The Impact of IoT in English Language Classroom

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Abstract: Technology becomes a part in every aspect of human life. Technology in education brings a new phase to the classroom in general and to the English classroom in particular. English language teaching was a challenging task for English teachers.
Technology supports English teachers to get best results. In this paper, the use of technology for the improvement of students' pronunciation is discussed. By using technology students can get right pronunciation. The usage of technology to improve students' pronunciation is analysed.

Key Words: Technology, education, classroom, python, algorithms, IoT, stress, Intonation, record, sensor

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Introduction

The impact of technology in education is inevitable. In future, the classroom management without technology may not be possible. By using technology, institutions can give learners an affluent learning experience, enhance their skills, and get best performance from students. IoT is one of the present fastmoving trends which change the traditional classroom setting and is helpful in all subjects. This paper explains how IoT is useful in English language classroom and in what way it helps to improve the language ability of the students.

Literature Review

Digital campus is a popular word which may decide the admission of a student in an institution in coming years. "There is an increasing demand for higher education institutions, especially, universities to digitize their content and activities, and adapt their methods to allow academic and researchers to work effectually in a

digital environment."(Sherson) The digital campus requires many components like IoT, artificial intelligence, machine learning cloud computing etc... Out of all the Internet of Things and machine learning are different because these domains are connected to sensors rather than users. These sensors enhance students learning abilities, manage time and reduce cost.

The recent research in IoT emphasizes the need of IoT things and technologies in classroom. The research of Barron, Kemker, Harmes, & Kalaydjian, 2003; Bauer & Kenton, have discussed the possibilities of effective integration of technology in education to inculcate the 21st century skills. They include; electronic white boards, mobiles, tablets, wireless door locks, Moocs etc.. IT industries like Google, Microsoft, CTS and other companies have already recognised that IoT devices are helpful not only for industries but also for educational institutions. They are working on new technologies related to IoT which can help learners as well as teachers to get best learning experiences.

Not only IoT but also Machine learning also plays a vital role in educational institutions. IoT along with Machine learning yield good results. Instead of depending on teacher all the time the IoT operated Machine learning helps a learner to save the time and money.

The Internet of Things change the entire education domain. Many educational institutional are benefited by implementing this domain in classroom and are getting best results. The students, teachers, and physical and virtual things can interact effectively and via efficiently using IOT.

1.An interactive model based on IoT is designed for teaching English language. This model utilizes voice and visual sensors for correcting the utterance and the form of English learners' mouth.

2.Using this device many changes can be brought in English language classroom.

Proposed Model for the usage of IoT in English Language classroom

The usage of technology in English language classroom is not a new topic. The use of audio and video clips in English classroom has been started long back. As technology has been increased for the last twenty years, many devices become a part of English language classroom. English classroom also becomes a digital classroom. Students are provided digital learning platform, where they can use online dictionary, know their language proficiency level, check grammar and get immediate feedback. As back-up facility is available students can check their progress also.

Once, English language teaching was a big challenging task for English teachers. With digitised classrooms the teachers' job become very easy and getting best results. The traditional method of English language teaching requires a lot of time and it is more costly also. By using the technology, teachers can save time and cost. There are already IoT tools which are helping students to learn English vocabulary, grammar and pronunciation. Besides these learning tools, there is a need of IoT to teach stress and intonation patterns of English language.

Every language has its own features. As English is the international language, it has standardised, stress, and intonation patterns. Making students to understand

English language is one aspect and teaching standard pronunciation with stress, and intonation is another aspect and achieving perfection here is very difficult. The use of IoT in such cases makes teachers works very simple and brings perfection in teaching as well as in learning.

In English Language Classroom, teachers demonstrate the rules for pronunciation, stress and intonation. When it comes to practice sessions, it is very difficult to teacher recognise each and every student's performance and correct students' pronunciation. IoT helps teacher in the classroom to immediately point out the exact mistake and guides students to know the right pronunciation. Personalised learning is also possible with IoT. To apply these things in the classroom, sensor voice recognition is required.

The Frame Work For Applying IoT In English Language classroom

Voice control, command and recognition using IoT is not a new topic. As per Kajal Purwar, home automation system using the Raspberry Pi module gives best results. In this system speech is converted to command and home appliances can be operated by using this Raspberry Pi module. In this system, it takes some time to convert speech into commands but can be useful for disabled persons very well.

Another famous voice recognition by using IoT is Amazon's Alexa voice. Alexa voice takes commands and works automatically. The other application is converting voice message into text in What's up. Instead of texting the message, one can give voice, it is automatically converted into text.

This background suggests that the voice recognition of a learner in English language classroom and finding the correct stress and intonation is also possible. This helps students a lot to correct himself and can practice number of times until he is right. The main intention behind this proposed concept is to recognize speech patterns from a micro-controller and use it to understand and improve student's speech dialect.

Python programming language is useful to do this project. Speech detection is done using python's inbuilt speech recognition library, "speech recognition". The speech signal of the student is captured with a micro controller and analysed using machine learning algorithms. A dataset consisting of the standard speech dialect will be gathered, to train and analyse deep learning model. We use this model to predict a score based on student's performance. Also, we try to produce a detailed report from this momentary data collected from the student, explaining the student's performance, drawbacks and suggestions.

Speech pattern recognition using Machine Learning is another solution provided by machine learning algorithms. This can be further developed to identify word pronunciation and understand its close-ness to a standardized speech pattern, thereby helping the students to fine tune their speech patterns to match a certain standardized speech pattern. The above-mentioned requirement can be solved by taking aid of present day machine learning algorithms. This algorithm helps to capture voice data and plot it, to recognize the degree of stress imposed on a certain word pronunciation. This plot will be compared to a previously mentioned

standardized word speech plot. Characteristics like the degree of stress, the timing and a similarity score will be produced.

This process will be continued for all words in the sentence. Regarding the standardized speech data, speech patterns vary depending on locality. So, US English, UK English are going to be considered as the standard speech data. This can be obtained by using algorithms and can install in language laboratory. Furthermore, depending on the amount of difference that, captured voice data, if it is away from the standard voice data, the algorithm is going to suggest numerous steps for improvement, so that the student can gradually develop his speech patterns, rather than trying to learn everything at once.

These are the Steps carried out in Sequence:

1. Record the voice data
2. Recognize the words in the recorded data
3. Plot the utterances of words (amplitude vs time)
4. Retrieve the standard voice data, for comparison
5. Compare recorded data with standardized voice data
6. Create a detailed report on the student's recorded voice data

Identifying stress

English is a stress syllabled language. Every word is divided into syllables. The primary stress and secondary stress are two important components in English

language. Sometimes instead of giving stress on the first syllable, if student gives stress on the second syllable the meaning of the word may be changed.

Example

Noun: WAter "We drink WAter"

Verb: WaTER "we WaTER the plants"

Water is the word which can be used both as noun and verb. The stress on the first syllable indicates that the word is noun and the stress on the second syllable indicates that the word is verb. Without this differentiation, if students speak, they cannot convey the meaning. When the speech signal of the student is captured, the microcontroller gives the right analysis for the student whether the right stress is used or not.

The installed software helps a teacher to record student's speech. It automatically identifies the wrong stressed words basing on its programme and gives the result. Basing on this result student can practice further. He can practice at home also.

Identifying intonation

Intonation is very important in English language. There is rising tone, falling tone, rise-fall tone and fall-rise tone. Depending on the kind of sentence, the tone varies. If it is declarative sentence it comes under falling tone. Interrogative sentence-Wh-questions falling tone and yes/no questions falling tone, imperatives-commands, requests and orders follow falling tone, whereas instructions follow rising tone, exclamatory sentences follow rising tone.

Basing on this background if the programme is written to identify sentences basing on kinds of sentences-declarative, interrogative, imperative and exclamatory, micro controller automatically catches the tone of the speaker and it warns the speaker to correct his/her tone basing on the type of sentence. The tone of the speaker infers his/her attitude to the listener. The purpose of communication is also achieved.

During the communication process, especially at interview place the selection of the candidate depends on his attitude. This attitude is judged not only by his speaking skills but also by his tone. Twenty percent of person's attitude can be inferred through voice modulation. To express the right attitude in workplace one should know the intonation pattern.

To do this the programme can be designed to identify the sentence. Basing on its kind, the intonation depends. When the students speak, basing on the kind of a sentence the intonation pattern is identified. If the wrong intonation pattern is used, red mark is shown on the system. If it is right, it can be shown as green. By observing that a student can check the intonation pattern and rectify his speech pattern.

Conclusion

EFL university, Hyderabad recently introduced this technology to improve the pronunciation levels of students in English language, If this is introduced throughout India it may help students and teachers to get good results.

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