The Implications of E-books in Teaching and Learning Practices in K-12 Schools

Maimoona Al Abri[*] Muna AlSyiabi[2]

1.   College of Education, Sultan Qaboos University, PO box 50, Muscat P.C. 123. Oman

2.   Ministry of Education, Seeb Exhibition Street, Oman

* E-mail of the corresponding author: m.alabri4@squ.edu.om

Abstract

Digital books' features and types have improved over time to offer better learning experiences. The current study aimed to explore interactive e-books' implications in elementary schools in terms of their effectiveness in teaching and learning practices, and their utility in classroom settings. An exploratory qualitative study was conducted using classroom observations, interviews, and focus group discussions. Seven science teachers and two Arabic teachers participated in implementing ebooks with the first and second grades. The finding of this study showed that both teachers and students liked using ebooks because of the interactivity features they have. A significant finding from interactions in the classroom was that students were excited, motivated, and eager to participate in selecting the right responses and engaging with a variety of interactive content. Ebooks contribute to enhance students with low academic levels to participate in the class activities. In addition, the majority of teachers expressed appreciation, comfort, and enjoyment of using ebooks in classroom settings. This study showed that e-books save time and simplify lesson planning and preparation for teachers and help students understand the materials better and faster by furnishing various interactive content. Lessons that took multiple sessions to complete are now completed in one session. Recommendations for future research are presented.

Keywords: Elementary schools; enjoyment, interactive e-books; interactive content; students motivation; student engagement.

1. Introduction

Ebooks have emerged as powerful education platforms. They are one of the most essential knowledge sources in K-12 education. They convey the most critical skills students must acquire through the prescribed curricula. However, with the demand to move forward with digital transformation in the education sector, it is debatable whether both printed textbooks and interactive digital books should be produced. Will interactive digital textbooks replace traditional textbooks in schools? Addressing this debate requires obtaining empirical evidence of the utility of interactive textbooks in K-12 schools for both teachers and students.

The existing body of research on digital book production showed that different types and formats of digital textbooks are produced for children. For example, a recent study by Ozbay and Ugurelli (2023) involved document analysis of e-books (N = 261), which were randomly selected from the internet and different bookshops. The results showed that over half the e-books were digitally adapted literary texts. Most digital books were created by scanning printed books and consisted of e-stories for beginner readers. The results of this study highlighted that these types of ebooks lack interactivity features because they are not supported by interactive multimedia elements. As a result, they have no effects on enhancing children's engagement with digital literacy. This study suggests a need for developing ebooks that are supported by various multimedia sources to boost children's engagement and interactivity in teaching and learning. In addition, it is still not known whether interactive ebooks enhance students' motivation and engagement toward learning compared to printed textbooks for k-12 students. Thus, this study aimed to explore the implications of interactive e-books in classroom settings. Specifically, it examined the effectiveness of ebooks in the learning and teaching process and their advantages for both teachers and students. The overarching research question guiding this study is: What are the implications of implementing interactive ebooks in teaching and learning practices?

The following sub-research questions were formulated to answer the above research question.

Q1. How do teachers perceive the effectiveness of ebooks in teaching and learning?

Q1. What are the advantages of ebooks in classroom settings?

2. Literature Review

2.1 An Overview of Ebooks

The term 'e-book' is rapidly evolving because of constant technological advancements. Different formats have emerged for e-books, such as EPUB, an open document format for digital publication that is easy to use and can be exported to various file formats (Chang & Hung, 2018). According to Shiratuddin et al. (2003), e-books refer to textbooks that are converted into digital versions. An e-book can also be defined as a learning environment that has embedded different types of multimedia related to specific materials in a book. This multimedia consists of digital content such as sounds, images, animation, and videos that are integrated into learning tools to make the book interactive and engaging.

Previous research has established that digital content integrated with e-books is more engaging because it includes not only text, but also graphics, videos, animations, interactive lessons, and simulations (Fletcher et al., 2012). In addition, digital content can easily be kept up-to-date and relevant to students' needs without having to pay the cost of reprinting or redistributing print materials. It can also be made available anywhere and at any time.

Regarding the expansion of e-books' implementation in education, Alice Chen et al. (2023) conducted a meta-analysis study to examine the evolution of ebooks from 2010 to 2020. Fifty-three articles (N=53) were analyzed from the Web of Science database. The study found that the most productive countries of e-book production were Taiwan and the United States. Regarding the educational level, the results of the study reported that preschool and elementary students were the targeted audience for these ebooks. It was emphasized that early language development was the focus of these ebooks, particularly, the main focus was the reading skills. For example, the Taiwanese government adopted initiatives to improve English language learning and teaching quality using e-books. Furthermore, the results showed that in the United States, public schools are equipped with computers and tablets for students that empower them to use e-books in their learning process (Alice Chen et al., 2023).

Another study (Park & Lee, 2021) has compared the effects of ebooks and printed books on English as a Foreign Language learners' reading comprehension and grammatical knowledge. This study involved 97 elementary students in South Korea. The students were split into three groups: Tablet group (participated in extensive reading using ebooks on tablets), print group (engaged in extensive reading using the printed books), and Control group (used the regular textbooks). The three groups attended 1-2 English classes per week for (11) weeks. The findings of the students revealed that the tablet group received a significant improvement in reading comprehension compared to other groups. The print group demonstrated greater enhancement in reading comprehension and grammatical knowledge than the tablet group. The study suggests that the use of ebooks on tablets enhances the fast and surface level of learning and printed books offer deep learning (Park & Lee, (2021). Thus, the literature on using e-books has highlighted several advantages for teachers and students alike. These advantages are discussed in the following sections.

2.2 Benefits Of Ebooks

Ebooks have benefits for both teachers and students. Regarding teachers' benefits, several studies have reported that integrating digital content in elementary schools facilitates the planning and teaching process (Jannah et al., 2020; Zhang et al., 2021). A study used the acceptance model to investigate K-12 and college Chinese teachers' perceptions of using an artificial intelligence interactive e-book. This was a qualitative study (N = 55) in which teachers were interviewed. The results showed that teachers positively perceived the implemented e-book's usefulness. Additionally, they found the e-book effortless to use, which motivated them to implement it in their classrooms (Zhang et al., 2021).

A quasi-experimental study was conducted to investigate e-books' usefulness based on student teachers' perspectives at the United Arab Emirates University (Almekhlafi, 2021). Two experimental groups and one control group were administered a pre-test-post-test design and post-treatment questionnaire. The first experimental group used an interactive e-book; the second experimental group used a non-interactive e-book, which was a PDF version of the interactive e-book; and the control group used the hardcopy version of the same

e-book. The study results showed no significant difference in achievement of course content in terms of the type of book used. However, teachers showed a positive attitude towards the usefulness and utilization of the e-book in learning the course content for several reasons: Interactivity and rich multimedia elements that made e-books appealing to users, opportunities for engaging with the interactive content, and increasing students' ability to learn independently.

Moreover, a recent study examined the impact of e-books on improving literacy skills among early childhood students in private schools in Istanbul from teachers' perspectives (Kaynar et al., 2020). Thirteen teachers were interviewed to explore their perceptions about the use of e-books. The teachers revealed that students enjoyed reading e-books. They appreciated using e-books for language learning with their students because of their functions, such as badges and stars, which increased students' interest in reading.

Another qualitative study was conducted to identify pre-service Turkish teachers' metaphorical perceptions of the e-book concept (Karakoç Öztürk, 2021). A semi-structured interview was conducted with 150 teachers. The results revealed eight attitudes, seven positive and one negative. These attitudes are facilitation, information source, accessible, portable, requirement, inadequate, attractive, and harmful. The positive attitudes stemmed from e-books' ease of use, ability to allow learning anywhere and everywhere, individualized learning opportunities, interactive content, and others. The negative attitude stemmed from possible health issues and virtual game friends.

To determine e-books' benefits for students, multimedia models for geographical content for grade four were tested against traditional teaching methods in a primary school. Maričić et al. (2020) investigated multimedia's effect on the quality and durability of students' knowledge of geographical content. The authors conducted an experimental study. One-hundred and forty-two (N = 142) students were divided into experimental and control groups. The experimental group learned geographical content with multimedia models, whereas the control group learned the same content using traditional textbooks. Pre-tests, post-tests, and re-tests were conducted for both groups. The results showed that students' learning through multimedia models was better than traditional methods.

Jones and Brown (2011) explored e-books' effects on third-grade students' enjoyment and reading comprehension. Twenty-two students participated in the study. Students completed reading comprehension tests and satisfaction surveys after reading one print book and two e-book titles in three different reading sessions. The results showed no significant difference between the two formats in enjoyment and reading comprehension; however, students preferred e-books due to the wider selection of titles to choose from. Moreover, students preferred e-book features such as word pronunciation, automatic page turning, pop-up definitions, and read-aloud narration. Children quickly became comfortable with e-book technology, but they were not yet ready to disregard print books.

Savva et al. (2022) conducted a meta-analysis comparing e-books' and traditional textbooks' effects on the language and literacy development of children aged 3–8 years. Their research consisted of experimental studies published between 2008 and 2021. The findings showed e-books' modest positive effects on language and literacy development. The effect was observed regarding vocabulary learning, particularly expressive vocabulary. Moreover, a positive correlation was found between code-related skills and multimedia e-books. However, no significant differences were noticed between print books and e-books regarding story comprehension. These results imply that researchers and educators should identify the digital features that significantly influence the development of children's language and literacy skills.

Another study examined whether e-books increase university students' motivation to read by improving cognitive learning strategies and learning self-regulation. The study involved 538 students who used a print or e-book. The dependent variables were intrinsic value, self-regulation, self-efficacy, cognitive strategies, and text anxiety. They were measured in each of the two groups using the Technology Confidences and Attitudes scale and the Motivated Strategies for Learning Questionnaire (MSLQ). The results indicated a significant difference in MSLQ scores between the two groups. Students who used e-books were more likely to use cognitive and self-regulation strategies than students who used traditional print textbooks in their courses (Rockinson-Szapkiw et al., 2013).

Laketa and Drakulić (2015) compared the quality of lessons in traditional and electronic textbooks. They set the following standards: the lesson as a functional unit, coherence in the presentation of lesson content, and visual graphic design lessons' clarity and uniformity. A theoretical analysis was conducted of a fourth-grade mathematics book. The electronic textbook was found to be better than the traditional textbook at achieving expected goals and outcomes in the context of the lesson as a functional unit and visual graphic design lessons'

clarity and uniformity. However, there was no difference between the two in the context of coherence in the presentation of lesson content. Thus, the results implied that the quality of electronic textbooks matches that of traditional textbooks.

A study examined students' perceptions of the value of interactive digital textbooks (LearSmart) and their influence on students' learning (Sun et al., 2018). Data were collected from the American public schools in New York over three semesters. The results of this study indicated that students showed positive perceptions about the interactive digital textbook due to its engaging features such as engaging activities, a variety of multimedia, and instant feedback. Furthermore, these features led to increased student engagement and motivation in the learning processes. Consequently, better students learning outcomes was observed in terms of higher grades, and retention of materials and understanding. Despite these positive perceptions, the study showed that some students felt overwhelmed due to the abundance of engaging features of these interactive digital books. A recommendation was reported to provide training programs for teachers to integrate this interactive content into their teaching and how it be tailored to support diverse learning interests.

2.3 The Factors For Successful Implementation Of Ebooks

A study conducted by Chung et al. (2018) outlined the steps of designing interactive e-books and explored their implications on students' and teachers' experiences. The digital textbooks were created in higher education settings, Korea National Open University. The selected content was virtual experiment e-learning content and textbooks. The results outlined the steps as follows: Needs assessment, content development, multimedia integration (e.g., videos, quizzes…etc.), testing, and feedback. The findings of the study revealed that students perceived better engagement and learning performance. Similarly, instructors benefit from the interactive and dynamic content to increase students' engagement in the learning process and construct better learning experiences.

Sari et al. (2017) insisted that teachers need intensive training on utilizing digital content in their teaching process. Moreover, they need to be equipped with technical skills and pedagogical knowledge during their professional development to integrate digital content into their teaching. Similarly, Jannah et al. (2020) pointed out that technological devices' availability in classrooms improves teacher performance regarding digital-based learning employment. In the same vein, a previous study on technology's impact on classroom engagement has shown that technology employment's benefit in K-12 instruction is to increase student engagement (Carver, 2016). Additionally, technology's integration into teaching and learning practices has been investigated via a review of studies in the last five years in Pakistan. The findings revealed that technology is vital in enhancing teaching and motivating learners to learn (Akram et al., 2022).

Regarding the Kindle books, which is the digital format of books that can be read on Amazon Kindle devices, a study examining the value of this format in secondary schools. The study found that using different devices in the learning process appealed to students and increased their engagement in the learning process (Martinez-Estrada & Conaway, 2012). However, this outcome depends on teachers' innovative teaching strategies. The findings also showed that students found Kindle materials to be accessible at any time. They could look up word definitions while they read the materials. Another study suggested a need to enhance e-book features to support instructional practices for teaching. The authors recommended paying attention to pedagogical aspects and the development of e-book functions in future research (Alice Chen et al., 2023).

3. Methods

3.1 Research Design

An exploratory qualitative case study was conducted to explore how interactive ebooks are employed in elementary schools, and to what extent they affect the learning and teaching process. These ebooks are the first version of a project "digitizing the national curriculum" that has been established in k-12 education in the Middle East Country. The project is still under the development phase and has not been implemented yet in schools. In this study, the researchers attempted to implement and evaluate the interactive ebooks in cycle one basic schools for the intended purpose of this study. The ebooks that were implemented included Science interactive e-books for grades 1 and 2 in seven classes in one school and Arabic interactive e-books for grade 1 in two classes in two different schools.

3.2 An Overview Of Interactive E-Books

The Arabic and Science e-books are digital and interactive books made by converting printed books into digital format. The language used to conduct teaching is Arabic, so all developed content is in Arabic. These ebooks are interactive in terms of embedding interactive videos, activities, games, and 3D images. Simulations, such as virtual experiments and 360-degree videos, are also included. Additional features such as highlights, note-taking, bookmarks, navigation, saving, indexing, online and offline saving are available.

The e-books were developed in a five-phase process by following the instructional design model, which ADDIE model: Analysis, design, development, implementation, and evaluation. In the first phase, the textbooks were analyzed to decide the list of digital elements (multimedia) could be embedded based on the learning outcomes of each lesson in the printed books. Then, instructional designers developed the storyboards for the determined digital content. Then, the design phase was carried out to transfer the storyboards into actual products. This design phase involved graphic designers, who designed the backgrounds and images, and developers, who developed different types of multimedia. When the digital content was ready, they were embedded into the e-books in dedicated lessons. After that, the interactive e-books should be implemented and evaluated in schools. During the implementation phase, the design and developer teams will receive comments and feedback from the end users, who are teachers and students. The evaluation inputs will be used to refine and modify the digital content to meet students' learning needs.

The above process was followed for both the Arabic and Science books used in this study. Figure 1 provides examples of some of the interactive contents of the e-books (e.g. video, audio, simulations, and games).

Example of audio content for speaking and listening activities in Arabic ebook

Example of interactive activity (game) in Arabic ebook

Example of of interactive activity in Science ebook

Example of simulation (virtual experiment) in Science ebook

Figure 1. Examples of interactive contents of Arabic and science e-books

3.3 Setting

Primary schools (Cycle One Basic Education (1-4) grades) were selected for this study. The selection criteria were readiness of infrastructure, willingness of teachers to contribute to the study, and the location (they need to be close to the research team). The selected schools were well equipped with interactive boards and internet connections. The schools provided tablets, and teachers used them for classes when needed.

3.4 Participants And Data Collection

The participants were Arabic and Science teachers. All Cycle One Basic Education's teachers for (1-4) grades are females. The teachers had basic knowledge of using technology in classrooms. The study employed three data sources: Classroom observations, teacher interviews, and focus group discussion.

3.4.1 Classroom Observation

Classroom observations were conducted to explore the implications of implementing ebooks in classrooms settings in terms of students' engagement and motivation toward the use of ebooks, the usefulness and usage of ebooks, and the implementation strategies used by teachers.

Two classes of grade one in which the interactive Arabic e-book was implemented were observed. The two teachers used interactive boards to display the e-book's digital contents. Tablets were given to students, who worked in small groups of two or three. In addition, seven science classes in grades one and two were observed. The teachers used interactive boards to display the e-books' digital contents. In three classes, students were given tablets to interact with e-books in pairs or small groups of three or four. However, in the other four classes, the teachers used only the interactive boards to present the contents to students.

3.4.2 Teacher Interviews

The Arabic and Science teachers were interviewed to explore their employment experiences and practices. All teachers had more than 10 years of teaching experience. The interviews took place after observing their classes. For Arabic teachers, online interviews were conducted based on their preferences, and face-to-face interviews were conducted with the science teachers. The interview questions focused on exploring the advantages of implementing e-books and the factors should be considered in the implementation phase to achieve better learning experiences. The interviews lasted for 30–40 minutes. The researchers recorded the interviews using the Microsoft Teams application. Then, the recorded interviews were transcribed. The transcribed teachers' interviews were analysed to answer the research questions.

3.4.3 Focus Group Discussion

The participants in the focus group discussion were 7 teachers. Four of them implemented Arabic ebooks for first grade, and two of them implemented Science ebooks for first and second grade. The discussion was recorded through Google Meet and continued for approximately one hour. Recording consent was obtained in the beginning of the discussion to get their approval. The data showed that the implementation duration ranged from 1-2 semesters. The number of classes was 9 classes and the number of students in each class was 29-33 students, total (N=320) students. The questions for the focus group discussion aimed to explore the effectiveness of implementing ebooks in teaching and learning practices and the utility of using them.

3.5 Procedures

The research team contacted the schools' principals and senior teachers to confirm dates for class observation. The research team took notes of what was going on during the lessons: Students' interaction with the interactive content of ebooks, teachers' ability to conduct lessons while using e-books and interactive boards, students' enthusiasm when accomplishing digital activities, and challenges facing both teachers and students while dealing with interactive e-books. These notes were analyzed to answer the research questions.

After the science lessons were observed face to face, interviews were conducted with teachers. The research team took notes of teachers' responses. The two Arabic teachers in both schools preferred online interviews. The interviews lasted for 30–40 minutes. The researchers recorded the interviews using the Microsoft Teams

application and the voice memo application on their Apple phones. Then, the recorded interviews were transcribed. The notes taken from the science teachers' interviews and the transcribed Arabic teachers' interviews were analysed to answer the research questions.

Finally, fosus group discussion was conducted with Arabic and Science teachers who implemented and experienced ebooks for 1-2 semesters. The discussion took place online through Google Meet. The discussion was recorded, transcribed, and anlayzed. Then, based on the data analysis from the three sources, the finding of this study was revealed as discussed in the results section.

4.Data Analysis

Thematic analysis was used to analyse the classroom observation and interview data. Data from the observations were analysed first. The analysis process for the observations started with reading the observation notes and scripts and writing down the initial codes. Then, the researchers listened to the interview recordings several times to construct an initial understanding of participants' responses. They transcribed the recordings and read the transcripts several times. While listening and reading, they took notes and looked for codes and patterns to interpret teachers' perspectives regarding e-books. After generating the codes, they grouped them into themes and revised them several times. Finally, they determined the organizational themes. After that, focus group discussion was anlayzed starting from transcribing the recorded discussion, listened to it several times, took notes and initiated the open codes. After reading and scripts several types and revised the open codes, the themes were generated and grouped under organizational themes. The analysis process was an iterative process to interpret teachers' perspectives (Maxwell, 2011). Finally, in order to conclude the finding of the current study, the findings from the observations, interviews, and focus group discussion were merged to unify the organizational themes.

4.1 Validity Measures

The current study employed different data sources. Classroom observation, teachers' interviews, and focus group discussions with teachers were conducted to validate the findings of the study for triangulation and complementation purposes. Different perspectives were analyzed and interpreted to conclude the findings of this study. In addition, rich information has been provided in this study to ensure its validity. The procedures were clear. The results of each instrument were used to build the questions for the next instruments: Classroom was observed, then teachers were interviewed, and after that, the focus group discussion was conducted. The finding of this study was obtained by merged the results of the three data sources from different perspectives.

5.Finding

5.1 The Implementation Of Interactive Ebooks In Classrooms

This study's findings shed light on the implications of interactive e-books in classroom settings. The study showed that teachers employed interactive/smart boards to present content to students. All students were excited and eager to interact with the digital content on the board by clicking on the right answers noting they used to study from the visual aids in the traditional textbooks (as shown in Figure 2). The research team took notes of what was going on during the lessons: Interactions between students and digital content, teachers' ability to conduct lessons while using e-books and interactive boards, students' enthusiasm when accomplishing digital activities, and challenges facing both teachers and students while dealing with interactive e-books. These notes were analyzed to answer the research questions.

Some teacher employed the interactive digital book for the majority of their lessons. They moved smoothly from one activity to another and asked students to come to the board to click on the correct answers. For example, in utilizing the Arabic ebooks, students listen to the audio related to an animated story, discuss the topic with teachers, answer questions, and play games. All students were extremely excited and enjoyed the lesson, especially when they received positive verbal reinforcement after clicking on the correct answers. For example, it was noticed that most students in the class raised their hands to participate and be involved in ebooks' activities.
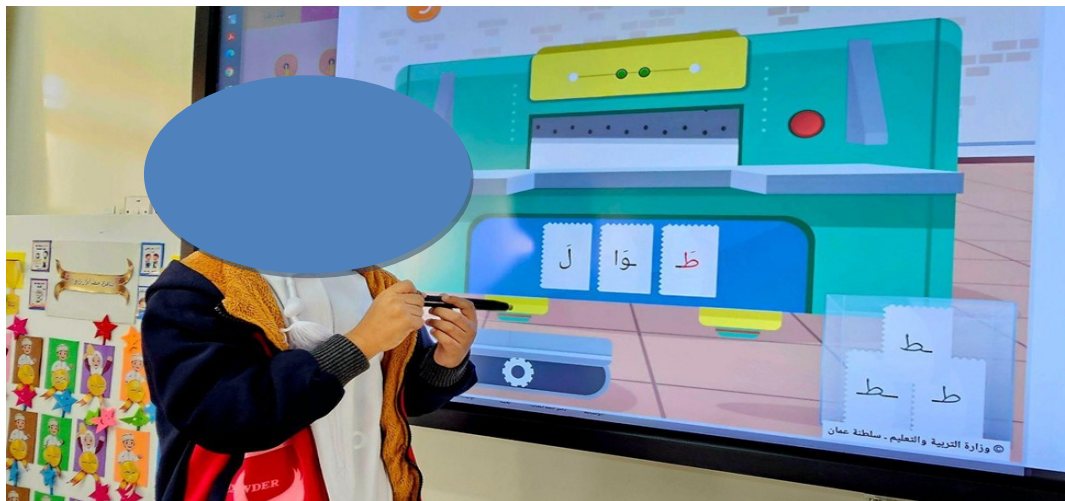
Figure 2. Students enjoyed using the interactive e-book and were eager to participate

5.2 Advantages Of Ebooks For Teachers

The findings showed that the interactive e-book helped teachers plan and prepare lessons. Teachers reported that it saved time and effort to search for visual aids. One teacher stated that "finding a suitable picture or audio takes a long time, and sometimes, it is not precisely related to the lesson topic. Using an e-book saves lesson time." Another teacher commented, "When using the textbook, the writing lesson took more than one lesson, but with the interactive book, it took only one lesson." In addition, the teachers expressed their gratitude for obtaining simulation objects in the interactive e-books for the science book experiments because, in most cases, some of the experiments' materials were unavailable in the school.

5.3 Advantages Of Ebooks For Students

Regarding the benefits of interactive e-books for students, teachers reported that students enjoyed using the interactive e-book and were eager to participate in the lesson. For example, some teachers mentioned that students enjoyed answering questions, especially when they were asked as part of a game. Moreover, students were more motivated to learn because they experienced greater self-efficacy and self-independence in their learning. For instance, instant visual and audio feedback encouraged students to try several times to reach the correct answers.

Teachers commented that implementing interactive books encourages students with poor academic performance to engage with content and interact with teachers and students in the classroom. In addition, the instant feedback helped students learn by having them try several times to interact with and learn from the digital content until they got the correct answers.

Furthermore, both teachers stated that their students learned better because of the various multimedia embedded in the interactive e-book. One teacher said, "Thanks to the presence of images, sounds, and videos, students could use all their senses." Another teacher expressed that her students learned to pronounce words correctly when listening to words, phrases, and sentences.

5.4 The Effectiveness Of Ebooks On Teaching And Learning Practices

The results of the focus group discussion showed that the majority of teachers expressed appreciation, comfort, and enjoyment of using ebooks in classroom settings.

The Arabic ebooks were implemented by teachers in the second semester of the academic year (2023-2024). Teachers reported that the Arabic ebook was interactive and grabbed students' attention to the topics under study. For, example, reading text in the ebook was attractive and interesting to students because the text was converted to animated stories. Thereby, students' interaction was increased because they interacted, discussed, and participated actively in the classroom. The classrooms were equipped with smart boards and iPads for students to

interact with the content such as playing digital games from the ebooks. However, the teacher preferred to use mostly the smartboard, and the iPads were used once they needed them. That is, they need students to focus and interact with the content.

Teachers reported that the significant benefits of using Arabic eBooks were saving time and making reading skills more engaging. Regarding time-saving, eBooks streamline the process of searching for supplementary materials, such as videos, by including them directly within the content. For instance, each lesson begins with a video that teachers can incorporate into their instruction. Additionally, teaching reading skills to students using printed books was often considered monotonous. However, it became more exciting with the eBook, which encouraged interaction through embedded multimedia. For example, students participated in activities like dragging and dropping words into bags and splitting words into parts. These interactive features made learning new vocabulary enjoyable for students.

Similarly, the implementation of Science ebooks found was amazing and easy to use. Teachers stated that teaching these subjects with ebooks saved their time and effort in searching for supplementary materials to support students' understanding of the concept. Especially, comprehending Science content requires to have tangible objects and illustrations to grasp the content effectively. It was difficult to deliver this content by using only visual objects and through rote learning. In addition, the content in the ebooks were diverse (e,g., video, puzzles, matching,.. etc.). The teachers stated, "Instead of designing a PowerPoint presentation with activities, ebooks provide a variety of content, like all in one." These characteristics made students eager to learn. Teachers stated that it was difficult to capture students' attention to this age group in first grade for 45 minutes. Besides, it is challenging to convey complex concepts easily to this age. The teacher assured, " ebooks were the successful project in providing diverse content, strategies, and activities to grasp students' attention to learn".

Other teachers pointed out that with using ebooks, it was hard to provide all experiment materials, however, ebooks provide simulating experiments for science subjects where students can manipulate substances and understand the concepts. Teachers commented, "We used a virtual lab for oven experiment". It was helpful and useful for us as teachers to bring materials to schools. It saved time, cost, and effort. The implementation of the ebook was for a whole lesson. Students enjoyed learning it because they felt it was fun.

In the Arabic book entitled, "I Love My Language", there is a lesson entitled: "I Reflect,", which aims to learn letters through a story so students can understand the origin of the letters. In ebooks, this explanation has become easier through the use of stories with words that illustrate the letters' forms. The letter is highlighted in a different color within the word – the letter of the lesson appears in red, while the rest of the letters in the word are in black.

In another lesson, "I Speak", teachers reported that it was an amazing learning experience for students. This kind of activity in the ebook presents a video clip of the conversation and then, presents questions about it. The teachers stated that these questions saved their time to formulate questions. The teacher said " Today, I am teaching about the letter "F" . There are 7 questions. Each question was phrased properly.

Regarding the "Reading" lesson, the video clip explains the statement and identifies the number of words as a teacher said: "It consists of 7 words". Students interacted with the content by dragging the words to a basket and splitting the statement into words. Teachers considered this feature to be a strength of the Arabic ebook.

Regarding the ebook's implementation in the classroom, teachers indicated that they implemented the ebook for a whole lesson due to its interactivity as they said "I am applying the ebook for the whole second lesson. For example, I am teaching "Read, Speak, Read using pictures. I am using the embedded activities in the ebook based on students' academic levels. For instance, " I observe and read" I am using it for intermediate-academic students", "speak" for low-academic students", and " read using pictures" for outstanding and intermediate-academic students ". The result showed that the ebooks' activities and interactive content support teachers in moving between different three levels of student academic levels in one competence such as reading competency.

In summary, teachers stated that implementing ebooks in teaching Arabic and Science subjects helped students understand the materials better and faster. For example, there are grammar lesson, which was complex for students to understand it with using the traditional textbook. However, the lesson in ebooks was explained and illustrated in an effective way that made students comprehend it better and faster.

5.5 Students' Interaction And Engagement With The Content Of Ebooks

Teachers stated that using ebooks was different from using the printed books. It was found that the preferred version to both teachers and students is ebooks because of the interactivity features they have. In addition, students felt excited using them even at the end of the day. A teacher commented, "Students usually felt tired at

the end of the day, but with the use of ebooks they are still active participants with the teacher and the content of the ebooks". That is, they played games, they interacted with the various activities incorporated in the ebooks.

Regarding students' interaction with the content of the ebooks, teachers reported that students felt that learning was fun due to the use of interactive ebooks. Students were excited to participate in the activities embedded in the ebooks. Even for students who often participated in the class, learning from ebooks motivated them to raise their hands to answer questions, and interact with activities on the smartboard for the class. One teacher reported that in science ebooks students' participation was increased compared to traditional textbooks, "some students said our teacher is going to open the magic book!".

5.6 The Utility Of Ebooks

Teachers reported that the ebooks are useful and easy to use. Teachers commented that in addition to that ebook saved their time and effort in the teaching process, it provided an opportunity for using different teaching strategies to deliver the content effectively through the embedded activities. However, a few activities needed to be fixed such as the slow speed of voice in some content as teachers reported. Also, teachers recommended enhancing these activities by giving students feedback at the end of games.

The finding highlights some of the challenges teachers and students encountered during the implementation. One of these challenges was some of the activities were complex and difficult for students to achieve such as coloring. It was difficult for students to complete it because it takes time. Another usability issue was in word segmentation. It was very fast. A teacher stated that "it was difficult. It takes too much time from the lesson so; we leave it without completion". Some challenge is the internet disconnection. Another usefulness of ebooks is that the activities embedded in the ebooks are not duplicated; they are varied and non-repetitive. This feature makes students curious about the next lesson in terms of what activities will be included. A teacher comments, "Students asked me: Teacher will the next lesson be exposed to the same activities or different activities?"

6. Discussion

The current study found that implementing interactive e-books in classrooms saved teachers' time and effort in searching for supplementary materials (e.g., visual aids). O'Bannon et al. (2017) found that teachers preferred to use interactive e-books due to their multimedia-rich content including quizzes, videos, games, and simulated content. This result was also in line with Zhang et al. (2021), who indicated that teachers found e-books effortless to use. Accordingly, they can focus on supporting students in their learning rather than searching for supporting materials. In addition, this study found that using ebooks encourages teachers to personalize learning based on student's needs and learning academic levels. Likewise, teachers can differentiate instructions for students by using a variety of interactive activities of the interactive e-books (Choi et al., 2011).

Another important finding is teachers' expression of the provision of simulation objects in the interactive e-books for science book experiments. That is, in most cases, some of the experiments' materials were not available in the school. As a result, teachers can not apply the experiments with students in schools' laboratories. However, by providing these simulated experiments in interactive e-books, students can practice and manipulate the experiments with teachers, peers, and individually. This result was in line with Clark and Mayer (2023), who highlighted the importance of simulations when experiments cannot be performed in a physical environment.

Furthermore, instant visual and audio feedback encouraged students to try several times to reach the correct answers. This result is in agreement with Rockinson-Szapkiw et al. (2013), who showed that students using e-textbooks improved their cognitive and self-regulation strategies more than students using traditional textbooks. Similarly, O'Bannon et al. (2017) found that students' motivation and engagement have increased due to the interactive content and activities of the interactive e-books. This finding is in line with the results of the current study on that ebooks can offer a learning environment that makes learning fun where students become active participants in the learning process; they participate, answer questions, play games, and manipulate interactive activities. That means ebooks provide better learning experiences for students. Moreover, ebooks' features of interactiveness and various interactive content encourage students of all different academic levels to participate actively in the learning process. In addition to making learning fun, also ebooks increase students' motivation and curiosity to use and interact with the content of the book. This is a significant indication regarding the positive impact of ebooks on students' learning experiences.

In addition, this study found that students learned to pronounce words correctly when listening to words, phrases, and sentences from the interactive e-books. This result is consistent with Savva et al. (2022), who showed a

positive effect of interactive e-books on students' vocabulary learning. In addition, Choi et al. (2011) make the same point in their study that the interactive activities in interactive e-books contribute to increasing and improving students' acquisition of language skills such as reading comprehension and vocabulary.

Regarding the schools' infrastructure, schools should be prepared with technology and good Internet connection. However, based on teachers' complaints about the technical issues that occur with the use of interactive boards, providing teachers with the basic skills of solving some simple issues could help to mitigate this challenge with the e-books implementation in schools. In some instances, it is a matter of lack of awareness of using and connecting the interactive board to the computer or the matter of synchronizing the screen with the computer and others.

7. Limitations of the Study

The current study had several limitations. It had a small sample size. More schools, teachers, and students should be included to validate the study's findings. The study was also limited to Arabic and Science subjects for grades one and two. Other grades' e-books should be investigated. Last, the implementation time was short. One academic year should be set for implementation and ongoing observation. Further longitudinal research is recommended with a larger sample and additional subjects.

8. Conclusion and Future Suggestions

This study set out to explore the implications of interactive e-books in classroom settings. It examined the effectiveness of using ebooks in the learning and teaching process and their advantages in classroom settings.

This study shows that both teachers and students liked using ebooks because of the interactive features they have. A significant finding from the classroom interactions was students' excitement and eagerness to participate in selecting the right responses. Students' enthusiasm was also observed. Their responses were reinforced by positive verbal feedback. Teachers generally appreciated using e-books because they empowered students to interact and engage with content and students learned better because of the various multimedia embedded in the interactive e-book. As a result, using ebooks in teaching Arabic and Science subjects helped students understand the materials better and faster

The advantages of interactive e-books are evident for both teachers and students. For teachers, e-books save time and simplify lesson planning and preparation by providing various interactive content. As a result, lessons that previously took multiple sessions to complete are now completed in one session. Interactive e-books also promote excitement, active participation, self-efficacy, and self-regulation for students. This is true even for students with lower academic performance. This was also found in Ilhan & Oruc (2016), who confirmed that all students are involved in the classroom when using multimedia. Finally, for the successful implementation of e-books in schools, it was suggested to prepare school classrooms with interactive boards to allow students to interact with the content front the class.

Future studies should expand the implementation and evaluation of interactive e-books to more schools across the country. The data obtained from this study will provide insights into different scenarios of e-book implementation in schools based on the status and readiness of each school. As a result, this kind of result will help decision-makers in to support these schools for better and seamless implementation.

A further study will be conducted to examine the process of designing, developing, and producing interactive e-books. The questions are raised: Is the process of designing and producing these interactive e-books effective? Is it straightforward? How can these processes be simplified more? How many iterative revisions should take place from the subject matter experts and designers?

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Maimoona Al Abri is an Assistant Professor of Instructional and Learning Technology at Sultan Qaboos University (SQU), Oman, and serves as the Deputy Director of SQU's Center of Excellence in Teaching and Learning. She holds a Ph.D. in Learning Technologies Design Research from George Mason University and an MEd in Learning Technology from Griffith University, Australia. Previously, she was the Director of the Educational Technology Department in Oman's Ministry of Education, where she led initiatives such as digitizing the national curriculum, establishing Oman's first digital school, and developing e-learning strategies and OER policies for K-12 education.Her research focuses on meaningful online learning, open educational resources (OER), open pedagogy, user experience design, and technology integration in schools. Recently, she has explored the pedagogical impacts of generative AI, strategies to enhance online learning environments, and constructivist models for student engagement.

Muna Al Siyabi is a e-content specialist at the Ministry of Education in Oman. She holds a Ph.D. in Educational Technologies from University of Reading, UK. She has been project manager for English section in Digitalizing Books Project at the Ministry of Education 2024-2025. She was also a project manager for science section in Digitalizing Books Project 2021-2024. She was a member of the evaluation team for Digitalizing Books Project tender in 2021. She was also a project manager for Video Recorded Lessons for 1-4 grades Project 2020-2022. She was a project manager for e-content program for the e-learning pilot project in 2010.