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## **STEAM AS AN EFFECTIVE TECHNOLOGY FOR TEACHING ENGLISH IN SMALL RURAL SCHOOLS**

*The research analyses the problem of teaching English in small rural schools. The article discusses the implementation of STEAM technology in small rural schools as an effective tool for engaging learners of different levels into a shared educational environment. The research discusses the importance of formation of new key skills in learning. The technology includes multicultural arts-based learning strategies and techniques across educational levels and disciplines. The study discusses the implementation of STEAM in teaching the English language in particular.*

*In this perspective, this article highlights art-based learning as an effective teaching approach in science, technology, engineering, arts, and mathematics (STEAM) to achieve school students' success in STEAM-based education at the secondary education level. The article suggests analysis of literature and discusses basic provisions on small rural schools of Kazakhstan. The research gives examples of the experience of teachers working at small rural schools and suggests ways of improving the current academic performance.*

*Key words: Arts-based learning, multicultural learning, education, STEAM education, small rural school.*

### **MAIN PROVISIONS**

One of the main goals of educational reforms in Kazakhstan is to adapt the education system to the new socio-economic environment. Upbringing of the younger generation is one of the most important tasks of any society as the success of a nation depends on the level of education. A well-structured educational system increases the quality of knowledge, instills the right values, and develops skills necessary for being a successful and useful member of the society. The government of Kazakhstan makes significant efforts to improve the level of knowledge of the new generation in order to develop their ability to quickly adapt to the changing world.

Positive changes at all the levels of educational system in Kazakhstan have already been made. And, secondary education being an integral part of the system should be subject to changes first of all as it forms the basis for obtaining professional and higher education. The results of studying at school determine the level of qualification and professional future of a personality. This is why before turning to professional development of higher quality it is important to discuss and improve the knowledge and skills received at the basic level.

Besides this, in the context of global scientific and technological progress, the government of Kazakhstan considers the importance of paying special attention to the development of teaching science, mathematics and the English language [1]. The rationality and relevance of training programs in this regard as well as the priority of the subjects has already been assessed and adapted at the level

of secondary education in Kazakhstan. However, the issue is still subject to further consideration: whether all Kazakhstani secondary school students have equal opportunity to learn the subjects and obtain knowledge of high quality.

According to the Fund for Sustainable Development of Education of the Republic of Kazakhstan for 2023, the number of rural schools is 75% of the total number of schools, half of which are small rural schools. Considering the fact that not all of the small rural schools are properly equipped, supplied with teaching material, have enough academic hours and teachers to arrange the learning process in a proper way the scale of the problem is evident. As the international experience shows one of the tools for solving the problem is the introduction of STEAM technology into small rural schools [2].

## INTRODUCTION

Today, STEAM technology combines science, technology, engineering, art and mathematics to develop students' 21st century skills such as problem solving skills, creative and critical thinking. The integrated learning does not only develop creative and critical thinking skills, but also increases students' motivation to learn [3].

STEAM technology is based on an interdisciplinary approach, integrating several academic subjects from different fields. The use of STEAM technology demonstrates to learners that any field of activity requires the integration of various types of skills acquired during the study of different disciplines.

The use of STEAM technology involves solving problem situations, that is, knowledge acquired in one subject area allows students to apply a creative approach and learn how to think critically. It also demonstrates how a solution to a problem can be found and how success in other areas can be achieved. In this way, students recognize how science and mathematics subjects are integrated in everyday life with the humanities [4].

Many advanced countries, such as China, Singapore, the United States, Australia, Great Britain, Israel, Canada, develop the STEAM-education, the principles of which have become a continuation of the STEM-education concept (science, technology, engineering, mathematics). For example, in the US, STEM-education is recognized by the National Council for Research (National Research Council) and the National Science Foundation (NSF) as the technological basis of a developed society. The degree of training in the field of STEM is an indicator of the nation's ability to support its development. [5] Creative disciplines supplementing the STEM-education, are complemented by the term Arts – art. They expand the direction and enrich the creative component. As practice shows, nowadays, an active movement from STEM to STEAM education is witnessed [6].

The start of implementing STEAM education in Kazakhstan has already been made. The project implemented at Rodina rural school demonstrates a successful launch of the technology. In order to critically assess the issue under study it is necessary to mention that the cause of establishing numerous small rural schools in the republic is connected with the historical and geographical and social features of Kazakhstan. They are large territory, low population density, difficult socio-economic conditions in rural areas and other features.

The concept of “small rural school” is defined by the Law of the Republic of Kazakhstan “On Education” (Article 1, paragraph 58) as “a comprehensive school with a small number of school students, combined classrooms and a specific form of organization of educational classes” [7]. The development of a modern small rural school is one of the priority directions of the educational policy of the Republic of Kazakhstan. [8] The “Concept for the Development of Small Rural Schools in the Republic of Kazakhstan for 2020 - 2025” states that out of 7,576 general education organizations in Kazakhstan, 4,288 are small rural schools, which is 56.5% of the total number. There are 6,032 secondary schools in rural areas, and 4,139 of them are small rural schools. Over the past 15 years, the number of small rural schools has increased sharply. This means that almost every fourth teacher works, and every sixth Kazakhstani school student attends a small rural school [9].

From the social perspective, the lives of all the rural dwellers are closely connected with school activities. As noted by O. Shunkeeva, currently the rural school is a cultural and informational center of the region, which involves participation of not only the younger generation and teachers, but of all the rural dwellers. All cultural and educational works are carried out in collaboration with rural schools, including small rural schools.

In this case, STEAM technology which presupposes a mixed environment with the involvement of learners of various age might be chosen as a framework of teaching English at small rural schools. Collaboration of school students from different grades can be implemented through joint projects. The learners can study the same problems from indifferent perspectives. The positive side of extracurricular or in class project activities implemented in a group of learners of different ages is that the teacher working in a small rural school knows all the children and what each learner is capable of.

Practical results play a very important role both in STEAM and project technology, and rural area has numerous advantages in this case as there are many objects of research (a river, a pond, a garden, animals and other objects) “at hand” that might be studied. Thus, all the children can be involved in the implementation of the STEAM based project through performing different activities such as searching for new information, performing practical experiments, preparation of decorations and other activities.

## MATERIALS AND METHODS

*Object of the research.* The object of the research is the application of STEAM education in the process of teaching English.

*Subject of the research.* The subject of the research is teaching English to school students of small rural schools in Kazakhstan.

The research is aiming to achieve the following *objectives*: 1) to analyze the current situation on academic performance of small rural schools students in learning English; 2) to study the experience of STEAM technology application at rural schools with the perspective on teaching English to multilevel classrooms; 3) to define the main provisions of improving academic performance of small rural schools students.

*Design.* The authors of the article used the qualitative research approach for data collection. For this purpose, the research survey was conducted through the analysis of information presented in various sources.

*Methods.* The techniques of theoretical analysis were applied to STEAM educational resources in teaching English which allowed to identify three main features of STEAM technology that distinguish it from other traditional methods of teaching English.

The theoretical character of the research presupposes the use of general scientific methods and approaches applied in the scientific environment: research and systematization of scientific literature on the research problem. They include analysis, synthesis methods. The outcomes of the research are based on the analysis of the works of foreign and Kazakh scientists.

## RESULTS

Learning English through STEAM has gained importance over the past decades due to the growing trend of all-round education and development of school learners. Teaching English through STEAM technology is very different from the traditional teaching system. STEAM technology creates conditions for the development and improvement of students' analytical and creative abilities. It provides the opportunity for school students to create collaboration, solve problems, and analyze research and practical goals. It develops independence in acquiring new knowledge. Three main features of STEAM technology distinguishing it from other traditional methods of teaching English are the following:

- owing to STEAM technology, school students may have more opportunities for independent work, they learn to identify problems and look for ways of solving them independently through active, purposeful and conscious actions;

- through participation in team work, students have the opportunity to share their creative and scientific ideas with other team members to solve educational and practical problems and tasks;

- a targeted development of communicative competencies of the English language is a part of STEAM education [10].

It should also be noted that one of the main differences between teaching English through STEAM technology and traditional methods is the development of learning skills, as opposed to memorizing material presented by the teacher, which is often very typical in most educational institutions. School students need develop the ability to work independently. They also need to develop the ability to create new ideas, work in a group of peers, find solutions to cognitive problems, identify errors in their activities and correct them. With the competent and comprehensive implementation of STEAM technologies, the achieved level of the English language skills and competencies of school students will create the key to successful further education and development of many areas of professional activity[11].

Numerous Kazakhstani scientists have discussed the problems of small rural schools in the Republic of Kazakhstan. They are Khairutdinova R.S., Akramova A., Akpaeva A., Adilgazinov G.Z. Shcheglov S.G. and other scientists. Beginning from 2010 universities of Kazakhstan implement projects aimed at improvement of the situation. Thus, the research project “Development of the information education system: Academy of small rural schools of the Republic of Kazakhstan” was one of them. It involved the active participation and training of small rural school teachers, where they learnt how an integrated STEAM-based lesson should be created [12].

Training of teachers is an important part of the integration of STEAM technology into the teaching/learning process. One of the features of small rural schools is the multi-subject nature of teachers’ work. The specifics of working as an English teacher in a small rural school is that they need to work in “small classes”. This means that students of different ages from two, three, four classes are joined into one class set. This determines the specifics of the educational process construction. At the same time, researches identify difficulties in mastering a foreign language at small rural schools as teaching children of different ages in one class necessarily leads to the lack of methods. For this reason foreign language training programs and textbooks should be developed.

As monitoring data show, the quality of knowledge in English at small rural schools of Kazakhstan over the past three years is as follows: 2020-2021 – 58%, 2021-2022 – 56%, 2022-2023 – 52%. There is also a decrease in the level of interest in learning English, respectively: 78%, 74% and 53% [13].

In this connection, it is necessary to highlight a number of features in teaching a foreign language at small rural school. First of all, the optimal combination of independent work of students and the work of the teacher should be designed, since the proportion of independent work in the classroom set is large.

Another issue is the introduction of new material. When conducting lessons simultaneously with two classes, it should be kept in mind that most dual-class lessons include new material in both the classes. As study demonstrates, a lesson presenting new material in two (or more) grades usually begins with independent work of upper grade school students (for example, 7th grade). While considerable amount of teacher’s attention is paid to younger students (for instance, 6th grade) [14].

A teacher of small rural school describes the teaching process as follows: “Independent work in the senior (for example, 7th grade) as a rule, is associated with preparing students to study new material and is based on what they have learned (the topic “Planet is in danger”, for example). While managing independent work in the senior class, which lasts for about 15-20 minutes, I explain new material on the topic “The modal verb “can” in the structure Can you play the guitar?” to the junior class and give assignments for independent work.” After that, the teacher continues working with upper level school students, checks the independent work completed by the learners and explains new material, ending with assignments for the whole class and home independent work. In the remaining

time, the teacher also has to check the independent work of primary school students and give additional exercises and homework assignments [15].

As the analysis shows, the teacher's workload at small rural schools is impressive, and requires considerable amount of time and enthusiasm. While the role of an educator is not only to cope with the situation, but to inspire students to actively discover and persevere. For this reason, methods of teaching foreign languages which do not rest on conventional traditions from the past might be considered as forward-thinking. If STEAM technology is integrated into everyday learning at small rural schools, school students of different levels will study a variety of fields with ease. This will also help them to obtain the experience in nontraditional thinking and working in collaboration.

## DISCUSSION

STEAM technology is an important trend in educational system of Kazakhstan. Due to the rapid pace of growing innovation and the changing nature of the labor market, education has to respond to global trends, putting STEAM technology at the forefront of education. And, teachers who can successfully incorporate these approaches into their English language curriculum can help school students prepare for their future career choices. Thus, when using STEAM technology in English lessons, school students develop relevant skills, which in the future will become the basis for choosing a profession.

In small rural schools STEAM could be implemented at early stages in typical craft projects. Learners of different levels may actively study and implement crucial knowledge and engineering tactics. This can be performed through introducing learners to processes like questioning and "intuitive creativity". This approach helps to create a new type of educational culture where learners join in one class and the teacher encourages them to learn in cooperation and try out their ideas.

Thus, an English lesson using STEAM technology can be divided into 6 stages. In order to solve a problem each stage should integrate English language teaching with interdisciplinary connections. It is also crucial to develop creative and critical thinking.

At the first stage, it is necessary to select a problem, set a task that requires a solution. It is important to understand how this problem or task relates to the educational topic and how school students of different levels should be merged into a team.

The next stage is the stage of forming associations, that is, students accumulate all the knowledge and ideas related to the problem posed. At this stage, it is obvious how interdisciplinary connections work, since associations can relate to different areas and levels of science, technology and art.

The third stage carries out the research. The school students study already applied solutions to the problem posed and evaluate the advantages and disadvantages of the proposed solutions. After the learners have deeply studied a given problem and are immersed in their research topic, they think through their solution to the problem at hand.

The fourth stage presupposes that the school students apply creative and critical thinking skills to their work. Once students have formulated a solution to the problem, it is time to share it with the whole set of classes.

The fifth stage involves the activity of school students demonstrating their product for assessment and feedback. Constructive feedback is very important, as at this stage learners have the opportunity to understand whether they are moving in the right direction and correct the direction of their movement.

The final step includes reflection. The learners receive the opportunity to reflect on the feedback they have received, reflect on their progress and identify steps to improve their skills to move forward.

Considering the structure of the STEAM based lesson it should be concluded that STEAM technology helps to:

1. Personalize training through deepening the existing practice of creating an individual educational path. At this stage teachers play a very important role as they teach learners how their educational needs and abilities could be satisfied and developed. Teachers should suggest possible

instruments of learning, give recommendations and show the direction of moving further, if necessary.

2. Develop project technology approach as an integral component of in-depth education, which allows to significantly increase the effectiveness of the educational process - from the first stage of understanding and identification of problems to the final stage of practical work. The project activities help learners to find solutions to a problem without adults' assistance. The school students also learn to develop the so-called soft skills through planning, delegating and cooperation.

3. Make creative spaces that act as integration areas for learners of various levels and ages. At this stage school students learn to create new ideas, select and develop them in order to receive a ready product as an outcome of their activity.

Summing up the discussion, it should be concluded that teaching English at small rural schools can also be effective and even consider individual features of each learner. Based on this the present study draws conclusions and suggests some steps to improve the performance of rural schoolchildren. However, further detailed research should be conducted on this issue.

## CONCLUSION

This article sought to highlight STEAM learning as an effective teaching approach to studying the English language in small rural schools. Summing up the conducted research it should be noted that in order to accomplish this goal, this reflection defined and explained the following concepts/constructs: education in small rural school, STEAM education. It reviewed pertinent literature on the topic and drew the conclusion of this writing. Based on the overall literature analysis performed in this study, results and findings of the research revealed the potential effectiveness of STEAM learning and teaching experiences that might be effective in teaching English to learners of small rural schools. The research findings showed how small rural schools might implement STEAM lessons for their different level school students.

Despite the fact that the practice of using STEAM all over the world has excellent results teachers often avoid introducing the technology into the educational process due to little knowledge of using it in different level classes of small rural schools. However, appropriate short-term training for rural teachers would improve their skills in this field, and help them to design and implement STEAM based lessons.

The suggested research could include exploring professional development strategies that increase the likelihood of actually implementing the technology in the small rural classroom, such as offering support to classroom teachers as they teach STEAM lessons to their children for the first time. All of the above will help focus on academic performance of learners in small rural schools and at the same time achieve the desired educational standards. The implementation of STEAM technology in the classrooms of small rural schools should be considered deeper, as many states, including Kazakhstan, formally include engineering education in the register of professions of the future.

The provisions suggested in the research might be used as the guide in constructing a STEAM-based lesson. Personalization of learning attained through STEAM technology makes the educational process conscious and helps school students to develop the skills necessary for further self-education. With this, the learning process does not stop at school it continues through gaining by the learners their personal experience and turns into life-long learning.

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**STEAM ауылдағы шағын мектептерде ағылшын тілін оқытудың тиімді технологиясы ретінде**

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*Зерттеу шағын жинақталған ауылдық мектептерде ағылшын тілін оқыту мәселесін талдайды. Мақалада әртүрлі деңгейдегі оқушыларды жалпы білім беру ортасына тартудың тиімді құралы ретінде шағын ауылдық мектептерде STEAM технологиясын енгізу қарастырылады. Зерттеу көпмәдениетті өнерге, білім берудің барлық деңгейлері мен пәндеріне, атап айтқанда ағылшын тіліне негізделген оқыту стратегиялары мен әдістерін қамтитын оқытуда жаңа негізгі дағдыларды қалыптастырудың маңыздылығын талқылайды. Осы тұрғыдан алғанда, бұл мақалада орта білім деңгейінде өнер және STEAM білімінде оқушылардың жетістіктеріне қол жеткізу үшін жаратылыстану, технология, техника, өнер және математиканы (STEAM) оқытудың тиімді тәсілі ретінде өнерге негізделген оқытуға баса назар аударылады. Мақалада әдебиеттерге талдау жасалып, Қазақстанның шағын ауылдық мектептері туралы негізгі ережелер қарастырылған. Зерттеуде шағын ауылдық мектеп мұғалімдерінің тәжірибесінен мысалдар келтірілген.*

*Кілт сөздер: өнерге негізделген оқыту, көп мәдениетті оқыту, білім беру, STEAM білім беру, шағын ауылдық мектеп*

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АУЫЛДЫҚ АУЫЛДЫҚ ӘЛЕУМЕТТІК-МӘДЕНИ ДАМУ ЖӘНЕ АҚПАРАТТЫҚ КЕҢІСТІК ОРТАЛЫҒЫ // Іргелі зерттеулер. – 2015. – No 2-14. – 3175-3179 беттер; URL: <https://fundamental-research.ru/ru/article/view?id=37713> (кіру күні: 30.10.2023).

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### **STEAM как эффективная технология обучения английскому языку в малокомплектных школах**

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*В исследовании анализируется проблема низкой успеваемости и преподавания английского языка в малокомплектных школах (МКШ). Статья рассматривает внедрение технологии STEAM в МКШ как эффективный инструмент вовлечения учащихся разного уровня в общую образовательную среду. В исследовании обсуждается важность формирования новых ключевых навыков в обучении, включающих стратегии и методы обучения, основанные на поликультурных дисциплинах, на всех уровнях образования, в частности, в преподавании английского языка.*

*С этой точки зрения в статье подчеркивается важность и эффективность обучения, основанного на применении STEAM технологии, как эффективном подходе к преподаванию естественных наук, искусства и математики (STEAM) для достижения высокой успеваемости учащихся в изучении английского языка на уровне среднего образования. В статье предложен анализ литературы и рассмотрены основные положения о малокомплектных сельских школах Казахстана. В исследовании приведены примеры опыта учителей МКШ, описаны трудности в обучении разно уровневых классов и даны практические рекомендации.*

*Ключевые слова: обучение, основанное на искусстве, поликультурное обучение, образование, STEAM-образование, малокомплектная школа.*

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