Integrating Steam in English Language Classrooms (K1-K2)

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Abstract: The article deals with the issues based on integrating STEAM in English language classrooms. It is revealed that STEAM education is not a separate subject, it implies the integration of knowledge from different areas, thanks to which this kind of education can be used in teaching different subject areas. A key feature of this kind of education is the interaction of younger students in line with teamwork, in the process of learner's activities in the mode of creating and demonstrating projects. Thanks to project activities, students get the opportunity to activate the creative, emotional, creative component of their personality. All this becomes possible due to the interdisciplinary applied nature of STEAM education.

Keywords: teamwork, education, learner's activities, STEAM education.

INTRODUCTION

It is known that, along with the development of technological progress, the improvement of modeling and programming of robots, the global introduction of IT technologies, the widespread study of English is not left without attention, not only as a means of international communication, but also as a basic element in mastering the stages of globalization.

English has recently become an integral part of the modern generation. More and more people every day are faced with the need to learn and use the skills of speech and writing communication in English.

Time does not stand still, as well as, along the time, science and education are moving forward. Over the last decade, STEAM education has come to the fore. STEAM is an English abbreviation that stands for S - science, T - technology, E - engineering, A - art and M – mathematics. These are exactly the disciplines that are becoming the most in demand in the modern world. That is why today the STEAM system is developing as one of the main trends.

STEAM education is based on the application of an interdisciplinary and applied approach, as well as the integration of all five disciplines into a single learning scheme.

Today, the development of technical orientation is given priority. A network of technology parks is developing throughout Russia, a new Russian format for additional education of children in this area has been created, which ensures the unification of the efforts of science, business and the state to form a system for the accelerated development of children's technical abilities in order to nurture engineers and scientists of a new type. But creativity and ingenuity have always occupied a central place in the Russian history of progress, and creativity is the leading competence of the 21st century.

STEAM education is a priority for several reasons:

In the near future, the world and, consequently, Russia will be in dire need of engineers, specialists in high-tech industries, and so on. We will have professions that will be associated with technology and high-tech production at the interface with the natural sciences, in particular there will be a great demand for specialists in bio- and nanotechnologies.

In this regard, it becomes a priority. Thanks to its widespread introduction into education, it will be possible to satisfy the need for scientific and engineering personnel who will play a leading role in the development of the technological process and the modernization of bio- and
nanotechnologies in our country.

Specialists will require comprehensive training and knowledge from a wide range of areas of technology, natural sciences and engineering.

So, how does this system of education differ from the traditional way of teaching the sciences?

STEAM education is a kind of bridge that connects the educational process, career and further professional growth. The innovative educational concept will prepare children for the technologically advanced world at a professional level.

How can you implement STEAM education in a foreign language?

The entire history of the development of the economy consists of the mutual influence of various fields of science, which at first glance are very far from each other.

But one of the important components of the goal is the formation of an engineering culture that involves

- Availability of a complex of knowledge in the humanities, natural sciences and technical fields;
- Ability to integrate general humanitarian and polytechnical knowledge;
- Application of acquired knowledge in real life situations;
- Development of such qualities of a modern person as flexible thinking, creativity, motivation, etc.

Does an engineer need a foreign language? Many employers give preference to those applicants who mention knowledge of the language in the resume. The language of science is English. If you want to study science and be a scientist, you need to know a foreign language.

As a freelance teacher trainer and materials writer, Sarah Hillyard specializes in STEAM education in language learning. In this post she explains why an integrated approach is useful, and how to integrate STEAM with your day to day teaching.

DISCUSSIONS

The world is integrated, so teaching should be too. No learning takes place in a vacuum. Instead, students should always be using their knowledge of the world to connect ideas.

This is especially true when it comes to STEAM subjects – science, technology, engineering, art and design and maths. After all, the subjects are naturally connected. For instance, scientists rarely do anything purely scientific without at least a speck of engineering, technological tools, or creative design, just as composers don’t write music without thinking mathematically.

So why should you make an integrated approach to STEAM a priority in your language teaching? And how can you integrate STEAM across your curriculum?

Most people understand how STEM (science, technology, engineering and maths) subjects are connected. But for students to develop STEM skills, we need to integrate these subjects with the arts – and vice versa. The arts is an umbrella term for things like dance, music, drama, movement, painting, drawing, crafting, sculpture, and design.

And as we mentioned above, scientists, technology developers, engineers and mathematicians need to be creative to innovate. Artists also need to observe, hypothesise and experiment – which in many ways is similar to a scientific process.

There are lots of benefits to creating connections across STEAM subjects and content areas in your curriculum. For example: our brains are wired to make connections. When we connect two pieces of information in our brain, we are much more likely to understand, remember, and be able to apply this knowledge. So, combining subjects mimics real life and prepares the brain for a world in which knowledge is integrated.
Work is transdisciplinary. Even if an individual chooses to become a scientist, there will most probably be a lot of maths in their job. Perhaps they will need engineering skills and creativity. They might have to use new technologies too. STEAM integration shows learners that whatever career they decide to follow, they will probably be working across disciplines.

It helps build problem solving skills. For learners, using what they know in one area can help them to solve new problems and become successful in other areas. By discovering inter-relationships in school, learners discover how different areas interweave in the real world. And once they are used to seeing these connections, it is much easier for them to find connections themselves.

One of the best ways adults can support STEAM learning is with language. The language teaching staff use when they engage with children can encourage creative thinking, reflection, pretend play and problem solving. By observing, listening, and responding to children’s interests, adults support their curiosity. When given the chance to communicate their thoughts and ideas, children develop their own thinking. Asking open-ended questions is an important way to guide a child’s exploration. This can be useful for children of all ages—even infants can give non-verbal responses. Using props and/or engaging in the process while using new vocabulary helps young children, including those who are dual language learners, see the vocabulary in action. Descriptive observations are a great opportunity for all children to build their vocabulary. For example, “This rock is very hard.” or “It feels bumpy.” The language of STEAM revolves around problem solving and the scientific method: observing, asking questions, making predictions, experimenting and discussing. It is important for teaching staff to model this process so that children become familiar with the steps involved in solving problems. This includes thinking out loud, and using STEAM language, such as “observe, explore, predict, experiment, etc.

Integrated learning makes school more interesting, relevant and meaningful. Studies have shown that it increases learners’ and teachers’ interest, motivation and enjoyment of school.

How to integrate STEAM in our language classes

1. Connecting STEAM subjects

STEAM subjects should facilitate interdisciplinary learning and always go hand-in-hand. For example, if you’re teaching your learners about patterns in English, you could make connections between patterns in odd and even number sequences (maths) and patterns in sound waves (science). And you could bring in patterns in buildings (engineering), patterns used for coding (technology) and dance choreographies or abstract paintings (art).

The implementation of the STEAM education model is an important component of many projects being implemented today. The coexistence or combined use of different possibilities is the basis of creativity and innovation. Thus, the simultaneous study and application of science and technology can create many new innovative projects.

2. Connecting STEAM and language

Learning objectives are a good starting point to develop STEAM connections. For example, when teaching the topic of animals and their habitats, there are lots of STEAM connections you can make.

For example, you could ask students to build a habitat for an animal (engineering), decorate the habitat (art and design) and include what that animal needs to survive (science).

You could then have students present their habitat creation to the rest of the class – practicing their English language presentation and speaking skills.

Depending on their proficiency level, learners can also learn language skills used by a range of STEAM professions. Take a scientist, for example. These language skills include listening to others and negotiating, reading and interpreting text or data, writing down hypotheses, labelling
designs, recording data, sharing explanations, communicating ideas and solutions, and publishing results.

3. Connecting STEAM and literature

You might decide to connect a STEAM challenge to a storybook you are reading in class. There are lots of books that develop creativity, thinking skills, critical thinking, and scientific thinking. Learners can retell the story or say what the caterpillar has eaten to explain why it has grown. You could also teach about the life cycle of caterpillars. You could even extend your teaching into other animals' life cycles, which includes science.

4. Connecting STEAM and Project-based learning

Project-based learning (PBL) helps learners identify a problem, generate other questions to research, think of solutions and present their ideas. And this process helps them make connections among different areas. Sounds a lot like STEAM, doesn't it? STEAM is all about discovery and problem solving.

CONCLUSION

Summing up, we can say that the possession of modern pedagogical technologies (STEM technologies, project-based learning technology, problem-based learning technology, collaboration technology, computer technology) is a component of the teacher's methodological culture. The introduction of new technologies into the educational process changes the position and habitual attitudes of not only the student, but also the teacher himself.

Skills of the XXI century is a special area that is being actively discussed now at different levels. The essence of the concept is this: the key skills that determined literacy in the industrial age were reading, writing and arithmetic. In the XXI century, the emphasis is shifting towards the ability to think critically, the ability to interact and communicate, and a creative approach to business. Thus, the main skills of the future 4C were formed:

- communication,
- cooperation,
- critical thinking,
- creativity.

References:


