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Impact of Implementing Blended Learning on EFL Students' Attitudes in HEIs in Palestine: Lessons learned from TEFL-ePAL project

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Abstract:

The present study addresses the impact of implementing blended learning, interactive learning materials, and 21st-century teaching methods on students' attitudes toward learning EFL at Higher Educational Institutions (HEIs) in Palestine. Moreover, it aims to highlight the efficacy of digital resources as supportive education, which can be relied on to achieve the goals of education. To achieve the purposes of this study, the researcher developed a 5 Likert scale questionnaire. The validity and the reliability of this instrument were tested and assured. The sample of the study consisted of 208 EFL students joining 4 Palestinian universities: Al-Quds Open University (QOU), Palestine Ahliya University (PAU), Palestine Technical University/ Kadoori (PTUK), and Al-Istiqlal University (PASS) during the first semester of the academic year 2021-2022. The quasi-experimental method was used. The results indicated that implementing 21st-century methods of teaching and using interactive learning materials developed positive attitudes toward learning English as a foreign language in higher education. The results also revealed several barriers that students face, that hinder adopting educational technology and enhancing professional and sustainable development in higher education in Palestine, including usability concerns, technical issues, digital literacy gaps, etc. The researcher offers recommendations on ways to foster adopting student-centered approaches and educational technology to enhance sustainability in teacher development in Palestine.

Keywords: *e-learning; interactive learning materials; TEFL; students' attitudes; freedom, individuality; barriers; collaboration; blended learning; flexibility and convenience.*

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تأثير تنفيذ التعلّم المدمج على مواقف طلاب اللغة الإنجليزية كلغة أجنبية في مؤسسات التعليم العالي في فلسطين: الدروس المستفادة من مشروع TEFL-EPAL

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ملخص:

تتناول الدراسة الحالية أثر تطبيق التعليم المدمج والمواد التعليمية التفاعلية واستخدام طرائق التدريس الحديثة الخاصة بالقرن الحادي والعشرين على اتجاهات الطلاب نحو تعلم اللغة الإنجليزية كلغة أجنبية في مؤسسات التعليم العالي في فلسطين. كما تهدف هذه الدراسة إلى تسليط الضوء على فاعلية المصادر الرقمية باعتبارها تعليمًا داعمًا يمكن الاعتماد عليها لتحقيق أهداف التعليم. ولتحقيق أهداف هذه الدراسة قامت الباحثة بتطوير مقياس ليكرت الخماسي. وتم اختبار صدق وثبات هذه الأداة والتأكد منهما. تكونت عينة الدراسة من 208 طلاب من طلاب اللغة الإنجليزية كلغة أجنبية المنتسبين إلى 4 جامعات فلسطينية: جامعة القدس المفتوحة (QOU)، جامعة فلسطين الأهلية (PAU)، جامعة فلسطين التقنية/ خضوري (PTUK)، وجامعة الاستقلال (PASS) خلال فترة الفصل الدراسي الأول من العام الدراسي 2021-2022. وتم استخدام المنهج شبه التجريبي. أشارت النتائج إلى أن تطبيق أساليب القرن الحادي والعشرين في التدريس واستخدام المواد التعليمية التفاعلية أدى إلى تطوير اتجاهات إيجابية نحو تعلم اللغة الإنجليزية كلغة أجنبية في مؤسسات التعليم العالي. وكشفت النتائج أيضًا عن الكثير من المعوقات التي يواجهها الطلاب والتي تعيق تبني تكنولوجيا التعليم وتعزيز التنمية المهنية والمستدامة في التعليم العالي في فلسطين. شملت هذه المعوقات مخاوف سهولة الاستخدام، والقضايا التقنية، وفجوات المعرفة الرقمية، وما إلى ذلك. قدّمت الباحثة بعض التوصيات حول سبل تعزيز تبني المناهج المتمركزة حول الطالب وتكنولوجيا التعليم بهدف تعزيز الاستدامة في تطوير المعلمين في فلسطين.

الكلمات المفتاحية: *التعلم الإلكتروني؛ مواد تعليمية تفاعلية؛ تدريس اللغة الإنجليزية كلغة أجنبية؛ اتجاهات الطلبة؛ الحرية والفردية. الحواجز؛ التعاون؛ التعلم الدمج؛ المرونة والراحة.*

1. Introduction

The rapid advancements of technology over the past two decades and the transition from face-to-face to online learning during the COVID-19 crisis reinforced the emergence of a global movement that calls for educational change in policies and models of learning for the twenty-first century (DeCoito & Estaiteyehm, 2022). Although there is widespread consent that formal education must be transformed to enable the new forms of learning needed to tackle the critical global challenges ahead, there is no universally prescribed method for educating young people in the twenty-first century. The role of the university in the 21st century as emphasized by The University of Toronto (2012), is to equip students with the skills and knowledge that are deemed necessary and needed to confront the challenges of the twenty-first century, to survive and succeed in their societies, be prepared to enter the workforce and successful in the future. Motivations, the specific competencies and skills needed to function effectively in the twenty-first century, and the pedagogy required to stimulate those capabilities are key elements for learning in the twenty-first century, and important aspects in a new model of learning (Scott, 2015). Modern learning involves working collaboratively with others, employing critical thinking and problem-solving, promoting different forms of communication and leadership skills, and enhancing motivation, innovation, and productivity (Wrahatnolo, 2018). Therefore, universities should reorganize their curricula, emphasize freedom and individuality, and respond to changing employment requirements.

The digital revolution is changing the world we live in (Bello et al., 2021). However, the current system of design education seldom prepares students for the challenges that they will face (Meyer & Norman, 2020). Making change that matters in a fast-changing world in the 21st century presents a challenge to governments and educators through reforming learning, curriculum, and pedagogy as a necessary and crucial factor in school systems and higher educational institutions (HEIs). The goal of reform is to equip students with the knowledge, skills, personal experience (Eichelberger & Leong, 2019), and competencies needed for the future, systematic change, and sustainable development (Gomez-Trujillo & Gonzalez-Perez, 2021). However, educators are facing significant challenges with technology integration and new educational tools (Johnson et al., 2016), with how to initiate such change most suitably and effectively (Gouëdard et al., 2020), in addition to the implementation gap between the intention and the realization of this curriculum reform.

The widespread adoption of technology, nowadays, has completely changed how teachers teach and students learn (Howard & Mozejko, 2015). The growing popularity and functionality of technology devices affect teaching and learning by providing students with facilities through flexible authentic learning environments have helped mitigate the constraints of time and place through blended and e-learning, and personalize learning (Johns & Wolking, 2018). The current pandemic and the sudden closure of HEIs tested the readiness of HEIs to keep the process of teaching/learning in progress and to provide quality education at the same time. Digital means of communication that include computers, television, mobile phones, email, and the Internet have made it easy to share information, ideas, and experiences (Bakeer, 2018; Bulman & Fairlie, 2016).

1.1 Statement of the problem

Many students in Palestine face major difficulties in learning English and using it for communication in real-life situations for several reasons (Bakeer, 2023). Overwhelmed with the effectiveness of implementing blended learning and 21st-century methods in enhancing students' competencies, lifelong learning, and 21st-century skills, the researcher tried to investigate the impact of implementing these methods and using interactive learning materials on students' attitudes. To shift to e-learning and innovative Tech-based education in higher educational institutions, provide students with quality education, and develop more positive attitudes toward learning English as a foreign language, stakeholders (Akbarov et al., 2018), and decision-makers need to plan adequately and conveniently for effective teaching learning strategies aiming to narrow the gap. This research will address the effectiveness of implementing blended learning and interactive learning materials in developing EFL students' attitudes toward the language.

1.2 Objectives of the Study

The main objective of the present semi-experimental study is to examine the impact of blended learning and interactive learning materials on developing students' attitudes toward learning the English language and enhancing student-centered methods in higher education in Palestine. With an emphasis on adopting and implementing technology-based learning methods and interactive learning materials, this study seeks to highlight learning practices that proved to have an impact on EFL students' attitudes toward learning English as a foreign language.

The following are the research's particular goals:

1. To gauge students' attitudes toward learning English as a foreign language in higher educational institutions in Palestine.
2. To examine EFL students' attitudes toward the effectiveness of implementing blended learning and interactive learning materials in education.
3. To highlight the barriers that hinder implementing blended and e-learning in higher education in Palestine.
4. To offer recommendations to stakeholders, educators, and other decision-makers for improving language competencies and skills by adopting technology-based learning in higher education in Palestine.

1.3 Research Questions:

This research aims to answer the following questions:

1. How do blended learning and interactive learning materials impact students' attitudes toward learning the English language?
2. How do students feel about implementing blended learning to motivate the development of personalized learning?
3. What are the most common barriers that hinder EFL students from using educational technology in higher education, and how can they be mitigated?

1.4 Research Hypothesis

The current study aims to test the following hypothesis:

1. There are no statistically significant differences at the level of ($\alpha \leq 0.05$) in the EFL students' attitudes toward learning the English language that could be attributed to the teaching method (blended learning) and interactive learning materials.

1.5 The significance of the study

The significance of this study appears in different aspects. First, this study aims to add to the body of knowledge on EFL students' attitudes toward learning the language and the impact of blended

learning and interactive learning materials on developing more positive attitudes toward the language in higher education in Palestine, and it offers a thorough analysis of the problem and recommendations for ensuring quality education by equipping students with 21st-century skills including communication and leadership skills, collaboration, critical thinking and problem-solving, global awareness, and digital literacy (Pinkerton, 2023). Second, the research offers a quantitative examination of the elements that should be considered when preparing future education plans and education strategies and programs in Palestine, particularly regarding language competency. Third, the research's findings may be utilized to pinpoint areas of competencies and practices for interactive digital activities, and digital feedback, where English language courses and programs need to be developed to enhance language learning and improve performance. Fourth, the research offers knowledge on the effectiveness of developing language competencies and 21st-century skills. The research adds to the areas of Tech-based learning and innovative pedagogies more broadly by fostering the implementation of blended learning and interaction in classrooms and outside schools.

1.6 Definitions

- Blended learning uses online and offline technologies in tandem, allowing instructors to quickly adopt the latest learning trends and modalities into the curriculum. Instructors can also use built-in reporting features in most LMS software programs for deeper, data-driven insights into student progress and success (Lim et al., 2019).
- Interactive learning materials are interactive resources designed to teach a specific learning outcome. They may comprise a single, or multiple pages that can contain any combination of text, images, audio, or video - including screencasts, animations, self-test questions, and other interactive activities (Secapuri, 2021).
- Interactive content is any type of material that conveys its message by encouraging user participation. Because of this, the content experience evolves from passive consumption to active engagement. Interactivity can appear in calculators, quizzes, e-books, videos, and animated infographics (Lange, 2023).
- Innovative pedagogy is the process of proactively. introducing new teaching strategies and methods into the classroom to improve academic outcomes and address real problems to promote equitable learning (Thompson, 2023).
- The TEFL-ePAL project is a three-year capacity-building project funded by the EU Commission. The wider objective of the TEFL-ePAL project was to implement initiatives that develop learners' linguistic capacity, skills, and English language excellence, to bridge educational and socio-political gaps, and enhance modernization, internationalization, and lifelong learning. To achieve this goal, nine European and Palestinian partners shared their knowledge, experience, and expertise, collaborated, supported the process of developing a rich syllabus and interactive learning materials, and implemented recent innovative methods using ICT tools (Bakeer & Bruce, 2019).

2. Review of related literature

Technology integration in English language teaching can create a new dynamism regarding quality education by enhancing the capacity of higher educational institutions in Palestine to create rich interactive content and update strategies and methodologies. In Palestine, the occupation fragments the territory geographically and impacts the movement of people, which results in society fragmentation into small isolated groups. This has led to inequitable access to quality education for all students in Palestine (Bakeer & Bruce, 2019). The results of

Emancipatory Action Research on 21st-century skills confirmed that teachers felt insufficiently motivated, with inadequate ICT resources and developmental training programs (Fragkaki et al., 2015). The results accorded with the findings of the policy paper on the Teacher Education Improvement Project funded by the World Bank, and developing inclusion for global education **(**UNESCO, 2005**)**. Palestinian educators are now striving to use advanced technologies and recent methodologies that focus on principles of personalized differentiated learning, student-centered instruction, and constructivism.

Previous research highlights the effectiveness of blended learning and interactive learning materials (Tong, Uyen, & Ngan, 2022; Ho, Cheong & Weldon, 2021; Hori & Fujii, 2021; Dziuban et al., 2018; Gambari et al. 2018) It was noted that the effectiveness may vary depending on the context, the subject matter, and the specific implementation. Regular assessment and feedback from students can help educators fine-tune their approaches to better meet the needs and preferences of their learners.

2.1 The Need for Change in the Learning System in Palestine

Over the last few years, easy access to fast internet and video calls on personal devices like laptops and mobile phones has mixed up different ways of teaching. Face-to-face and online learning methods are now more similar, giving teachers many options to blend these methods smoothly (Irvine, 2020). The COVID-19 pandemic has affected several areas of one's life in some way and affected education globally, leading teachers to try pedagogical approaches and new methods to adapt to changes. The rush to emergency remote education faded, but the new teaching approaches it brought will likely stay (Grady, 2022). In Palestine, the closure of schools led to a loss of learning, prompting Higher Education Institutions (HEIs) to shift to e-learning and remote teaching. HEIs explored tech-based education options to manage crises and encourage digital communication (Shraim, & Crompton, 2020). HEIs are transitioning from traditional to student-centered learning using multimedia and technology to adapt to the change and the current needs and circumstances (Yao et al, 2021). Despite challenges, the shift to virtual and hybrid instruction in HEIs has fostered technological innovations. The increased investment in technology during the pandemic is expected to continue and accelerate, with technologies evolving for educational purposes (Baber, 2023; Baxter & Hainey, 2023). While the current reliance on technology is due to the pandemic, using instructional technology thoughtfully holds promise for meeting diverse learner needs, emphasizing evidence-based practices and ongoing evaluation (Darling-Hammond & Hyler, 2020).

Future learning environments are more likely to be digitally infused at varying levels, with the use of technology defined more by the activity, lesson, or student need at the moment rather than the setting in which the learning takes place. Instead of serving as a temporary "stop-gap" in the instructional process until teacher educators can return to the face-to-face classrooms of the pre-pandemic era, emergency remote education may become a transitional phase for future educational practices which will be primarily dynamic and equip teacher educators with a set of pedagogical tools that are not modality-specific but can be mixed and matched across educational settings and formats to meet student needs. Current research suggests that most of the strategies that appear to be effective in online environments are the same as those considered to be effective in face-to-face environments, including the use of multiple pedagogies and learning resources to address individual student needs (Lockman & Schirmer, 2020).

Consequently, teacher educators in a post-pandemic era can expect to apply multiple pedagogical supports more flexibly to accommodate students who may be accessing their

learning online, face-to-face, or remotely, depending on their circumstances, and further provide learning resources to help these students navigate digitally infused learning environments to construct their learning. Later,

2.2 Why Blended Learning?

Blended learning, as described by Claned (2023), is a combination of face-to-face and online learning. It is known as self-paced learning and provides opportunities for interaction and communication, group discussions, hands-on activities, virtual collaboration, and the convenience of online resources. It is a pedagogical approach that combines traditional teaching methods with digital technology to create a more dynamic and effective educational experience. There are some key advantages and considerations associated with the shift to blended learning in Higher Education Institutions. Blended learning enhances flexibility and accessibility; in other words, allows students to access educational materials and resources at their own pace and from anywhere with an internet connection (Li, 2022). This flexibility is particularly beneficial for non-conventional students, career men, and women, or those with other commitments. Blended learning promotes personalized learning and increases integration of technology enabling the tailoring of content and delivery to individual student needs, preferences, and learning styles (Childress & Benson, 2014). This personalized approach enhances student engagement and comprehension. Teachers can boost students' engagement and motivation by aiming to maintain student interest and participation and using interactive multimedia content, gamification, and collaborative online activities that enhance interaction and engagement (Claned, 2023). By offering effective resources in blended learning courses and leveraging online materials, institutions can optimize the use of physical facilities and reduce the demand for traditional classroom space. This can lead to cost savings and efficient resource allocation. Blended learning aims to prepare students for the digital age. The exposure to digital tools and collaboration platforms prepares students for the demands of the modern workplace, where technology is integral to communication, problem-solving, and information access (Dangwal, 2017).

2.3 Tech-based education and teaching languages

Advances in technology have made it easier for teachers and learners of English to access comprehensive widespread resources in terms of authentic materials that help learners successfully interact with classmates and communicate with native and non-native speakers of English around the world. Technology-integrated methods, such as blended learning, incorporate the use of technology in language learning to strengthen learner engagement, facilitate the teacher's role, and provide a structured, comprehensive learning experience for everyone involved (Rosell, 2020; Huang, 2018). In language teaching, there is evidence that the growing range of uses of technology in and out of the classroom and multimedia technology has the potential to promote students' motivation and enhance learning interest in the English language. In the non-native English-speaking context, this can provide students with a practical way to get involved in language learning (Pawlak, 2018; Tran, 2018). Students learning English as a foreign language can acquire new vocabulary and how to use them in a real-life situation through meaningful and digital authentic materials, and through listening to native speakers. Online participation and interaction with classmates, keeping students in touch, sharing information, and digital communication the growing range of uses of technology in and out of the classroom increases the potential for enhanced

motivation (Tran, 2018; Herro, 2015; Dörnyei et al., 2014; Stockwell, 2013), and students' determination to learn English. In addition, studies have shown that technology can promote the learning performance of language learners as students often get meaningful learning experiences, and collaborate with their peers resulting in learning from each other, which helps them retain more information for a longer time, and have more opportunities for flexibility and convenience (Costley, 2014).

In addition, giving feedback online or commenting on students' participation can develop students' understanding and improve their language skills. It has been found that comments and prompts enable students to share knowledge, gain learning, and boost their experience; they are more likely to contribute to learning when they are not accompanied by scores (English, 2020).

2.4 Innovation within the TEFL-ePAL project

Educators in TEFL-ePAL developed rich content and interactive learning materials to foster freedom and enhance students' integration by developing digital materials that students can access, using mainly the platforms in addition to any available tool students can use to learn at their own pace and convenience. In addition, the researcher aimed to reach marginalized people who live in challenging situations in remote areas and the Gaza Strip (Bakeer & Bruce, 2019). It also aimed to empower students (in some sectors of Palestinian society, primarily women, the disabled, and workers) who were unable to attend regular classes to continue their higher education and develop their language skills to bridge the gap between what was expected and what was happening the current situation. Moreover, the interactive learning materials can ensure that students continue their education in emergencies and during closures.

The added value of the TEFL-ePAL project outputs includes:

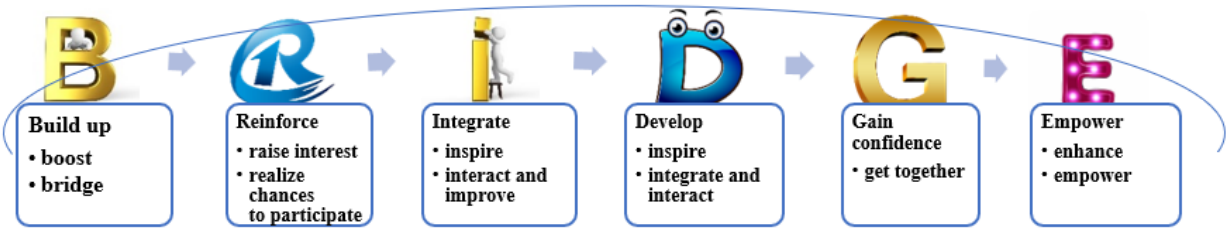
- Reaching students wherever they are when they want to learn ensuring the continuity of education in difficult and challenging times and meeting students' needs and interests.
- Providing extra-curricular online activities that extend the class use of the English language to outside classrooms.
- Designing digital materials that can elevate students' proficiency levels of language skills, mainly in listening, reading, speaking, and writing.
- Providing students with various digital resources and tasks to achieve skills development while not neglecting individual differences.
- Providing students with a variety of tasks and activities (formal and informal) to keep their interest alive such as using interactive videos, crossword puzzles, etc. to encourage students' critical thinking and creativity and promote more positive attitudes and innovation.
- Providing students with immediate feedback on their work after they complete the exercise.
- Promoting quality education by adopting EU standards and building the capacity of teachers on the 21st-century methods in higher education.
- Providing institutions with platforms and digital tools that are required for blended and e-learning.

2.5 Procedure: Implementing BRIDGE formula in Tech-based curricula:

A six-factor formula was designed by the researcher and approved by the European partners to show the changing role of the teacher in a student-centered approach and enhance awareness about the teacher's role in teaching the interactive content that was developed within the TEFL-ePAL project. The researcher in the design and implementation of this model aims to assist the students participating in the pilot phase and affect their attitudes toward the developed content and the implemented

methodology. The 'Formula' was represented by the BRIDGE acronym coined by Dr. Bakeer; it was adopted to redefine the teacher's role and help teachers improve plans and processes.
The Bridge Formula of the teacher role aims to:

- Build up knowledge, boost, backing, etc.
- Reinforce, realize interest, reach success, right, etc.
- Integrate inspire increase, improve, implement, Interact, Integrate, etc.
- Develop, do well, etc.
- Gain confidence and strength, get together, generate, give prominence to, etc.
- Empower, encourage, equip, enrich, expand, enhance, enlarge, evolve, etc.



The new pedagogical practices emphasize that digital technologies must be integrated into course designs and their use facilitated by teachers because it is not the availability of digital materials and technologies that solve teaching and learning challenges.

3. Methodology and Research Design

Within this part of the study, the research methodology, sample, instrument, and data collection are presented. In addition, it presents the study design including the field study, instruments, validity and reliability, and data analysis techniques.

3.1 Methodology

This study employed the quasi-experimental approach to investigate the impact of blended learning and interactive materials on EFL students' attitudes toward learning English as a foreign language in higher education in Palestine. In experimental designs, the experimental group, and control group are determined and the questionnaire is applied before participation begins for both groups the control and the experimental groups at the beginning of the course (pre-test); the collected data is analyzed and then the results are compared, the lessons are taught in both groups, and the questionnaire is re-applied at the end of the semester (post-test), the collected data is analyzed and the results in both groups are compared. This research demonstrates that blended learning and interactive materials aim to promote innovation in education and develop positive attitudes toward learning English as a foreign language. For this research, the researchers used a quasi-experimental design. A two-group experiment was conducted with EFL students enrolled in the remedial English language course during the first semester of the academic year 2021-2022 to respond to the research surveys. The population of the study consisted of 503 EFL students enrolled in the remedial English course at the four HEIs participating in the TEFL-ePAL project: Al-Quds Open University (QOU), Palestine Ahliya University (PAU), Palestine Technical University/ Kadoori (PTUK), and Al-Istiqlal University (PASS). The sample comprised 208 students who were randomly selected and distributed into the control group and the experimental group. 114 students participated in the experimental group, while 94 students participated in the control group.

3.2 Research design and sample

For the research mentioned above objectives, some of the tasks were outlined. The researchers developed a pre-test to administer to the control group and the experimental group, and a post-test to administer to the experimental group only. Experimental lesson plans will be developed to develop EFL student's attitudes and self-study abilities. The academic team was responsible for teaching, supporting, and collecting information facilitating the experimental process related to the practicability and efficiency of the teaching process. Support aimed to enhance students' participation in learning activities and doing their assigned homework as well as the student's engagement in learning activities following the instructions of the teacher (delivered online and offline), and the student's practices to personalized learning. To collect data on EFL students' learning attitudes, the students were asked to rate how much they agreed or disagreed with 31 statements about the implementation of blended learning, which were assessed on a 5-point Likert scale: Strongly disagree, Disagree, Neutral, Agree, and Strongly agree. Another instrument was used to assess EFL students' perspectives on the effectiveness of blended learning and interactive learning materials in promoting personalized learning and the barriers that hinder e-learning they faced. These instruments were created by the academics participating in the project from Palestine and were reviewed by academics participating in the project from Europe.

3.3 Data collection and analysis

The mentioned above questionnaires were created and distributed using Google Docs, and students were required to complete them online. Data from the pre-and post-tests were collected and analyzed quantitatively to answer research questions. The data from the pre-and post-tests were analyzed quantitatively. A quantitative analysis was attached to the t-test in the software SPSS Statistics to examine the difference in mean values between the experimental and control groups. In addition, a quantitative analysis was used to examine the means and the standard deviations of the statements in the second questionnaire to measure the experiment's impact on students' perception of implementing blended learning using interactive learning materials for the experimental group.

4. Results

The Study Result

To achieve the study purposes, the researcher used means, standard deviations, percentages and ranks for items.

The means were classified according to a five-point Likert scale to the following scale:

Table 1: The Scale Used to Represent the Students' Responses' Estimation Level

Score	Level of Students' Responses
1-2.59	Low
2.60-3.39	Moderate
3.40-5	High

Pre-test results

The results and scores of the pre-test of the experimental group were compared to those of the control group using SPSS software to mark a statistically significant difference between the scores of the two groups. Descriptive statistics of the mean of the experimental and control groups are shown in Table 2 below.

Table 2: The Differences in the Mean Scores between the Experimental and the Control Groups in the Pre-test

Experimental Group			Control Group			Sig. (2-tailed
N	Mean	SD	N	Mean	SD	
114	2.618	.4844	94	2.526	.4883	0.734

Table (2) shows slight apparent differences in students' attitude scores in the pre-test Results show that the mean score of students' attitudes toward learning English as a foreign language of the experimental and control groups is 3.68 and 3.126 respectively, in addition, results show that there is no significant difference between the scores of the two groups as the significance value in Levene's test for equality of variances equals 0.734 which is less than the significance level 0.05; this result shows that the mean score difference between EFL students' attitudes in experimental and control groups do not differ and was not statistically significant, and thus, students' attitudes of the two groups are equivalent and, therefore, are suitable for conducting experiments.

Post-test results

Q1: How do blended learning and interactive learning materials impact students' attitudes toward learning the English language?

To answer this question and to test the impact of applying the experiment on students' attitudes toward learning the English language, the mean score difference between EFL students' attitudes in experimental and control groups in the post-test is calculated. The results are shown in Table 3 below.

Table 3: The Differences in the Mean Scores between the Experimental and the Control Groups in the Post-test

Experimental Group			Control Group			Sig. (2-tailed
N	Mean	SD	N	Mean	SD	
114	3.471	0.55	94	2.968	.4883	0.001

Results in Table 3 show that the descriptive statistics of the mean score of students' attitudes toward learning English as a foreign language of the experimental and control groups is 3.471 and 2.968 respectively, in addition, results show that there is a significant difference between the scores of the two group as the significance value in Levene's test equals 0.001 which is less than the significance level 0.05; this result shows that the mean score difference between EFL students' attitudes in experimental and control group differ in their attitudes and the development in developing more positive attitudes and was statistically significant in favor of the experimental group. This result ensures the appropriateness of the experiment application in developing EFL students' attitudes toward learning the language. These results answer the first question and the research hypothesis.

Q2: How do students feel about implementing blended learning to motivate the development of personalized learning?

To answer this question, descriptive statistics are used to calculate the mean scores of the statements of the second questionnaire of the experimental group. The results are shown in Table 4 below:

Table 4: Mean Scores of Students' Attitudes Toward Blended Learning and Interactive Learning Materials

N	Statement	Mean	SD	Level
1	I feel that blended learning enhances my motivation to learn the English language.	3.50	1.167	High
2	I think that blended learning improves my language skills.	3.02	1.10	Moderate
3	I feel that the availability of interactive learning materials encourages critical thinking.	2.95	1.413	Moderate
4	I notice that interactive learning materials enhance my engagement.	3.18	1.211	Moderate
5	I feel that digital activities encourage collaboration (pair and group work).	3.07	1.020	Moderate
6	I think that blended learning helps us share learning experiences.	3.39	1.203	Moderate
7	I believe that interactive materials are customized to cater to my learning style.	3.59	1.035	High
8	I feel that digital materials encourage me to respond appropriately to real-life situations.	3.32	1.131	Moderate
9	I feel that the immediate feedback I receive helps me retain new information longer.	3.62	1.128	High
10	I feel that interactive learning materials reinforce my learning in face-to-face classes.	3.53	1.167	High
11	I think that blended learning allows for flexibility in terms of when and where I can access learning materials.	3.76	.968	High
12	I feel that interactive learning materials create more interaction between me and the teacher.	3.35	1.202	Moderate
13	I think that the digital materials demonstrate the practical relevance of the language items being taught.	3.18	1.211	Moderate
14	I think that technology distracts me when I am studying.	3.36	1.203	Moderate
15	I think that technology makes education inaccessible to all students.	3.38	1.135	Moderate

Results in Table 4 illustrate that blended and interactive learning developed positive attitudes toward the opportunities provided by technology-based learning. It encourages good practices and facilitates learning including enhancing students' motivation to learn the English language with a mean score of 3.50 through allowing flexibility in terms of when and where I can access learning materials with a mean score of 3.76, and reinforcing their learning in face-to-face classes with a mean score of 3.53. The immediate feedback students receive proved to help students retain new information for a longer time with a mean score of 3.62. The results also explore students' attitudes toward the effectiveness of technology-based learning in sharing learning experiences with classmates with a mean score of 3.39. The results show that students' attitudes toward digital learning materials encourage students to respond appropriately to real-life situations with a mean score of 3.32 and create more interaction between them and the teacher with a mean score of 3.35. In contrast to the above-mentioned positive results, students thought that technology makes education inaccessible

to all students and distracts them when they are studying with a mean score of 3.38 and 3.36 as they are at the early stages of becoming acquainted with blended learning.

Q3: What is the most common barrier that hinders EFL students from using educational technology in higher education, and what is the solution to mitigate the potential obstacle?

To answer this question, the descriptive statistics of the mean scores of students' responses to barriers to blended learning items are shown in Table 5.

Table 5: Students' Attitudes Toward Barriers to Blended Learning

N	Item	Mean	SD	Level
1	Insufficient administrative support.	3.30	0.89	Medium
2	Lack of previous knowledge, experience, and investment in using blended learning.	3.61	0.86	High
3	Lack of technological competence and information technology.	3.65	1.08	High
4	Lack of time for traditional learning, and completing online learning tasks.	3.47	0.85	Medium
5	Shortage of technical facilities	3.52	0.95	Medium
6	Lack of student motivation.	2.95	0.75	Medium
7	Difficulty in learning independently.	3.15	0.76	Medium
8	Problems associated with cost and access to the Internet.	3.23	0.82	Medium

Results of the descriptive analysis in Table 5 show that a lack of technological competence and information technology is a significant barrier for those wishing to implement blended learning, and a lack of previous knowledge, experience, and investment in using blended learning with a mean score of 3.65 and 3.61 respectively. The third-ranked barrier is the shortage of technical facilities with a mean score of 3.52, followed by a lack of traditional learning time and completing online learning tasks with a mean score of 3.52. The lowest mean score of 3.23 is given to problems associated with cost and access to the Internet.

5. Discussion

Research results and the knowledge gained from conducting this experiment indicate that implementing blended learning and using interactive learning materials affected positively students' attitudes toward learning the English language. The potential positive impact of blended learning sheds light on adopting 21st-century pedagogies and implementing technology-based education including blended learning. Integrating students in online activities and providing students with interactive learning materials supports personalized learning. Results also indicate that adopting blended learning provides opportunities for establishing communities for students to be more engaged and active in communicating with classmates and teachers by enhancing teacher-student online communication and through classrooms and interactive channels on the academic portal and social networks. Blended learning enables sharing information and getting immediate feedback on how students are doing to solidify their knowledge and retain new knowledge for a longer time. Results also indicated that some significant barriers hinder the adoption of blended learning for those wishing to implement this method. One of the significant barriers is the shortage of technical facilities to support students in online learning. One solution to the potential obstacles associated with this approach to learning is to empower students and teachers with digital skills to enhance their

confidence in their abilities and online learning skills and competencies. Such issues should be considered when planning pedagogic agendas for Tech-based education and sustainable education.

6. Conclusion

Research results illustrate how EFL students perceive the impact of blended learning and interactive learning materials on developing their language skills and supporting student-centered learning. Although students have first become acquainted with blended learning, the results demonstrate moderate and high learning efficiency when learning online. They thought that blended learning and interactive learning materials reinforced their learning in face-to-face classes through direct interaction with students in class and online. Results of the study indicate that although blended learning and accessing digital and online materials have a positive impact on students' attitudes, undergraduate students need to develop their digital skills as they face challenges and barriers to accessing materials effectively in learning English as they are at the early stages of becoming acquainted with blended learning. Training is a process that can respond to and manage change. New competencies and skills are to be developed through workshops for teachers and students. A contemporary vision for innovation collaboration should be highlighted to achieve quality learning that values individual requirements and meets real learning needs.

7. Recommendations

Based on research results, the following recommendations are made:

1. Higher educational institutions are recommended to adopt 21st-century methodologies and implement blended learning on a wider range regularly.
2. Equip higher educational institutions with sufficient technical facilities to adopt blended learning.
3. Administration in higher educational institutions is recommended to invest more in using blended learning, offer support to students, and provide them with knowledge and experience to pursue online teaching/learning in Tech-based education.
4. Collaborate with experts capable of designing interactive learning materials following the latest educational theories and principles, which contribute to providing curricula that keep pace with the current era.
5. Conduct scientific and academic conferences that familiarize teachers and students with the new technological tools that are used in an online class situation.
6. Employ new techniques that motivate student, develop competencies, and boost their confidence in their written and spoken fluency.
7. Cooperate with students by asking for fewer assignments to do so as to make online learning more enjoyable and not overwrought.
8. Educators in HEIs should be equipped with competencies, guidelines, and advice on how to enable teachers to integrate ICT tools using appropriate curricula to young people develop their linguistic competence,
9. Educators in HEIs work on developing more flexible curricula to be able to enhance students' participation creatively, critically, and productively in e-learning.
10. Stakeholders in HEIs, hand in hand with relevant national institutions should provide professional training workshops that educate teachers on how to develop flexible content and how to use this curriculum in the classroom and outside the classroom.
11. Stakeholders at HEIs should provide significant training workshops to empower students with sufficient skills needed for e-learning.
12. Stakeholders at HEIs are advised to consider the lessons learned from the experience they had from e-learning. Learning about the success and failure of previous experiences is an opportunity

to modernize the education systems to be stronger and more equitable than they are in the current situation.

13. Educators should make more efforts to conduct awareness campaigns to disseminate practices that can promote students' attitudes toward online learning and more active participation.

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