Design of Spoken English Teaching Based on Artificial Intelligence Educational Robots and Wireless Network Technology

Binbin Liu[1,*] and Zhen Lu[2]

[1]School of Foreign Languages, Changsha Medical University, Changsha 410000, Hunan, China.
[2]Hunan Branch, China Mobile Group Design Institute Co., Ltd., Changsha 410000, Hunan, China.

Abstract

Introduction: The use of AI in education can give students a more engaging learning environment and boost their motivation, and it also represents a continuation of research into the problem of human individuality in the modern era.
Objectives: This paper examines the challenge of human individuality in Artificial intelligence with the Capsule network (CapsNet) scheme from two vantage points: the practical need to address issues that have arisen with the latest wave of AI advancements and a philosophical examination of how AI has already been put to use in a variety of industries.
Methodology: This article investigates the new Internet spoken English teaching method, describing its benefits and providing solutions to its drawbacks, and it describes in detail how wireless technology will be implemented into online spoken English teaching. The technology provides visual representations of each stage of the gesture recognition process to aid learning. The interactive interface guides students through the gesture recognition system using computer vision applications, allowing them to encounter it firsthand; then, the sophisticated and abstract action recognition method is described with a representational illustration, which is helpful for students in elementary and secondary school to gain a more thorough understanding of and develop their capacity for logical reasoning. This will benefit students at elementary and secondary levels because it will help them think more critically and thoroughly. As a final step, we devise an experiment to compare the results of using our CapsNet method to acquire AI knowledge with those of more conventional learning strategies.
Results: Experimental findings were analyzed to demonstrate that this approach is useful for acquiring CapsNet and AI and that it increases users' motivation to study and their practical competence.

1. Introduction

The economy and culture of our country have increased the importance of having native-level English speakers. Since China's reform and opening up, there has been a steady increase in the number of English classes offered in the country. The widespread adoption of English-language education has had remarkable positive effects, helping to foster a new generation of multifaceted thinkers and doers who are also fluent in English [1]. As the economy has changed, so have the standards for the quality of language used in daily life. The friction between these transitions and the aims of English education is growing. Modern talent is subject to increasing pragmatic limitations on their language competence. Students need to be better equipped to adapt to societal progress and the promotion of English competency because too much focus is on teaching formal English formality. At the same time, the content of language use and the end purpose are overlooked.

---

*Corresponding author. Email: wenjuanhue040@gmail.com

Because of the Internet's explosive growth, the field of TESOL has had sufficient time to evolve and adapt, settling into what is now generally accepted as a network teaching system [2]. With modern tools like the Internet and desktop computers, the network teaching system has emerged as a promising new method of imparting knowledge. It is a significant improvement over the old-school ways. A perfect network-based educational system would allow us to forego traditional classrooms altogether. The English teaching network system is superior to the standard educational approach in four significant ways. Third, teaching resources are handled and utilized more effectively because of IE landing [3]. First, the network teaching system is created from the ground up to incorporate enrolment, instruction, learning, assessment, graduation, and evaluation. The student's ability to choose their study schedules is the fourth and final advantage since it dramatically improves the quality of their education [4]. The automated test paper system is an integral feature of the English-speaking world's web-based education system. Automated test papers may be categorized according to one of three fundamental algorithms: random algorithms, backtracking test methods, or artificial intelligence algorithms [5]. Artificial intelligence (AI) is a relatively new branch of computer science that tries to replicate the human mind via research and development of appropriate theories, methods, tools, and applications [6]. Artificial intelligence (AI) is a branch of computer science. Research into specific domains, such as robotics, speech and image recognition, NLP, and computer vision, expert systems, aims to deconstruct intelligence at its foundation and provide humans with a fresh way to interact with intelligent machines. Automatically generating test papers using an AI system will improve pass rates and exam quality since the algorithm will generate specific intelligent search queries based on human knowledge [7]. Cluster analysis is a technique for breaking down massive datasets into more manageable chunks by identifying commonalities. Classification is the process of grouping things into groups according to their characteristics, whether those characteristics are genuine or imagined. Numerous disciplines employ cluster analysis as a research approach, including computer science, mathematics, statistics, biology, economics, and many more. Distance and its effects on grouping are the primary focus of cluster analysis, a branch of statistics. Unsupervised learning occurs during the searching phase, and the cluster is hidden from view [8]. Clustering, which automatically identifies and marks categories without needing labeled classes or pre-designed data, is an excellent example of observational learning instead of a classification technique. It is common to practise dividing clustered items into several subclasses, with each item assigned to a particular group. However, a fuzzy clustering algorithm model is proposed to execute effective cluster analysis to cluster pedagogical indicators. This is necessary due to the non-stationary nature of the signal. Although cluster components may be further subdivided using fuzzy

clustering, being part of a cluster is not reliant on the method used to create the cluster. Time and space limitations are often used to change this kind of clustering to account for the effect of the shift in ability evaluation, keep the number of subset sets from getting smaller, and shorten the distance between some cluster centers [9].

The use of robots in educational settings has been hailed as a game-changer. Several studies have indicated that this novel method may have far-reaching consequences for students and the educational system. According to some researchers, students' computational thinking, problem-solving, self-efficacy, creativity, collaboration/cooperative abilities, and logical reasoning may all benefit from their exposure to educational robots. Robots have also found use in fields as diverse as language, mathematics, physics, and interdisciplinary STEM [10]. The potential of robots as teaching aids in schools was highlighted by a meta-analysis of 10 research papers on robotics in education, which also demonstrated improved performance in STEM subjects. Most of the pupils in the 22 studies the researcher looked at were in elementary school and were all using LEGO robots to learn about robotics. What we know today suggests that robots play a dual role in education, assisting mentors and mentees. The author of this study acted as the mentor for Baxter, a robot created to instruct students in grades K–12 in computer programming [11]. Some research suggests that robots may aid in the learning process. The robot used interactive storytelling to engage the kids and teach them something new. The area of robotics has significantly benefited from the fast progress of AI. Traditional robots (like LEGO robots) are solely used to assist students in the construction and writing of computer programs, but AI robots may engage in two-way interaction with humans using natural language processing, voice recognition, and picture analysis [12]. This broadens the potential applications for artificial intelligence robots in the classroom, where they might be used for individualized instruction, active learning, and the incorporation of a fully autonomous intelligent tutoring system (ITS). To rephrase, AI robots can serve as learning facilitators even without human instructors, unlike in a traditional classroom. In addition, AI has been proven to be helpful in a variety of other contexts, such as engineering, mathematics, languages, e-learning, and healthcare training. Since there are so many potential uses for artificial intelligence robots, researchers and instructors must stay abreast of the latest advancements in the field [13].

Several researchers have also emphasized using bibliometric analysis and systematic reviews to recognize new tendencies in specific fields of study [14]. Conducting a systematic review, which includes searching the relevant literature, identifying relevant studies, selecting the best studies, evaluating the studies, and synthesizing the findings, may teach researchers more about the topic and inspire them to perform novel, significant research. The field of foreign language education and the institutions that support it in my country

have faced significant new challenges and possibilities in recent years. Growing difficulties are emerging due to the strict training paradigm that fosters students' complete language proficiency in advance of globalization and economic integration [15]. The results will have far-reaching implications for educational programs' content, approach, and organization. The use of multimedia in language instruction has been a hot topic of study ever since the advent of the computer, but notably in the twenty-first century with the widespread proliferation of digital devices and the ubiquitous accessibility of the Internet [16]. Computers may assist teachers in raising students' linguistic competence by making it easier to teach reading, writing, and translation. Multimedia lessons are widely used in schools due to the widespread availability of modern computer technology [17]. Using a teaching resource library to supplement multimedia courses is a fantastic way to pique students' interest in learning and enhance community nursing education. The authors investigated how using YouTube can affect students' ability to learn and remember new words in English [18]. The findings suggest that the groups that saw the YouTube clips did better on the following examinations than the control group, who had never seen the films before. The author shares data from her empirical study with high school students to shed light on how to motivate young people to study English in a digital setting [19].

The "input and interaction" process is crucial because it guarantees that the learner's demands will be met and leads to measurable learning results [20]. By employing music software to compose, arrange, and playback electronic music, modern multimedia programs make excellent use of modern computers' real-time, dynamic processing power. The author contends that educators are rethinking their roles in the classroom due to students' increased ability to tailor their schooling to meet their specific needs, regardless of where they happen to be physically located [21]. Because of this need, the curriculum will be adjusted to include lessons on effectively using multimedia tools in group work and conversation. By using multimedia tools, instructors may better meet their students' requirements in a language classroom. Students are encouraged to participate in their education by researching topics that either pique their interest or that they feel they need a firm grasp on [22]. Instead of having every student study the same thing at once, computers make it possible to provide each one with a customized lesson plan. It is an excellent resource for students of any age, from any culture or language, and in any academic field. This study evaluates the design of spoken English teaching based on artificial intelligence educational robots and wireless network technology with CapsNet.

Contributions

- This research examines the challenge of human individuality in artificial intelligence with the Capsule network (CapsNet) scheme from two

perspectives: the practical need to address issues that have arisen with the latest wave of AI advancements and a philosophical examination of how AI has been used in various industries.

- This research discusses the new Internet spoken English education approach, its pros and cons, and how wireless technology will be used in it. To help develop gesture recognition, the technology shows each step.

- The interactive interface guides students through the gesture recognition system using computer vision applications, allowing them to experience it firsthand. Then, the sophisticated and abstract action recognition method is described with a representational illustration, helping elementary and secondary school students understand and develop their logical reasoning. This will help primary and secondary pupils think critically and deeply.

- Finally, we conduct an experiment to compare our CapsNet technique to other AI learning methodologies.

2. Related Work

Learn English from afar through a Web-based system called the English teaching network. As one of the most crucial components of the English teaching network, automatic test paper production helps pique students' curiosity and encourages them to learn of their own volition. In this article, Tan Minghua (2020) provides a wireless sensor network teaching experiment system predicated on a genetic algorithm after briefly introducing the network's architecture. The system's many sensor nodes can arrange themselves in a wide variety of topologies; data collected by the system can be transmitted to a user terminal over a GSM network, and the user terminal can be used to perform remote control of a sensor node [23]. First, the paper introduces the automatic test problems as a constrained multi-objective problem, then it details the genetic algorithm's design for improving the paper, and finally, it proposes questions based on an encoding method and the difficulty and test points of F fitness function for dynamic adjustment of the parameters during the iterative process. Finally, experimental evidence shows that the resulting test paper successfully meets users' expectations in terms of questions, topics, and scores, while also dramatically increasing the speed with which a random optimization algorithm completes its tasks.

As computing and AI improve at a rapid pace, automatic assessment of English composition will become the norm rather than the exception. This improves the theoretical grounding and practical viability of studies into an algorithmic scoring system for composition. The increased use of AI in the classroom that has resulted from the convergence of IT and the English curriculum presents a fresh window of opportunity for the improvement of the pedagogy behind teaching English

and a blank slate upon which to build an adaptive and adaptively adaptive learning space. This paper by Bin Yi and Mandal Durbadal (2019) draws on pertinent theories of curriculum theory, literature analysis, and field investigation to examine the application of artificial intelligence in English teaching at the middle school level [24]. This work is grounded in the integration of IT and curriculum and aims to improve the quality and effectiveness of English instruction there. There is a proposal for an AI-powered system to aid with the teaching of English at the university level. Some aspects of the English education system are enhanced and softerened when combined with English instruction. To boost the quality and effectiveness of English instruction, researchers investigate how artificial intelligence technologies may be applied in the classroom.

Using the web as a medium, the English teaching network system offers remote learning. Problems might arise in the classroom due to a number of factors, such as instructors' own learning gaps, students' high standards, a lack of resources, and widespread negative attitudes against the method of teaching and learning English. In today's digital age, students benefit from a hybrid approach to education that brings together the best of both traditional classroom instruction and internet resources. Producing exam pattern paper is an integral aspect of the English education infrastructure since it encourages students to study on their own time. Research by Xing Liu (2022) suggests that AI-based English network teaching (AI-ENT) is an effective strategy for improving students' outcomes while taking courses online [25]. There are signs that AI has the potential to radically revolutionize both the means of education and the instruments used for instruction in machine learning. Students can make substantial improvement in their English learning experiences with the use of AI technology tools and teacher mentoring. This layout is inspired by the logic of artificial intelligence expert systems. Having access to pertinent data from a variety of sources can help educators and students enhance their English language skills. Testing shows that the approach can help students learn more quickly and more effectively, and that the material they study is more applicable to their lives.

An English listening education experiment is designed and implemented by Li Liu (2021) in this study. The experiment makes use of a wireless communication microcontroller and a virtual environment. This thesis builds on a thorough familiarity with wireless communication algorithms by enhancing the general-purpose compact instruction set computer architecture (RISC) with new instructions for frequently used operations in wireless communication algorithms, such as multiplication, addition, and bit inversion [26]. The number of execution clocks in the CPU has been increased to facilitate the processing of wireless algorithms. To improve the speed of digital signal processing, an interrupt interface has been added to the CPU to enable communication between the processor and the outside world. In the spirit of virtual reality (VR)

education and the general progress of English pedagogy, a survey and comparison of the current state of research in the United States and abroad are provided. Next, the issues and hypotheses that will be tested in this study are described, and various research strategies for elucidating the solutions to these issues are introduced. Specific performance data was collected and compared between the two classroom configurations. The results showed that students in the VR scenario teaching group improved significantly in vocabulary judgments, complementing dialogues, and Chinese to English translation, with a 43% merit rate and a 100% pass rate in English. Students were more engaged and teachers were more successful because of the immersive learning environments made possible by virtual reality (VR) technology. Technology in education is trending toward virtualization and intelligence, making the incorporation of VR into the educational process that much more crucial to advancing the informatization of secondary school in the modern era.

The use of AI robots (Artificial Intelligence-based robots) in education has emerged as a promising area of study thanks to the exponential growth of AI technology. AI robots, according to a growing body of research, could usher in novel approaches to curriculum development and teacher training. But there hasn't been a comprehensive look at the role and focus of artificial intelligence robots in education (AIRE) studies [27]. Therefore, Shih-Ting Chu et al. (2022) conducted a systematic review of journal articles included in the Web of Science's SSCI (Social Sciences Citation Index) to learn more about the patterns of AIRE research (WoS). Participants, study lengths, settings for learning, application domains, data analyses, learner performance assessments, pedagogical approaches, the part played by AI robots, and research gaps were all examined. The following is a summary of the study's findings: (1) Canada, Chile, and South Korea made early investments in AIRE research and prioritized student achievement and study habits. (2) The majority of AIRE studies had participants younger than 13 years old and take place over the course of four weeks in a real-world setting. The majority of AIRE applications have been in the fields of Language and Science, with the most popular approaches being those directly related to the solution of problems and a hybrid of these two. Thirdly, AI robots are frequently used in the role of a tutee or tutor. AIRE studies tend to focus on learning performance as a primary variable regardless of the AI-intended robot's purpose. In addition, topics such as students' perspectives on learning and how they act as they do so are regularly brought up in discussions. Based on the findings, the authors of this study offer numerous suggestions for future AIRE studies that can serve as a useful resource for higher education faculty, researchers, and policymakers.

Changes in instructional strategies are inevitable when new technologies enter the picture. Using AI in the classroom is becoming increasingly obvious as artificial intelligence (AI) technology has advanced rapidly in recent years. Adaptive learning, teacher evaluation, online classes, and other uses of artificial intelligence in the

classroom are first discussed in this work by Huang J et al. (2021). And then draws conclusions about how that affects classroom practice; this has important implications for enhancing the quality of education for both educators and students [28]. Finally, it identifies some of the potential pitfalls that AI-based educational applications may encounter and offers some suggestions for how AI might be used to further reforms in the field of education.

Artificial intelligence (AI) is used extensively in the field of educational robotics (ER), which includes but is not limited to the STEM (Science, Technology, Engineering, and Mathematics) fields, logical mathematics, debugging, LEGO robots, and many more. The policy and application of (ER) research is in dire need of investigation. Nonetheless, DALIA KHAIRY et al. (2020) provide a framework for the representation of knowledge concerning the application of Educational Robotics and Context-Aware technology in the classroom. With this system, college classrooms can function as efficiently as possible. This research offers a novel approach in various respects [29]. Increasing the scope and quality of the students' responses and fostering active engagement in conversation among the users. To link and process information from robotics indicators, the framework implements a context controller system on the mobile terminal. In addition, it combines a number of cloud-based AI recognition services to mine the data for contextual clues. Additionally, we outline a future where robotics and context-aware technologies are integrated into the classroom to maximize the usefulness of environmental context.

Ahmad S. F. et al(2021) 's research aims to investigate the potential of AIA in the classroom. The exponential growth of current challenges poses barriers to education and learning that can be alleviated with the help of AI technologies [30]. You can find their fingerprints all over things like social robots (SR), smart learning (SL), and intelligent tutoring systems (ITS). Based on the findings, it is recommended that the educational sector similarly adopt contemporary pedagogical practices and the required technological infrastructure. Organizations working in the field of education must, in order to keep up with the times, embrace artificial intelligence technologies. Statistical testing is needed to further understand and generalize the study's findings.

The practical need to address issues that have arisen with the latest wave of AI advancements and a philosophical examination of how AI has already been put to use across industries inform this paper's examination of the challenge of human individuality in Artificial intelligence with the Capsule network (CapsNet) scheme.

3. Materials and Method

This section shows how wireless technology will be integrated into online spoken English instruction and discusses the CapsNet framework that will be used to investigate the novel approach of teaching spoken English

via the computer vision applications in further detail. The topology of the network is shown in Figure 1.

Advances in AI and computer visions applications have been profoundly influenced by the proliferation of CapsNet and "Wireless Network (WN)" based communication devices. The Internet of Everything together with the pervasive network that defines WN technology have the potential to significantly improve computer vision and AI. This effect is now pervasive, giving us a first taste of what AI might look like. In the realm of education, CapsNet technology is still very much in use. Teachers may quickly assess their students' mental approaches to learning and current progress. Teachers and AI tools working together may analyse student data to inform instructional decisions. It helps spread the concept that learning should be tailored to each individual student's strengths and weaknesses.

Learning plans, pedagogical approaches, and course materials can all be tailored to the specifics of individual students as much as feasible. Second, AI and computer visions techniques can assist educators do a better job of instructing students. Without AI, educators can only adapt their methods based on their own experience in the classroom or the needs of their pupils. Teachers may not always be aware of whether or not their pupils have internalised the material they are presenting in class. Education can be made more compassionate and individualised with the application of CapsNet, which can aid teachers in modifying their approaches, expanding their knowledge, and gauging pupils' levels of acceptance.

With the rapid growth of WN and computer visions, education and teaching techniques need to become more inventive in order to keep up. Education is a crucial window for the diffusion of Chinese culture. For instance, "Virtual Reality (VR)" and "Augmented Reality (AR)" can be integrated into the classroom to give pupils with an engaging learning experience; through correspondence courses, explore the teaching mode of dual-teacher classroom and professional classroom to maintain teaching resources; utilize every opportunity of big data analysis to collect learning information and personalise education programmes according to pupils' features; bring additional to the benefits of expressing novel ideas; and give full play to the advantages of expressing neologisms. The virtual reality and augmented reality are the significant techniques of computer vision.
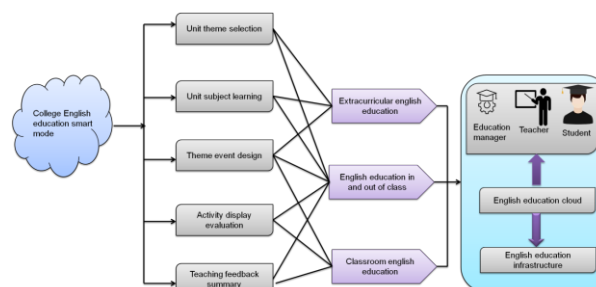

Figure1. Network topology diagram

Second, online educators have the option of either videotaping or streaming their classes in real time using computer vision applications. In order to provide students more time for speech practice during class, some teachers post the class's video footage to the site ahead of time. The recorded lecture and course materials can be archived for future viewing at the convenience of the student. If a student does not pay close enough attention in class, they might review the material at length before the next meeting. Some modern online education platforms feature an automated gradebook correction system that runs two rounds of statistical analysis on the rectified data before sending it on to the instructor. Students are more likely to pay attention if they know their teacher will be administering tests and displaying their results while in class. It does a better job of ensuring that teachers are effective and also helps them become more efficient at their jobs. Teachers can tailor homework and extra lessons based on student performance using data gleaned from the system.

Because of its uniform resonant frequency in the bandpass, the Butterworth filter may be utilised as a band-pass filter, and therefore the Butterworth function (whose amplitude squared function is provided by the following expression) is chosen as the system component.

$$|H(jw)|^2 = \frac{1}{1-\varepsilon^2(i\Omega/i\Omega_d)^{2M}} \qquad (1)$$

$$M \geq km\left(\frac{\lambda}{r}\right) \qquad (2)$$

The additional problem of the standard wavelet denoising technique is that, although for noisy signals, a higher denoising result may be achieved by predicting the noise variance, for small-scale noise this is not the case." Surface electromyography (sEMG") is commonly assumed to have Gaussian background noise. So, the "Gaussian mixture model (GMM)" is employed to estimate the noise variance of EMG and CapsNet in this work, with the minimal Gaussian coefficient serving as the estimate.

$$q(z|\theta| = \sum_{n=1}^{l} b_n o(z|\theta_m) \qquad (3)$$

Since the preprocessed sEMG cannot be provided straight to the types on the basis for action classification without first extracting the useful data in the form of features that might denote multiple action categories, a wide range of features are used to create a feature vector. Good features are those that capture both the shared characteristics of a gesture and the distinctiveness that sets it apart from others. Extracting useful features from the sEMG signal is the goal of SEMG feature extraction, and the quality of the features extracted has a direct bearing on the accuracy of the gesture detection system as a whole.

$$MAV = \frac{1}{M}\sum_{j=1}^{M} v_j, \qquad (4)$$

$$VAR = \frac{1}{M+1}\sum_{l=1}^{M} v_j^2 \qquad (5)$$

sEMG's unpredictability causes temporal domain analysis instability. By applying a Fourier transform to the signal to get the spectral distribution, we may gain insight into muscle tissue activity. After being preprocessed, the original surface EMG signal has a frequency distribution in the 20-500 Hz range, which is rich with information about the muscle contraction. In this research, we focused on extracting four particular frequency domain properties.

$$PKE = \min(o_1, o_2, o_3, \dots o_N) \qquad (6)$$

$$\sum_{j=1}^{MDF} o_j = \frac{1}{M} \sum_{j=1}^{M} o_j \qquad (7)$$

The recognition effectiveness of a system relies heavily on the feature vectors that are chosen and extracted. More complex feature vectors do not always lead to more accurate classifications. Students need to broaden their viewpoints and gain richer settings to understand humanities and culture in other places. Since English is a unique subject, they need to study it. Therefore, it is essential that not only the students' learning content be present within the classroom, but also the pupils' vision is highly significant, and educators need to make utilize specific situations and resources to enhance students' speaking and listening ability and the overall quality of their work.

The improvement of junior high school students' English listening and speaking skills is contingent upon their willingness to put in the time and effort required to cultivate these skills, as well as their willingness to abandon the traditional teaching model in favour of one that is more student-oriented and teacher-led. In this paper, we take a different approach by extracting and selecting features after reading a large body of literature on the topic, and then we use random forest to calculate the importance of each feature value and demonstrate that the features we chose play a significant role in the final classification effect, thus mitigating the previously mentioned negative outcomes. The information gain-based decision tree method not only does classification, but also performs sample division based on the features. This allows for a full comparison of the relevance of the input set of characteristics. After training is complete, the score for each feature is computed in each decision tree, and then the overall score for each feature is calculated in the random forest. The data is scaled such that equation (8) represents a global average of all characteristics' relevance.

$$H^n = 1 + \sum_{j=1}^{M} (o_j^n)^2 \qquad (8)$$

Reforming education requires fixing problems like "inadequate funding for educational technology," "the inability to synchronise hardware and software," "an emphasis on effects rather than effectiveness," "large differences between theoretical research and practical needs," "the imperfect management system in the field of practise," and "duplicating theories and experiences from other countries." Future trends in educational technology

are predicted, and it is argued that pragmatic and cooperative studies on educational technology, joint research on the learner's psychology in a technological landscape, and the design of learning activities should merge with comprehensive studies on digital education applications. Thus, it appears that computers will play a pivotal part in the evolution of educational technology, and that the field of computer education applications will continue to shine brightly in the years to come.

CapsNet structure

Spoken English teaching based on artificial intelligence educational robots the text classification situation using CapsNet and it is used to identification of text. Assume lower level capsules detect the text pronunciation activities of robot and output of the capsules detects their corresponding face action of robot to their corresponding text. Let the equation (9) can be defined as follows,

$$textEXPf_1, textEXPf_2, \ldots, textEXPf_k \qquad (9)$$

be the output vectors coming from the capsules of the below layer. By using the neural network, the vectors $textEXPf_1, textEXPf_2, \ldots, textEXPf_k$ are sent to all possible parents. The vectors $textEXPf_1, textEXPf_2, \ldots, textEXPf_k$ are multiplied by corresponding matrix $ttU_{ij}, i = 1, 2, \ldots, k$ that encode important spatial and other relationships between the lower level capsules (text pronunciation) into the higher level capsules (face action of robot to their corresponding text). That is, in layer m the output vector $textEXPf_i$ of the ith lower capsule (text pronunciation activities of robot) is fed into all capsules in the higher level capsule (face expression of robot to their corresponding text) m + 1. The resulting vector $\widehat{textEXPf}_{j|i}$ is capsule i at level m's transformation of the entity represent by capsule j at m + 1 level. Then the predicted vector of the higher level as follows:

$$\widehat{textEXPf}_{j|i} = ttU_{ij}textEXPf_i \qquad (10)$$

The above equation (10) indicates the initial capsule i contributes to the capsule j. A weighted sum $textt_j$ with weight ttv_{ij}, then the equation (11) becomes

$$textt_j = \sum_{i=1}^{k} ttv_{ij}\widehat{textEXPf}_{j|i} \qquad (11)$$

Where ttv_{ij} is the coupling coefficient that ensures the prediction of i to j in the layer level m to m + 1. Then calculate the candidates for the squashing function ttu_j as defined in equation (12) follows:

$$squash\ fn\ ttu_j = \frac{\|textt_j\|^2 textt_j}{1 + \|textt_j\|^2 \|textt_j\|} \qquad (12)$$

The above equation is squashing function to the scalar vector between zero and unit length and also the vector direction is not change and $textt_j$ is the input vector of the jth capsule and the norm of the vector t_j is the length of the module (refer Equation (13)). Suppose $textt_j$ is short. Then

$$squash\ fn\ ttu_j \approx \|textt_j\|textt_j \qquad (13)$$

Suppose $textt_j$ is long (that is, unit vectors). Then equation (14) becomes

$$squash\ fn\ ttu_j \approx \frac{textt_j}{\|textt_j\|} \qquad (14)$$

The coupling coefficient ttv_{ij} is defined by Equation (15) as follows:

$$coup\ coe\ of\ ttv_{ij} = \frac{\exp(ttw_{ij})}{\sum_k \exp(ttw_{ik})} \qquad (15)$$

The above equation determined by iterative dynamic routing process and ttw_{ij} calculating as defined in equation (16) follows:

$$ttw_{ij} = ttw_{ij} + \widehat{textEXPf}_{j|i}.(squash\ fn\ ttu_j) \qquad (16)$$

all capsule i in layer m and capsule j layer (m + 1) level. The objective functions of the text and number classification of blockchain of the optimized CapsNet as defined in equation (17) follows:

$$text\ L_Q = textT_q max(0, mam^+ - \|textt_q\|)^2 + \mu(1 - textT_q)max(0, \|textt_q\| - mim^-)^2 \qquad (17)$$

Where $textT_q$ represents q th target label and $\|textt_q\|$ is the length of q th digit capsule.
mam^+- maximum margin; mim^- - minimum margin; μ- weight factor; the total loss is denoted by $textL_Q$ and is equal to the sum of the losses of all digit capsules.

4. Results and Discussion

This section highlights the outcomes of the framework, which is built on WN technology and AI educational robots. Technologies like "Machine Learning (ML)" [31], "Deep Learning (DL)" [32], and "Virtual Reality (VR)" [33] each have unique properties that they apply to. This study compares these strategies with the suggested methodology CapsNet in order to contrast and choose the best technology.

Figure 2 presents the results of an investigation about the content requirements of spoken English. The delivery of the most useful educational materials at the times and places when students have the most need for them or are most receptive to new information should be the primary objective of the content creation process for spoken English courses. Combining the resources of the computer vision applications and literature with linguistic research is the best way to accomplish this goal.
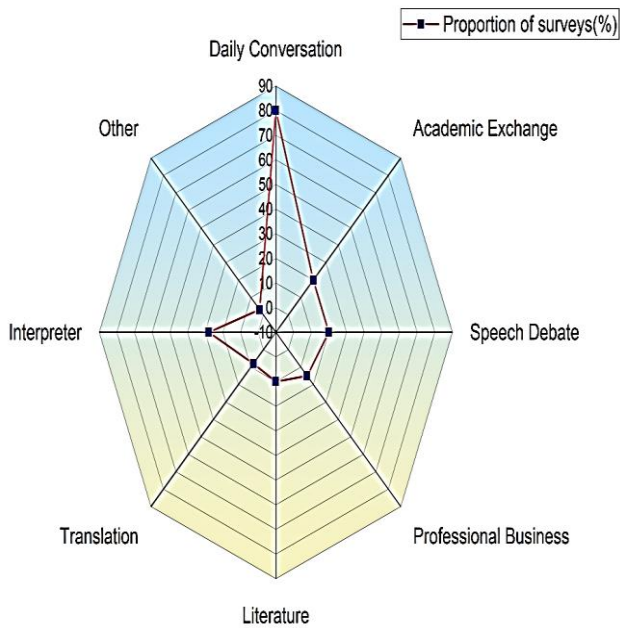
Figure 2. Evaluation of the spoken English course content requirements

Figure 3. Paired sample test results

The results of the paired-samples test are shown in Figure 3. In pair 1, students in the experimental class show an improvement in their ability to perceive linguistic information, while in pair 2, students show a significant improvement in their ability to comprehend linguistic information, and students in the pair 3 experimental class show no improvement in their ability to evaluate linguistic information.

In order to conduct a more in-depth analysis of the shift in the students' level of interest in English, the many choices for the questions on listening and speaking interest that were included in the student survey were investigated. These findings are presented in Figure 4. The figure makes it abundantly evident that the proportion of respondents who selected "very much in line" or "conform" rose by a certain percentage, while the proportion of respondents who selected "very much not conform" dropped by 1.49 percent. It demonstrates that, during the process of experimental teaching, students' interest in English hearing and speaking is slightly growing, and it shows that pupils' English listening and speaking behaviors are also changing slowly. Both of these things are reflected in the fact that pupils' English listening and speaking behaviours are changing slowly. A comparison of the students' interest in learning after exposure to various types of technology education is shown in Figure 5. The student who learnt using the suggested approach CapsNet with AI had a greater learning interest as compared to other methods, as seen clearly in the figure.
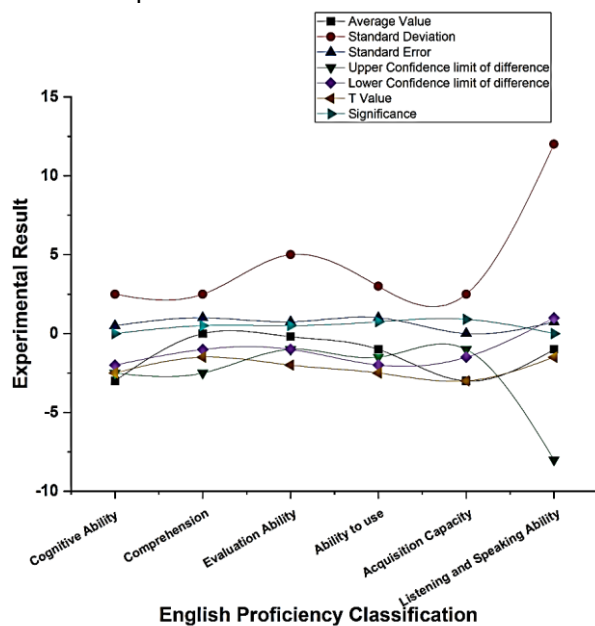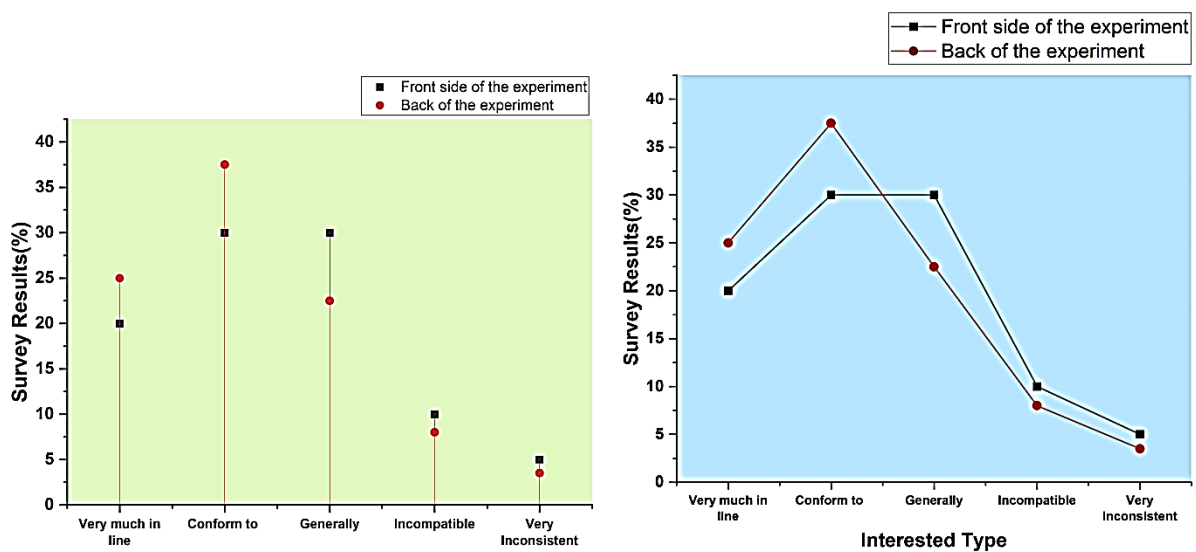
Figure 4. Variations in the interest of learners in speaking and listening to English
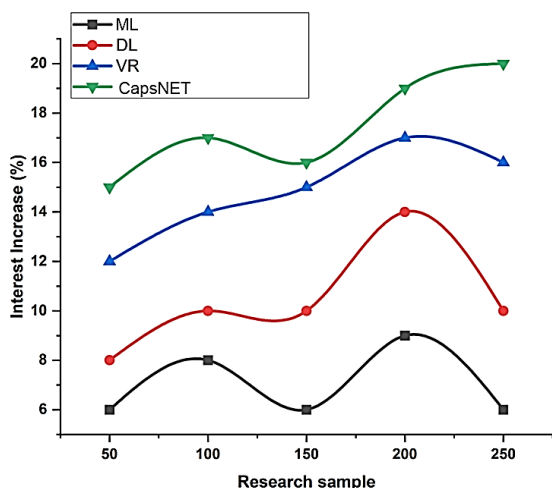

Figure 5. Learning Interest

5. Conclusion

This study takes a philosophical look at how AI has previously been put to use in various industries, and then applies that to the practical requirement to address challenges that have developed with the latest wave of AI breakthroughs, which poses a challenge to human individuality in the CapsNet with AI scheme. In this new perspective, the issue of human uniqueness is examined. Using AI in the classroom not only symbolises a continuation of research into the issue of human individuality in the modern period, but it may also provide students with a more interesting learning environment and enhance their motivation. This article

details the implementation of wireless technology into online spoken English teaching, as well as a case study framework to analyse the new Internet spoken English teaching technique, highlighting its merits and giving answers to its drawbacks. To aid in the learning process, the technology displays visual representations of each step in the gesture recognition process. Elementary and secondary school students can benefit from a more thorough understanding of and development of their capacity for logical reasoning by interacting with the gesture recognition system through the interactive interface, which guides them through the system and allows them to experience it firsthand. This will assist students in elementary and high school to think more critically and comprehensively. Finally, we build an experiment to evaluate CapsNet method against more standard approaches to AI knowledge acquisition. The results of experiments were studied to show that this method is effective for learning about AI with CapsNet, and that it raises both the interest and ability of its users.

References

[1] Li P, Li C. Construction of multimedia teaching platform for community nursing based on teaching resource library technology. International journal of emerging Technologies in Learning. 2017, 12 (7): 68.

[2] Kabooha R, Elyas T. The effects of Youtube in multimedia instruction for vocabulary learning: perceptions of EFL students and teachers. English language teaching.2018, 11(2): 72.

[3] Philominraj, Jeyabalan D, Vidal-Silva C. Visual learning: a learner centered approach to enhance English language teaching. English language teaching. 2017, 10(3): 54.

[4] Jin. Analysis of music teaching mode innovation based on intelligent classroom and multimedia system. Revista De La Facultad De Ingenieria. 2017, 32(1):534–543.

[5] Mpemba T. Reluctance to sanction Kiswahili instructional medium in post-primary education: how do the learners and their instructors cope with or resist the English medium policy?. Phi delta kappan. 2018, 92(4): 15–21.

[6] Muslem, Abbas M. The effectiveness of immersive multimedia learning with peer support on English speaking and reading aloud. International Journal of Instruction. 2017, 10(1): 203–218.

[7] Hennessy DA. Conceptual models underlying economic analysis of animal health and welfare with the inclusion of three components: people, products, and resources. Revue scientifique et technique (International Office of Epizootics). 2017, 36(1): 77–85.

[8] Liou H. The roles of second life in a computer-assisted language learning (CALL) course in Taiwan, ROC. Computer-assisted Language Learning. 2012, 25 (4), 365 – 382.

[9] Thang S. M., Mahmud N., Razak, N. A. The use of wireless technology in UKM: Challenges faced and its impact on English language learning. 3L: The Southeast Asian Journal of English Language Studies. 2012, 18 (1):129-143.

[10] Huang L.H., Chen C.Y. GM (0,N)model-based analysis of the influence factors of network English learning platform. Journal of Grey System. 2016, 19(1): 31–40.

[11] Yingjie S, Qingshui Q, Ruiqing G. Construction of the classroom teaching capability system of English teachers based on an artificial intelligence environment. Agro Food Industry Hi Tech. 2017, 28(1): 511–515.

[12] Pingxiao W. Research on the English teaching and autonomous learning based on multimedia platform and smart classroom system. International Journal of Smart Home. 2016, 10(9): 373–384.

[13] Balagansky IA, Stepanov AA. Numerical simulation of composition B high explosive charge desensitization in gap test assembly after loading by precursor wave. Shock Waves. 2016, 26(2): 109–115.

[14] Cao. Research on the interactive classroom of English situational teaching based on multimedia network. Boletin Tecnico/technical Bulletin. 2017, 55(4): 132–138.

[15] Ketabi S, Kavoshian S. Innovative technology in English language teaching: the utility of mobile social network sites to improve teacher education. English Language Teaching.2017, 11(1): 39–67.

[16] Howie M. Embracing the other within: dialogical ethics, resistance and professional advocacy in English teaching. English Teaching Practise Crit. 2017, 7(1): 103–118.

[17] Caccese V, Ferguson J, Lloyd J, Edgecomb M, Seidi M, Hajiaghamemar M. Response of an impact test apparatus for fall protective headgear testing using a hybrid-III head/neck assembly. Exp. Tech. 2016, 40(1):413–427.

[18] Veldkamp BP, Avetisyan M, Weissman A, Fox JP. Stochastic programming for individualized test assembly with mixture response time models. Computers in Human Behavior. 2017, 36(7): 58–59.

[19] Atman Uslu N, Yavuz GO, Usluel YK. A systematic review study on educational robotics and robots. Interactive Learning Environments. 2022, 1-25.

[20] Auerbach JE, Concordel A, Kornatowski PM, Floreano D. Inquiry-based learning with robogen: An open-source software and hardware platform for robotics and artificial intelligence. IEEE Transactions on Learning Technologies. 2018, 12 (3):356-369.

[21] Chevalier M, Giang C, Piatti A, Mondada F. Fostering computational thinking through educational robotics: A model for creative computational problem solving. International Journal of STEM Education. 2020, 7 (1) : 1-18.

[22] Conti D, Cirasa C, Nuovo SD, Nuovo A D. Robot, tell me a tale!": A social robot as tool for teachers in kindergarten Interaction Studies. Interaction Studies. 2020, 21 (2) : 220-242.

[23] Tan M. Research on English teaching system based on artificial intelligence and WBIETS wireless network system. EURASIP Journal on Wireless Communications and Networking. 2020, 2020:134.

[24] Bin Y, Mandal D. English teaching practice based on artificial intelligence technology. Journal of Intelligent & Fuzzy Systems. 2019, 37: 1-11.

[25] Xing L, Xiaoyin H. Design of Artificial Intelligence-Based English Network Teaching (AI-ENT) System. Mathematical Problems in Engineering. 2022, 2022: 12.

[26] Li L. Design and Implementation of English Listening Teaching Based on a Wireless Communication Microprocessor and Virtual Environment. Journal of Sensors, 2021, 2021:12.

[27] Shih-Ting C, Gwo-Jen H, Yun-Fang T. Artificial intelligence-based robots in education: A systematic review of selected SSCI publications. Computers and Education: Artificial Intelligence. 2022, 3.

[28] Huang J, Saleh S, Liu Y. A Review on Artificial Intelligence in Education. Academic Journal of Interdisciplinary Studies. 2021, 10(3):206.

[29] Dalia Khairy, rania AA, Marwa FA, Safaa MA, Salem A, Mohamed AA. Educational Robotics Based On Artificial Intelligence and Context-Awareness Technology: A Framework. Journal of Theoretical and Applied Information Technology. 2020, 98(13).

[30] Ahmad SF, Rahmat MK, Mubarik MS, Alam M.M, Hyder SI. Artificial Intelligence and Its Role in Education. Sustainability. 2021, 13:12902.

[31] Jiao F, Song J, Zhao X, Zhao P, Wang R. A spoken English teaching system based on speech recognition and machine learning. International Journal of Emerging Technologies in learning (iJET). 2021, 16(14):68-82.

[32] Cai W, Peng Y. Sharing Method of Online Teaching Resources of Spoken English Based on Deep Learning. Journal of Electrical and Computer Engineering.2022, 2022:9.

[33] Bao S. Design of Digital Teaching Platform for Spoken English Based on Virtual Reality. Advances in Multimedia. 2022,2022:10.