Research on the Effectiveness of College English Teaching Based on 5G Mobile Internet

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Abstract:-

Technical assistance for the building of a distant learning environment for learning English is provided by the advancement of information technology and the educational information process. People are still getting used to online teaching method, and it is becoming more widely accepted. This article presents an optimization approach for English teaching mode in colleges based on 5G technology to overcome the constraints of the existing college English teaching mode and to increase the service scope of 5G technology. This optimization technique deviates from standard college English teaching methods and incorporates 5G technology, which significantly enhances the intelligence of English classrooms in colleges. At the same time, the optimization method may improve the quality of English teaching at colleges in a variety of ways, and implement the teaching principle of "teach students according to their ability" in a complete and systematic way. We propose an energy-efficient routing protocol for efficiently transmitting the educational data to the receiver. Also, we employ Bat Optimization Algorithm (BOA) for optimization of the transmission process. process. The students' cognitive abilities are examined. The findings demonstrate that the optimization method may not only overcome the limits of the English model in colleges, but also expand the service reach of 5G technology, therefore improving students' cognitive abilities such as listening, speaking, reading, and writing ability in various dimensions.

Keywords: 5G technology, English teaching, Energy-efficient routing protocol, Bat Optimization Algorithm (BOA), cognitive skills

INTRODUCTION

Lecture rooms and classrooms benefit from smart classroom technology. By incorporating contemporary computers, these rooms provide instructional and learning possibilities, as well as multimedia and networking technology. The material offered in smart classrooms as optimization, interactivity, and ease of learning tools is a complex technological idea. It is also situational aware, and the classroom structure and administration are conducive . The presentation, management, access, real-time interactions, and testing, as well as its moniker "SMART," may all be summarized. As a conceptual model of "SMART," the features encapsulate the functions of a smart classroom. The following facts demonstrate that teaching in literary works is unsuitable in this situation. Most students in most nations have struggled to see the value in informal, conventional English classrooms, where English has long been taught as a second or foreign language. The motivation of English learners has long been a focus of researchers as one of the most important study objects in second language acquisition. With the expansion of the information age on the Internet and the evolution of distance education goods, online English (second language) courses in English, as well as changes in motivation to study, have attracted increasing attention from all sectors of society. However, study findings on motivation in traditional second language classrooms are difficult to adapt to online English classroom learners' learning conditions, and the varied incentives of online second language learners have diminished. Traditional static motivation theory fails to describe and investigate the process of dynamic transformation . As a result, the issue of demotivation among online English course students in distance education is rapidly becoming a new subject in second language study. The development of a 5G wireless distance teaching system based on the English learning system of mobile edge computing not only enhances student knowledge and promotes teacher-student interaction, but also allows everyone to communicate and study with each other without regard to time or place . Educational reform has had a significant impact on the area of education in today's society. Education is undergoing changes in terms of the cognitive structure of students, their learning techniques, their interpersonal connections, and their self-evaluation. The 5G wireless remote education environment enabled by mobile computing enables students to study intelligently. For Indians who study other languages, the terms "loss" and "lost" are synonymous. In comparison to them, their linked research is more limited in scope and less frequent. It is still in its infancy in Western countries. The majority of their study is empirical. Existing research have increased our understanding of online education on one hand, but the experimental results are not entirely plausible on the other. The sample sizes are tiny, and the results aren't general enough to be persuasive. Using 5G Internet simulation technology, this study combines the two approaches of computational analysis and questionnaire survey to create a diverse assessment system comprised of college professors and students. Here an energy-efficient routing protocol for

efficiently transmitting the educational data to the receiver. Also, we employ Bat Optimization Algorithm (BOA) for optimization of the transmission process. The results of the questionnaire survey are used to analyse the students' cognitive abilities. This research has identified current problems in English teaching and proposed solutions to these issues, which will help to enrich online teaching content and improve the teaching quality of college teachers. Data communication is inextricably linked to real-time data gathering, real-time data management, and real-time data transmission, according to studies on real-time data services. Delays or data loss might occur if communication techniques are chosen incorrectly. As a result, selecting the right communication channel and protocol is critical. Other equipment are not required for data gathering since devices linked to the 5G Internet and the cloud computing centre complete data exchange through wireless transmission. The paper can be organized in the form, Section 1 introduces the introduction to the effectiveness of English teaching over improving the network performance over information sharing. In contrast, the research report on other existing technologies shown in section 2, Section 3, offers a description of the suggested technique. Its findings in Section 4 show the feasibility of the proposed method. Eventually, we will review the total concepts results in the final section.

RELATED WORKS

[1] A B/S architecture pattern is used here, together with the SSM framework and MYSQL database development to create the recommended solution. Building a flawless classroom teaching quality assessment system, evaluating instructors' teaching work objectively, justly, and scientifically, and improving the school's teaching quality system overall. Ultimately, the system's core function is to recognise that students can evaluate course teachers online for their quality of teaching. Teachers can evaluate their peers by listening to students speak about their experiences in class and viewing the summary information from students' and peers' evaluations. [2] this article provides an introduction to the idea and characteristics of mobile learning and smartphones as well as the underlying theory and technological support for mobile learning. While this is going on, a fresh approach to English education is being developed in light of mobile internet . [3] enhances mobile learning's theoretical foundations and methodological approaches. A CAD theoretical model is presented, and a case study on English vocabulary is conducted, which help popularize mobile learning in English learning and enhance teaching quality at the same time . [4] focuses on the development of an edge computing-based mobile platform for English language education. As a result of cognitive flexibility theory and informal learning theory combined with situational cognition and network architecture, it covers edge computing and network architecture. The construction of a mobile English teaching model based on "listening, reading, and hearing" and the design and implementation of a mobile English teaching information service platform are both underway . [5] The author develops a learner and teacher interest model, incorporates a suspicious degree update model into the interest model, recommends composition resources using a deep learning network algorithm, and enhances the accuracy of composition resource recommendation using a deep network adaptive learning algorithm. Additionally, this article develops a system framework structure based on real-world requirements and examines the method by which each of its functional modules is realized . In [6] 5G network-based English writing and communication tools are used to improve the performance. In [7] the manner of instruction for mechanical manufacturing within the network teaching platform. This article analyses and compares critical topics, such as the technique for developing a network virtual platform and the operating principle of X3D virtual reality technology, and then establishes the critical technology and overall strategy for developing a network teaching platform. This article uses CATIA to set and optimize the part model and generate file types that the X3D language can recognize in order to ensure a reasonable configuration of the start and stop times of each component in the motion mechanism, as well as the specific motion trajectory and rotation angle for each component. The [8] The article addresses the practical implementation of network multimedia courseware in the teaching of college basketball. This article begins by outlining the multimedia courseware teaching strategy, which includes instructional material, instructor supervision, student learning, and multimedia courseware. Second, the multimedia courseware for teaching basketball strategies fundamentals is finished with the use of the Flash mx2004 plug-in. Following that, it discusses how to broadcast basketball instructional information using multimedia equipment to a video network for students to study in a wireless network setting. It highlights the importance of the "wireless multimedia communication" course in the electronic information topic. Finally, the accuracy of the multimedia teaching technique was evaluated using the teaching experiment, and the courseware content's validity was evaluated using the empirical validity evaluation method. The [9] study examined how higher vocational college students can improve their ability to learn English on their own, with a focus on informationization, to promote bidirectional interaction between teachers and students, cultivate students' awareness of lifelong learning, improve teachers' technical skills and develop a connotative system in higher vocational schools . [10] explains the wearable technology in depth and utilizes the chance to teach English in a collegiate setting. Data collected from instructors and students was analyzed in this study using a questionnaire. According to the findings of the study, students' interest in college English may be piqued by wearable technology. the following study aims to undertake interdisciplinary research on multi-modal semiotics and humanistic education techniques that broadens the research scope and helps multi-modal discourse analysis maintain its vitality to some degree.

3. PROBLEM STATEMENT

To teach English as a foreign language is a difficult job no matter how experienced they are. Teaching and learning English becomes much more critical and time-consuming in areas where the language serves only a limited function. Through the use of 5g mobile internet, 5G based training hopes to improve the efficiency of English instruction in colleges while also increasing students' understanding of other academic subjects.

4. PROPOSED METHODOLOGY

The general structure for English classrooms based on 5 G networks is described in this proposal. First and foremost, now is the moment to investigate the methods for implementing systematic and intelligent English classroom education as well as intellectual classroom education platforms in universities, with the number of intelligent classroom education platforms expected to treble. Following that, it will provide an overview of the network education platform's requirements analysis, performance needs analysis, and functional design in light of the system's 5 G network. The recommended technique is depicted schematically in Figure 1. To acquire the effect's placement must improve the usability.

a. Data collection

Intelligent English classroom tests were used to measure the information that an English teacher need for a practical English lecture . The database was obtained from https://unimelb.libguides.com/2nd_language/databases. The database can be used as a research tool for Education students interested in teaching second languages .
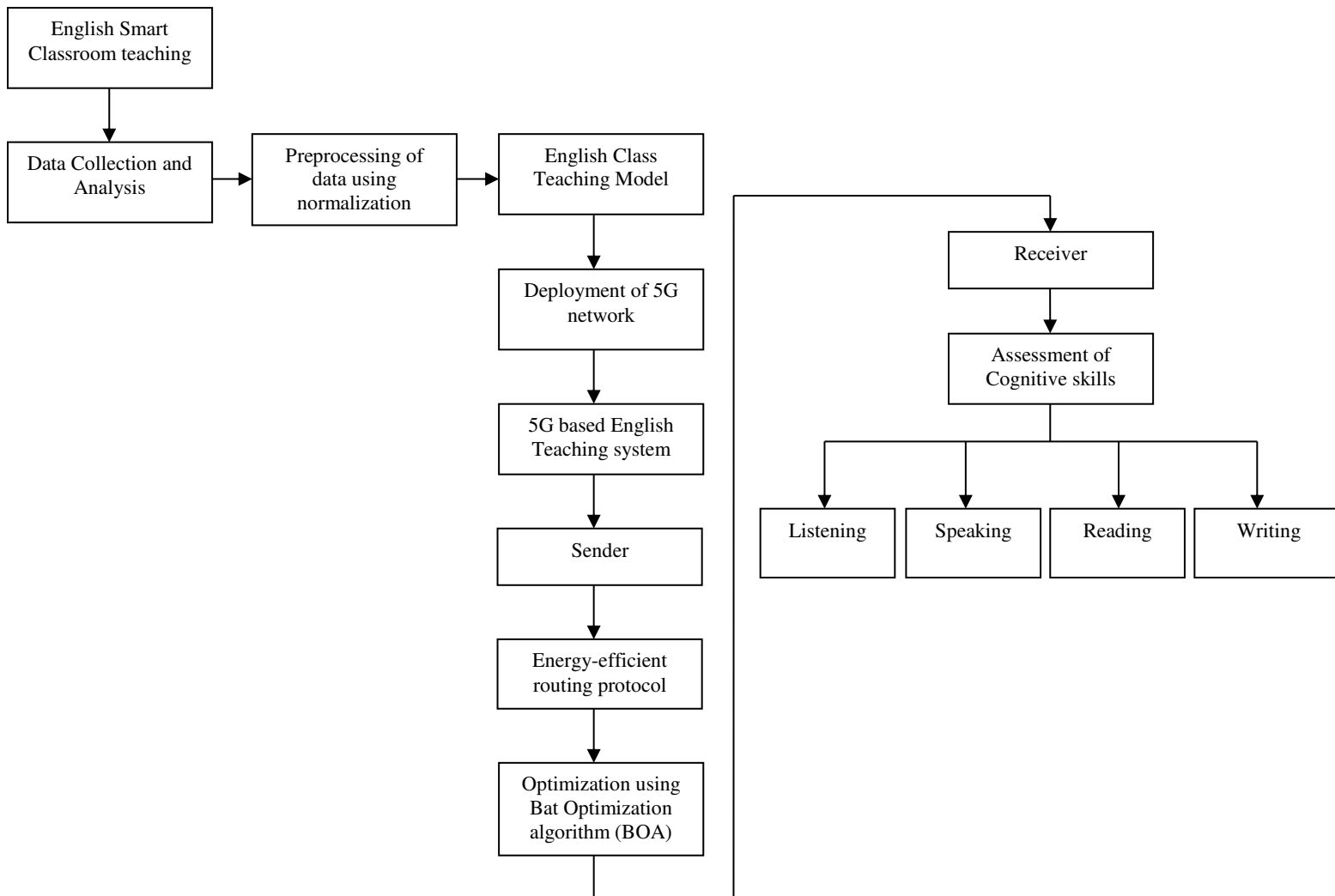
Figure 1   Schematic representation of the suggested methodology

b. Data normalization

The input data is unprocessed and may contain duplicate packets and missing data. It has been cleaned up and preprocessed to remove redundant and repeated instances as well as missing data. Because the dataset for the educational system is large, sample size minimization techniques must be used. Because there are so many attributes in this dataset, feature extraction methods are required to filter out the ones

that aren't important. During the pre-processing step, the dataset might be normalised. The z-score, which is represented by equation, is acquired in the first phase of the normalisation procedure (1).

$$Z = [(U - \alpha)/\omega] \tag{1}$$

Here, α represents the mean of the dataset and ω denotes the standard deviation. And Z is given by,

$$Z = \frac{U - \bar{U}}{D} \tag{2}$$

Here $\bar{U}$ represents the mean of the sample, and D denotes the standard deviation of the model.

The random sample must follow a pattern of,

$$Z_j = \beta_0 + \beta_1 U_j + \varepsilon_j \tag{3}$$

Here ε_j denotes the errors, which is relied on the ω^2

The mistakes must therefore be independent of one another, as illustrated below.

$$U_j \sim \sqrt{W} \frac{U}{\sqrt{U^2 + w - 1}} \tag{4}$$

Here U denotes a random variable. The standard deviation is then used to normalize the variables' movements. The moment scale deviation is calculated using the equation below.

$$M = \frac{\lambda^m}{\emptyset^m} \tag{5}$$

Here m denotes the moment scale.

$$\lambda^m = E(U - \alpha)\,^\wedge M \tag{6}$$

Here Y represents a random variable, and E denotes the expected value.

$$\emptyset^m = \left(\sqrt{E(U-\alpha)\,^\wedge M}\right)^\wedge 2 \tag{7}$$

$$y_w = \frac{m}{\overline{U}} \tag{8}$$

Where y_w denotes the coefficient of the variance.

By changing all of the variables to 0 or 1, the feature scaling operation will be terminated. This method is known as the unison-based normalizing approach. The normalized equation will be written as follows:

$$U' = \frac{(U - U_{min})}{(U_{max} - U_{min})} \tag{9}$$

In this manner, the data set may be controlled and the data's size as well as variation can be kept constant. At this point, the focus is on reducing or completely eliminating data delay. Afterward, the normalized data may be used as a source for the succeeding phases of the work.

c. Deployment of 5G Network

We investigate a 5G wireless network design in which all SN and some gateways are randomly dispersed and immobile after use. Sensor nodes will be allocated to each gateway if their contact range is within the range of the sensor nodes. Sensor nodes can therefore be assigned to pre-specified gates. There are a limited number of portals that may be allocated between sensor nodes, thus each one has its own list. The data collecting procedure is divided into rounds in the same manner as the DSR research approach. During each round, both SNs capture data from the immediate area and send it to the relevant CH (i.e., the gateway). By using another CH as a next hop relay node, the data gates remove outdated and uncorrelated data before sending it to the base station. After two cycles of turning off their energy-saving radios, the two nodes disconnect from the network. Everybody has a 5G wireless access to the internet. Even when two nodes are in close proximity to one another, they are still connected wirelessly.

d. Optimization based Energy-efficient routing protocol (BOABEERP)

As they seek for food, bats leave their colony and move in the direction of the prey. It's up to the bat when it comes to making a decision when it comes to an intersection. Bats excrete pheromones while walking, leaving a trail of their whereabouts. Using a pheromone is shown by the concentration of it along a certain path. Diffusion processes cause the concentration of pheromone to drop with time. This is normal. Due to the dynamic nature of path Searching, this feature is critical.

After the clusters have formed, the recommended routing algorithm will be discussed. There are two steps to this process: selecting a trusted node and selecting the appropriate path. At first, the recommended algorithm selects the safest route based on trust ratings. It is clear that the node in this case indicates a group of bats. Route is a representation of a bat's flight route.The wireless condition with fifteen nodes is used to assess nodal trust, and the initial trust value is set to zero. In our job, we use the BOABEERP to transport data. For each node, the trust score is calculated using the following two criteria. The initial group consists of nodes that legitimately acknowledge packets they receive from neighbours by sending an acknowledgement back to the sender. Different routing parameters (such as rreq, rply, err, etc.) or routing metrics will be used to compute the trust value (bandwidth, cost, etc). Group 2 nodes are those that sent out a large number of packets at once. When all nodes' input energy values are assessed, the rate of genuine acknowledgment is shown by equation (10).

$$SR_{(1,j)} = \frac{\left[K1 \times \left(\frac{ACK}{NP} \times 100\right) + K2 \times Temp_{score}\, K3 \times Spatial_{score}\right]}{[K1 + K2 + K3]}$$

(10)

In which K1, K2, and K3 denote the weights provided to the various energy values, $TR_{(1,j)}$ denotes the initial energy value in ratio for j^{th} node, ACK represents the count of acknowledgment transferred to the neighbor nodes and NP denotes the packet count attained from neighbor nodes.

The trust score of the neighbor nodes is evaluated utilizing equation (2) that estimates the released packet.

$$SR_{(2,j)} = 100 - \left(\left(\frac{SRP}{TSRP}\right) \times 100\right), t1 < t < t2 \qquad (11)$$

in which $SR_{(2,j)}$ denotes the neighbor trust value in ratio for j^{th} node, DRP presents the packet count released and TDRP denotes the entire packet count released in the network and t represents the temporal restraint to verify the time bounds t_1 and t_2 for minimum and maximum restrictions of the time gap.

At last, the entire trust value of the route specific node j is estimated by utilizing the equation (12).

$$SR_{Fitness\ value} = \frac{(SR_{(1,j)} + SR_{(2,j)})}{2} + \text{Fitness score} \qquad (12)$$

in which $SR_{Fitness\ value}$ denotes the entire nodal trust score, $SR_{(1,j)}$ denotes the initial trust score and $SR_{(2,j)}$ represents the second trust value for node j.

The trusted path can be selected once the trusted node has been selected. As a result, dynamic values are better for prefixes than static values. The routing events may be grouped using our technique since the signal strength of the nodes diminishes with distance, d. The energy required to transmit k bits is calculated using equation (13) based on the distance between two nodes. As a result, we believe that dynamic values are better for prefixes than static values. The routing events may be grouped like bats using our technique, which uses the equation,

$$En_{tx}(k, d) = k \times En_{elec} + k \times \varepsilon \times d^m \qquad (13)$$

in which En_{tx} indicates the energy utilized by the BATS, En_{elec} denotes the broadcasting circuit loss. m acquires the value of 2 or 4 based on multipath fading. ε represents the energy needed by electricity amplification.

The average values of the complete trust value for every BAT node available in the network condition are used to determine a best fitness route in this article.

$$BAT_{route} = \sum_{j=1}^{m} \frac{TR_j}{m} \qquad (14)$$

Here BAT_{route} indicates the average value of the route trust, TR_j represents the trust score aggregation and m denotes the count of nodes/BATS. The data will be transmitted over the trusted path when it has been identified. The data is received in CH through a cluster route designed for the sink node. Finally, the data from the sink node may be retrieved.

Algorithm 15G_BOA

Step:1 START

Step:2 Process of clustering

Step:3 V,S,D,R= Nodes set up

tep:4 Route checking

BEST route selection

If current route=Trusted best route

Else

Detect for a sink hole

Step:5 cost of path can be calculated

Step:6 Selective Packets dropped if an intruder occurs(optional)

Step:7 Calculate the amount of packets to be send

*Step:8 For each optimized path update the link cost*

5. RESULT AND DISCUSSION

The evaluation of the suggested methodology was illustrated in this section. To have in-depth discussions about 5G and the 5G educational system in smart classrooms, it is necessary to build an English educational information system as a starting point. It is appropriate for the functioning of the 5G-education network's information system to construct an intelligent classroom education information transmission system in English.
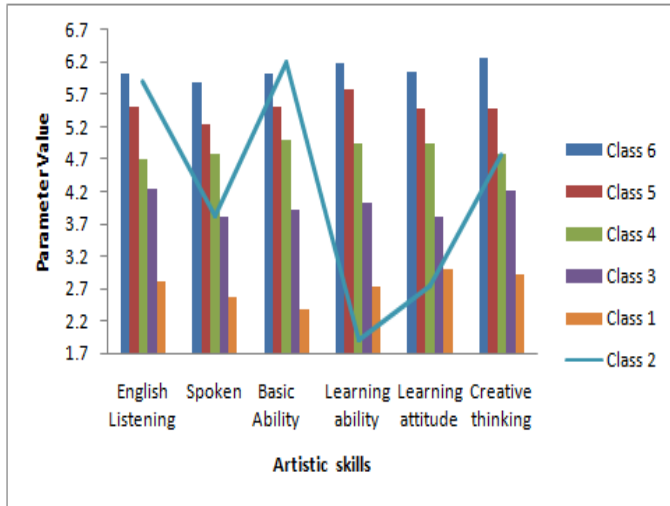
**Figure 2 Artistic skills Vs. Parameter value**

We can observe from Figure 2 that after processing the result the English abilities had improved to some extent. Education delivered through the 5G internet has a far greater impact than education delivered through face to face learning . In comparison to traditional teaching techniques, 5G computing-based distant education has twice the impact and is 50 percent more cost-effective.
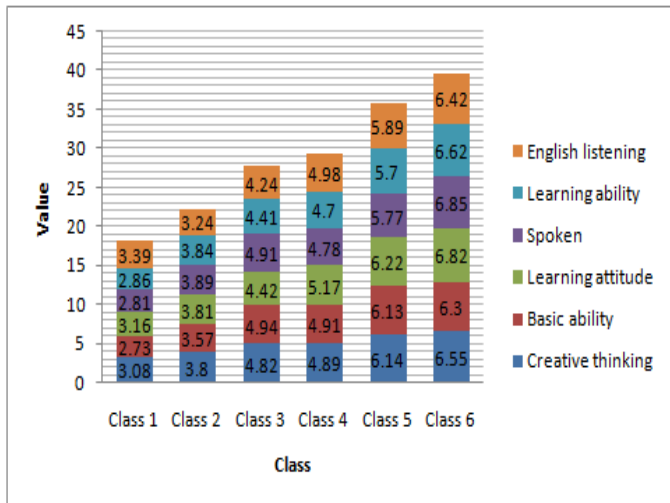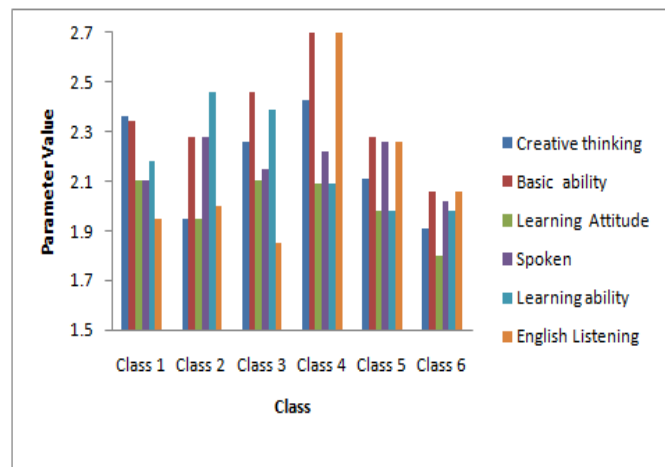
Figure 3 Class Vs. Parameter value

As shown in Figure 3, students' English language abilities significantly increase will indicating that 5G-based online instruction may outperform than the face to face approach. The total improvement in student performance following 5G-based instruction was somewhat larger than that following face-to-face instruction.
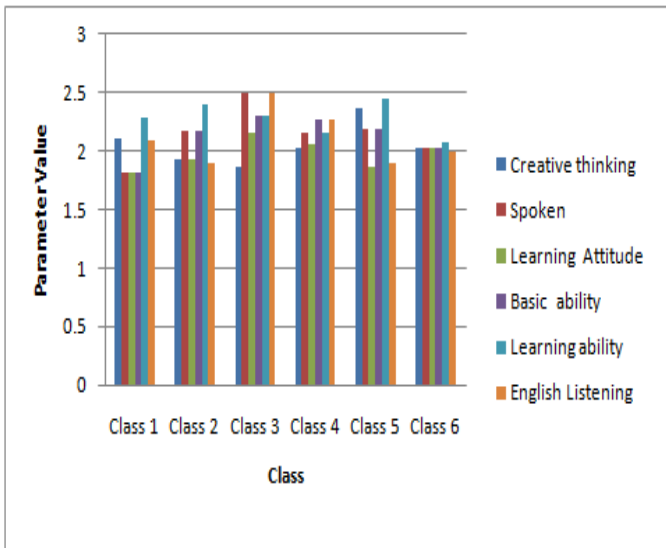
Figure 4 Class Vs. Parameter value

From Figure 4, we can see that before 5G- training, the ability of the students for various skills is not deep even though they are not upto the mark.


Figure 5 Class Vs. Parameter value

From Figure 5, we can see that after 5G- training, the ability of the students for various skills is highly deep eventhough they are exceed over their academic performance.
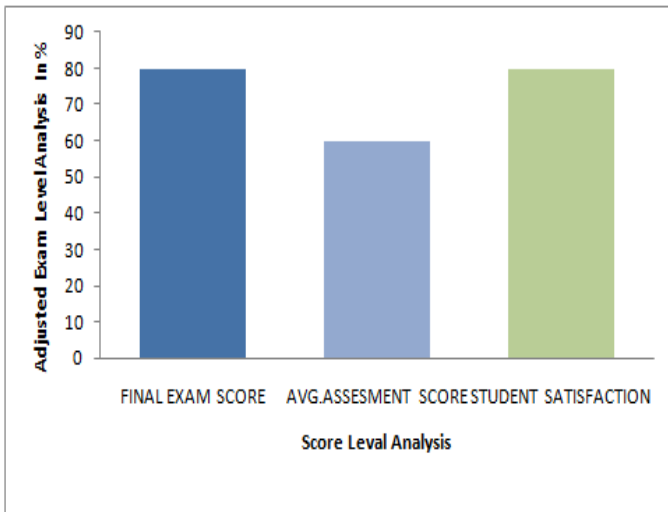
Figure 6 Score analysis

Figure 6 shows the comparison of exam score analysis. Average student outcomes under each condition from covariate-adjusted regression models for three outcome measures: final exam score, average assessment score, and self-reported student satisfaction. English 5G- classroom scale with learning level analysis is the final exam score with 80%, average assessment score with 63% and student satisfaction score with 80%.
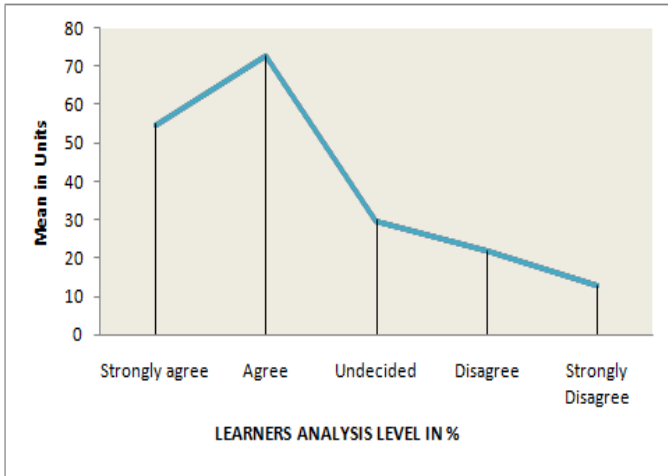
Figure 7 Learners level analysis

Figure 7 shows that most learners prefer the traditional audio delivery method in smart classrooms and can have a positive attitude towards using 5G English classroom lessons. The questionnaire is designed to find learner opinions in terms of entertainment, information, understanding, organization, and the usefulness of educational effectiveness in teaching in English smart classrooms. Responses given by the interview are evaluated according to the following scales: Strongly Agree, Agree, and Undecided, Disagree, and Strongly Disagree. Learner perceptions about the use of smart classroom instruction are strongly agreed level is 55%, agree level is 75%, the undecided level is 32% and disagrees level is 22%, strongly disagree 13%

To prove the effectiveness of the suggested methodology it can be compared with the existing methodology [11].
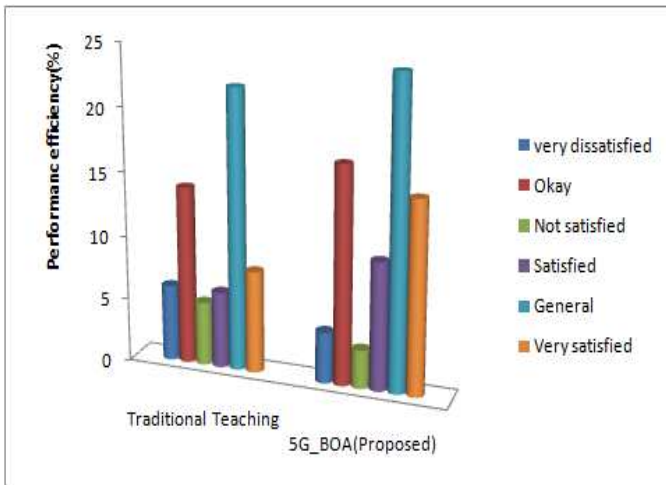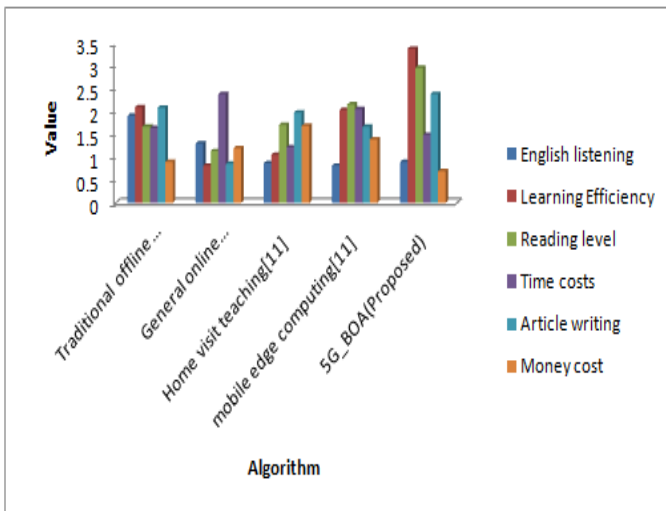
Figure 8 (a)

Figure 8(b) Comparative analysis

From Figure 8 (a), we can see that the satisfaction of traditional teaching is not high, which is much lower than that of simulated 5G online teaching. Simulated 5G online teaching is a kind of distance teaching. According to the development of main media and information technology, multimedia network teaching belongs to the third generation of distance teaching. Simulated 5G online teaching is the product of the development of modern computer network technology and multimedia technology to a certain extent, and it is extremely attractive to students. In order to compare the costs of different teaching methods, we have carried out relevant statistics on the costs of these types of teaching methods, used a variety of algorithms for calculation and statistics, and finally reached a conclusion. Due to the differences between different algorithm teaching, different implementation results may exist. Although there are certain deviations, the relative differences between different algorithms should be negligible. The specific data are shown in Figure 8(b).From the results obtained the suggested methodology express satisfied results when compared to other existing mechanisms.

6. CONCLUSION

Traditional classroom placement and internal structure have nothing to do with the digital changes that occur in the current scene of the educational system . Smart classrooms rethink and consider learning spaces and learner expectations, along with resources and educational learning methods. Smart classrooms are useful for students interested in reading and writing research, technology, or academics. The use and implementation of this new technology should encourage higher education courses from the current education system in primary schools. Smart 5G classrooms offer students and teachers with new skills and learn in different and exciting ways. It is fair to say that students and teachers are increasingly leaning towards a new era of technology and digitalization. Students will soon adapt to new technologies, As a result, more participation in learning allows students to adapt to different learning styles. Not only shortly, but also in the classroom, students and teachers adjust and improve themselves accordingly. The

proposed 5G network technology to evaluate the English smart classroom teaching was done. From the results obtained the learner perceptions about the use of smart classroom instruction are strongly agreed level is 55%, agree level is 75%, the undecided level is 32% and disagrees level is 22%, strongly disagree 13%

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