



## BLENDED TEACHING SYSTEM FOR COLLEGE ENGLISH WITH MULTI-SOURCE DATA FUSION IN EDGE COMPUTING

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**Abstract.** The Modern education system involves the online education system with the traditional method of studies. This increases the education system's versatility and helps increase the quality of studies. The use of modern digital technology also helps the students to gather and accumulate information about their study topics. The use of edge computation helps the education system to access all the information in comparatively less time. This increases the performance of the students and teachers in analyzing the different things in the study. Multi-source data fusion is important for comparing synchronized data from different sources. This fusion system helps to allocate the data through the database and helps the students to use data from a distinctive database. This system has saved the time of students to search different contents. They are getting ready-made content from the database as per their requirements. This type of technology is essential to increase students' performance. These systems collectively develop the education system more easily and will enhance students' interest. The students could learn English using different related content and practice sheets. Digital education helps students to get appropriate sources of study materials for developing quality.

**Key words:** multisource, edge computing, blended teaching, data fusion

**1. Introduction.** Blended teaching system is a complex teaching system in which the traditional and modern systems of teaching are included. The importance of the blended teaching system is quite high to increase the students' confidence as this helps them to understand the matter from different online sources as well as from the classroom. Data gathering from the other sources is demarcated as multi-source data fusion. In modern times, the educational system is not only dependent on the traditional classroom but it includes the online education system as well as guides the students to gather the information by using modern technology. The competition among the students has arisen from the earlier times, and the mode of study has changed from the traditional to the online. For increasing the sources of study materials and the quality, the implication of a blended teaching system is a must.

The above figure represents all the interrelated things of the BTS. This helps to understand the features of this modern education system [2]. This also helps to understand the things that are interrelated with this education system. This includes the real and virtual classes for developing a clear sense of students. Modern education systems like BTS also develop communication skills for representing their views. The processes of delivering content are through offline and online methods[5]. The offline teaching method is according to the traditional education system, and online methods are followed in the online education system. It also increases the thinking capability of all the students. BTS education system helps to increase the complicated thinking process. This helps the students to increase their efficiency in their studies as well as in the decision-making process of life. BTS helps the students by increasing their talents and enhancing their scopes for achieving higher success in life [24]. BTS is the essential strategy of education, and it increases the efficiency of students and makes them all-rounder.

### 2. Objectives.

1. To analyze the meaning of the blended teaching system (BTS) and its characteristics
2. To know the impact of the blended teaching system on the modern students
3. To analyze the importance of multi-source data fusion in the field of education
4. To check the actual impact of a blended teaching system on the learning of the English language
5. To analyze the importance of edge computing in the education system

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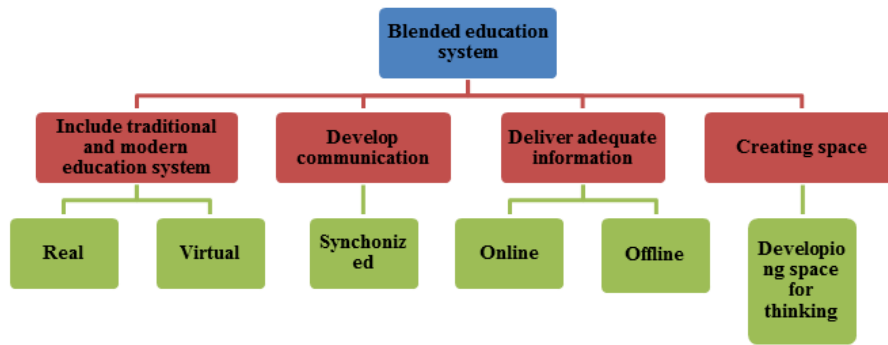


Fig. 1.1: Blended education system

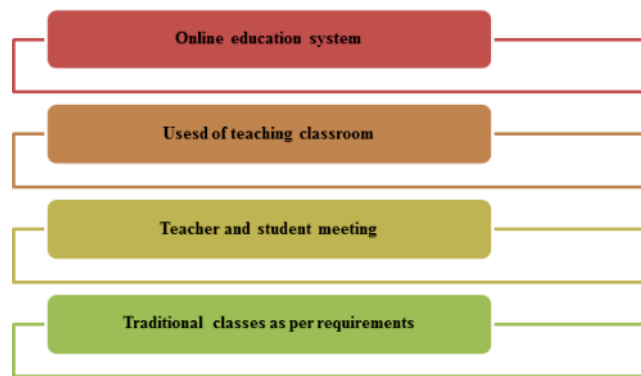


Fig. 4.1: Characteristics of BTS

6. To know the relationship between the blended teaching system and edge computing

**3. Methodology.** A systematic review of the different sources helps to understand the correlated matters of the blended teaching system. The qualitative analysis of the different sources through the process of observation and analysis helps to determine the most influential factors that increase the importance of BTS in the developmental process of students [16]. The qualitative study expands the knowledge of the research topic and helps analyze the effective factors behind the research topic. All the available sources have systematically aligned according to the required values and analyzed the research results through understanding all the study materials details. Qualitative analysis does not include any kind of calculation and helps the researcher to find the related influential factors through the process of observation only [10]. This method of analysis has allowed to complete the task with adequate quality.

**4. Characteristics of blended teaching system (BTS).** BTS is mainly based on the modern system of education as well as on the traditional teaching process. This helps the students to analyze all the study materials. The purpose of this BTS is to increase the understanding capability of students [18, 4]. This includes the processes to obtain or collect the information on the study material from the classroom and from different online sources. This enhances the quality of the education system in other educational organizations. BTS has developed by following the ideology of both teaching methods and those are traditional and modern ways of teaching. The development of this teaching system is helping the students to increase their analysis capabilities and enhance their knowledge of different subjects [22, 15]. The requirement of this education system is essential for developing the actual knowledge of the students as well as increasing the educational performance of students. It has several characteristics which are represented in the following figure.

Table 5.1: Positive impacts of BTS on students

SL NO	Effect of BTS
1	Increase the number of engaged students
2	Enabling students to understand the real-time feedback
3	More clear knowledge of students
4	Time management
5	Collaborative teaching to increase their performance

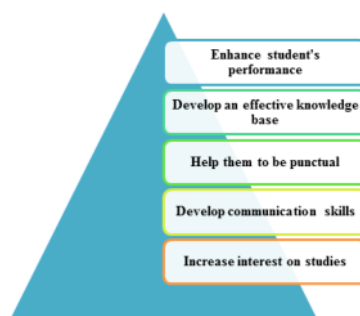


Fig. 5.1: Consequence after the implication of BTS

Figure 1.1 has represented the features of BTS and it helps to know the actual characteristics of this education system. This is a more complex and modern version of education where the online and offline education system has been agglomerated to enhance the teaching method. Digital technology helps to collect qualitative study material from different online sources [9]. It increases the scope of the students to compare their traditional teaching classes with the teachers of different online platforms such as YouTube. BTS is a modernized system of education with several unique features compared to other educational systems such as student-teacher meetings, the conduction of conferences, online guidance, a digital submission system, Online education and classes, and so on [19]. The main objective of this education is to increase student's knowledge by using different required processes.

**5. Effect of BTS on the process of performance development of modern students.** The ideology of the BTS education system is to engage students and teachers through traditional methods and modern methods for enhancing the performance of education. This system of education also enhanced the relationship between the teacher and students as this includes the system of conferences and suggests the physical presence of teachers and students in the same place.

Table 5.1 has described the advantages of the BTS and its impact on the character development of the students. This helps the students to develop better communication, time management or punctuality, and enhancement of knowledge in different subjects to increase overall performances [14]. This is the most ideal process of teaching as this provides ways to develop learning habits as well as helps the students to develop suitable characteristics for getting more opportunities in the future. A collaborative system of education is essential to evaluate the actual development of students. Online education is not as capable as this may decrease the interest and motivation of the students [13]. The implication of this type of teaching process should be preferable in all education centers to increase the engagement of students with their studies. It directly boosted the quality of the traditional education system by collaborating the modern online education system. BTS is more prominent for its effect on the student's performance and brings a drastic change among the students.

Figure 4.1 has represented the actual scopes of the BTS that increased the performances of students such as increasing the knowledge of students, making them punctual, developing communication skills, increasing

Table 6.1: Benefits of using the methods of MSDF

SL NO	Important factors related to MSDF
1	Producing results from different databases
2	Increase the quality of information
3	Specific interface
4	Increase the quality of data

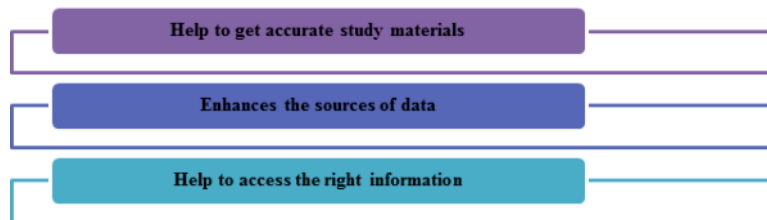


Fig. 6.1: Effect of MSDF implication in the education system

interest in studies and so on[14]. The increasing interest of the students helps them to engage in educational activities for more time. The traditional education system is comparatively less formative as in this education system the teacher can guide the students in the classroom only. BTS has several positive sides such as increasing the satisfaction of students to understand all the complicated study topics through the use of internet facilities and digital systems [24]. The modern system of teaching becomes more effective after the collaboration of all the teaching processes in the same place.

**6. Impact of multi-source data fusion (MSDF) in the education system.** MSDF is the process of management of complex situations through the use of massive and core evidence. MSDF process helps to manage complicated situations through enhanced clarity by enabling the usage of different authorized data [11]. This system helps the students and teachers to collect sufficient sources to understand a topic from different aspects. The implication of this process increases the sources of information on the same topic and helps the student to know the basic things about the study topic. Data fusion systems are interrelated with the management of data from different databases to increase the accuracy of the research and stated statement [21]. This means this method increases the accuracy of learning and decreases the possibility of occurring error in the learning process. This increases the confidence of the student to gather the information by accessing different databases.

Table 6.1 has described the details of the MSDF as this helps to collect the right information from different sources and increases the accuracy of information. This system is basically interrelated with the search system for getting important and required information from databases [1]. This makes the search process easier and more accurate in comparison to other processes.

The above-mentioned Figure 5.1 has represented the effect of MSDF on the education system. The MSDF increases the quality sources of the study and affects the development of students' knowledge [23]. This is a system to gather the right information by comparing all the available sources of databases.

**7. Relation of BTS and learning of the English language.** English is the most usable language in the whole world and it needs to be learned by the students. The learning of language is totally dependent on the teacher and the availability of suitable study materials [3]. Quality study materials are really important for learning good English. The learning of a language also depends on the practices of the student and it develops through the repetitive practice of the language. BTS helps the students to increase their speaking capability in English and helps them to evaluate their own quality [16]. This helps to determine the most effective practice methods for increasing the strengths of the students in the communication and usage of the proper abbreviation of English.

Table 7.1: Impact of BTS on the Learning of Language

Effect of BTS on the studying process	Consequences of effects
Increases the sources of study materials	Increase knowledge
Improving the understanding capability of students	Develop clear knowledge
Provide practice set	Helps to remember all things
Make the students capable to analyze their own growth	Evaluation of growth

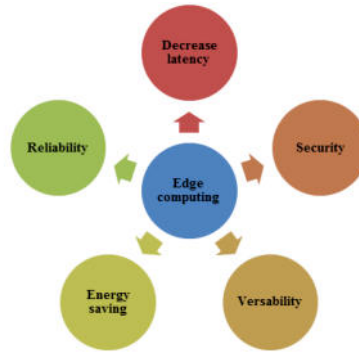


Fig. 8.1: Advantages of edge computing

Table 7.1 has represented the effect of BTS on the learning process of language. The learning of language is basically dependent on the sources of study materials, understanding process, and repetitive practices. BTS provides all these things to the students to get higher satisfaction from the study as well as helps them to analyze their depth in English. In this education system, teachers could suggest following better skill development styles for promoting the knowledge of the English language. This teaching process helps the students by providing them with better learning materials and increasing their speaking capability through conducting special conferences for analyzing the developing status of all students [18]. BTS helps to learn all the subjects by engaging the students with practice, enabling them to align the study with the realm of life situations, developing the practical sense among the students, and making them capable of critical thinking.

**8. Effect of edge computing in the modern Studies and System of education.** Edge computing is the process in which the latency of the system has decreased. This increases the capability of any system by decreasing the factors that affect the performance of the system [17]. This helps the students and teachers to connect their systems and makes the virtual conversation much easier. This affects the performance of teachers and students in the long term.

Figure 6.1 has represented the advantages of the commuting edge in the different sectors such as it decreases the latency means it increases the speed of the work. This increases the overall performance of the operated system and related activities [7]. This also impacts the education system by enabling students and teachers to connect with the fast system.

Figure 6.1 has represented the impact of edge computing on the education center. Edge computing increases the system of education by increasing the speed of work and quality.

**9. The relation between edge computing and BTS.** BTS is dependent on the quality of edge computing and all the systems of education are dependent on edge computing. Edge computing increases the communication speed and enhances the quality [8]. BTS is an interrelated process of the digitalized system and a traditional system of education.

Figure 8.1 has represented the relationship between edge computing and BTS. This enhances the accessibility of information and technology from different sources at comparatively low costs. Edge computing helps educational organizations to apply the ideology of BTS in a fruitful way [25]. This enhances the experiences of

Table 8.1: Effect of Edge Computing on Studies

Relation between edge computing and studies
Making the fast connection of all members in virtual classes
Enhance the speed of search engines and other machinery
Decreases the possibility of data leakage
Decreases the cost of education

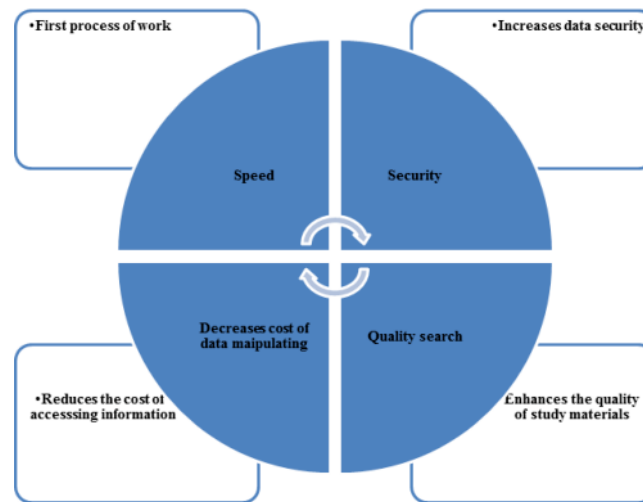


Fig. 9.1: Relation between the computing edge and blended teaching system

students, as this system is fast and durable in comparison to traditional digital technologies. It provides better security to the system of the school and secures the system from any kind of external effect [7]. BTS system becomes more performative after the implication of the edge computing process.

**10. Result.** In the result section, multisource data fusion and edge computing bring improvement in the teaching system throughout the world. A blended teaching system brings revolutionary changes in a country’s education system. Here are the competitive characteristics of BTS, an educational institute that brings improvement in classroom teaching quality.

As per the above graphical image, edge computing improved the classroom teaching quality through the help of searchability. Here, an edge computing-based teaching system provides effective communication between teachers and students [10]. Through this advanced technology, students can solve different learning activities. On the other hand, this technology brings reformation to the education system where students get competitive advantages. Through this edge computing-based education system, students can manage their time which creates positive impacts on students’ performances. Through the help of this multisource data fusion, students can get huge amounts of data that can improve the quality of the teaching system. Here students get real-time feedback from the teachers that helps to fill the gaps and improve their performances.

As per the above image, edge-based computing teaching methods in classrooms bring context optimization. Through the help of context optimization, teachers can provide relevant study materials to the students as a result; this multisource data fusion and edge-based computing system create positive impacts on the student’s performances. Here, increasing the number of students who adopt edge computing-based teaching systems, those students get competitive advantages [12]. On the other hand, BTS provides different learning practices that include a collaborative learning process that brings strong relationships between students and teachers that help to analyze different educational contexts easily. Sometimes, this fusion learning system brings punctuality among students that create positive impacts on the student’s performances. For improvement of learning per-

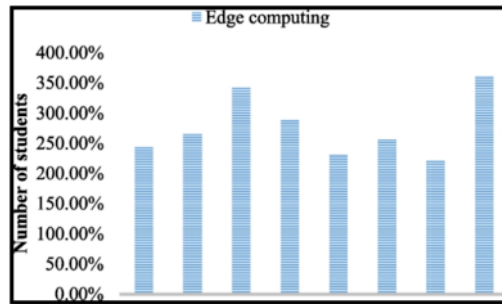


Fig. 10.1: The searchability of the classifier's process improvement of an edge-computing classroom teaching quality evaluation

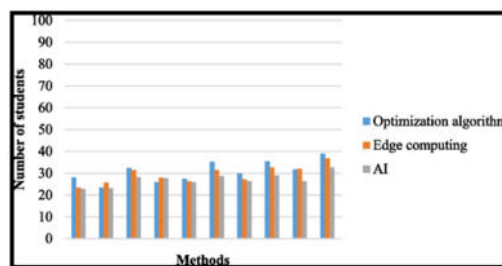


Fig. 10.2: The analysis of the optimization in the context of edge computing-based classroom teaching methods

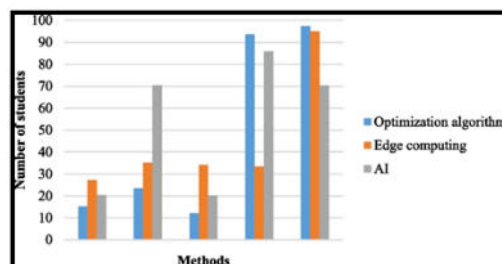


Fig. 10.3: Improvement of resource creation using Edge computing in the modern educational system

formances, students from different educational fields adopt BTS which includes edge-based computing learning systems and multisource data fusion. The availability of study materials increases the interest level among students which creates positive impacts on the context analysis aspects as a result, students get positive developments in the future. This technology reduces the cost of context analysis helps an educational institute to bring more improvement in the teaching process.

The above image provides information about the creation of the resource through edge computing-based teaching systems as well as multi-sources data fusion. As per the image, the increasing number of students who adopted edge computing helps them to make effective resources for their studies. More than 90 percent of students adopt this teaching system to get extra benefits as a result; students bring improvement in their performances. Here, a blended teaching system helps provide competitive advantages for the student and teachers where the availability of a vast amount of data helps to make effective resources for students and teachers [20]. By getting effective resources, students can improve their time management and help them to

reduce the time consumed for source creation. By reducing the time consumption to make effective resources, students can spend their extra time on extracurricular activities that increase the interest level in English study among students. On the other hand, through the edge computing teaching system, students can produce results from the different types of databases that bring quality to the learning performances among students. By making appropriate study materials, students who adopt BTS get effective advantages as compared to the traditional learning system.

**11. Problem statement.** The main problem is to increase the reach of education to all. The cost of developing the modernized education system is high and this factor affects the extension of this system of education. This is a problem because there needs huge investment for developing an effective BTS [6]. This is the main issue of the education system as they need huge investments to expand the modernized education system in all places. The government of the country needs to implement a strategy and plan for enabling the students to use the modern education system. This increases the knowledge, performance, and interest of students and helps them to develop more clear concepts on different topics.

**12. Conclusion.** The blended education system is so advanced and it increases the quality of education by providing better learning opportunities. The implication of modern digitalized technology helps this education system to be successful in nature. The students access the information by using the internet facilities and they discussed the matter with the teacher. Edge computing increases include mechanical support and digitalized functions to increase the efficiency of students. On the other hand, multisource data fusion helps to analyze the different sources of data and enhances the quality of students' presentations. These processes are necessary to enhance the knowledge and ideal characteristics of human beings among students.

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*Edited by:* Sathishkumar V E

*Special issue on:* Scalability and Sustainability in Distributed Sensor Networks

*Received:* Jul 1, 2023

*Accepted:* Sep 28, 2023

