, focus on the ways in which education can challenge existing power relations, emphasize the importance of developing critical consciousness among students. Much attention has been paid to the relationship between education, democracy, and social justice, the relationship between race, culture, and education. The concept of activity theory has also been developed, which emphasizes the importance of understanding the social and cultural context in which learning occurs and focused on the ways in which educational practices are shaped by broader societal and cultural forces, and he has emphasized the importance of developing more collaborative and participatory forms of education.

Overall, the study of the global context in pedagogical activity is a rich and diverse field that has been influenced by many scholars and researchers from around the world.

The purpose of the article is to analyze trends and prospects for the development of science and education in the context of globalization. In accordance with the goal, the following research objectives were identified:

1) determine the essence of the problem of globalization of education and its key aspects;
2) consider the present educational systems and models;
3) specify the importance of STEM/STEAM system introduction;
4) focus on modern projects in the educational process

2. The essence of the education globalization

Globalization refers to the process of increasing interconnection and interdependence among people, economies, and nations across the world. Here are some key aspects of globalization: economic (increasing integration of markets, production, and financial systems across the world), cultural (diffusion of cultural products, such as music, art, and movies, as well as the adoption of global norms and standards), political (increasing interconnectedness of national governments), technological (spread of technology and information across borders), social (increasing interconnectedness of individuals and social groups across national borders), educational (increasing internationalization of education systems and the spread of educational practices and ideas across national borders). It involves the growing use of global educational standards, the development of international student mobility, and the emergence of transnational educational institutions. When taken together these key aspects of globalization reflect the growing interconnection and interdependence of the world's economies, societies, and cultures. While globalization has brought many benefits, such as increased economic growth and cultural exchange, it has also given rise to many challenges, such as growing economic inequality, cultural homogenization, and environmental degradation.

The globalization of education refers to the increasing interconnection and interdependence of education systems, institutions and individuals worldwide. It involves the exchange of knowledge, skills and ideas, as well as the internationalization of educational programs, policies, and practices. Here are some key aspects of the globalization of education:

– *Cross-border mobility*: The globalization of education has led to increased cross-border mobility of students, teachers, and researchers. This includes students studying abroad, international collaborations between universities and research institutions, and the recruitment of international faculty and staff.

– *Internationalization of curriculum*: Many educational institutions have internationalized their curricula by incorporating global perspectives, languages, and cultural experiences into their courses. This prepares students to live and work in an increasingly interconnected world.

– *Collaborative research*: The globalization of education has led to increased collaborative research among scholars from different countries and disciplines. This has helped to address global challenges and has resulted in the development of new knowledge and innovations.

– *Global education policy*: The globalization of education has led to the development of global education policies, such as the Sustainable Development Goals, which aim to promote equitable and quality education for all. International organizations, such as UNESCO, also play a key role in setting global education standards and promoting education as a human right.

– *Internationalization of credentialing*: The globalization of education has led to the internationalization of credentialing, with increasing recognition of degrees and qualifications across borders. This has facilitated the mobility of students and professionals and has contributed to the growth of a global knowledge economy.

– *Technology and online learning*: The globalization of education has been accelerated by advances in technology and the growth of online learning. This has made education more accessible and affordable to learners around the world, and has facilitated the exchange of knowledge and ideas across borders.

– *Cultural exchange*: The globalization of education has led to increased cultural exchange and understanding, as students and scholars from different countries and backgrounds come together to study, research, and collaborate. This has contributed to the development of a global community of learners and has helped to break down cultural barriers and stereotypes.

– *Skills development*: The globalization of education has helped to develop the skills needed for success in a globalized economy, such as intercultural communication, language proficiency, and adaptability. This has prepared students to work and live in an increasingly diverse and complex world.

– *Global citizenship*: The globalization of education has promoted the development of global citizenship, encouraging individuals to take responsibility for their actions and to contribute to the well-being of the global community. This includes promoting values such as human rights, sustainability, and social justice.

– *Economic benefits*: The globalization of education has contributed to economic growth and development, as education is a key driver of innovation, productivity, and competitiveness. It has also created new opportunities for businesses and entrepreneurs, as well as increasing demand for education services and products.

The essence of the globalization of education is the recognition that education is an essential driver of economic, social, and cultural development in a globalized world. By promoting cross-cultural understanding, knowledge exchange, and international collaboration, the globalization of education can help to address global challenges and promote a more peaceful and equitable world.

3. The education systems in the modern world

There are several basic models of education systems that are used around the world. Here are five of the most common models:

– *Centralized model*: In a centralized model, the government or a central authority has control over all aspects of the education system, including curriculum, funding, and staffing.

This model is often associated with countries that have a strong centralized government, such as China.

– *Decentralized model*: In a decentralized model, individual schools or local authorities have greater control over the education system. This model is often associated with federalist countries, such as the United States, where each state has control over its own education system.

– *Progressive model:* In a progressive model, the focus is on developing the whole child and encouraging critical thinking, creativity, and collaboration. This model emphasizes experiential learning, project-based learning, and student-centered teaching methods. This model is often associated with countries such as Finland.

– *Vocational model:* In a vocational model, the focus is on preparing students for specific careers and developing practical skills. This model often includes apprenticeships, internships, and work-based learning opportunities. This model is often associated with countries such as Germany.

– *Religious model:* In a religious model, education is closely tied to religion and religious values. This model often includes religious instruction and the integration of religious values into the curriculum. This model is often associated with countries where religion plays a significant role in society, such as Saudi Arabia.

These are just a few examples of the basic models of educational systems that exist around the world. In reality, most countries use a combination of these models, and education systems are constantly evolving in response to changes in society, technology, and the needs of students *(Holovina, Kamenova, 2021).*

Determining the effectiveness of a particular educational model can be a complex process that involves multiple factors. Here are a few key considerations:

– *Learning outcomes:* One of the most important factors to consider when evaluating the effectiveness of an educational model is the learning outcomes of the students. This includes academic achievement, critical thinking skills, creativity, problem-solving skills, and other outcomes that are important for success in the real world.

– *Student engagement:* Another important factor is student engagement. An effective educational model should be able to engage students and motivate them to learn. This includes creating a positive learning environment, providing relevant and meaningful learning experiences, and giving students a sense of ownership over their learning.

– *Teacher effectiveness:* The effectiveness of an educational model can also be influenced by the quality and effectiveness of the teachers. Teachers play a critical role in delivering the curriculum, engaging students, and creating a positive learning environment.

– *Student diversity:* It is also important to consider the diversity of the student population when evaluating the effectiveness of an educational model. Effective models should be able to accommodate a wide range of learning styles, cultural backgrounds, and socio-economic levels.

– *Resources:* Finally, resources can also impact the effectiveness of an educational model. Resources include things like funding, technology, and support services. Effective models should be able to make the best use of available resources to create a positive learning environment.

In order to evaluate the effectiveness of a particular educational model, it is important to gather data and feedback from various sources. This can include student assessments, surveys, and feedback from teachers, parents, and other stakeholders. It is also important to consider the context in which the model is being used, as different models may be more effective in different settings.

4. STEM Education Initiative

One of the most popular education strategies in the world is STEM education. STEM (Science, Technology, Engineering, and Mathematics) education appeared in the United States in the early 20th century. At that time, the US was experiencing a period of rapid technological innovation and economic growth, and there was a growing need for workers with skills in these areas.

The first formal STEM education programs in the US were established in the early 1900s, with the aim of training students in the skills needed for industrial and technological jobs. One of the earliest such programs was the Manual Training School, established in St. Louis in 1880, which taught students skills in woodworking, metalworking, and drafting.

In the years that followed, STEM education became more widespread in the US, with many public schools and universities establishing science and engineering programs. In the 1950s and 1960s, the US government began to invest heavily in STEM education, with the launch of programs such as the National Science Foundation and the National Aeronautics and Space Administration (NASA).

In the decades that followed, STEM education in the US continued to evolve, with a growing emphasis on interdisciplinary approaches and hands-on learning. Today, STEM education is a major priority for the US government and many private organizations, with the aim of preparing the next generation of workers for careers in science, technology, engineering, and mathematics *(U.S. Department of Education, 2022)*.

Gradually, new disciplines were added to the STEM program, and new letters were added to its name. So, STEM turned into STEAM, and later into STREAM. The addition of the "A" in STEAM and the "R" in STREAM reflects a recognition that incorporating the Arts and Robotics into STEM education can enhance students' learning experiences and better prepare them for the challenges of the future.The inclusion of the Arts in STEAM education acknowledges that creativity and design thinking are important components of innovation and problem-solving. Educators hope to encourage students to think outside the box and explore different ways of approaching complex problems *(Nikitina, Ishchenko, 2022)*.

The addition of Robotics to STREAM education recognizes the increasing importance of automation and robotics in various industries, as well as the need for individuals with strong technical skills in these areas. Incorporating robotics into STEM education can help students develop an understanding of robotics principles and technologies, and build skills in programming, engineering, and problem-solving.

Overall, the introduction of these new acronyms represents a broader approach to STEM education that seeks to integrate multiple disciplines and emphasize the importance of creativity, design thinking, and technical skills in preparing students for the challenges of the future.

STEM careers are in high demand and are expected to grow in the coming years. Pursuing a STEM education can lead to greater job opportunities and job security. STEM jobs typically pay well, with many of them offering above-average salaries. STEM education emphasizes critical thinking and problem-solving, which are essential skills in many fields. STEM education encourages creativity, innovation, and experimentation, which can lead to breakthroughs in science, technology, engineering, and mathematics. STEM education often involves working collaboratively on projects, which can help develop teamwork skills. With technology playing an increasingly important role in our lives, STEM education can help students become more proficient with technology and better prepared for the future.

STEM education is also an important focus in many European countries.

Many STEM education initiatives in Europe involve partnerships between schools, universities, and industry partners. This can provide students with access to the latest technology and expertise, and can help to bridge the gap between education and industry. European countries have invested in teacher training programs to support STEM education, with the goal of improving the quality of instruction and increasing student engagement and interest in these fields.

Like in the US, there is a growing recognition in Europe of the need to increase gender diversity in STEM fields, and many initiatives have been launched to address this issue *(Skyba, Tkachenko, 2021).* These efforts aim to increase the participation of underrepresented groups, such as women and minorities, in STEM education and careers.

While STEM education has many benefits, there are also some potential drawbacks or limitations that should be considered:

Lack of diversity: STEM fields have historically been dominated by men and people from certain racial and ethnic backgrounds, leading to a lack of diversity in the field. This can create a cultural and social gap that can make it harder for some students to succeed or feel included.

Emphasis on memorization: Some STEM curricula may prioritize rote memorization of formulas and equations over critical thinking, creativity, and problem-solving skills. This can lead to a narrow view of the subject matter and may not adequately prepare students for real-world problem-solving.

Limited focus on soft skills: STEM education often places a heavy emphasis on technical skills and knowledge, but may not provide enough emphasis on developing soft skills such as communication, teamwork, and leadership. This can be a disadvantage for students who may have strong technical skills but lack the interpersonal skills needed to succeed in a collaborative work environment.

Lack of relevance to students' lives: STEM education can sometimes seem disconnected from students' daily lives and experiences, leading to disinterest and disengagement. It may also fail to address important social issues and the impact of science and technology on society.

Cost and access: Access to quality STEM education can be limited due to cost and geographic location. This can create barriers for students from low-income families or rural areas who may not have access to the same resources and opportunities as students in more affluent or urban areas.

5. Modern international education projects and programs

In solving the problems of world education, major international projects and programs are becoming important, since they necessarily involve the joint participation of education institutions and teachers representing various education systems.

There are several large international education projects that have been launched in recent years. Here are some examplesof them that are well-known and have a significant impact on education globally:

United Nations Sustainable Development Goals (SDGs): The SDGs are a set of 17 goals adopted by the United Nations in 2015 to promote sustainable development around the world. One of the goals is to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

International Baccalaureate (IB) Programme: The IB Programme is a comprehensive and rigorous educational programme for students aged 3 to 19. It is designed to develop the

intellectual, personal, emotional, and social skills students need to live, learn, and work in a rapidly globalizing world. The programme is recognized by universities and employers around the world.

Global Partnership for Education (GPE): The GPE is a multilateral partnership that works to improve education in developing countries. It provides financial support to countries to help them build more effective and equitable education systems.

Open Educational Resources (OER): OER is a global movement to provide free and open access to education resources and materials, such as textbooks, lesson plans, and online courses. The goal is to increase access to education and improve learning outcomes for students around the world.

Teach for All: Teach for All is a global network of independent organizations that recruit and train young professionals to teach in underserved communities around the world. The goal is to ensure that all children have access to quality education, regardless of their background or socio-economic status.

UNESCO: The United Nations Educational, Scientific and Cultural Organization (UNESCO) is a specialized agency of the United Nations that promotes education, science, culture, and communication around the world. UNESCO is responsible for several initiatives, including the Education for All program and the Global Education Monitoring Report.

Erasmus+ Programme: The Erasmus+ Programme is a European Union initiative that provides funding for education, training, youth, and sport projects across Europe. The program aims to support the development of skills and competencies, promote social inclusion, and increase opportunities for young people.

PISA: The Programme for International Student Assessment (PISA) is a global survey that measures the performance of 15-year-old students in reading, mathematics, and science. The survey is conducted every three years by the Organisation for Economic Co-operation and Development (OECD), and it provides a way for countries to compare their education systems and identify areas for improvement.

Education First (EF): EF is a global education company that offers language courses, cultural exchange programs, and educational travel opportunities. The company operates in over 100 countries and serves over 15 million students each year. EF's mission is to break down barriers of language, culture, and geography to create a more connected and open world.

These programs are just a few examples of the many international initiatives that exist to promote education and learning around the world. These programs are aimed at improving access to education, promoting equity and inclusion, and preparing students to succeed in an increasingly globalized world. They represent a diverse range of approaches and goals, but all share a common commitment to providing access to quality education for all.

6. Conclusions

The globalization of education is a complex and multifaceted process that involves the exchange of knowledge, skills, and ideas across borders. The key aspects of education globalization such as cross-border mobility, collaborative research, global education policy, cultural exchange and many others have been described. Globalization process has many benefits, including increased cultural exchange, skills development, and economic growth. However, it also poses challenges, such as ensuring equitable access to education, maintaining quality and standards, and addressing cultural differences and barriers.

Among the numerous education systems we have chosen the five that are widely accepted in the contemporary world and present our view on the effectiveness of a particular educational model.

Much attention has been given to one of the most popular education strategies nowadays – STEM education. Benefits and drawbacks of this system, the process of transforming it into STEAM and then STREAM have been described.

Having analyzed the key aspects of the process of globalization in the sphere of education it is vitally important to view the **i**nternational educational projects and programs which to promote education and learning around the world and should facilitate the educational process, provide free and open access to educational resources, support the development of soft skills and competencies and give the students the opportunity of cross-border mobility to enjoy the benefits of globalized learning.

As the world becomes increasingly interconnected, the globalization of education will continue to be an important driver of progress and development.

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