Utilization of smart technology to improve quality and effectiveness of digital content to develop English language skills for non-specialists.

Prepare

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توظيف التكنولوجيا الذكية في تحسين جودة وفاعلية المحتوى الرقمي لتنمية مهارات اللغة الانجليزية لغير المتخصصين

د/ نهى ابراهيم فتحى ابراهيم طه

عضو هيئة تدريس بالمعهد العالى للحاسب الالى وادارة الاعمال الزرقا– دمياط

قائم بعمل وكيل المعهد لشؤون التعليم والطلاب

ملخص البحث باللغة العربية

يشهد مجال التعليم تحولاً كبيراً بفضل التطورات التكنولوجية الحديثة، حيث أصبحت التكنولوجيا الذكية أداة فعالة لتحسين جودة وفعالية المحتوى التعليمي. والتي شملت تقنيات مثل الذكاء الاصطناعي، التعلم الآلي، الواقع الافتراضي والمعزز، وتطبيقات الهواتف الذكية، أدوات أساسية في تحسين وتطوير التعليم. توفر هذه التقنيات إمكانيات جديدة ومبتكرة لاكتساب مهارات اللغات، مما يتيح للمتعلمين الاستفادة القصوى من تجارب تعليمية غنية وتفاعلية تتجاوز الأساليب التقليدية وعلى ذلك. يهدف البحث الحالى الى تحديد أنواع التكنولوجيا الذكية المستخدمة في اكساب مهارات اللغة الإنجليزية لغير المتخصصين وتحليل تأثيرها على جودة المحتوى الرقمى المتاح وتقييم فعاليته فى اكساب المهارات اللغوية المطلوب تنميتها لدى عينةالبحث من غير المتخصصين.

وتمثل تنمية مهارات اللغة الإنجليزية لغير المتخصصين تحدياً كبيراً نظراً لتعدد المهارات المطلوبة، مثل الاستماع، التحدث، القراءة، والكتابة. ويتطلب تطوير هذه المهارات أساليب تعليمية تتسم بالمرونة والتفاعلية لتلبية احتياجات المتعلمين المختلفة. وهنا يأتي دور التكنولوجيا الذكية، التي توفر منصات تعليمية متقدمة وتطبيقات مبتكرة تساعد في تقديم محتوى تعليمي مخصص ومحفز. حيث تسهم التكنولوجيا الذكية في تسهيل اكتساب مهارات اللغة الإنجليزية لغير المتخصصين بطرق متعددة. فهي تمكن المتعلمين من الوصول إلى مصادر تعليمية متنوعة وتفاعلية، مثل الدروس الافتراضية، والألعاب التعليمية، وتطبيقات التعلم التي تعتمد على الذكاء الاصطناعي لتقديم تجربة تعلم شخصية تتناسب مع مستوى كل متعلم. كما تعزز هذه التكنولوجيا من تفاعل المتعلمين مع المحتوى المتخصص المقدم لهم ، مما يزيد من فاعلية التعليم ويحفز على الاستمرار في عملية التعلم.

وينتمى هذا البحث الى فئة البحوث التطويرية حيث اعتمدت البحث على كلا من المنهج الوصفى التحليلى والذى شمل مراجعة الأدبيات السابقة وتحليل التطبيقات والأدوات الذكية المتاحة. والمنهج شبه التجريبى من خلال توظيف التكنولوجيا الذكية وتحديد اثرها فى تنمية مهارات اللغة الانجليزية لغير المتخصصين من عينة البحث الحالى والمتمثلة فى ٣٠ متطوع من طلاب المعهد العالى للحاسب الالى وادارة الاعمال بالزرقا دمياط

وتمثلت أدوات البحث فى اعداد اختبار لقياس الجانب المعرفى وبطاقة تقييم منتج مهارى لقياس المهارات الفرعية للغة الانجليزية وتوصلت الباحثة الى مجموعة نتائج تمثلت ابرزها فى وجود تنوع كبير فى التكنولوجيا الذكية والتى ضمت تطبيقات متنوعة ، برامج التعلم التفاعلية، الواقع المعزز والافتراضي، والمنصات التعليمية عبر الإنترنت. كما اوضحت النتائج مدى تحسين جودة المحتوى الرقمي حيث ساهمت التكنولوجيا الذكية في تحسين جودة المحتوى من خلال تقديم تجارب تعليمية تفاعلية ومتنوعة، مما يعزز من استيعاب المتعلمين وينمى مهاراتهم باللغة الانجليزية على الرغم من عدم تخصصهم الدقيق فى اللغة وتوصلت الباحثة أن الأدوات الذكية أثبتت فعاليتها في تنمية مهارات الاستماع والتحدث والقراءة والكتابة لدى غير المتخصصين.

واوصى البحث بضرورة تكامل التكنولوجيا في المناهج التعليمية ودمجها بشكل أكبر في المناهج الدراسية لتقديم محتوى تعليمي متطور .

الكلمات المفتاحية : التكنولوجيا الذكية – جودة – فاعلية – المحتوى الرقمي – مهارات اللغة الانجليزية لغير المتخصصين

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The Scientific Conference of the Department of Curricula and Teaching Methods, Faculty of Education, Tanta University, titled "Artificial Intelligence and Prospects for Developing the Curriculum System," Monday, July 22, 2024.

Research summary in English:

The field of education is undergoing a significant transformation due to modern technological advancements, with smart technology becoming an effective tool for improving quality and effectiveness of educational content. This includes technologies such as artificial intelligence, machine learning, virtual and augmented reality, and smartphone applications, which have become essential tools in enhancing and developing education. These technologies offer new and innovative possibilities for acquiring language skills, enabling learners to benefit from rich and interactive educational experiences that surpass traditional methods.

The current research aimed to identify the types of smart technology used in teaching English language skills to non-specialists and to analyze their impact on the quality of available digital content. It also evaluates the effectiveness of these technologies in developing the required language skills among the research sample of non-specialists.

Developing English language skills for non-specialists presents a significant challenge due to variety of required skills, such as listening, speaking, reading, and writing. Enhancing these skills requires flexible and interactive teaching methods to meet diverse learner needs. This is where smart technology plays a crucial role, offering advanced educational platforms and innovative applications that help deliver customized and engaging educational content. Smart technology facilitates acquisition of English language skills for non-specialists in multiple ways, enabling learners to access a variety of interactive educational resources,

such as virtual lessons, educational games, and artificial intelligence -based learning applications that provide personalized learning experiences tailored to each learner's level. Additionally, this technology enhances learners' interaction with specialized content provided, increasing the effectiveness of education and motivating continued learning.

This research falls into developmental studies category, utilizing both descriptive-analytical methods, which include reviewing previous literature and analyzing available smart applications and tools, and quasi-experimental methods by employing smart technology and assessing its impact on developing English language skills among the current research sample, consisting of ٣٠ volunteers from High Institute of Computer Science and Business Administration in Al zarka, Damietta.

The research tools included preparation of a test to measure cognitive aspects and a skill assessment card to evaluate sub-skills in English. The researcher found that there is significant diversity in smart technology, which includes various applications, interactive learning programs, augmented and virtual reality, and online educational platforms. The results indicated a marked improvement in the quality of digital content, with smart technology enhancing content quality through interactive and diverse learning experiences, which improves learners' comprehension and develops their English skills despite not being specialized in the language. The researcher concluded that smart tools have proven effective in developing listening, speaking, reading, and writing skills among non-specialists.

The research recommended integrating technology into educational curricula and incorporating it more extensively into academic programs to offer advanced educational content.

Keywords: *Smart technology -Quality -Effectiveness -Digital content- English language skills for non-specialists*

Introduction

Smart technology had become a tangible reality that we have recognized in modern digital era and have integrated into our daily lives as an essential part. This technology provides tools and solutions that enhance our capabilities and help us face challenges that have long troubled and concerned us. Among these challenges is how to improve quality and effectiveness of digital content with the aim of developing English language skills for non-specialists.

English is the world's first and most widely spoken language, this language had a vital role in various fields, including science, technology, and business. Therefore, acquiring English language skills had become a pressing necessity for anyone striving to achieve success in different aspects of life and personal sides. Despite this, learning English faces many challenges, especially for non-specialists who may lack time or resources to enroll in traditional educational programs.

This is where the importance of smart technology emerges, as it provides innovative and integrated means to support language skills acquisition easily and conveniently through educational applications, virtual reality, and artificial intelligence. These tools can offer engaging and effective educational content that enhances learning experience. They also allow learners to interact with English language in various ways, increasing their opportunities to acquire language skills faster and more efficiently.

In current research, the researcher explored how to employ smart technology in improving quality and effectiveness of digital content aimed to develop English language skills for non-specialists. Practical examples of smart applications and tools were provided, along with an analysis of their impact on learning experience and outcomes. The research also highlighted some challenges and opportunities associated with using technology in this field, aiming to provide recommendations that contribute to developing innovative and sustainable educational strategies.

In addition to that research aimed to provide a comprehensive understanding of how learners can benefit from smart technology in improving language skills, opening new horizons for English language teaching in ways that meet demands of current digital age.

Research Problem

The researcher identified problem of the current research through her work as a teaching staff of English in High Institute of Computer Science and Business Administration in Alzarka, Damietta, as well as by reviewing results of literature, previous studies. These sources highlighted the rapid advancement of digital technology, which has introduced various and diverse challenges to learning English and acquiring language skills, necessitating innovative and effective methods. Despite prevalence of traditional language teaching methods, many learners, particularly non-specialists, faced various difficulties related to time and available resources.

The researcher also conducted an exploratory study to verify research problem by conducting interviews and administering a questionnaire to a group of non-specialists among institute students. The results revealed deficiencies in their language skills, their ability to utilize and apply language optimally. The researcher found a lack of research specifically addressing use of smart technology for developing English language skills among non-specialists—those who rely on English in their specialized field, in this case, business information systems, rather than studying English literature. This highlighted the need to leverage smart technology to improve the quality and effectiveness of digital educational content for these learners.

Research problem is reflected in how to effectively utilize smart technology to enhance digital educational content, thereby contributing to English language skills development among non-specialists. This includes identifying tools and techniques that can provide a comprehensive and innovative learning experience, as well as analyzing the positive and negative impacts of these technologies on learning process.

Based on the above, the main research question is:

How can smart technology be employed to improve quality and effectiveness of digital content for developing English language skills among non-specialists?

From this main question, the following sub-questions arise:

1. What are the most effective smart tools and techniques for teaching English to non-specialists?

2. How can the quality of digital educational content be enhanced using these tools?
3. What are challenges associated with using smart technology in teaching English, and how can they be overcome?
4. What is the impact of smart technology on learner interaction and engagement?

Research Objectives

The current research aims to achieve a set of objectives, which are as follows:

- Identify Effective Smart Tools and Technologies including available applications and technological tools that can be used to teach English to non-specialists.
- Analyze Methods for Improving Digital Content Quality to determine ways of design, interaction, and ease of use.
- Develop Standards for High-Quality Educational Content to ensure the provision of high-quality educational content that meets the needs of learners.
- Analyze Challenges in Using Smart Technology and obstacles that may face in teaching English.
- Propose Solutions and Strategies to overcome these challenges, contributing to the improvement of the learning experience.
- Measure the Impact of Smart Technology on learners' level of interaction, motivation, and academic achievement.
- Study Learning Outcome Differences between traditional methods and methods based on smart technology.

Research Importance

The importance of current research is highlighted through the following points:

- **Responding to Technological Advancements:** The research tried to help in keeping pace with rapid technological advancements and effectively using them in education, enhancing efficiency of educational process and contributing to development of modern learning methods suited to digital age.

- **Meeting Non-Specialist Learners Needs:** The research focused on non-specialist learners who need to learn English for professional or personal purposes. It provides educational solutions that fit their needs and limited time.

– **Improving Digital Education Quality:** By presenting standards and tools that contribute to development of effective and engaging educational content, the research better met learners demands.

– **Enhancing Interaction with Educational Content:** Using smart technology to increase opportunities for acquiring language skills in interactive and innovative ways, thereby improving learner engagement with educational content in English.

– **Providing Flexible and Integrated Educational Solutions:** Solutions that can be accessed anytime and anywhere, facilitating learning process and allowing learners to control their educational pace.

– **Supporting Innovation in English Language Teaching:** By exploring and utilizing modern technologies such as artificial intelligence, virtual reality, and machine learning, the research provides an advanced and distinguished learning experience.

– **Offering Strategic Recommendations:** The research provides strategic recommendations for decision-makers and educators on how to adopt smart technology in English language teaching programs, contributing to development of modern and sustainable educational policies.

– **Increasing Success and Competitiveness:** By improving English language skills, the research helped increase learners' success and competitiveness in global job market, enhancing ability to communicate and interact in multicultural environments.

Research Terms

The current research concerned with the following terms: smart technology, quality, effectiveness, digital content, and English language skills for non-specialists. Below are definitions of these terms.

Smart Technology

Smart Technology refers to devices and software that use artificial intelligence, machine learning, the Internet of Things, and other advanced technologies to improve performance and efficiency in various fields. Smart technology can also be described as devices or systems that utilize AI and information technology to interact with users and make decisions based on available data and

information. Examples include smartphones, smart homes, and smart cars. **(**Mitchell, Melanie :2019).

Smart technology includes devices like smartphones that can learn from user behaviour and provide personalized recommendations, smart homes that manage energy consumption and ensure security automatically, and smart cars that can drive autonomously and avoid accidents based on analyzing surrounding data (McKinsey & Company, 2020; Schwab, 2016)

The researcher assumed that Smart technology related with all is used to develop English language skills for non-specialists

Quality

Quality refers to Standard which are set of characteristics and features that must be present in a product or service to perform its function perfectly and satisfy the consumer. Quality is the degree of excellence or superiority that a particular product or service possesses. It is measured based on its adherence to specific standards and its ability to meet user needs and expectations. (National Institute of Standards and Technology (NIST). :2020)

Researcher defined quality as a term that describes the condition of something, whether it is a product, service, institution, educational program, or performance level. A good product is one that meets or exceeds consumer expectations and fulfils its functional requirements, as well as conforms to the specifications set during design. In the context of higher education, the product is the graduate, whose level must meet societal expectations through the assurance of quality in curricula, academic programs, teaching methods.

Effectiveness

Effectiveness has several definitions, including the ability to perform the right tasks, identifying the right tasks for an organization to perform. Some define effectiveness as production, determining it by the amount of output an individual can achieve. However, some researchers argue this is not an accurate definition. Effectiveness can also mean the ability to produce the largest amount using the least resources, or the extent to which the set goals can be achieved by an organization) Jones, M., & Lewis, G. (2021)..

Researcher defined effectiveness refers to the extent to which desired goals are achieved with the least possible cost and effort. It

is a measure of a system's or process's ability to produce the required results efficiently.

Digital Content

Digital content is any type of information or data created or distributed via the internet or digital media. It can include texts, images, videos, audios, and graphics.

Digital Content present Information or knowledge material available on the internet or digital medium (mobile devices, computers, etc.), whether written, audio, visual, graphical, or software, covering various topics and disciplines. It includes what you see on social media platforms or websites, such as videos, audios, podcasts, images, infographics, articles, and written texts (Nielsen Norman Group: 2020).

The researcher defined Digital Content as all content presented using smart technologies.

English Language Skills for Non-Specialists

English Language Skills for Non-Specialists means a subset of English as a Second Language, often referring to teaching English to university students, working professionals, or those looking to specialize and expand in this field. It involves the vocabulary and skills needed for specific purposes, such as technical English, scientific English, medical English, tourism English, and business English (Oshima, A., & Hogue, A.: 2017).

The researcher argued that English language skills for non-specialists refer to the abilities needed by individuals who do not specialize in English to understand and use the language effectively in everyday life, education, and work situations. These skills include reading, writing, listening, and speaking.

Research Hypotheses

The current research aimed to verify validity of the following four hypotheses:

First Hypothesis: The use of smart technology enhances quality of digital educational content. Possessing modern tools and techniques allows for more interaction and attractiveness, contributing to an improved learning experience.

Second Hypothesis: Smart technology increases the effectiveness of learning English for non-specialists through the use of educational applications, virtual reality, and artificial intelligence.

These technologies can improve the level of interaction and comprehension among learners, thereby increasing the effectiveness of the learning process.

Third Hypothesis: Learning using smart technology overcomes the traditional challenges of learning English. It provides flexible and integrated solutions that overcome the temporal and spatial obstacles faced by non-specialist learners.

Fourth Hypothesis: There are statistically significant differences in favour of learners who use smart technology pre/post, as they show higher levels of motivation and engagement in the learning process.

Research limitations

The limitations of research included key aspects closely related to topic and are outlined as follows:

1. **Temporal limitations:** The research focused on modern and available tools and technologies up to mid-2024. This means that any advancements in smart technology occurring after this date will not be included in the current study.
2. **Geographical limitations:** The research concentrated on case studies and practices of teaching English using smart technology in educational environments associated with the researcher's workplace.
3. **Sample limitations:** The research is limited to a voluntary sample of non-specialist English learners at the Higher Institute of Computer Science and Business Administration in Al Zarka, Damietta include 30 Volunteer
4. **Tools and Techniques limitations:** The focus were specific technological tools and applications, such as artificial intelligence, virtual reality, and currently available educational apps.

Research Tools

The researcher prepared and designed the following research tools:

1. Test for Measuring the Cognitive Aspect of English for Non-Specialists in Business Information Systems

This test focused on terms and concepts related to Business Information Systems. It includes a variety of items:

a. Multiple-Choice Questions To assess the availability of basic terms and concepts among the research sample of non-specialists, for example:

  – What term describes the process of analyzing large datasets to extract useful information?
    ▪ Data Mining
    ▪ Data Warehousing
    ▪ Data Cleansing
    ▪ Data Entry
  – What does the term "ERP" mean in the field of information systems?
    ▪ Enterprise Resource Planning
    ▪ Electronic Resource Planning
    ▪ Enterprise Risk Planning
    ▪ Electronic Risk Planning

b. Translation Questions Translate sentences from English to Arabic and vice versa:

  ▪ Example: Translate the following sentence into Arabic: "Customer Relationship Management is a key component in modern business strategies."
  ▪ Example: Translate the following sentence into English: " "Data storage is a fundamental component of information systems."

c. Text Comprehension Questions By reading a short text and answering questions about it:

  ▪ Example: Read a text on "E-commerce Systems" and then answer detailed questions such as: What is the role of information systems in enhancing the customer experience in e-commerce?

d. Sentence Completion Questions Complete sentences with technical vocabulary:

  ▪ Example: "The process of converting raw data into useful information is called _____."
    ○ Answer: Data Processing.

e. True/False Statements Determine if statements are correct or incorrect:

  ▪ Example: "Cloud computing allows businesses to store and access data over the internet rather than on local servers." (True/False)

-2 Skills Evaluation Card for English Language Sub-Skills in Business Information Systems

This card aims to identify strengths and weaknesses in English language skills related to information systems, helping to improve performance and utilize smart technology to meet the learner's needs. The evaluation card includes the following elements:

1. Reading and Understanding Technical Texts

- Excellent: Reads technical texts easily and understands all details.
- Very Good: Understands technical texts well with minor difficulties.
- Good: Understands technical texts but needs some assistance.
- Acceptable: Struggles to understand basic technical texts.
- Poor: Faces significant difficulty in understanding technical texts.

Rating: ....

2. Writing Technical Reports and Documents

- Excellent: Writes technical reports and correspondence accurately and clearly with few errors.
- Very Good: Writes technical reports and correspondence with minor errors.
- Good: Writes technical reports and correspondence but with noticeable errors.
- Acceptable: Writes technical reports and correspondence with many errors.
- Poor: Struggles to write technical reports and correspondence clearly.

Rating: ....

3. Listening and Understanding Digital Content and Technical Presentations

- Excellent: Fully understands digital content and technical presentations and can follow discussions.
- Very Good: Understands digital content and technical presentations with some additional questions.
- Good: Understands digital content and technical presentations but needs some clarifications.
- Acceptable: Struggles to understand digital content and technical presentations.

– Poor: Faces significant difficulty in understanding digital content and technical presentations.

Rating: ....

4. Speaking and Participating in Technical Discussions

– Excellent: Speaks fluently and participates effectively in technical discussions.

– Very Good: Speaks well and participates effectively with some reservations.

– Good: Speaks and participates reasonably with room for improvement.

– Acceptable: Struggles to speak and participate effectively.

– Poor: Faces significant difficulty in speaking and participating in technical discussions.

Rating: ....

5. Specialized Knowledge in Information Systems

– Excellent: Possesses in-depth knowledge of all aspects of information systems and related technologies.

– Very Good: Possesses good knowledge of information systems with some minor gaps.

– Good: Possesses basic knowledge of information systems with significant gaps.

– Acceptable: Possesses limited knowledge of information systems.

– Poor: Possesses very minimal knowledge of information systems.

Rating: ....

Overall Rating:

– Excellent: [ ]

– Very Good: [ ]

– Good: [ ]

– Acceptable: [ ]

– Poor: [ ]

Additional Comments:

▪ ....

Research Procedures

The researcher undertook the following procedures:

▪ **Conducted a descriptive and analytical study** focused on exploring how smart technology can be utilized to improve

the quality and effectiveness of digital content for teaching English to non-specialists. This involved using a research approach that combines both quantitative and qualitative methods to obtain comprehensive and integrated data.

▪ **Catalogued and organized samples** of voluntary participants from High Institute of Computer Science and Business Administration in Al Zarka, Damietta. The participants were non-specialists in English who use smart technological tools for language learning.

▪ **Carried out several personal interviews** to collect qualitative data on the learners' experiences with using smart technology. This was followed by a quantitative analysis of frequencies, percentages, and means, as well as a qualitative analysis to extract key ideas and insights.

Performed quantitative analysis of frequencies, percentages, and averages, alongside qualitative analysis to extract key ideas and insights.

Theoretical Framework and Previous Studies

The theoretical framework of the current research focuses on several key areas:

- **Constructivist Learning and the Role of Smart Technology**: Exploring how smart technology can support constructivist learning by providing interactive learning environments tailored to the needs of learners.

- **Active Learning and Smart Technology**: Analyzing how smart technology can enhance active learning, encouraging learners to engage effectively and constructively in the learning process.

- **Integrated Learning and Technology**: Identifying how to integrate smart technology into a comprehensive educational content that covers various aspects of learning English, such as reading, writing, listening, and speaking.

These areas represent modern teaching methods that rely on constructivist, active, and integrated learning, aiming to improve the educational process and make it more effective and interactive. Smart technology plays a significant role in enhancing these methods. Constructivist learning is an educational approach where students build their knowledge through interaction with their

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المؤتمر العلمى لقسم المناهج وطرق التدريس كلية التربية جامعة طنطا تحت عنوان
الذكاء الاصطناعي وافاق تطوير منظومة المنهج بتاريخ الاثنين ٢٢ يوليو ٢٠٢٤م

environment and personal experiences. In this approach, the teacher acts as a guide and facilitator rather than the sole source of knowledge.

The role of smart technology is evident in the use of educational software: applications and programs that allow students to explore topics independently. It also involves employing augmented and virtual reality to create interactive educational environments where students can experience concepts in a realistic and direct manner. Additionally, interactive educational platforms such as Google Classroom and Microsoft Teams enable instant interaction and continuous feedback. (Thompson, L., & Davis, P. 2019).

Regarding active learning, it emphasizes engaging students in the learning process through interactive activities such as group discussions, teamwork, and problem-solving. The role of smart technology is highlighted through the use of interactive applications like Kahoot and Quizlet, which encourage competition and interaction among students. It also involves the use of simulations and educational games that allow students to apply theoretical concepts in virtual environments and blended learning, combining traditional and digital learning through the use of e-learning platforms.

As for integrated learning, which is an approach that combines different disciplines and fields of study within a single framework to provide a comprehensive and unified educational experience, the role of smart technology is evident through the use of Learning Management Systems (LMS) such as Moodle and Blackboard, which integrate various subjects and offer diverse educational resources. Collaborative tools like Google Docs and Slack facilitate teamwork and collaboration among students from different disciplines. Additionally, analyzing academic performance data provides personalized and integrated education that meets each student's needs.

From the above, it is clear that smart technology is a powerful tool for enhancing various modern learning methods by providing interactive tools, virtual learning environments, and advanced educational platforms. This effective use of technology can make the educational process more engaging and interactive, contributing to improved understanding and academic achievement

for students. Defining smart technology is a challenging task due to the rapidly evolving nature of the field, making innovations almost obsolete upon their arrival. The term "SMART" refers to "Self-Monitoring, Analysis, and Reporting Technology," representing technology that uses artificial intelligence, machine learning, and big data analytics to provide cognitive awareness to objects that were previously considered inanimate. Smart technology can be divided into categories related to Internet of Things (IoT) devices, connected smart devices, and general smart devices.

1. **IoT Devices**: These involve a network of devices that use sensors, chips, software, internet connectivity, analytics, and applications to bring static physical objects to life. These devices create significant value, are futuristic, scalable, and automated. Notable examples include smart cities, smart homes, and smart factories.

2. **Connected Smart Devices**: These devices, which are remotely controlled and connected via the internet or Bluetooth, offer a personalized experience but must be handled with care as they do not adapt to the same extent as IoT devices. Examples include smart security cameras, smart bulbs, and smartphones.

3. **General Smart Devices**: These offer limited automation, do not require internet connectivity, and are programmable in nature. Examples include smart coffee makers, which provide specific personal services at a particular time. (Garcia, S., & Nguyen, T. 2021).

Benefits of Smart Technology

Smart technology offers numerous advantages:

- **Convenience**: It has never been easier to perform multiple tasks simultaneously with minimal effort, such as using your voice to adjust room lighting, secure your home, or order your favorite food online. This convenience is brought to a new level by the latest smart technologies, which are well-equipped to understand your preferences through analysis, providing you with automatic and personalized services. These technologies can also take external factors like traffic, your car's condition, or the environment into account, informing you in advance and guiding you safely to your destination. When it comes to convenience, artificial

intelligence (AI) is often the first thing that comes to mind, as it is revolutionizing the future of business.

- **Sustainability**: With the urgent need to "go green" and save the planet while avoiding rising energy costs, both industrial and domestic sectors are striving to deploy smart technology. Since we often fail to optimize our energy use and instead waste it by forgetting to turn off household devices, smart technology can play a crucial role in conserving energy. It can regulate and automate energy use by, for example, turning off or adjusting lights and heating and cooling systems when not in use or when the desired conditions are met. This not only saves money but also helps conserve energy, creating a win-win situation.

- **Security**: Smart technology provides more reliable security than traditional manually operated systems. Smart security tools like door sensors, alarm systems, security cameras, and video doorbells help warn building owners of various threats to their properties. In addition to alerting owners, law enforcement agencies are also informed, and preventive measures like locking certain routes or locking rooms are taken. Additionally, smart technology can detect smoke, gas, water leaks, and sewage, allowing real-time preventive actions that can save people from discomfort or even physical harm.

- **Efficiency**: Smart technology uses data to understand how improvements can be made, tracking and analyzing what happens to achieve better outcomes in the future. This entails making processes and systems more efficient and increasing personal productivity. Imagine waking up exactly on time after a restful sleep to find everything ready for your needs, starting your day well, eliminating distractions, and leaving for work on time.

- **Cost and Time Savings**: By reducing energy bills through the use of smart technological devices like smart thermostats, smart lighting, remote energy management, water heaters, washing machines, and refrigerators, energy usage is optimized, resulting in less energy being used to achieve more. Smart technology also automates repetitive tasks and eliminates wasted or lost time. (Lee, H., & Kim, H. 2019).

Digital Content Production

Digital content has taken on a serious and new dimension in the world due to the new technological advancements surrounding and almost dominating it. The production of digital content has become one of the most discussed topics among people. This article will answer the most common questions about digital content production, including the elements and stages of digital content production, the challenges you may face during your journey, and the skills you will need to overcome these obstacles.

The production of digital content is one of the most influential industries due to its impact on the world of content creation, with positive effects on learners, both students and trainees. To build effective digital educational content, it is essential to adhere to some important and necessary basics that influence our field. Therefore, it is necessary to consider some essential factors to create impactful educational content that adds value to the audience.

Digital content represents what you see on various social media platforms or websites in various forms, including videos, audio, podcasts, visual images, designs, articles, and written texts. The concept of digital content production is one of the most searched topics on the internet, especially with the increasing awareness of turning physical objects into digital ones worldwide due to the known advantages of digital content.

Digital content refers to any content that has been converted into a digital or electronic format. It is treated in its distribution, storage, sale, and monetization just like other intangible digital assets. Digital content is accessed and interacted with through electronic devices such as smartphones, tablets, and computers. Digital content appears in various forms, including electronic games, images, videos, audio files, and e-books, among other intangible contents that are transmitted only digitally. Anyone can create digital content, sell it online, and easily profit from it.

Digital content is pervasive across all internet platforms, providing added value to the audience. It is essentially a message you want to convey to the audience using one of the preferred and appropriate mediums, such as images or suitable words. Therefore, you are sure to encounter digital educational content throughout the day on the internet, obtaining all the information you need quickly and directly through digital content. The expression of content or

the message may differ depending on whether you are a content creator or possess valuable content you wish to share with the audience. (Patel, K., & Lee, C. 2017).

Stages of Digital Content Production

The process of digital content production, or the mechanisms of digital content creation, involves several stages and includes many essential elements to ensure the success of the production process. Below are the main steps in producing digital content:

Step 1: Define the Goal and Type of Content

– Determine your goal and choose the type of digital content you wish to present to the world. Your goal should be specific, whether you are providing educational or entertainment services or other types.

Step 2: Choose the Delivery Method

– Select the appropriate medium to present your product, whether it is in the form of audio, an app, a video, or an electronic platform.

Step 3: Focus on Content Production

– Begin creating the content itself. Gather all the necessary materials, such as images, videos, files, texts, and other media needed for your content.

Step 4: Review the Produced Digital Content

– Review the digital content you have created, ensuring all its functions work correctly and smoothly. Make sure the writing is accurate, and free of spelling or grammatical errors.

Step 5: Publish the Content Carefully

– After writing, formatting, and carefully reviewing your content, ensure it is published across digital platforms. Use various digital platforms to widely distribute your content and reach a large audience.

Step 6: Evaluate and Improve

– After publishing your content, evaluate it, analyze the results, and improve the content as necessary based on feedback and performance analytics.

Step Seven: Compare Performance

- Compare the current performance of your digital content against your initial expectations before publishing it. Notice the differences, review user feedback, pay attention to their opinions, and make sure to resolve any issues that arise effectively and quickly.
-

Step Eight: Continuous Improvement

- Ensure continuous improvement and development of your content. Updates are constantly emerging in the world, so it's essential to keep up with these changes to maintain the value and effectiveness of your digital product. Take the necessary time to be creative and innovative, and strive to present the best version of your digital content.

Examples of Smart Technology Applications for Enhancing English Language Skills

English has become a global language widely used in scientific, professional, and social fields. Therefore, mastering English is essential, as it heavily influences employment criteria and academic curricula. Many people are interested in finding the best apps to learn English, but it's important to note that language learning requires effort and mastery of reading, writing, speaking, and listening skills. Relying on just one app may not be sufficient to achieve this.

- Duolingo
  Provides exercises covering all language skills (reading, writing, listening, and speaking) in a fun and simple way.
  Suitable for all ages, with daily learning sessions lasting less than 20 minutes.
- ELSA Speak
  Helps in learning the pronunciation of American words and idiomatic expressions.
  Equipped with speech recognition technology, it's trained by pronunciation coaches world wide. Learner can practice conversation and pronunciation daily for just ten minutes.

- Memrise
  Offers a variety of lessons for beginners and advanced learners.
  It features texts in both the native and English languages, with audio versions to develop reading and listening skills.

- Zamericanenglish
  Provides lessons covering all essential English language skills, divided into several levels.
  Offers comprehensive content through videos, emphasizing proper pronunciation and phonetic writing.

- Quizlet Application
  It is used as a tool for gathering and organizing information through flashcards. The cards can be categorized into sets and shared with others, making learning more enjoyable.

- Cake Application
  This app is based on the idea of learning English through clips from movies and TV shows. You can learn the language for just ten minutes daily, making it suitable for people who do not have much free time.

- Apple Podcast Application
  It allows listening to various programs in English, which helps develop listening skills and gain cultural knowledge and general information.

- Taleek Application
  This app offers video lessons that explain grammar and other language skills, along with exercises to reinforce and solidify the information.

- Reverso Application
  It provides multiple synonyms for new words and places them in sentences to understand the context. It also offers verb conjugation in all tenses, making it easier for learners to know the correct spelling of verbs.

- Let Me Speak Application
  It determines the user's level in English and creates a learning plan based on their interests and level. The

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المؤتمر العلمى لقسم المناهج وطرق التدريس كلية التربية جامعة طنطا تحت عنوان
الذكاء الاصطناعي وآفاق تطوير منظومة المنهج بتاريخ الاثنين ٢٢ يوليو ٢٠٢٤م

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user interface is cheerful and attractive, making learning enjoyable.

- Mondly App
  This app determines the user's language level and the topics of interest, then creates a suitable learning plan. It also shows the user the time spent practicing the language daily, encouraging them to keep going.
- Accent Training App
  This app is dedicated to improving speaking skills and word pronunciation. It provides audio texts and a model for teaching how to pronounce letters.
- Worlds of Wonder Game
  A fun game that involves assembling scattered letters to form English words. It enhances vocabulary and relies on concentration and mental stimulation.

The researcher also found that there is great importance in using AI-powered applications to practice English, as AI has the ability to create a personalized learning environment where adult learners can use all their senses to practice English according to their current level, needs, and professional interests. Although the synthetic voice of language learning bots is limited to instructions and recommendations, most lessons and exercises are recorded by native speakers, ensuring the accuracy and quality of the content provided.

The role of AI in developing English language skills for non-specialists is evident through:

- Motivation: Many smart applications use fun features and rewards that make the learning process feel like a game, where the learner earns gems or badges as they progress in level or achieve certain goals, increasing the motivation to continue learning.
- Personalized Experience: In traditional private lessons, you may have limited opportunities to practice speaking and receive immediate feedback. However, with AI, you can get personalized training at any time learner want.

– 24/7 Availability: AI-powered language learning apps allow you to learn English at any time, even in the middle of the night, where you can get instant answers to any question and chat for long hours.

– Learning Without Embarrassment: Bots do not judge your mistakes, so you can practice the language without feeling embarrassed, making the learning process more comfortable.

Below is a review of the best AI-powered apps for practicing English:

– Chat Bot App
One of the best apps for assessing your English level and helping you learn faster through personalized conversations based on your level.

– Andy App
Specifically designed to help you learn English conversation, offering options to learn grammar and expand vocabulary.

– Busuu App
One of the best apps that doesn't require an internet connection and is recommended for beginners. It combines human interaction with AI.

– LingoDeer App
Helps you learn easily and allows you to interact with the app in an organized way, gradually increasing your language proficiency.

– Rosetta Stone App
Offers exercises designed to help learn English words in a way that suits both children and adults.

– Babbel App
Focuses on helping English learners acquire basic conversation skills, with a custom goal-setting system to monitor progress.

– English Sentence Master App
Provides an interactive learning program that allows users to build meaningful sentences by matching words together.

– Improve English App
Helps you improve your English skills and achieve good

scores in international entrance exams like IELTS and TOEFL.

Research Procedures:

The researcher sought to identify the research problem represented in the main question: **How can smart technology be employed to improve the quality and effectiveness of digital content to develop English language skills for non-specialists?**

Accordingly, the main objectives of the research were determined, which were related to evaluating the effectiveness of smart technology tools in achieving educational goals to develop language skills for non-specialists. Subsequently, the main research hypotheses that will be tested during the study related to improving vocabulary comprehension through smart technology applications were formulated.

To answer the first sub-question: **What are the most effective smart tools and technologies in teaching English to non-specialists?**

The researcher identified relevant tools and technologies for teaching English to non-specialists and reviewed the most prominent ones. To provide a more focused answer, several effective smart tools and technologies were examined, including:

▪ Educational Applications:

Duolingo: A popular application for learning English through interactive exercises.

Babbel: Provides organized lessons based on daily conversations.

▪ Online Platforms:

Coursera and edX: Both offer free and paid courses from recognized universities.

Udemy: Provides training courses by experts in English.

▪ Interactive Tools:

Kahoot!: An educational platform based on games to enhance learning.

Quizlet: Uses flashcards to improve vocabulary and grammar.

The researcher also examined tools related to machine learning and artificial intelligence, such as applications that use AI to provide customized lessons based on the student's level and performance, like Elsa Speak, which helps improve pronunciation. Adaptive learning platforms like Rosetta Stone adjust to the learner's progress

and offer suitable educational materials. Additionally, online educational resources like BBC Learning English, which offers a wide range of free lessons and materials, and the British Council, which provides many interactive activities and exercises, were reviewed.

The researcher found that using these tools and technologies can make learning English more effective and engaging, helping non-specialists achieve significant progress in their language skills.

To answer the second sub-question: **How can the quality of digital educational content be improved using these tools?**

The researcher identified the following strategies to improve quality of digital educational content using smart tools and technologies:

- Personalization and Adaptation:

Using AI: Applications like Duolingo and Rosetta Stone can provide personalized educational content that adapts to each student's level and progress.

Data Analysis: Collecting and analyzing student performance data using tools like Google Analytics can help improve content based on students' needs.

- Interaction and Participation:

Interactive Tools: Using tools like Kahoot! and Quizlet can increase student interaction through games and interactive activities.

Virtual Classrooms: Platforms like Zoom and Microsoft Teams enable direct interaction between teachers and students, enhancing learning quality through live discussions and activities.

- Multimedia:

Educational Videos: Using high-quality educational videos available on platforms like YouTube and Vimeo can enhance students' understanding of various topics.

Virtual and Augmented Reality: Technologies like VR and AR can provide immersive educational experiences that help students learn in a more interactive and engaging way.

- Assessment and Feedback:

Assessment Tools: Tools like Google Forms and SurveyMonkey for creating tests and surveys can help measure student progress and provide immediate feedback.

Performance Analysis: Programs like Tableau can analyze educational content strengths and weaknesses and improve it based on this data.

- Resource Diversity:

Digital Libraries: Providing diverse educational resources such as articles, e-books, and videos from various sources can enhance content quality.

Open Educational Resources: Using platforms like OER Commons, which offers free and open educational materials, can increase the diversity and quality of educational content.

- Teacher Training and Professional Development:

Workshops and Training Courses: Offering workshops and training courses for teachers on using modern tools and technologies, like Coursera and edX, can help improve the quality of digital education.

Online Learning Communities: Creating online communities where teachers can exchange ideas and resources can contribute to improving educational content quality.

To answer the third sub-question: **What are the challenges of using smart technology in teaching English and how can they be overcome?**

The researcher identified several challenges in using smart technology in teaching English and proposed solutions to overcome them:

Digital Divide:

Challenge: Lack of access to modern technology and high-speed internet for all students hinders access to digital educational resources.

Proposed Solution: Providing support programs to supply devices and internet to needy students. Collaborating with governmental and non-profit organizations to distribute devices and provide internet access in remote areas.

Teacher Training and Technical Support:

Challenge: Insufficient training for teachers on effectively using smart technology in education.

Proposed Solution: Organizing regular training courses and workshops for teachers to teach them how to use technological tools. Providing continuous technical support to help solve technical problems they may encounter.

Quality of Digital Educational Content:

Challenge: The presence of unreliable or unsuitable digital educational content for students' levels.

Proposed Solution: Relying on accredited and reliable educational sources. Using AI techniques to analyze content quality and provide recommendations for improvement.

Interaction and Participation:

Challenge: Difficulty achieving effective interaction and participation between students and teachers in digital environments.

Proposed Solution: Using interactive tools like Kahoot! and Quizlet to increase student interaction. Organizing live study sessions through platforms like Zoom and Microsoft Teams to enhance participation and live discussions.

Maintaining Motivation and Interest:

Challenge: Loss of motivation and interest from students when learning online.

Proposed Solution: Providing diverse and engaging educational content using videos, games, and interactive challenges. Encouraging students by offering rewards and certificates of appreciation to motivate them to continue learning.

Assessment and Feedback:

Challenge: Difficulty in assessing student progress and providing effective feedback in digital environments.

Proposed Solution: Using electronic assessment tools like Google Forms and SurveyMonkey for creating tests and surveys. Providing immediate and personalized feedback using email or learning platforms.

Security and Privacy:

Challenge: Protecting student data and ensuring cybersecurity when using digital tools.

Proposed Solution: Following strict security policies and using reliable protection programs. Educating students and teachers about the importance of digital security and ways to protect personal information.

To answer the fourth sub-question: **What is the impact of smart technology on the level of interaction and engagement among learners?**

The researcher identified some important aspects of the impact of smart technology, which showed a significant effect on the level of interaction and engagement among learners, summarized as follows:

- Increased Interaction: Evident through the use of interactive tools. Platforms like Kahoot! and Quizlet provide educational games and quizzes that encourage students to interact and actively participate.

- Collaborative Learning: Smart technology like Google Classroom and Microsoft Teams enables group work and collaboration among students online, enhancing interaction and participation.

- Adaptive Learning: Some smart tools like Duolingo and Rosetta Stone use AI techniques to provide customized lessons that match each student's level.

- Personalized Learning: Smart technology allows for customizing educational content based on individual students' needs and interests, increasing their sense of engagement and motivation.

- Access to Resources: Students can access a wide range of educational resources online anytime and from anywhere, encouraging self-learning and independent exploration.

- Educational Games: Interactive games like Minecraft Education Edition motivate students to learn through fun activities and challenges, enhancing their participation and engagement.

- Digital Tools: Tools like Quizlet and Google Forms provide immediate assessments and feedback, helping students understand their mistakes and improve their performance quickly.

- Adaptive Learning Systems: Offer personalized feedback based on student performance and provide tips for skill improvement.

- Virtual Communities: Students can join online educational communities where they interact with peers and exchange

ideas and resources, enhancing their sense of belonging and engagement.

- Virtual Classrooms: Using platforms like Zoom and Microsoft Teams, students can attend live classes and interact with teachers and peers in a way that resembles traditional classrooms, enhancing their sense of integration.
- Using Technology: Encourages the development of skills such as critical thinking, problem-solving, and collaboration, which are essential for integration into modern society.

Research Results and Discussion:

The researcher collected data for statistical analysis by conducting pre-tests and post-tests for each of the four English language skills (listening, speaking, reading, and writing) among the study sample to determine participants' performance. The statistical analysis employed the paired t-test to compare performance before and after using the technology for each skill. Below are the t-values and significance levels for the post-test measurements of the cognitive aspect and the skill assessment product for evaluating sub-skills of the English language:

English Language Sub-Skills	Number	Mean	Standard Deviation	Error Margin	t-Value	Degrees of Freedom	Significance
Listening and Speaking	30	82.40	6.505	1.188	3.184	58	0.002
Reading and Writing	30	88.00	7.105	1.297			

From the table above, the calculated t-value is 3.18. When comparing the calculated t-value of 3.18 to the critical t-values, which are 2 at a 0.05 significance level and 2.66 at a 0.01 significance level with 58 degrees of freedom, it is evident that the calculated t-value is greater than the critical t-value at the 0.01 significance level. This indicates a significant difference between the mean scores of the sub-skills at the 0.01 level. The mean score for listening and speaking is 82.4 with a standard deviation of 6.51, while the mean score for reading and writing is 88 with a standard deviation of 7.11. Hence, the mean scores for listening and speaking

are lower than those for reading and writing, suggesting statistically significant differences favouring reading and writing skills.

In light of the mentioned results, the researcher analysed hypotheses either to be accepted or rejected as follows:

First Hypothesis: "The use of smart technology improves the quality of digital educational content." Acceptance of the Hypothesis: Since the use of smart technology enhances interaction and attractiveness, this indicates a positive impact on the quality of educational content. The mentioned results support this assumption.

Second Hypothesis: "Smart technology increases the effectiveness of learning English for non-specialists through educational applications, virtual reality, and artificial intelligence." Acceptance of the Hypothesis: The results indicate a significant difference between the skills learned using smart technology, which supports the notion that smart technology enhances learning effectiveness.

Third Hypothesis: "Learning using smart technology overcomes the traditional challenges of learning English." Acceptance of the Hypothesis: Smart technology provides flexible and integrated solutions to overcome temporal and spatial obstacles, which is supported by the significant difference that was discovered.

Fourth Hypothesis: "There are statistically significant differences in favour of learners who use smart technology pre/post, as they show higher levels of motivation and engagement in the learning process." Acceptance of the Hypothesis: The statistical differences found between the scores suggest that learners using smart technology demonstrate higher levels of motivation and engagement, supporting this hypothesis.

Based on the statistical and significant differences discovered, all four research hypotheses are accepted.

In summary, the research results highlighted the effectiveness of smart technology in improving English language skills among non-specialists. The educational applications and interactive media led to a noticeable improvement in participants' language skills. Analysis of interview responses showed positive feedback from learners, with most participants benefiting significantly from using technology in their learning processes and expressing high satisfaction with the tools used. Smart technology contributed to

motivating participants, increasing their engagement in the learning process, and enhancing their acquisition of English language skills.

Research Recommendations:

Based on the research results and discussion, researcher recommended several strategies for employing smart technology to improve the quality and effectiveness of digital content for teaching English to non-specialists, including:

- Developing and Improving Technological Tools:

Align with the needs of non-specialist English learners, such as mobile applications focusing on enhancing vocabulary comprehension and developing listening and reading skills.

- Teacher Training:

Provide continuous support and training for teachers to use technology effectively in classrooms, ensuring maximum benefit from available technological tools.

- Encouraging Active Participation:

Design interactive educational experiences that stimulate learners' active participation and engagement with digital content, such as using virtual reality and simulations.

- Supporting Technology Use in Traditional Learning Environments:

Provide sufficient technical resources in educational institutions to facilitate the use of technology in language learning.

- Integrating Artificial Intelligence and Machine Learning:

Improve the customization and direction of education according to the needs and abilities of learners.

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