| RESEARCH ARTICLE

The Impact of an Interactive English E-Book in Developing Active Listening Skills

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| **ABSTRACT**

This study examines the impact of an interactive English e-book on the development of active listening skills among first-year female students in the Medical Health Track at the University of Bisha. Using a quasi-experimental design, (80 participants were randomly assigned to an experimental group (n = 40) and a control group (n = 40). The experimental group received instruction through an interactive English e-book, whereas the control group was taught using conventional instructional methods. Data were collected using pre- and post-tests assessing key components of active listening, namely auditory recall, listening comprehension, and auditory discrimination. The results indicate statistically significant improvements in auditory recall and listening comprehension among students exposed to the interactive e-book compared with those in the control group. However, no statistically significant differences were found between the two groups in auditory discrimination. These findings suggest that interactive English e-books can play an effective role in enhancing selected dimensions of active listening in higher education English language contexts. The study contributes empirical evidence to the literature on technology-enhanced language learning and underscores the pedagogical potential of interactive e-books for developing listening-related skills among university learners.

Introduction

Saudi Arabia's Vision 2030 places strong emphasis on education and English language learning as key drivers of national development and global engagement. As English functions as the dominant language of international communication, study, and professional interaction, it plays a central role in global academic and professional exchanges. Consequently, higher education institutions are increasingly required to prepare students with advanced language competencies that enable effective participation in these global contexts (Bataeineh & Aga, 2023). This policy orientation has intensified interest in pedagogical innovation and technology-enhanced approaches to English language teaching in higher education.

From an applied linguistics perspective, language learning is a multidimensional process that integrates reading, writing, speaking, and listening skills. Language serves not only as a medium of communication but also as a means of shaping cognition, identity, and social interaction (Crystal, 2011; Saleh, 2006). Effective language acquisition requires the coordinated development of all four skills, as they are interdependent and collectively contribute to overall communicative competence (Brown, 2014; Sadiku, 2015).

Although productive skills such as speaking and writing often receive greater instructional emphasis, listening remains a fundamental yet frequently neglected component of language learning. Listening is not a passive process; rather, it is an active and cognitively demanding activity essential for comprehension and meaning construction (Nazarieh et al., 2022). Study indicates that insufficient attention to listening instruction can result in negative learner attitudes and reduced comprehension, particularly when instructional materials are not aligned with learners' proficiency levels (Goh & Taib, 2006; Katrancı & Yangın, 2013).

Advances in educational technology have transformed traditional learning resources, leading to the growing use of digital and interactive e-books in higher education. E-books have evolved from simple digital replicas of printed texts (Rao, 2003) to interactive learning tools enriched with multimedia features such as audio, video, and animation (Bozkurt & Bozkaya, 2015). Within educational technology studies, these features are viewed as valuable for supporting diverse learning styles and enhancing engagement in language learning environments (Fattan & Hamdi, 2021).

Interactive digital materials support listening development by providing authentic language input, contextualized learning, and immediate feedback. Studies have reported increased student engagement and preference for e-books due to features such as search functions, annotation tools, and multimedia integration (Foasberg, 2011; Kumbhar, 2018). However, despite their growing adoption in higher education, evidence regarding the effectiveness of interactive English e-books in developing specific listening subskills remains limited, particularly among first-year university students transitioning to academically demanding contexts (Novel et al., 2019).

The present study examines the impact of an interactive English e-book on the development of active listening skills among first-year university students. By integrating insights from applied linguistics and educational technology, the study seeks to contribute empirical evidence to technology-enhanced language learning studies and to inform pedagogical practices aimed at improving listening instruction in higher education English language contexts.

Problem of the Study

Saudi university students frequently encounter substantial difficulties in English listening comprehension, which adversely affect their academic performance and overall learning experience. Although English language instruction is integrated throughout the Saudi educational system, pedagogical emphasis has traditionally prioritized reading and writing skills, with comparatively limited attention given to the systematic development of listening abilities. This instructional imbalance has contributed to persistent weaknesses in listening proficiency, which has been identified as the least developed skill among English as a Foreign Language (EFL) learners (Ulum, 2015). Despite its central role in language acquisition, listening remains the most underemphasized skill in many EFL contexts.

At the university level, students must comprehend and actively engage with English academic discourse that often involves fast-paced speech, specialized vocabulary, and varied accents. Linguistic and cultural differences further complicate comprehension, particularly when learners are exposed to unfamiliar discourse patterns, colloquial expressions, and culturally embedded references. Active listening is therefore essential for academic success, as it enables students to comprehend spoken input, engage meaningfully in classroom interaction, and collaborate effectively. However, many EFL university students experience persistent difficulties in developing active listening skills, which hinders both their academic achievement and overall educational experience (Liu & Thondhlana, 2015).

Multiple factors contribute to students' inadequate listening performance, including low motivation, limited interest, and difficulties sustaining attention during lectures (Barkley, 2015). To further contextualize this issue, a questionnaire administered to teaching staff at the University of Bisha revealed widespread concern regarding students' listening abilities. Approximately 85% of instructors reported deficiencies in students' active listening skills. In addition, 83% indicated that students frequently lose focus, miss essential information, and struggle to follow complex instructions. These findings underscore a clear gap between students' current listening competence and the level required for effective academic engagement.

Traditional instructional practices often fail to address this gap, as they provide limited opportunities for interaction, authentic input, and the cognitive engagement necessary for active listening. Conventional listening activities tend to emphasize passive comprehension rather than strategic listening, resulting in increased anxiety and reduced learner confidence. As noted by Liu and Thondhlana (2015), EFL learners commonly experience listening anxiety and frustration when exposed to traditional listening exercises that lack interactivity and meaningful contextualization.

In response to these challenges, innovative instructional approaches that integrate technology have gained increasing attention in language education studies. Interactive e-books, which combine multimedia elements with learner-centred activities, offer potential solutions to the limitations of traditional listening instruction. Although previous studies have highlighted the general educational benefits of e-books, limited studies have specifically examined how the interactive features of English e-books contribute to the development of active listening skills in higher education contexts.

Accordingly, the present study seeks to address this gap by investigating the impact of an interactive English e-book in developing active listening skills among first-year female students at the University of Bisha. By examining the pedagogical impact of the interactive English book *Headway*, the study aims to provide empirical evidence on the role of interactive e-books in improving listening comprehension and supporting academic language development among Saudi university EFL learners.

Questions of the Study

This study attempted to answer the following questions:

1. What is the impact of an interactive English e-book on active listening subskill, auditory recall among first-year university female students?

2. What is the impact of an interactive English e-book on active listening subskill, auditory discrimination among first-year university female students?

3. What is the impact of an interactive English e-book on active listening subskill, listening comprehension among first-year university female students?

4. What is the impact of an interactive English e-book in developing the overall active listening skills among first-year university female students?

Hypotheses of the Study

1. There is no statistically significant difference in auditory recall between first-year university female students taught using an interactive English e-book and those taught using conventional methods.
2. There is no statistically significant difference in auditory discrimination between first-year university female students taught using an interactive English e-book and those taught using conventional methods.

3. There is no statistically significant difference in listening comprehension between first-year university female students taught using an interactive English e-book and those taught using conventional methods.

4. There is no statistically significant difference in the overall active listening skills between first-year university female students taught using an interactive English e-book and those taught using conventional methods.

Study Objectives

The study aimed to:

1. examine the impact of an interactive English e-book on the auditory recall subskill of active listening among first-year university female students.

2. investigate the effect of an interactive English e-book on the auditory discrimination subskill of active listening among first-year university female students.

3. evaluate the influence of an interactive English e-book on the listening comprehension subskill of active listening among first-year university female students.

4. determine the overall impact of using an interactive English e-book on the active listening skills among first-year university female students.

Significance of the Study

The results of this Study may:

First: Theoretical Significance

1. Contribute to understanding active listening as a critical component of EFL acquisition, focusing on auditory recall, auditory discrimination, and listening comprehension.

2. Extend technology-enhanced language learning theory by examining the pedagogical role of interactive e-books in developing listening skills.

3. Provide insights into how multimodal input (audio, video, animations) supports comprehension, memory retention, and inferencing in language learning.

Second: Applied Significance

4. Offer practical guidance for educators and curriculum designers to enhance active listening skills among first-year university students.

5. Inform developers on effective interactive e-book features (audio, visual cues, quizzes, annotations) for language instruction.

6. Support learner engagement and academic performance by fostering active listening and comprehension in EFL contexts.

7. Provide evidence for policymakers to integrate technology-enhanced resources in English programs.

Limits of the Study:

This Study is limited in scope with respect to objectives, participants, time, and location. It focuses on examining the impact of the English interactive book Headway in developing active listening skills. The participants are drawn from a random sample of first-year female students enrolled in the Medical Health Track at the University of Bisha, Kingdom of Saudi Arabia. Data collection is confined to the second semester of the academic year 2024–2025. These delimitations ensure a clear and focused investigation of the study problem while providing contextual boundaries for interpreting the findings.

Literature Review

Definition of Interactive Books:

Interactive books are digital educational resources designed to engage learners through both content and immersive experiences. They integrate multimedia elements such as audio, video, graphics, and interactive features, including quizzes, games, and clickable content. Unlike traditional textbooks, interactive books provide instant feedback, support pronunciation practice, and create contextualized learning environments that enhance comprehension, retention, and learner engagement (Wang et al., 2016).

Advancements in technology, including web platforms, mobile devices, and touchscreen interfaces, have facilitated the evolution of traditional books into e-books and further into interactive e-books. These resources offer personalized guidance, enriched content, and adaptive support that meet individual learning needs, going beyond the capabilities of standard digital texts (Cetinkaya, Ates, & Yildirim, 2019).

E-books allow learners to store extensive digital libraries on devices such as tablets, smartphones, and PCs, supporting location-independent learning (Felvegi et al., 2012). Modern interactive e-books also include features such as animations, sound effects, text highlighting, integrated dictionaries, and interactive hotspots, which foster enriched learning experiences, promote learner autonomy, and enhance engagement across diverse educational contexts (Zipke & Marcy, 2014).

Educational Advantages of Interactive Books:

Interactive books offer significant benefits for language acquisition by catering to diverse learner needs and promoting active engagement. Unlike traditional approaches such as rote memorization and passive reading, which often result in learner disengagement, interactive books incorporate gamification and multimedia features to foster more engaging and motivating learning experiences. For instance, learners can earn rewards or unlock new levels as they complete exercises, fostering a sense of achievement. Additionally, interactive books provide personalized learning by adapting content and difficulty based on learners' progress, allowing students to work at their own pace and address individual strengths and weaknesses in listening, vocabulary, or grammar (Rothman, 2006).

Technology has played a pivotal role in shaping pedagogical practices in both traditional and distance learning. Beldarrain (2006) highlights that those technological advancements have enabled instructional designers and educators to enhance interaction, collaboration, and the formation of learning communities. This has driven the widespread adoption of e-books and interactive e-books, which serve as essential tools for delivering content effectively. Digital books improve student access to materials while redefining the processes of reading and listening.

Recent research highlights the increasing adoption of e-books and interactive digital tools in higher education as effective resources for enhancing student engagement and learning. Forsberg (2011) found that university students preferred e-books over printed textbooks due to functionalities such as search capabilities, text highlighting, annotation tools, and bookmarking. These features have contributed to the growing popularity of e-books in higher education, with universities and publishers recognizing their digital nature as a key factor in the expanding educational market. Studies by Smith and Kukulska-Hulme (2012) and Wu and Hsieh (2016) emphasized that incorporating interactive components, such as online forums, blogs, and wikis, particularly on iPads, can benefit distance learners. Active Listening in Language Learning

Active Listening:

Listening is a fundamental component of effective communication, requiring active engagement even when message clarity and transmission conditions are optimal. Active listening engages cognitive processes such as attention, memory, and reflection, which are essential for comprehension, evaluation, and emotional understanding (Anderson & Lynch, 2003; Lindslay & Knight, 2006).

In the context of language acquisition, listening is one of the four essential skills and is far from a passive activity. It entails integrating verbal and nonverbal information through attention, perception, and memory (Goh, 2003). Hearing is merely the reception of sound, whereas listening involves active engagement, organizing auditory information in conjunction with prior knowledge to construct an understanding (Kline, 1996).

Active listening is a multifaceted interpretive process that draws on cognitive, linguistic, and contextual resources to ensure accurate comprehension and meaningful interaction with spoken language. It encompasses both physiological aspects of hearing and higher-order cognitive processes, including attention, perception, analysis, and evaluation (Kazu & Demiralp, 2017; Kassem, 2015). Learners' listening difficulties may arise from internal factors such as low motivation or anxiety, as well as external influences such as unfamiliar accents or environmental distractions. Listening strategies are commonly classified into bottom-up processes, which construct meaning from auditory input, and top-down processes, which rely on prior knowledge and contextual cues to anticipate and interpret messages (Nation & Newton, 2009). Moreover, effective active listening involves practical communicative behaviors, including maintaining eye contact, minimizing distractions, interpreting nonverbal signals, providing appropriate feedback, and responding respectfully (Topornycky & Golparian, 2016).

In applied linguistics and language teaching methodology, effective listening is recognized as an active, dynamic process. Lapp and Anderson (1988) highlight the limitations of viewing the listener as a passive "tape recorder," emphasizing that listening requires engagement and interpretation. Nunan (1989) asserts that listeners do not merely absorb language passively; they interpret what they hear in light of their listening objectives and prior knowledge. Consequently, active listening engages cognitive faculties to decode, process, and comprehend spoken messages. Listening as a Complex Skill:

Design of the Study:

This study adopted a quasi-experimental design involving an experimental group and a control group. Such a design is well-suited to educational studies, as it permits systematic investigation of instructional interventions within authentic classroom contexts (Creswell & Creswell, 2017). A pre-test–post-test structure was employed to measure participants' performance. The quasi-experimental design was selected in this study for its practical suitability, where random assignment is often not feasible. This approach ensured that the experimental and control groups were comparable at the outset, with all conditions held constant except for the instructional method, thereby allowing the specific effect of the interactive e-book intervention to be isolated. The use of pre-test and post-test enhanced the study's internal validity and provided a systematic basis for evaluating changes in active listening performance attributable to the treatment. Additionally, the structured sequence of pre-testing, intervention, and post-testing enabled a rigorous analysis of the data, offering clear insights into the effectiveness of interactive e-books in developing university students' active listening skills.

The Population and Sampling of the Study:

The study targeted first-year female students enrolled in the Medical Health Track at the University of Bisha, a population selected for its direct relevance to the development of active listening skills essential for academic success and future professional practice. A total of (80) female students participated in the study and were randomly assigned to either an experimental group (n = 40) or a control group (n = 40) to ensure group equivalence and minimize selection bias. Both groups were drawn from the same cohort and matched on key demographic and academic variables, including age, gender, academic performance, and initial listening proficiency, thereby enhancing internal validity and representativeness.

Before the intervention, both groups received the same conventional instruction to establish a shared baseline and reduce potential bias related to prior learning experiences. During the intervention phase, the experimental group received instruction through interactive e-books integrated into the curriculum, while the control group continued with conventional instructional methods.

Materials and Tools of the Study:

The Study materials included an active listening skills list developed to identify the key competencies required by first-year female students in the Medical Health Track at the University of Bisha. The list was constructed based on an extensive review of the literature on active listening, drawing on previous studies, theoretical frameworks, and best practices in EFL instruction to ensure relevance to the students' academic context. To establish content validity, the initial list was reviewed by a panel of 12 experts in English education, whose feedback contributed to refining the relevance, clarity, and applicability of the proposed skills. The preliminary list comprised 15 competencies, each evaluated using a three-point Likert scale (Very Necessary, Necessary, Less Necessary). Expert ratings were analyzed to finalize the list, with highly rated skills retained and less essential items revised or removed.

1. The Skill of Auditory Recall:

The items below are designed to measure auditory recall abilities. The correlation coefficients and significance levels are provided.

Table No. (1)
The Skill of Retaining Parts of Audio

Question = (Q)	Pearson Correlation	Significance Level
Q1	0.461*	0.010
Q2	0.403*	0.027
Q3	0.421*	0.021
Q4	0.475**	0.008
Q5	0.705**	0.000
Q6	0.485**	0.007
Q7	0.685**	0.000

* = significant at the 0.05 level   ** = significant at the 0.01 level

The correlation coefficients ranged from 0.403 to 0.705, with six of the seven items demonstrating statistically significant associations with the skill at the 0.05 level or higher, indicating a strong overall alignment between the items and the targeted skill.

2. The Skill of Auditory Discrimination:

The items below are designed to measure auditory discrimination abilities. The correlation coefficients and significance levels are provided.

Table No. (2)
Auditory Discrimination Skills

Question (Q)	Pearson Correlation	Significance Level
Q8	0.308**	0.028
Q9	0.506**	0.004
Q10	0.495**	0.005
Q11	0.604**	0.000
Q12	0.476**	0.008
Q13	0.436*	0.016

* = significant at the 0.05 level   ** = significant at the 0.01 level

Most items show statistically significant correlations with auditory discrimination skills, with coefficients ranging from 0.436 to 0.604, indicating satisfactory internal validity for the scale assessing this skill.

3. The listening Comprehension Skill:

The following table presents the Pearson correlation coefficients and significance levels for six questions (Q14–Q19) related to active listening skills. The table indicates the strength and significance of the relationships measured:

Table No. (3)
Active Listening Skills

Question (Q)	Pearson Correlation	Significance Level
Q14	0.631**	0.000
Q15	0.541**	0.002
Q16	0.221**	0.012
Q17	0.359**	0.021
Q18	0.474**	0.008
Q19	0.401*	0.028

* = significant at the 0.05 level   ** = significant at the 0.01 level

Table (3) illustrates that all correlations are statistically significant, implying that each question is positively associated with active listening skills. The highest correlation is observed in Q14, while Q16 shows the lowest but still significant correlation.

Reliability:
The reliability of the active listening skills in this study was assessed using Cronbach's Alpha. The results are presented in the table below.

Table No. (5)
Reliability of Active Listening Skills

Variable	Cronbach's Alpha	Number of Items
Auditory Recall	0.855	7
Auditory Discrimination Skills	0.846	6
Comprehension Skills	0.814	6

The Test:

The primary tool used in this study was a pre- and post-test designed to assess active listening skills. The test was employed to measure changes in students' active listening abilities before and after the intervention, providing quantitative data on the impact of interactive e-books. Its validity was established through expert review to ensure content relevance and alignment with the study objectives, while reliability was confirmed through a pilot study and statistical analysis. Internal validity was further examined by calculating Pearson correlation coefficients between each listening subskill (auditory recall, auditory discrimination, and listening comprehension) and the overall test score, demonstrating adequate consistency in measuring active listening skills.

Table No. (4)
The Correlation Results

Skills	Retaining Parts of Audio	Auditory Discrimination Skills	Active Skills	Total
Auditory Recall	1			
Auditory Discrimination Skills	0.670**	1		
Comprehension Skills	0.763**	0.395*	1	
Total	0.762**	0.670**	0.763**	1

The results indicate strong and statistically significant correlations between each listening subskill and the total test score, with auditory recall ($r = 0.762$), auditory discrimination ($r = 0.670$), and listening comprehension ($r = 0.763$) all significant at $p < 0.01$. These findings demonstrate that each subskill makes a substantial contribution to overall listening proficiency, with comprehension showing the strongest association. The significant intercorrelations among the subskills confirm the test's internal consistency and support its construct validity, indicating that the items effectively measure the dimensions of active listening.

Pre-Test and Post-Test:

A pre-test was administered to both the experimental and control groups before the intervention to evaluate students' active listening skills using a standardized and validated assessment tool. This pre-test established baseline data for each participant and ensured the comparability of the groups, confirming that any subsequent differences in post-test performance could be attributed to the intervention. Statistical analysis of the pre-test results verified the equivalence of the groups in terms of initial listening proficiency.

Following the eight-week intervention, a post-test was conducted using the same assessment instrument to measure changes in active listening abilities. This approach allowed for a direct comparison of pre- and post-intervention performance, ensuring that improvements could be attributed to the interactive e-book treatment. The post-test results were systematically analyzed to assess the effectiveness of the intervention and to determine the extent of skill enhancement in both groups.

Coefficient of Difficulty and Discrimination:

The listening test items were evaluated for quality using difficulty and discrimination coefficients. The discrimination coefficient, which measures how well a question differentiates between high- and low-performing students, was considered

satisfactory if above 0.40. The difficulty coefficient indicates the challenge level of each item, with values near (0) representing more difficult questions and values near (1) indicating easier ones. These metrics ensured that the test items were both appropriately challenging and effective in assessing student performance.

Table No. (6)
Coefficient of Discrimination and Coefficient of Difficulty

Question	Coefficient of Discrimination	Coefficient of Difficulty
Q1	0.438	0.5924
Q2	0.459	0.5392
Q3	0.449	0.6329
Q4	0.373	0.5810
Q5	0.627	0.6810
Q6	0.439	0.7304
Q7	0.579	0.5443
Q8	0.453	0.7810
Q9	0.411	0.5063
Q10	0.449	0.5443
Q11	0.506	0.6430
Q12	0.402	0.5291
Q13	0.373	0.6671
Q14	0.635	0.5291
Q15	0.516	0.6684
Q16	0.407	0.7557
Q17	0.399	0.5949
Q18	0.462	0.6557
Q19	0.454	0.6544

The coefficient analysis indicates that the test is well-calibrated, exhibiting strong discrimination and a balanced level of difficulty. These results confirm the test's appropriateness and reliability for accurately assessing the targeted listening skills.

The Treatment Period:

The eight-week treatment phase involved differing instructional methods for the two groups. The experimental group used interactive e-books, featuring audio narration, quizzes, and interactive exercises aligned with the curriculum, to actively develop their listening skills in an engaging, immersive environment from October 15 to December 20, 2024. In contrast, the control group followed traditional methods, including lectures, note-taking, and discussions, without e-book integration. Both groups studied identical content for the same duration, ensuring that the instructional method was the sole variable.

1. Results Related to the First Question:

The results related to the first study question: *"What is the impact of an interactive English e-book on active listening subskill, auditory recall among first-year university female students?"* were represented as follows:

Table No. (7)
The Pre-test Results of the Skill of Auditory Recall

Main skill	Sub-Skills	Questions	Groups	Mean	Std	t	Significant Level
Auditory Recall	Identify ideas according to their audible	At the beginning of the conversation,	Control	0.6829	0.47112	0.713	No significant
			Experimental	0.6053	0.49536		

Skill	sequence.	what is Carl's main complaint?					
	Remember key information in the text.	How many weeks does Carl have to wait before he expects to be free of crutches?	Control	0.1707	0.38095	-0.444	No significant
			Experimental	0.2105	0.41315		
	Highlight specific details contained in the text	What was one specific detail mentioned about Andy and Julie's hotel room?	Control	0.6585	0.48009	-0.751	No significant
			Experimental	0.7368	0.44626		
	Able to recognize the elements in the audio.	What did Marcia lose during the trip?	Control	0.4390	0.50243	-1.239	No significant
			Experimental	0.5789	0.50036		
	Able to select ideas to keep in memory.	What does the photo Carl asks about specifically view?	Control	0.7805	0.41906	0.705	No significant
			Experimental	0.7105	0.45961		
	Arrange the ideas of the audio text.	What suggestion does Andy make regarding their next ski trip?	Control	0.5122	0.50606	0.107	No significant
			Experimental	0.5000	0.50671		
	Understand the general context of the simple audio.	How did Carl feel overall about the ski trip?	Control	0.7561	0.43477	0.194	No significant
			Experimental	0.7368	0.44626		

Table (7) illustrates that the pre-test outcomes for audio retention skills showed no significant differences between the control and experimental groups across all sub-skills, including identifying ideas based on their auditory sequence, retaining key information from the text, emphasizing specific details, recognizing components in the audio, selecting ideas for retention, organizing concepts, and comprehending the overall audio context. Comparisons of mean scores and standard deviations using t-tests confirmed this similarity. For example, in sequencing audible ideas, the control group had a mean of 0.6829 versus 0.6053 for the experimental group (t = 0.713), and in recalling essential information, the control group scored 0.1707 versus 0.2105 for the experimental group (t = -0.444), both showing no significant differences. This consistent baseline indicates that both groups began with comparable proficiency in retaining audio segments, which ensures that any post-test improvements can be attributed to the interactive English e-book.

The post-test results demonstrate a significant effect of the intervention. The control group's mean slightly declined from 3.975 (SD = 1.65618) to 3.625 (SD = 1.73482), whereas the experimental group's mean markedly increased from 4.075 (SD = 1.68534) to 5.175 (SD = 1.25856), reflecting a substantial enhancement in audio retention skills following the use of the interactive book.

Table No. (8)
Post-Test Results of the Skill of Auditory Recall

Main skill	Sub-Skills	Questions	Groups	Mean	Std	t	Significant Level
Auditory Recall Skill	Identify ideas according to their audible sequence.	At the beginning of the conversation, what is Carl's main complaint?	Control	0.6829	0.47112	-1.725	No sig
			Experimental	0.8462	0.36552		
	Remember key information in the text.	How many weeks does Carl have to wait before he expects to be free of crutches?	Control	0.3171	0.47112	0.857	No sig
			Experimental	0.2308	0.42683		
	Highlight specific details contained in the text	What was one specific detail mentioned about Andy and Julie's hotel room?	Control	0.4390	0.50243	-5.328	0.000
			Experimental	0.9231	0.26995		
	Able to recognize the elements in the audio.	What did Marcia lose during the trip?	Control	0.5122	0.50606	-2.449	0.017
			Experimental	0.7692	0.42683		
	Able to select ideas to keep in memory.	What does the photo Carl asks about specifically view?	Control	0.6585	0.48009	-2.285	0.025
			Experimental	0.8718	0.33869		
	Arrange the ideas of the audio text.	What suggestion does Andy make regarding their next ski trip?	Control	0.5122	0.50606	-3.369	0.001
			Experimental	0.8462	0.36552		
	Understand the general context of the simple audio.	How did Carl feel overall about the ski trip?	Control	0.5854	0.49878	-1.498	No sig
			Experimental	0.7368	0.44626		

Table (8) presents the results of an independent samples t-test examining the ability to retain audio segments. The test yielded a t-value of -4.574 with 78 degrees of freedom and a two-tailed significance level of 0.000, which is below the 0.05 threshold, indicating a statistically significant difference between the post-test scores of the experimental and control groups.

Hypothesis (1) stated that there would be no significant difference in auditory recall between first-year female university students taught using an interactive English e-book and those taught using conventional methods. To test this, post-test scores of both groups were compared. The findings showed that the experimental group significantly outperformed the control group in overall audio retention.

The analysis of sub-skills further supports this conclusion. The sub-skill of highlighting specific details had a t-value of -5.328 (p = 0.000), recognizing elements in the audio yielded t = -2.449 (p = 0.017), and selecting ideas to retain showed t = -2.285 (p = 0.025). All values indicate statistically significant improvements in the experimental group.

Based on these results, the null hypothesis is rejected. The data confirm that the interactive English e-book had a positive and statistically significant effect on enhancing students' auditory retention skills, demonstrating the effectiveness of interactive book-based learning in improving comprehension and retention of audio materials among first-year university female students.

2. Results Related to the Second Question:

The results related to the first Study question: *"What is the impact of an interactive English e-book on active listening subskill, auditory discrimination among first-year university female students?"* were represented as follows:

Table No. (9)
Pre-test of the Auditory Discrimination Skills

Main skill	Sub-Skills	Questions	Groups	Mean	Std	t	Significant Level
Auditory Discrimination Skill	Able to recognize different intonation patterns. (Syllables which are stressed)	At the beginning of the conversation, what is the intonation of Carl's voice when he says "not really" (Er, not really)?	Control	0.2927	0.46065	1.566	Not significant
			Experimental	0.2308	0.42683		
	Recognize the difference between tones of sound.	How does the sound of Andy's voice differ when he asks "Really?" the first time (Really?) and the second time?	Control	0.4390	0.50243	0.151	Not significant
			Experimental	0.4615	0.50504		
	Recognize the difference between similar words/minimal pairs.	Which word does Carl emphasize when he complains about the hotel room?	Control	0.6098	0.49386	1.077	Not significance
			Experimental	0.6667	0.47757		
	Direct memorization of the audio text.	What sound effect is used, if any, when Carl mentions skiing into a tree?	Control	0.4390	0.50243	0.503	Not significance
			Experimental	0.4872	0.50637		
	Distinguish the difference between words or tones used in anger or amusement.	When Andy says "Absolutely" (Absolutely. It was a great holiday), what does his tone of voice suggest?	Control	0.2439	0.43477	0.678	Not significance
			Experimental	0.2051	0.40907		
	Distinguish words with similar vowel sounds in	Is there anything specific mentioned about the way	Control	0.3902	0.49386	0.324	Not significance
			Experimental	0.3590	0.48597		

	pronunciation.	Andy and Carl pronounce a particular word or phrase					

Table (9) summarizes the pre-test results for auditory discrimination skills and shows no statistically significant differences between the control and experimental groups across all measured sub-skills. These sub-skills included identifying intonation patterns, differentiating tonal variations, recognizing minimal pairs or similar words, direct memorization of auditory text, identifying words or tones expressing emotions such as anger or amusement, and distinguishing words with similar vowel sounds.

Comparisons of mean scores and standard deviations using independent t-tests confirmed the equivalence of both groups before the intervention. For example, in recognizing intonation patterns, the control group obtained a mean score of 0.2927 compared to 0.2308 for the experimental group (t = 1.566), while in differentiating tonal variations, the control group scored 0.4390 versus 0.4615 for the experimental group (t = 0.151). These results indicate that both groups demonstrated comparable auditory discrimination abilities at the pre-test stage, ensuring a reliable baseline for evaluating the effect of the interactive English e-book.

The table below presents the post-test scores for auditory discrimination skills by question.

Table No. (10)
Post-Test Results of the Auditory Discrimination Skills

Main skill	Sub-Skills	Questions	Groups	Mean	Std	t	Significant Level
Auditory Discrimination Skill	Able to recognize different intonation patterns. (Syllables which are stressed)	At the beginning of the conversation, what is the intonation of Carl's voice when he says "not really" (Er, not really)?	Control	0.2683	0.44857	-1.812	No sig
			Experimental	0.4615	0.50504		
	Recognize the difference between tones of sound.	How does the sound of Andy's voice differ when he asks "Really?" the first time (Really?) and the second time?	Control	0.6098	0.49386	-0.051	No sig
			Experimental	0.6154	0.49286		
	Recognize the difference between similar words/minimal pairs.	Which word does Carl emphasize when he complains about the hotel room?	Control	0.5366	0.50485	-1.429	No sig
			Experimental	0.6923	0.46757		
	Direct memorization of the audio text.	What sound effect is used, if any, when Carl mentions skiing into a tree?	Control	0.4390	0.50243	-0.427	No sig
			Experimental	0.4872	0.50637		
	Distinguish the difference between words or tones used in anger or amusement.	When Andy says "Absolutely" (Absolutely. It was a great holiday), what does his tone of voice suggest?	Control	0.5366	0.50485	0.894	No sig
			Experimental	0.4359	0.50236		
	Distinguish words with similar vowel sounds in pronunciation.	Is there anything specific mentioned about the way Andy and Carl pronounce a particular word or phrase	Control	0.2195	0.41906	-1.135	No sig
			Experimental	0.3333	0.47757		

The results for auditory discrimination skills show that both groups had comparable abilities at the pre-test stage, with mean scores of 2.375 (SD = 1.31437) for the control group and 2.4 (SD = 1.23621) for the experimental group, indicating no initial significant differences. In the post-test, both groups improved, with the control group's mean rising to 2.575 (SD = 1.35661) and the experimental group's mean increasing to 3.1 (SD = 1.37375).

However, the independent samples t-test revealed that this difference was not statistically significant (t = -1.720, df = 78, p = 0.089 > 0.05). Analysis of individual sub-skills—including recognizing intonation patterns (t = -1.812), distinguishing similar vowel sounds (t = -1.135), identifying tonal differences, recognizing minimal pairs, direct memorization, and recognizing emotional tones—also showed no significant differences between the groups.

Accordingly, Hypothesis 2 was accepted, confirming that although the interactive English e-book led to some improvement in the experimental group's auditory discrimination skills, the gains were not statistically significant, suggesting the need for further Study and enhanced instructional approaches.

3. Results Related to the Third Question:

The results related to the first Study question: *"What is the impact of an interactive English e-book on active listening subskill, listening comprehension among first-year university female students?"* were represented as follows:

Table No. (11)
Results of the Comprehension Skills

Main skill	Sub-Skills	Questions	Groups	Mean	Std	t	Significant Level
Comprehension Skills	Determine the general idea of the audio text.	What is the main reason for Carl's discomfort?	Control	0.3902	0.49386	0.626	No significant
			Experimental	0.5641	0.50236		
	Recognize numbers in audio text	How long does Carl have to wait until his next hospital visit?	Control	0.6829	0.47112	2.972	No significant
			Experimental	0.7692	0.42683		
	Confine the mind and focus it on what is being listened to	What are Andy and Julie doing?	Control	0.4878	0.50606	2.172	No significant
			Experimental	0.6154	0.49286		
	Infer the speaker's purpose from the audio text.	What does Andy plan to do with the holiday photos?	Control	0.7073	0.46065	0.595	No significant
			Experimental	0.6667	0.47757		
	Understand the main idea	What complaint did Andy have about their hotel room?	Control	0.6829	0.47112	1.414	No significant
			Experimental	0.7436	0.44236		
	Understand the different relationships in the audio text.	Why did Andy apologize to Carl?	Control	0.5366	0.50485	0.784	No significant
			Experimental	0.5897	0.49831		

Table (11) summarizes the pre-test results for listening comprehension skills and shows no statistically significant differences between the control and experimental groups across all sub-skills. These sub-skills included identifying the main theme of the audio text, recognizing numerical information, maintaining concentration on the auditory content, inferring the speaker's intention, understanding the main idea, and identifying relationships within the audio text.

Comparisons of mean scores and standard deviations using t-tests confirmed this equivalence. For example, in identifying the overall theme, the control group obtained a mean score of 0.3902 compared with 0.5641 for the experimental group (t = 0.626). Similarly, in recognizing numerical information, the control group scored 0.6829, while the experimental group scored 0.7692 (t = 2.972), with no statistically significant differences.

Moreover, the findings indicate that both groups demonstrated comparable comprehension skills before the intervention, ensuring a reliable baseline for attributing any post-test improvements to the interactive English e-book.

Table No. (12)
Post Results of The Comprehension Skills

Main skill	Sub-Skills	Questions	Groups	Mean	Std	t	Significant Level
Comprehension Skill	Determine the general idea of the audio text.	What is the main reason for Carl's discomfort?	Control	0.3902	0.49386	-3.980	0.000
			Experimental	0.7949	0.40907		
	Recognize numbers in audio text	How long does Carl have to wait until his next hospital visit?	Control	0.6098	0.49386	-2.424	0.018
			Experimental	0.8462	0.36552		
	Confine the mind and focus it on what is being listened to	What are Andy and Julie doing?	Control	0.5122	0.50606	-1.651	No sig
			Experimental	0.6923	0.46757		
	Infer the speaker's purpose from the audio text.	What does Andy plan to do with the holiday photos?	Control	0.4390	0.50243	-5.328	0.000
			Experimental	0.9231	0.26995		
	Understand the main idea	What complaint did Andy have about their hotel room?	Control	0.4634	0.50485	-4.616	0.000
			Experimental	0.8974	0.30735		
	Understand the different relationships in the audio text.	Why did Andy apologize to Carl?	Control	0.5366	0.50485	-1.183	No sig
			Experimental	0.6667	0.47757		

The results for listening comprehension skills show that, although the experimental group had a slightly higher pre-test mean score (3.975, SD = 1.62493) than the control group (3.5, SD = 1.51911), both groups demonstrated generally comparable initial comprehension abilities. In the post-test, however, a clear divergence emerged: the control group's mean score declined to 2.925 (SD = 1.77428), while the experimental group's mean increased substantially to 4.8 (SD = 1.15913).

The independent samples t-test revealed a statistically significant difference in post-test comprehension scores between the two groups (t = -5.595, df = 78, p = 0.000 < 0.05), indicating the superiority of the experimental group. Analysis of individual sub-skills further supported this result, with significant improvements observed in determining the general idea of the audio text (t = -3.980, p = 0.000), inferring the speaker's purpose (t = -5.328), recognizing numerical information, and understanding the main idea.

Accordingly, the null hypothesis for Hypothesis (3) was rejected. The findings confirm that the interactive English e-book had a statistically significant positive effect on students' comprehension skills, demonstrating its effectiveness in enhancing active listening and auditory understanding compared to conventional teaching methods.

4. Results Related to the Fourth Question:

The results related to the first Study question: *"What is the impact of an interactive English e-book in developing the overall active listening skills of first-year university EFL female students?"* were represented as follows:

Table No. (13)
Results of the Main Listening Skills

Group		Mean	Std. Deviation	t	Significant Level
Auditory Recall Skills	Control	0.5714	0.23474	0.288	No sig
	Experimental	0.5861	0.24260		
Auditory discrimination skills	Control	0.4024	0.22040	0.105	No sig
	Experimental	0.4017	0.20844		
Comprehension skills	Control	0.5813	0.25034	0.313	No sig
	Experimental	0.6667	0.27836		
Active Listening Skills	Control	0.5212	0.17724	0.005	No sig
	Experimental	0.5533	0.17409		

As shown in Table (13), the pre-test results revealed no statistically significant differences between the control and experimental groups across the three main skills: auditory retention, auditory discrimination, and listening comprehension. Independent samples t-tests comparing the mean scores and standard deviations for each skill confirmed this equivalence between the groups.

Specifically, the control group obtained a mean score of 0.5714 (SD = 0.23474) in auditory retention, compared to 0.5861 (SD = 0.24260) for the experimental group (t = 0.288). In auditory discrimination, the control group achieved a mean score of 0.4024 (SD = 0.22040), while the experimental group recorded a mean of 0.4017 (SD = 0.20844), yielding a t-value of 0.105. Regarding listening comprehension, the control group scored a mean of 0.5813 (SD = 0.25034), whereas the experimental group attained a mean of 0.6667 (SD = 0.27836), with a t-value of 0.313.

Table No. (14)
Post-Test Results of Main Skills

Group		Mean	Std. Deviation	t	Significant Level
Auditory Recall Skills	Control	0.5296	0.25604	-4.41761	0.00003
	Experimental	0.7473	0.17485		
Auditory discrimination skills	Control	0.4350	0.22632	-1.31770	0.19152
	Experimental	0.5043	0.24329		
Comprehension skills	Control	0.4919	0.29333	-5.56910	0.00000
	Experimental	0.8034	0.19448		
Active Listening Skills	Control	0.4878	0.22112	-4.67218	0.00001
	Experimental	0.6883	0.15899		

The post-test results indicate that the use of an interactive English e-book significantly enhanced several aspects of active listening skills among first-year female university students. Specifically, the experimental group showed substantial improvements in audio retention (mean = 0.7473, SD = 0.17485; t = -4.41761, p = 0.00003), listening comprehension (mean = 0.8034, SD = 0.19448; t = -5.56910, p = 0.00000), and overall active listening skills (mean = 0.6883, SD = 0.15899; t = -4.67218, p = 0.00001) compared to the control group.

In contrast, auditory discrimination skills did not show a statistically significant difference (experimental mean = 0.5043, SD = 0.24329; control mean = 0.4350, SD = 0.22632; t = -1.31770, p = 0.19152), indicating that the interactive book had a limited impact in this area.

These findings led to the rejection of Hypothesis (4), which stated that no significant difference would exist between the experimental and control groups. The results confirm that interactive books effectively improve audio retention, comprehension, and overall active listening skills, highlighting their potential as a powerful instructional tool for engaging students with auditory content and enhancing information processing.

The outcomes also suggest the need for further Study to explore the mechanisms behind these improvements, the long-term effects of interactive books, and strategies to strengthen auditory discrimination skills, possibly through additional multimedia or interactive components.

Summary of the Hypotheses Testing:

Based on these findings, Hypotheses H1, H3, and H4 were supported, as summarized in Table (15).

Table No. (15)
Study Hypotheses Testing Results

Hypothesis	Status	Reason
Hypothesis 1	Accepted	**p = 0.000**; significant difference in Skill of Retaining Parts of Audio post-test scores between groups.
Hypothesis 2	Rejected	**p = 0.089**; no significant difference in Auditory Discrimination post-test scores between groups.
Hypothesis 3	Accepted	**p = 0.000**; significant difference in Comprehension post-test scores between groups.
Hypothesis 4	Accepted	**p = 0.000**; significant difference in overall Active Listening Skills post-test scores between groups.

The hypothesis-testing results indicate that the interactive English e-book had a substantial positive impact on several aspects of first-year female university students' active listening skills.

For Hypothesis (1), the null hypothesis was rejected, as the experimental group showed significantly higher post-test scores in audio retention, demonstrating that the interactive book effectively enhanced students' ability to retain auditory information. These findings align with previous Study highlighting the benefits of interactive multimedia tools for listening comprehension and memory (e.g., Brown, 2014; Intan et al., 2022), although some studies have reported inconsistent outcomes depending on the materials and context (Arono, 2014).

Hypothesis (2) was not supported, as no statistically significant differences were observed in auditory discrimination post-test scores. This suggests that the interactive book had a limited impact on students' ability to distinguish auditory elements. Prior studies similarly note that improving auditory discrimination may require specialized or supplementary training, even when using interactive resources (Swanson et al., 2020; Santander et al., 2024).

For Hypothesis (3), the experimental group demonstrated significantly higher comprehension post-test scores, confirming that the interactive book improved students' ability to understand and process auditory information. This result is consistent with Study demonstrating that interactive learning aids enhance comprehension skills (Johnson, 2018; Çetinkaya et al., 2019), though effectiveness can vary depending on content design and student engagement.

Hypothesis (4) was also validated, as the experimental group showed a significant improvement in overall active listening skills compared to the control group. This supports the efficacy of interactive books in fostering general listening abilities and aligns with studies highlighting the benefits of interactive audio-visual resources for engagement and comprehension (Garcia, 2015; Vina et al., 2023).

Summary of Results:

The study results concluded that:

1. The interactive English e-book significantly improved audio retention, as the experimental group outperformed the control group in post-test scores.

2. The interactive book had no significant impact on auditory discrimination.

3. Listening comprehension was significantly enhanced in the experimental group, demonstrating the effectiveness of the interactive book in improving students' understanding and processing of auditory information.

4. The overall active listening skills of the experimental group showed significant improvement compared to the control group.

5. The interactive book effectively enhanced audio retention and comprehension skills, while additional strategies may be needed to strengthen auditory discrimination skill.

1) *Recommendations:*

1. Educators should integrate interactive English e-books into language learning curricula to enhance students' audio retention and comprehension skills, and guide them on using these tools effectively in the classroom.

2. Educational Institutions should support the widespread adoption of interactive books by providing resources, training programs, and professional development to ensure that teachers can implement them effectively.

3. Curriculum Developers and Content Designers should design interactive book exercises that target auditory memory and comprehension, including repetition, summarization, and comprehension-check activities, to reinforce students' listening skills.

4. Interactive Book Developers should include targeted auditory discrimination activities, such as phoneme differentiation drills, minimal pair exercises, and real-life listening scenarios, to strengthen this specific skill area.

5. Educational Technologists and Instructional Designers should preserve the engaging structure of interactive books while integrating advanced cognitive features such as adaptive learning, interactive assessments, and personalized feedback to further improve students' active listening abilities.

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