

Involvement of information technologies for the startup online course for learning the English language

Kyryl Korobchynskiy¹ and Anastasiia Berestenko¹

¹ Kharkiv National Aerospace University 'KhAI', 17, Chkalov str., 61070 Kharkiv, Ukraine

Abstract

The modern educational landscape is evolving with the integration of information technology and intelligent communication tools. This article explores the role of these technologies in creating and developing online English language courses. It delves into technological aspects, content development, intelligent technologies for learning improvement, and student engagement. The study identifies various platforms, tools, and methodologies for optimizing the online learning experience. It also emphasizes the importance of incorporating data analytics, security, and personalized learning to enhance educational outcomes. Furthermore, the article discusses the implementation and startup launch strategies, drawing inspiration from methodology for agile startup. Overall, this research aims to provide valuable insights into leveraging technology for effective English language learning in the digital age.

Keywords

Information technology, intelligent communication technologies, educational environment, online education, course quality, technology in education, English language learning, intelligent technologies.

1. Introduction

The modern educational landscape is undergoing significant changes due to the active use of information technology and intelligent communication technologies. The increasing relevance of these tools in the educational environment creates opportunities for innovation and improving the quality of learning.

Contemporary society is experiencing profound changes due to the proliferation of information technology. The Internet, mobile applications, virtual reality, and other innovative tools have already changed the way people acquire and exchange knowledge. In the modern educational environment, the relevance of using these technologies becomes particularly important.

As highlighted by Adair and Shattuck [1], ensuring quality while creating and innovating in online education is essential for the continuous improvement of the learning experience. Evaluating online course quality, as discussed in their study, offers valuable insights into the implementation of course quality standards.

Additionally, Bazluki, Gyabak, and Uderman [2] emphasized the significance of instructor feedback on a formal online course quality assurance review process. Their research in the Online Journal of Distance Learning Administration underscores the importance of quality assurance in online education.

Shank [3] noted that online course quality assurance involves using evaluations and surveys to enhance online teaching and learning. Such practices are essential in the modern educational landscape, where technology plays a pivotal role in shaping the learning environment.


The article by Shanshan Shang [4] identified 50 factors that affect the quality and relevance of any online course. Let's highlight the key aspects of relevance:

ProfIT AI 2023: 3rd International Workshop of IT-professionals on Artificial Intelligence (ProfIT AI 2023), November 20–22, 2023, Waterloo, Canada

✉ k.korobchinskiy@khai.edu (K. Korobchynskiy); kiwi20197@gmail.com (A. Berestenko)

ORCID 0000-0002-3676-6070 (K. Korobchynskiy); 0009-0002-1532-1766 (A. Berestenko)

© 2023 Copyright for this paper by its authors.
Use permitted under Creative Commons License Attribution 4.0 International (CC BY 4.0).

 CEUR Workshop Proceedings (CEUR-WS.org)

- **Accessibility:** Information technology makes education more accessible, allowing students from different parts of the world to learn online and receive a quality education.
- **Interactivity:** Information technology allows the creation of interactive lessons and assignments that engage students and improve learning outcomes.
- **Adaptability:** Thanks to intelligent systems, courses can adapt to the needs of each student, providing an individualized approach.
- **Analytics:** Real-time data analysis allows for improving the learning process and achieving better student results.

In accordance with the article by R. Raja and P. C. Nagasubramani [5], research in the field of the influence of modern technologies on education underscores the importance of innovations in teaching.

The aim is to research and analyze the integration of modern information and intelligent communication technologies in the context of creating and developing online courses for learning the English language.

The main research objects include:

- **Technological Aspects of Course Creation:** Investigating the selection of technical platforms and tools for creating and managing online courses.
- **Development of Course Content and Structure:** Analyzing the methodology for selecting and organizing educational materials, as well as developing interactive modules and virtual sessions for learning the English language.
- **Intelligent Technologies for Enhanced Learning:** Researching the use of intelligent recommendation systems and data analytics to improve the learning process.
- **Student Engagement and Interaction:** Exploring methods of motivating students through information technology and employing interactive assignments and forums to facilitate discussion and knowledge exchange.
- **Startup Implementation and Launch:** Preparing the course for launch and marketing to attract initial users.
- **Course Evaluation and Enhancement:** Measuring student success and course effectiveness, as well as seeking innovative solutions to improve the course.

This research approach will allow for a deeper examination of the role of information and intelligent technologies in the educational process and their impact on learning outcomes.

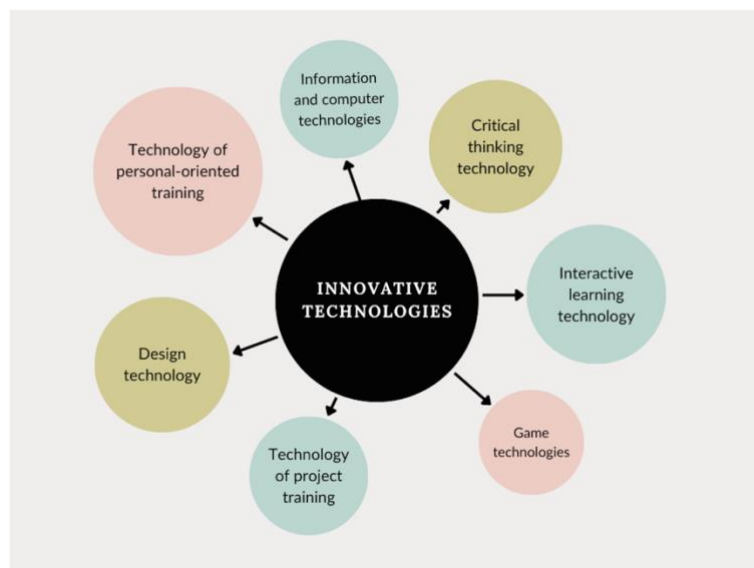


Figure 1: Types of innovative technologies

Figure 1 [7] displays various technologies that can be utilized in the creation of online courses. Research has unveiled various educational technologies designed to enhance learning outcomes. One such technology focuses on personalized learning, tailoring educational materials

and assignments to individual student needs for more effective learning. Information and computer technologies are employed for information management and communication, utilizing web platforms, databases, and electronic resources.

Another area of technological intervention aims at fostering critical thinking skills through interactive assignments, discussions, and text analysis. Interactive learning technology engages students actively through methods like virtual labs, games, and video conferencing. Game technologies leverage the use of games to stimulate interest, create competitions, and develop skills.

Project-based learning technology incorporates real projects to apply knowledge and skills in practical tasks, while design technology focuses on creating engaging educational materials, websites, and interfaces to facilitate user engagement [8].

2. Technological Aspects of Creating an Online Course

Modern information technologies have become an essential component of the educational process. They provide new opportunities for learning and student development, making the process more efficient and engaging. Many researchers have explored the use of various information technologies in online courses for learning the English language, and various platforms like OPEN edX [5], LSM MOODLE, and more are available.

Research indicates that technology has significantly impacted the landscape of English language learning. Online platforms like Duolingo, Babbel, and Rosetta Stone offer interactive and gamified lessons, leveraging technology for engaging and personalized learning experiences. Mobile apps such as Memrise, FluentU, and HelloTalk enable on-the-go language learning with features like speech recognition and cultural insights.

Educational software, learning management systems, and virtual reality/augmented reality technologies have been implemented to create immersive learning environments. These tools simulate real-life situations for language practice and provide opportunities for interactive experiences. Speech recognition technology, exemplified by Google's Speech-to-Text and Apple's Siri, aids learners in practicing pronunciation with accurate feedback.

Online tutoring platforms like iTalki and Preply connect learners with native-speaking tutors for personalized one-on-one instruction through video calls. The shift to digital textbooks and e-books allows for interactive exercises, multimedia content, and easy access to additional resources.

Gamification strategies are incorporated into language learning apps to make the process enjoyable, with features such as point systems, challenges, and progression through levels. Adaptive learning systems, utilizing data analytics and AI, tailor learning experiences to individual students by adjusting content and difficulty based on progress and performance.

Social media platforms and online communities play a role in language learning, providing opportunities for language exchange and connecting learners with English speakers worldwide. Overall, these technological advancements contribute to a dynamic, accessible, and personalized approach to English language learning, accommodating diverse learning styles and preferences.

Figure 2 illustrates how important it is to thoroughly study the capabilities and limitations of each technical platform and tool to ensure an optimal learning process for students and interaction with instructors during the creation and management of an online course.

In the realm of constructing a bespoke online educational module, an array of methodologies and tools beckons exploration. Webinars emerge as synchronous, real-time platforms, facilitating interactive lectures and immediate student engagement. Recorded lessons, whether disseminated through platforms like YouTube or integrated within Learning Management Systems (LMS) such as Moodle, offer a versatile avenue for asynchronous content consumption.

Podcasts, as auditory supplements, provide an auditory dimension to course delivery, accessible through popular platforms like Apple Podcasts or Spotify. Specialized online course platforms, exemplified by Teachable and Thinkific, present integrated solutions for content creation, video management, and transactional functionalities.

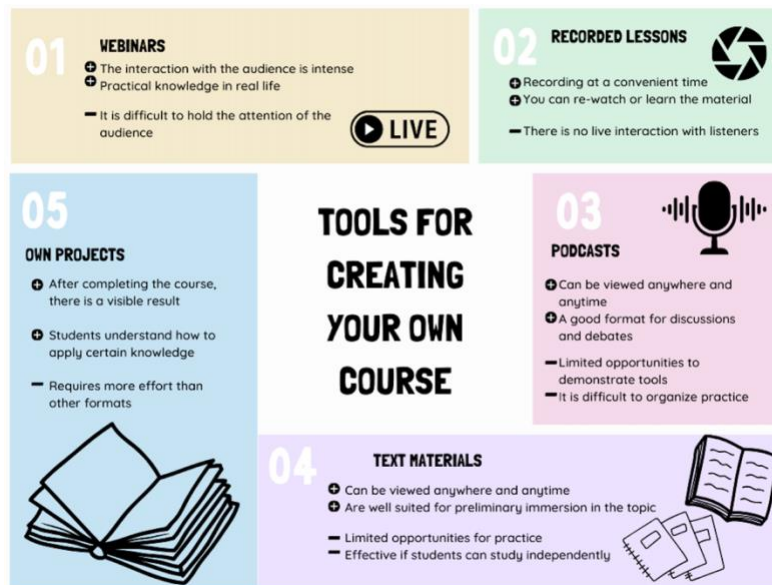


Figure 2: The connection of technical means with creating your own course.

Content creation tools such as Camtasia and Adobe Captivate extend capabilities to produce interactive video lessons, screencasts, and simulated scenarios. Learning Management Systems like Moodle and Canvas afford a structured approach, incorporating tools for content delivery, assessments, and student progress tracking.

Interactive eLearning authoring tools, such as Articulate Storyline and Lectora, empower educators to design engaging and participatory eLearning experiences. Slide presentation software, typified by Microsoft PowerPoint and Google Slides, lends itself to the creation of linear courses, convertible into various formats.

Content Management Systems like WordPress, in tandem with plugins like LearnDash, offer a dynamic solution for those desiring a dedicated website for their course, integrating management functionalities seamlessly. Social media platforms, exemplified by Facebook Groups or specialized forums, serve as conduits for discourse and community development among course participants.

The nuanced selection and amalgamation of these tools and methodologies contribute to the intricate architecture of an online course, offering educators a diverse toolkit for crafting pedagogically rich and technologically refined learning experiences[9].

3. Development of Course Content and Structure

A holistic assessment goes beyond course design it acknowledges the nuances that make a course unique, including input and contributions from students, developments in the field of study, and current events. Most valuable are student’s perceptions of their learning and of the course experience. A good course assessment considers the course over a period of time, and considers interactions between instructor and students, students and students, all of which create artifacts that can be studied and analyzed this is shown in the Figure 3[10]. Artifacts might include, emails or forum posts of student questions, dialogue within forums, feedback from group interaction, end-of-course student surveys, LMS reports on student interaction patterns, student assignment results, and more. Course artifacts give valuable clues to a course’s quality, more so when collected from two or more course iterations and analyzed collectively.

The efficacy in crafting an online English language learning course is intricately tied to the methodological precision applied in the curation and arrangement of educational materials. This intricate process unfolds through a sequence of pivotal stages.

Commencing with a meticulous analysis of the target audience, the cohort identified comprises individuals characterized by a dearth of prior experience in English acquisition. This

demographic spans a spectrum of ages, each harboring distinct purposes, be it oriented towards travel or general communication, and varied linguistic needs.

The focal point of the A1 level course lies in endowing students with foundational English language proficiencies tailored for commonplace communicative exigencies. Objectives span the execution of dialogues, the comprehension of uncomplicated textual content, and the adept deployment of English in commonplace scenarios, such as within retail establishments or amidst of airport environments.

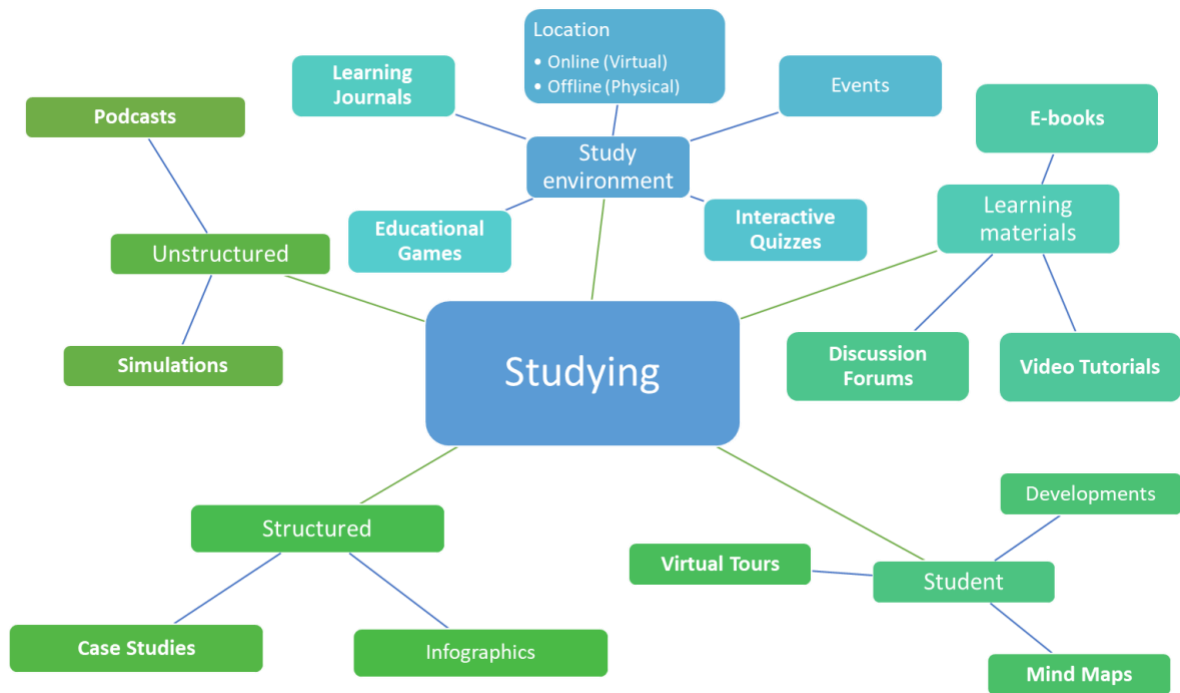


Figure 3: Concepts Underlying Learning

The structural framework of the course emerges as a nuanced design, featuring 12 units, each subdivided into three sections. This segmentation serves to unravel the complexities of novel vocabulary, grammatical constructs, and the contextual relevance of situational applications. The pedagogical approach shuns unnecessary intricacy, opting instead for a easily assimilable graphical elements, instructional aids, auditory components, and video content. This amalgamation creates an interactive enclave meticulously tailored for novice learners, with speaking exercises assuming a performative dimension, enhanced by engaging playing activities.

The corpus of educational materials is orchestrated through interactive textbooks and online resources, meticulously calibrated to cater to the developmental needs of beginners. This collection features concise textual excerpts, videos, and audio clips infused with the linguistic sophistication characteristic of the A1 proficiency level.

The narrative extends beyond mere curriculum, embarking upon a multifaceted exploration of task diversity. This journey encompasses listening, reading, writing, and oral exercises, thereby affording students opportunities for experiential engagement through playing scenarios, collaborative pair work, and intellectually stimulating group projects.

A fundamental tenet of the course architecture is the imperative of accessibility, ensuring inclusivity for all participants, irrespective of constraints or special needs.

Finally, within the domain of assessment and updates, the course metamorphoses into a dynamic entity, perpetually evolving and adapting to the dynamic landscape of language acquisition. This iterative process stands as a testament to the commitment to sustaining not just efficacy but perpetuating relevance throughout the academic journey.

4. Intelligent technologies to improve learning

Using intelligent technologies to improve education involves the implementation of various innovations, including high-level security, speech recognition technology, automation of routine tasks, and the use of intelligent chatbots (Figure 4). Let's consider the aspects of this approach:

- **Extracting data:** Intelligent learning systems can analyze students' behavior and progress, providing personalized tasks and recommendations. High-level security ensures the protection of students' personal data.
- **Digital assistants:** Predicting student success: Intelligent technologies can use data about students, their achievements, and activity to predict their success and timely identify problems, offering personalized recommendations regarding courses, materials, assignments, or teaching methods.
- **Predictive analytics:** Text analysis technologies can help teachers and students quickly find and understand information in educational materials. Data analytics can assist in tracking students' progress in real-time, identifying trends and weaknesses, enabling teachers and administrators to respond promptly to students' needs.
- **Content creation:** Intelligent testing systems can automatically generate questions, conduct tests, and provide assessment results. This allows teachers and students to assess knowledge and skills efficiently without a significant amount of manual work.

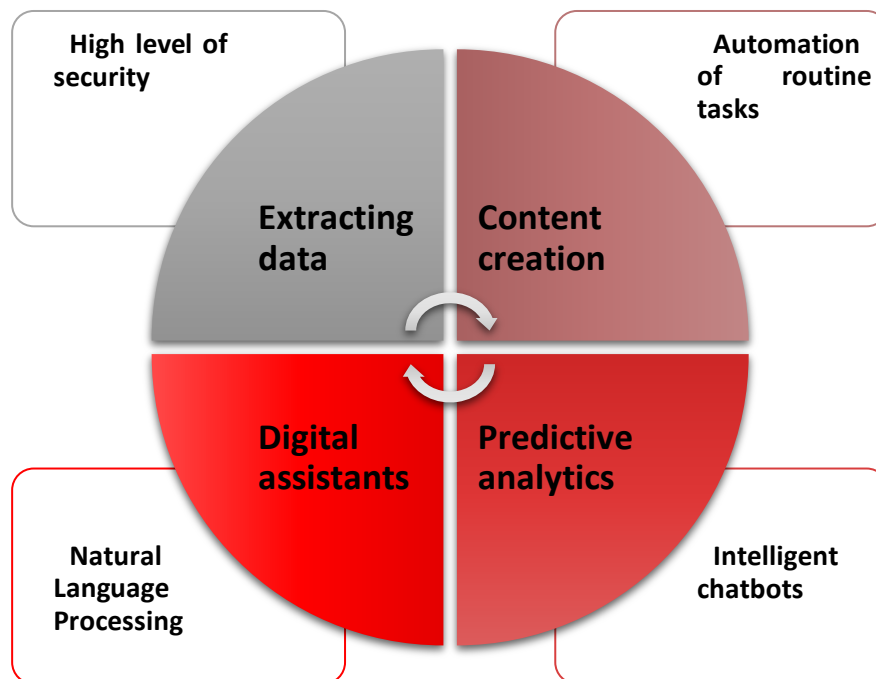


Figure 4: Concepts of intelligent technologies for learning improvement

The use of intelligent technologies and data analytics to enhance education can significantly simplify the teaching and learning process, providing greater efficiency, personalization, and improving students' outcomes.

5. Results

The primary purpose of creating measurement tools for an online course is to address the issue related to specifying learning outcomes. The specification process involves several stages, which can be seen in the schematic representation in Figure 5. Importantly, this applies not only to English language courses but also to all online courses.

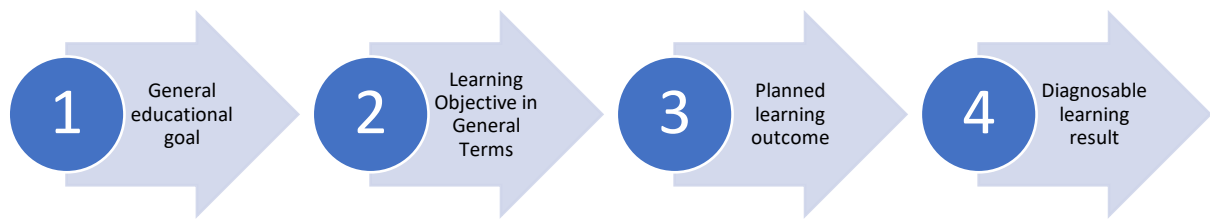


Figure 5: Stages of operationalization of training results

When we consider the future achievements of students, they begin to take shape in the teacher's consciousness against the backdrop of the subject matter they are teaching, and the test material takes on its structure. Of course, the chosen assessment methods play a significant role in this process because not every aspect of the subject and every form of learning can be reflected in knowledge assessment tools, most commonly in the form of test assignments.

Among the requirements for planned learning outcomes, they typically include a system of mastered subjects, a description of types of educational activities, and the quality of mastering educational materials.

E-learning systems can collect a large amount of information about students' behavior during online course learning, their choices, and achievements. After processing this data using specialized methods, it is possible to obtain information about the difficulty of tasks in the course, considering how much time a user spends on their completion and how many attempts are needed; about the quality of the material, considering the time a student spends on mastering sections of the online course and the number of page revisits.

Conclusions about the activity of users in the learning process can be drawn by tracking data on their visits and analyzing their emotional reactions in feedback. One of the key conditions for building trust in e-learning, both from the students' perspective and educational institutions, is ensuring the quality control of electronic educational courses. Legislative support will contribute to the improvement of mechanisms to protect students from low-quality online courses and serve as a motivational system for developers of online courses, aimed at enhancing and improving e-education.

E-learning is an integral part of modern education, and the evaluation of electronic educational courses is a mandatory element of this process. Various approaches and a limitless number of quality indicators and criteria can be used during the evaluation. However, it's important to consider only those that are meaningful to the expectations of the participants in the learning process. In practical activities, both existing systems, such as those used during accreditation or certification, and proprietary quality assessment systems can be employed.

The algorithm for creating your own evaluation system includes the following stages:

1. Identifying the factors that influence quality.
2. Transforming the identified factors into indicators or groups of indicators.
3. Defining criteria for calculating the indicators.
4. Establishing the significance or weight of each indicator or group.
5. Verifying the correctness of the created system.

Considering these fundamental stages for conducting English language training, an educational course was developed based on the Moodle LMS (Learning Management System), as shown in Figure 8.

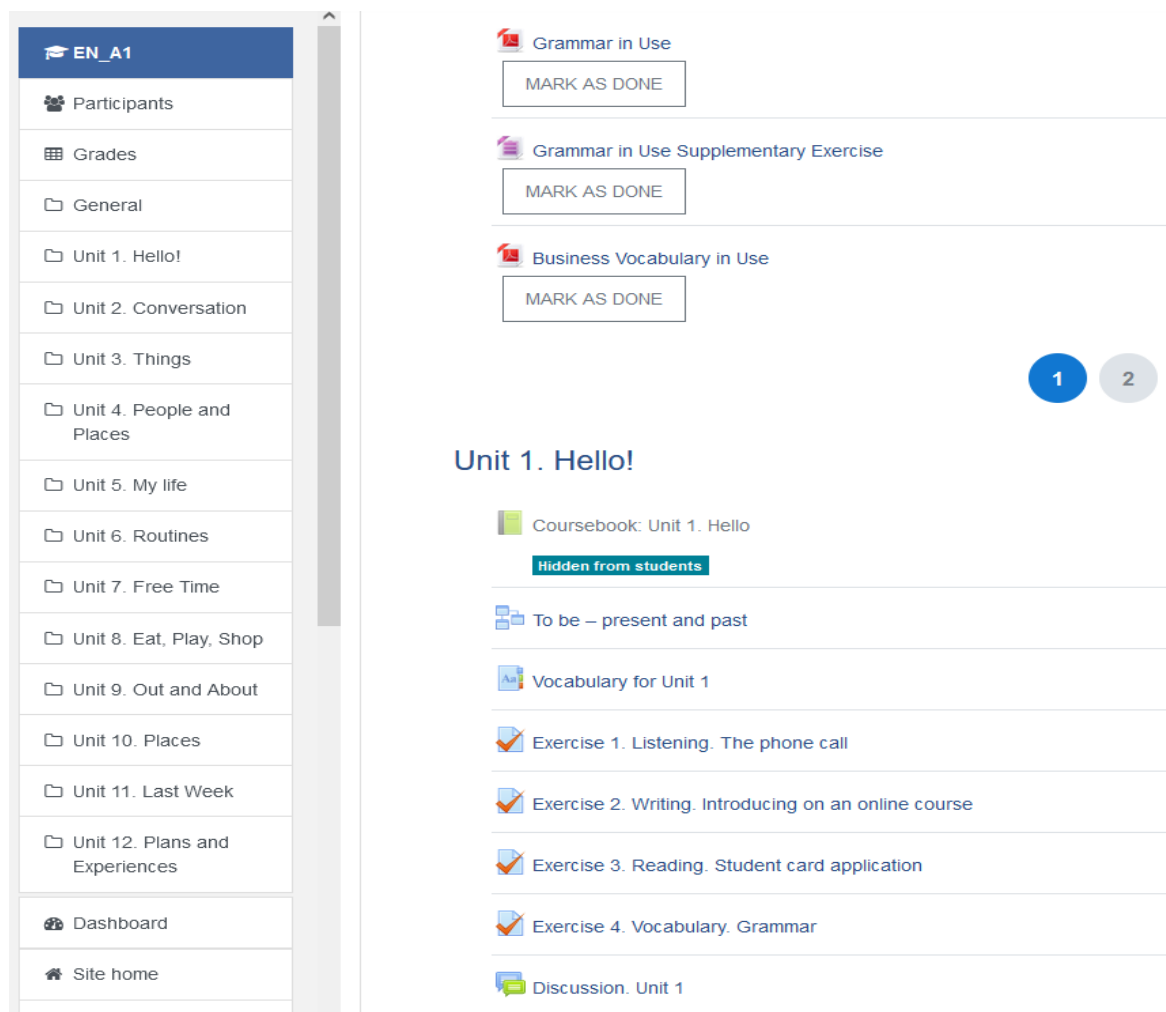


Figure 8. Developed training system

To ensure effective monitoring of students' progress and the evaluation of the quality of the English language course, educational tests have been developed. These tests serve as a means of measuring students' comprehension and mastery of the material. However, their role in the context of education goes beyond assessing students; they also play a crucial role in determining the overall effectiveness of the educational course.

Analyzing the results of these tests allows us not only to assess the level of material mastery by students but also to gain a deeper understanding of how effective the course itself is. The insights we obtain from this analysis provide vital answers regarding how well the course is fulfilling its purpose, namely, facilitating students' learning of the English language.

This analysis enables the identification of strengths and weaknesses in the educational process and offers opportunities for further enhancement. It is essential to consider the test results as a tool to provide students with the best educational experience and to determine ways to improve the educational course.

On Figure 9, it can be noted that the learning process of the first topic of this course has been completed by most students and, in general, at a relatively high level. Specifically, even on the first attempts, the "Average Score on First Attempts" is 78.8%.

Close the quiz		Monday, 11 September 2023, 3:25 PM
Number of complete graded first attempts		22
Total number of complete graded attempts		22
Average grade of first attempts		78.8%
Average grade of all attempts		78.8%
Average grade of last attempts		78.8%
Average grade of highest graded attempts		78.8%
Median grade (for highest graded attempt)		80.1%
Standard deviation (for highest graded attempt)		13.6%
Score distribution skewness (for highest graded attempt)		-0.040
Score distribution kurtosis (for highest graded attempt)		-1.524
Coefficient of internal consistency (for highest graded attempt)		29.5%

Figure 9. Result of Test #1 English course

6. Conclusion

The paper underscores the modern educational landscape is undergoing a transformation thanks to the use of information technologies. The use of these technologies in the creation and improvement of online courses for learning the English language makes learning more accessible and effective.

The model shows that the introduction of intelligent technologies, such as high levels of security, speech recognition technology, automation of routine tasks and intelligent chatbots, can improve learning. And use this approach as a startup for English courses.

Based on the presented model, a training course on teaching English was developed. The course involves tutors/teachers leading classes for groups of students. The learning process can provide data analysis to improve education. This allows you to track student progress in real time. Teachers and administrators are given tools to quickly identify student trends and weaknesses, allowing them to respond to student needs and improve learning. Make grading easier and improve your course. Also, in the learning process, artifacts have been identified that can be used to improve the quality of learning, increase efficiency and personalize learning: all these innovations help increase the speed of learning, which is very relevant today.

For operation, a web server with Moodle LMS was deployed, which allows you to create and improve online courses taking into account intelligent technologies and data analysis, not limited to what is presented in this article.

As can be seen from the training results, the first thematic block of the course was successfully completed by the majority of students with high grades. This proves the effectiveness of the approach used in the course.

References

- [1] Adair, D., Shattuck, K. (2019). Ensuring quality while creating and innovating. In K. E. Linder(Ed.), *The business of innovating online: Practical tips and advice from industry leaders*(pp. 97–112).(2) (PDF) Evaluating Online Course Quality: A Study on Implementation of Course Quality Standards. URL: https://www.researchgate.net/publication/347312455_Evaluating_Online_Course_Quality_A_Study_on_Implementation_of_Course_Quality_Standards [Accessed Nov 04, 2023].
- [2] Bazluki, M., Gyabak, K., & Uderman, B. (2018). Instructor feedback on a formal online coursequality assurance review process. *Online Journal of Distance Learning Administration*,21(2). URL: https://www.westga.edu/~distance/ojdla/summer212/bazluki_gyabak_udermann212.html (2) (PDF) Evaluating Online Course Quality: A Study on Implementation of Course Quality Standards. URL: https://www.researchgate.net/publication/347312455_Evaluating_Online_Course_Quality_A_Study_on_Implementation_of_Course_Quality_Standards [Accessed Nov 04, 2023].
- [3] Shank, M. (2010). *Online Course Quality Assurance: Using Evaluations and Surveys to Improve Online Teaching and Learning*. Retrieved from URL: <https://www.facultyfocus.com/wp-content/uploads/2015/02/OnlineCourseQualityAssurance.pdf> [Accessed Nov 01, 2023].
- [4] Shanshan Shang, Chenhui Du Online course quality evaluation from the perspective of knowledge management: analysis of online reviews URL: <https://www.emerald.com/insight/content/doi/10.1108/LHT-08-2021-0290/full/html> [Accessed Nov 01, 2023].
- [5] М. Поясник, Технічні аспекти створення онлайн-курсів на платформі open edxдля змішаного навчання. October 2020 *Art of Medicine* URL: https://www.researchgate.net/publication/346126578_tehnicni_aspekti_stvorennja_onlajn-kursiv_na_platformi_open_edx_dla_zmisanogo_navcanna [Accessed Nov 02, 2023].
- [6] Raja, R., & Nagasubramani, P. C. (2018). Impact of modern technology in education. Department of Pedagogical Sciences, Tamilnadu Teachers Education University. Retrieved from <http://surl.li/mvyes> [Accessed Nov 04, 2023].
- [7] Пометун О. Інтерактивні технології навчання: теорія і практика /О.Пометун, Л.І.Пироженко. - К.: Вид-во А.С.К., 2002. – 136 с. [Accessed Nov 01, 2023].
- [8] Пометун О. Сучасний урок: інтерактивні технології навчання: наук- метод, посібник/ О.Пометун, Л. Пироженко. - К.: Вид-во А.С.К., 2004. - 192 с. [Accessed Nov 03, 2023].
- [9] Li, G., Li, W., & Li, B. (2022). Integration Practice of Modern Information Technology in English Teaching. *MATEC Web of Conferences*, 365, 01019. URL: https://www.matec-conferences.org/articles/matecconf/pdf/2022/06/matecconf_isc-fte2022_01019.pdf [Accessed Nov 03, 2023].
- [10] Thompson, K. (2005). Construction educational criticism of online courses: A model for implementation by practitioners. URL: http://pegasus/cc.ucf.edu-kthompso//criticism/thompson_kevin_200508_EdD.pdf [Accessed Nov 01, 2023].
- [11] Enhancing Student-Student Online Interaction: Exploring the Study Buddy Peer Review Activity - Scientific Figure on ResearchGate. Available from: https://www.researchgate.net/figure/Modes-of-interaction-in-distance-education-from-Anderson-2003a_fig1_303317733 [Accessed Nov 07, 2023]
- [12] Purdue University Fort Wayne. [no data] "INTERACTION and ENGAGEMENT." URL: <https://www.pfw.edu/offices/enhancement-learning-teaching/pedagogical-resources/interaction>. [Accessed Nov 07, 2023]
- [13] E. Ries, “The Lean Startup: How Today’s Entrepreneurs Use Continuous Innovation to Create Radically Successful Business”, Kindle Edition, 2011.
- [14] Letsmobility [23 July 2019] Minimum Viable Product. URL: <https://letsmobility.com/blog/minimum-viable-product/> [Accessed Nov 07, 2023]