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Improving the methodology of developing the creativity competence of elementary school students (in the example of the subject of computer science and information technology)

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Abstract: *STEM education is a teaching and learning approach that is a unique combination of* ***Science, Technology, Engineering, and Mathematics.*** *To be precise, STEM education primarily focuses on hands-on and problem-based learning methodology. STEM emphasizes developing logical and critical thinking skills by allowing students to learn and understand things from the perspective of the real world. STEM education equipped students with the skills that are required to succeed in their respective careers whether it be in jobs, entrepreneurship, etc.*

Keywords: STEM,Technology,Engineering,Mathematics,Informatics

Introduction

Importance Of STEM Education in the 21st Century:

With **STEM (Science, Technology, Engineering, and Mathematics)**, it is not the teaching of one subject but rather the amalgamation of all four subjects as a comprehensive one through an interdisciplinary curriculum. This helps students to deal with real-world situations and apply their learnings to create, innovate and discover new things. Also, it has been proven that students who adopt the STEM learning approach have better possibilities of getting placed at good companies, achieving the goals of their life contributing to the environment, etc.

Benefits of STEM Education:

As we read above that stem education is quite important these days and has many benefits let's take a look:

1. Enhance Critical Thinking

STEM education is a very important aspect of student's life as it teaches them to solve problems effectively. Students who are accustomed to STEM education at an early age learn to analyze challenges and are able to develop strategies to tackle them.

2. Motivates Experimenting

In the last couple of decades, it has been noticed that STEM education provides a healthy environment and encourages students to try new things. Children who are part of STEM education learn the importance of failure and how to tackle it without getting affected.

3. Teamwork

STEM education is best for team-building activities and it helps students from every level to work together. They come together and find solutions to the problem discuss with each other, record data, give presentations, write reports, etc. In the end, they come to know the importance of working with each other and, flourish in a complete team-building environment.

4. Boosts Curiosity

This is one of the most vital **features of STEM education**. Students who are made habitual of this type of education since childhood, develop curiosity and innovation as their regular habits. This type of education enhances the critical way of thinking and empowers them to ask questions.

5. Enhances Problem Solving Skills

With the enhancement of critical thinking, students also learn problem-solving skills. By **adapting STEM education from an early age** children learn the ways of examining problems. Children can also create amazing plans to solve problems. Also, it helps students to look at the bigger picture and not from the smaller aspect.

Objectives Of STEM Education:

These are the objectives of STEM education, take a look:

1. Meeting Demand For Highly Skilled Professionals

To stay afloat in the market, companies hire the best talent pool to help them stay competitive and relevant. People with 21st-century skills as well as **STEM skills** are the most sought-after. According to many researchers, there is a rise in professions that require STEM skills. Besides, who doesn't want skilled people that would require very less time to adapt to the new environment? Therefore, **stem education** is playing a crucial role in determining the future of the youth and their employability.

2. Skill Development

Living in the digital age it is pertinent to say that technology has become an integral part of living therefore the students skilled in digital technology are going to be beneficial. Having faced the coronavirus lockdown almost every student was forced to switch to online platforms to impart knowledge. Students are now accustomed to learning online in the comfort of their place. Likewise, STEM education also helps students develop skills like critical thinking, creative thinking, digital literacy, spatial reasoning, etc.

3. Helps To Create Equality

There is no gender of subjects. However, people attach genders to subjects as well as to occupations. This is one of the major reasons behind the skewed gender ratio as one advance towards executive and leadership roles. This gender gap can be met by **introducing STEM courses** at an earlier age. Girls along with boys can then develop 21st-century skills and increase their employability rate. Furthermore, providing equal opportunities for each student towards exploring technologies through an integrated and interdisciplinary educational approach will take the world to the next level.

Components of STEM Education :

#Attentive Learning

Learning attentively is quite a vital component of STEM education as it encourages students to think deeply and create a few assumptions in order to memorize things properly.

#Personalized System of Learning

In this, there are various methods of learning such as the shift method which is provided by the instructor in this the students have a choice of learning things at their pace, choosing subjects according to their choice, and giving exams accordingly.

#Problem-Based Learning

This is a simple way in which students collect various data from the things they come across in their daily life and analyze it. They can come up with different solutions by applying scientific, mathematical, or technological approaches.

#Connecting with a Bigger Level of Community

Students are made extroverts who can connect with a large number of people and share their ideas with them. It also helps them in learning several new things thus making them ambitious along with taking a look at various perspectives.

Pros and Cons of STEM Education:

Here are some of the prominent pros and cons of STEM education listed below:

Pros of STEM Education:

- *Widens career opportunities*
- *Develops resilience*

- *Develops communication, critical thinking, cognitive skills, etc.*
- *Allows to understand the practical application of concepts*
- *Helps in preparing students for future workforce*
- *Helps in promoting gender equality*

Cons of STEM Education

- *No proper guidelines/set of protocols*
- *Might be costly*
- *Requires a significant amount of time*

Why is STEM Important in Early Childhood Education?

Schools play a vital role in imparting knowledge to students. After all, a person spends nearly 1/5th of his/her life going to school. **STEM education focuses on building habits that will help children throughout their lives, from critical thinking skills, problem-solving and creative thinking to computation and interpersonal skills.** They learn how to apply all of these to their daily life for building a better world around them.

1. Elementary School

One might think that students under 5 years of age can do little when it comes to STEM. However, researchers have found that children in this age bracket are exceptionally quick learners and exhibit great creative and technical abilities. Hence, at this stage, a brief **introduction to STEM** courses along with future career options are discussed. Its primary focus is on standards-based structure, inquiry-based and real-world problem-based learning, connecting all four STEM subjects. The objective is to arouse students' interest and curiosity to pursue these courses without forcing them.

2. Middle School

The courses are designed in such a way that the students are curious to learn more. The objective here is to make them learn 'how' to learn not 'what' to learn. This enables them to pursue their interests early on while also being aware of the career options available to them after taking STEM courses.

3. High School

Students are in their teens during High School. Therefore, this is the time when they are searching for their identity and trying to make career choices. Hence, the programs focus on the application of the subjects in a challenging and rigorous manner. Along with that students are also guided for post-Secondary Education and employment.

Making Sense of 'STEM Education' in K-12 Contexts:

K-12 education is a short form used for classes from kindergarten to 12th grade and STEM has a lot of importance during those years. **K-12 STEM education** keeps children connected with the real world from a small age. It also helps in motivating students to learn new things, improves their interest, and makes them persistent in completing their tasks. The incorporation of STEM education in K-12 increases the standard of the things taught and helps children to choose careers in STEM-related fields.

Career Opportunities after STEM Education:

Well, it is one thing to **study STEM** and other to find jobs that are lucrative enough to give you reasons to keep doing what you are good at. So, here's a list of career opportunities you can make after completing STEM courses.

- **Software Engineer –** From designing, and developing to implementing software for all types of platforms, software engineers are always under the spotlight. The online world is hence the world made by these techies.
- **Cloud Architect –** From the initial design through the building stage, cloud architects deal with cloud-based technology and platforms. They are the ones who take care of the platforms once they are up and running.

- **Web Developer –** Today, every company has its website and all of them give their customers the best website experience. Web developers work on the front and back of websites to ensure they operate in the desired way for a good user experience. Coding is the basic need for becoming a web developer.
- **IT Manager –** An IT manager's role is similar to any other manager's role, however, the only difference is that they look after all the work done in the IT department of a company to support the organization's technology needs.
- **Astronomer –** Fascination with celestial objects offers lucrative and interesting courses and professions in astronomy. Students take courses in calculus, astrophysics, astronomical techniques, and mechanics to further choose their career paths as college faculty members, a job at federal laboratories, and other aerospace sectors.
- **Electrical Engineer –** Electrical engineers work from improving and creating electrical systems and devices to improving the human experience. These are other sought-after engineers as they shape everything from iPads and GPS navigation hardware to hydro, wind, and solar power generation systems.
- **Geologist –** Career options in urban planning, mining and resource extraction, and primary education are opted for after doing courses in geology. Gaining knowledge of the planet's surface and other related things help improve the ability to understand nature and its workings.
- **Mechanical Engineer –** With the increase in mechanization, there is a growing need to research, design, develop, build, and test mechanical and thermal sensors and devices, including tools, engines, and machines. This is where mechanical engineers take the charge and help in the advancement of the entire industrial system.
- **Actuary –** Though most of the calculative and analytical work can now be done by machines. But there would still be a need for exceptional brains to assess and manage financial risk by implementing statistical, financial, and mathematical theories.
- **Doctor** – Doctors are the professionals who are responsible for seeking out several methods to restore the health of patients. **STEM education** also helps in building a career in the healthcare field by stimulating the medical essentials studied in high school.
- **Scientists** – They are the people who are responsible for conducting scientific research in the area of advanced knowledge and trying to understand the world from a different perspective. STEM education helps people in building careers as scientists by improving their cognitive, critical, and experimenting skills.

Conclusion

Now that you know a lot about **STEM education** and its prospects, you can make better decisions for yourself and your loved ones' careers. One thing that you need to keep in mind is that in this era, the more you work on honing your skills, the better it would be to give you an edge over others. So, if you are opting for honing your **STEM skills** then be assured that you'll get myriad opportunities in the market that will provide lucrative salaries, wonderful job cultures, and exceptional growth rates.

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