

Research Article

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Creating a Design Framework for Producing an Interactive Animated E-book

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Abstract

Background/purpose. Embedding animated, interactive e-books into early childhood instruction in the Arab world creates new opportunities to increase engagement and cognition. This research explores how design, animation, and pedagogical matching influence the educational experience of young students in Jordan, creating a localised design framework that enhances learning outcomes and user experience.

Materials/methods. The study adopted an exploratory sequential mixed-methods design. Qualitative data were collected through interviews with educational designers from the Ministry of Education and the National Centre for Curriculum Development in Jordan, complemented by expert evaluations of animated e-books. Quantitative data were obtained from a teacher survey examining perceptions of engagement, usability, and pedagogical impact. Instrument reliability was verified through pilot testing and descriptive analysis.

Results. Results showed that participants judged animated e-books as very useful and pedagogically efficacious, having a positive impact on vocabulary learning, conceptual understanding, and learner engagement. However, participants also mentioned insufficient institutional reinforcement and inadequate preparatory training for teachers to exploit such tools efficiently. These findings both emphasize the promise and the pitfalls of adopting animated e-books in formal instruction in the Arabic language.

Conclusion. Animated, interactive digital books are an enriching resource for advanced-grade students learning Arabic. Their sustainability is also contingent on design premises, cultural norms, teacher in-services, and administrative backing. The proposed framework renders learner-centered, pedagogically consistent pedagogy central to making both the integration of technology and pedagogic richness in early learning of the Arabic language possible.



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1. Introduction

Interactive animated e-books, that is, multimedia products that integrate multimedia components such as animations, narration, audio, and user interactivity, have emerged as innovative early-grade learning tools. These materials transcend the static text by incorporating visual and auditory prompts that accommodate multiple learning styles, making students more motivated, attentive, and understanding (Çırakoğlu et al., 2022; Christ et al., 2019; Alshaya & Oyaid, 2017; Alsalhi et al., 2020). Their pedagogical potential arises from their ability to deliver kinetic, captivating content that facilitates processing in the mind and long-term concentration (de Koning et al., 2010).

Although increasing numbers of studies investigate multimedia learning and the usability of e-books, few explicit design frameworks for interactive animated e-books exist, particularly in educational settings where the language is Arabic (Almekhlafi, 2020; Chammas et al., 2015; Cockton, 2020). Most provided e-books are either non-instructive or overly demanding, making it hard for teachers to incorporate them into lessons (Campbell & Martin, 2010; Coiro, 2021). Existing studies emphasize the value of aligning multimedia components with the principles of cognitive load theory and instructional design so that interactivity supports learning objectives rather than distracts learners (Bodemer et al., 2004).

There are different theoretical and practical models—such as user-oriented design (Chammas et al., 2015), gamification for learning engagement (Alsawaier, 2018), and the integration of digital assessment (Anwyl-Irvine et al., 2021)—that have framed the development of digital learning tools. Yet there is a gap in detailed, context-based models for designing animated e-books for Arabic-speaking early learners, particularly in Jordan, where curriculum reforms place the assimilation of digital transformation and interactive learning at the forefront.

In response, the current study seeks to develop and validate a contextualized design framework that integrates animation principles, usability attributes, and pedagogical matching to enrich the learning of Arabic by early-grade learners.

Accordingly, the research seeks to answer the following questions:

1. What design and animation elements characterize effective interactive animated e-books for early-grade Arabic learners?
2. How do animated e-books influence learners' engagement, comprehension, and motivation?
3. What best practices and theoretical principles can inform the development of a culturally grounded design framework for interactive animated e-books in Jordan?

2. Literature Review

The development of educational technologies has led to the growing popularity of interactive, animated e-books as dynamic learning tools that reinforce instruction and learning. In contrast to static print materials, dynamic print materials integrate multimedia components—videos, audio narration, animations, and interactive quizzes—whose overall purpose is to accommodate diverse learning styles, engage students, and enhance retention. With the increasing popularity of digital learning environments, the pedagogical and technical underpinnings of interactive e-book design have emerged as an essential area of study.

Multisensory learning through interactive animated e-books has been proven to enhance both the cognitive and emotional domains of learner engagement. Studies have consistently shown that multimedia components enhance learners' motivation and understanding, especially when intentionally designed to align with learning intentions (Haniah et al., 2023; Hidayah et al., 2021). For instance, Afriwardani et al. (2023) showed that students who animated e-books with in-built quizzes and multimedia explanations outperformed their counterparts in both recall and conceptual-level

understanding. Similarly, Asrowi et al. (2019) reported that the integration of visual and audio cues in reducing cognitive load was particularly pronounced among children or participants with weaker prose ability.

One major characteristic that sets animated e-books apart from static e-books is their interactivity. By interactivity, I don't only mean clickability and navigation buttons, but also user-initiated exploration of the content through choices, feedback loops, and in-quiz quizzes. Studies have shown that integrating interactive components facilitates deep learning by enabling exploration, pacing, and active engagement (Wen et al., 2022; Batoon et al., 2018). This is particularly the case in the acquisition of metacognitive skills—planning, monitoring, and judging how well one has understood—required for independent and lifelong learning.

In an attempt to render the e-books not only interesting but also instructionally effective, various researchers have suggested using conventional Instructional design models in the production process. The most well-known in the field, the ADDIE model—named Analysis, Design, Development, Implementation, and Evaluation—standardizes the process of designing digital learning instruments in architecture. These studies by Suprpto et al. (2022) and Haniah et al. (2023) pinpoint the observance of such formalized design models as the reason that renders the contents coherent, learning outcome consistent, and reusable in all learning settings.

Besides design principles, the integration of technology is an essential element in raising the educational value of the e-book. Software such as Flipbook Maker and other HTML5-based software enable developers to incorporate active animations, quizzes, and simulations into the e-book, offering richer learning experiences (Mellisa & Saputri, 2023; Kusumawati et al., 2022). Thereafter, the integration of augmented reality (AR) in the form of augmented reality-based e-books has also come into the spotlight. AR-based e-books can superimpose virtual information on the real world, enabling students to engage with abstract concepts in hands-on, immersive ways (Huang et al., 2019; Kaimaris et al., 2023). These technologies enable diversification of learning preferences, increase accessibility, and stimulate learner curiosity.

A good book is also pedagogically coherent at the standard and contextual level. The readings emphasize the value of curriculum objectives and learners' sociocultural contexts in guiding content design. Sarlita et al. (2024), for instance, suggest incorporating scientific literacy and local values into the design of interactive content to instill in learners a sense of relevance and identity. Embedded quiz tools and scenario learning tasks, meanwhile, can transform passive reading into an active, reflective process (Suyatna et al., 2018).

Evaluation and iterative refinement are other essential elements of the iterative e-book production cycles. Recursive piloting, under the aegis of formative (ongoing) and summative (terminal) evaluation, is essential to ensuring that the e-books remain pedagogically sufficient and technically up-to-date. Asrowi et al. (2019) and Ayulistiana and Yuliani (2020) point to the necessity of aggregating user response both by students as well as by teachers so that in informing the revising and updating of function as well as content, the resulting product stays current in accommodating the needs of learners, the latest technology, as well as the latest findings in the educational research base.

The latest studies in the field also support the value of well-organized, multimedia-enhanced e-books. Asayed and Lucas (2024) assert that pedagogically well-designed animated e-books not only provide students' learning engagement but also offer individualized learning trails that can accommodate students' needs. Similarly, Çırakoğlu et al. (2022) demonstrate that pedagogically guided development—namely, the Predict-Observe-Explain (POE) method—yields more robust learning outcomes, in particular in the natural and language studies field.

In conclusion, the study verifies that the most efficient design of an interactive animated e-book requires an integrative approach that harmonizes multimedia theory, learner-centered design, curriculum alignment, and continuous evaluation. The integration of pedagogy and technology in the field has much promise to revolutionize the distribution and acceptance of learning material, especially among early-grade learners. As digital learning is expanding in scope, a robust structure grounded in research literature will be essential to guide the design and implementation of e-books that are instructionally sound, fun, and reusable.

3. Methodology

The research employs a structured qualitative review methodology to discuss how artificial intelligence (AI) impacts cultural storytelling in Eastern animation. The method is designed around a thematic analysis template, which is suggested for extracting, comparing, and synthesising patterns and results from peer-reviewed sources. The aim is to uncover the opportunities, risks, and conceptual tensions that arise as AI interacts with culturally ingrained storytelling norms in animation.

3.1. Research Design

In pursuit of devising an efficient framework for designing active, animated e-books for beginners studying Arabic, the current study adopted an exploratory sequential mixed-methods research design (Teddlie & Tashakkori, 2009; Plano Clark, 2019). The rationale was that the researchers wished to conduct a qualitative, in-depth exploration first and then confirm it with figures.

In the first stage, the above study was conducted qualitatively through semi-structured interviews with 10 expert designers affiliated with the National Centre for Curriculum Development in Jordan and the Ministry of Education. These designers gained direct experience designing educational books and digital materials for Arabic-speaking students at the primary level.

The second step was a content analysis of five current animated e-books, selected for their applicability to the early-grade Arabic curriculum. Data collection was done by expert evaluation and researcher observation, accompanied by taped interviews with both PhD-level Instructional designers and publishers' professionals who cooperate with the Ministry of Education. The participants were invited via the digital communication platform the Ministry of Education uses, as well as through official invitations sent to schools and partnering designers to obtain representation in various educational contexts.

In the third stage, the researcher combined findings of the previous phases to create a suggested design framework that holds interactive principles, animation practices, and gamification practices. It was designed based on theoretical models of multimedia learning and user experience design.

Then, the fourth stage adopted a quantitative approach by conducting a survey of primary school teachers. The goal was to assess the usability of the proposed e-book design in terms of technology, pedagogy, and cognitive load in students' learning, and to answer the third research query concerning the learner outcome.

3.2. Research Participants

Participants in the qualitative phase were 10 Instructional designers purposively sampled based on their membership and experience. In the quantitative phase, 1,034 primary teachers of Arabic were recruited from public and private primary schools in both urban and rural areas. Demographic traits (teaching experience, gender, and age) are detailed in the Results section.

Inclusion and Exclusion Criteria

Inclusion criteria were that participants had at least 3 years of experience in the practice or production of Arabic-language educational materials and were currently engaged in the

implementation or production of digital or interactive materials. Those with no prior experience in digital learning or in areas unrelated to the instruction of the Arabic language were excluded.

Recruitment Process

The participants were approached by formal means of the Ministry of Education and the National Centre for Curriculum Development in Jordan, such as school emails and regional education coordinators. An invitation was made available to ensure equal representation of both urban and rural schools, thereby preserving the diversification in teaching experience and exposure to technology.

3.3. Sample

A quantitative phase sample was collected through purposive and convenience non-probabilistic sampling, focusing on schools that had, in fact, incorporated some digital or interactive content into their instruction. These schools were selectively chosen to provide familiarity with digital e-books and applicability to the research environment. The sample consisted of both government primary and private schools in three regions. Since the sample was based on a non-probabilistic method, the results cannot be generalized to all Arabic-language teachers. The limitation is recognized as a natural function of exploratory mixed-methods research.

3.4. Data Collection Instruments

To accommodate the mixed-methods design of the current study, both qualitative and quantitative data collection instruments were adopted. In the qualitative stage, a semi-structured interview protocol was formulated, consisting of 12 open-ended questions that probed essential areas of interactive e-book development. These consisted of probing into design practice, the principle of animation, consideration of usability, pedagogical matching, and learner cognitive engagement. In the quantitative stage, a specially designed questionnaire was formulated to assess participants' perceptions in three main areas: technological usability (8 items), perceived pedagogical effectiveness (10 items), and cognitive engagement and cognitive load (7 items). The items were thoroughly vetted by subject matter experts to establish content validity and were further refined through piloting before full implementation. The responses in the questionnaire were measured on a 5-point Likert scale, with participants responding at either end or in the middle (average or neutral). The responses in the questionnaire thus provided a ready means to quantify perceptions regarding the proposed design framework.

3.5. Data Analysis

The interview and expert review qualitative data were thematically analyzed using the six-stage Braun and Clarke (2006) method. Codes and themes were inductively generated to identify design elements, animation techniques, and the integration of pedagogically related patterns.

Quantitative data were analyzed using descriptive statistics, independent t-tests, and ANOVA, depending on the distribution of the variables. The analysis was performed to identify statistically significant areas concerning the perceived influence of the e-book framework on technology and learning outcomes.

3.6. Pilot Test Results

Pilot testing was conducted with 10 Arabic-language teachers to establish the reliability and clarity of the survey questionnaire. The findings indicated acceptable Internal consistency in all subscales, with Cronbach's alpha coefficients of 0.78-0.86. Comments from the participants clarified the wording of some items and confirmed the content's suitability for the survey's targeted pedagogical context.

As shown in Table 1, most mean scores fell between 3.55 and 3.94, indicating a generally positive perception of animated e-books among participants. The highest-rated item concerned students' technological readiness ($M = 3.94$), while the lowest-rated item concerned school encouragement for using animated e-books ($M = 3.55$), suggesting room for institutional support enhancement.

Table 1. Descriptive Statistics of Animated E-book Perceptions ($N = 1,034$)

No.	Survey Item	Mean	Median	Std. Deviation	Min	Max
1	Animated e-books help me meet my educational needs	3.60	4.00	0.966	1	5
2	Animated e-books are intriguing and attention-grabbing	3.82	4.00	0.798	1	5
3	I like the text font and images in animated books	3.80	4.00	0.780	1	5
4	It is easy to read a long paragraph in an animated book	3.56	4.00	0.781	1	5
5	I have basic technological knowledge (e.g., a phone and a tablet).	3.94	4.00	0.800	1	5
6	The use of technology supports navigation through animated books	3.90	4.00	0.815	1	5
7	Animated e-books help me learn new words	3.77	4.00	0.843	1	5
8	Animated e-books help me learn new ideas	3.81	4.00	0.813	1	5
9	Animated e-books help me appreciate my own culture	3.72	4.00	0.862	1	5
10	My school encourages my use of animated e-books, such as those in textbooks	3.55	4.00	1.026	1	5

As shown in Table 2, a majority of participants (63.9%) agreed or strongly agreed that animated e-books make it easier to learn new information. This finding suggests a notable enhancement in content accessibility and comprehension through the use of multimedia elements.

Table 2. Distribution of Responses on "Animated E-books Are Easier to Learn New Information"

Response Option	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	5	0.5%	0.5%	0.5%
Disagree	45	4.4%	4.4%	4.8%
Neutral	324	31.3%	31.3%	36.2%
Agree	471	45.6%	45.6%	81.7%
Strongly Agree	189	18.3%	18.3%	100.0%
Total	1034	100%	100%	100.0%

As illustrated in Figure 1, a significant portion of participants agreed that animated e-books make it easier to learn new information, with 63.9% selecting "Agree" or "Strongly Agree".

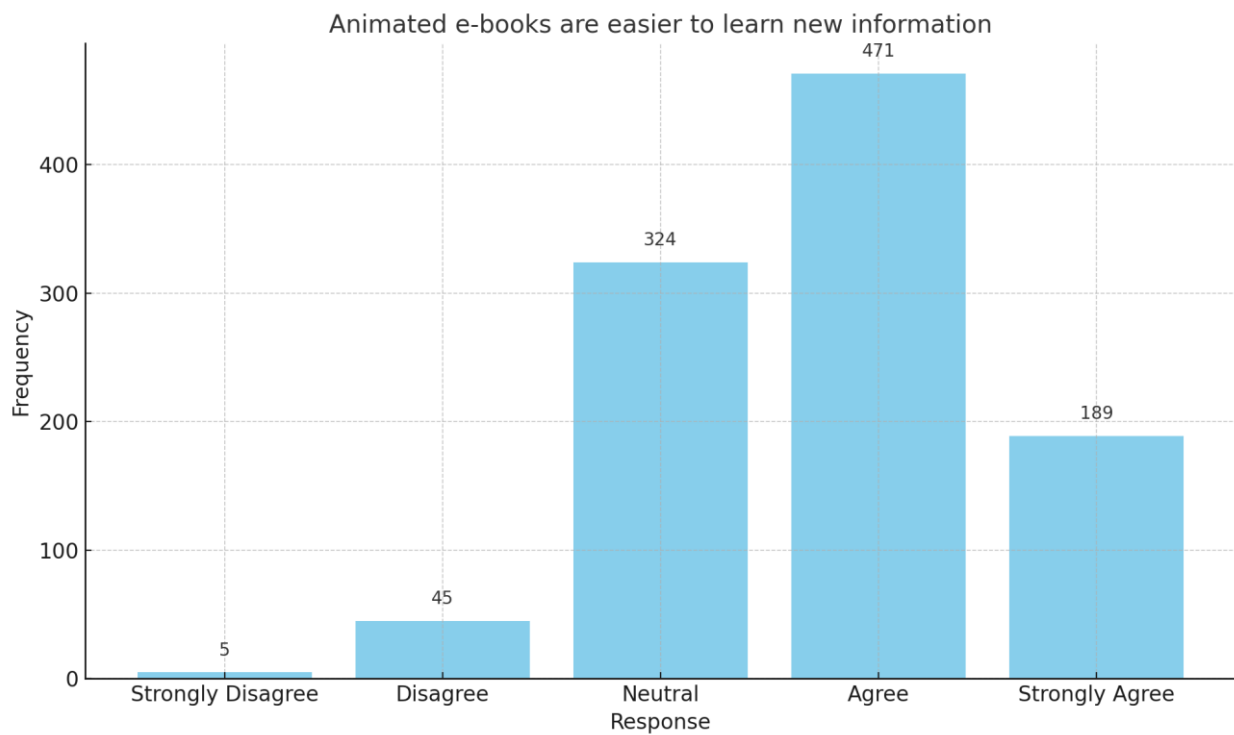


Figure 1. Distribution of participants' responses on whether animated e-books make it easier to learn new information

As shown in Figure 2, although many participants acknowledged institutional encouragement, only 55.1% of respondents expressed clear support from their schools for using animated e-books.

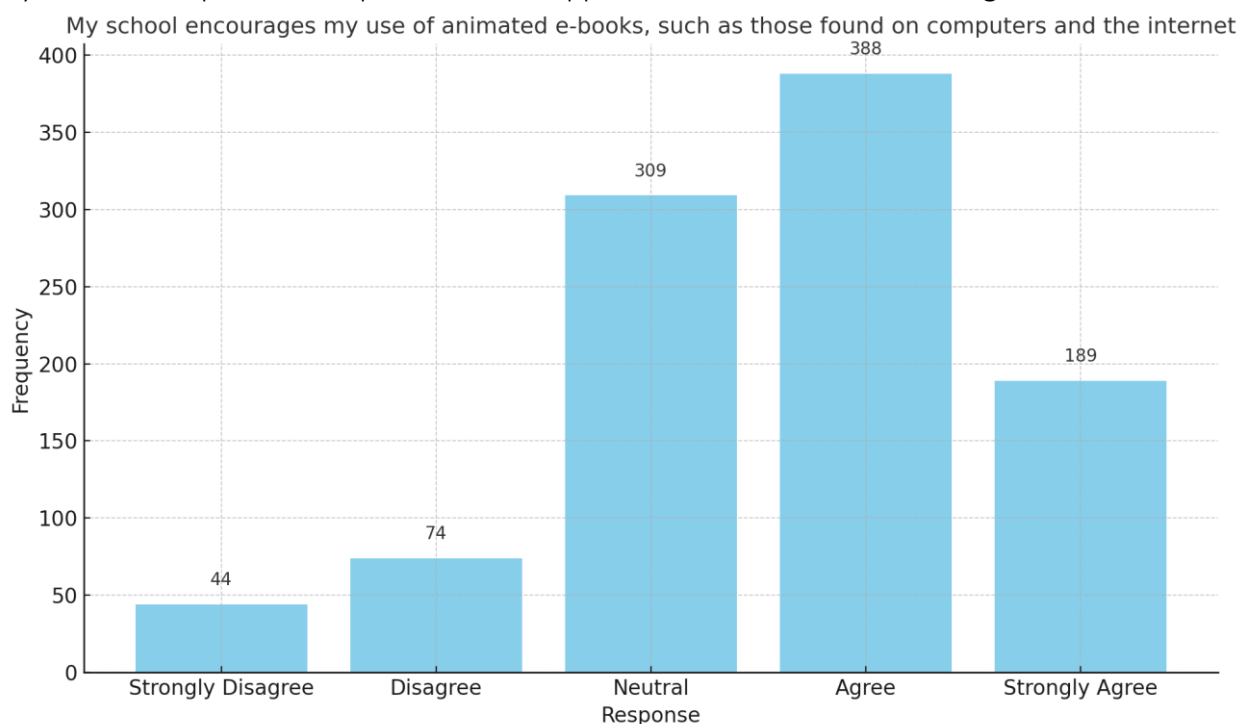


Figure 2. Distribution of participants' responses on whether their schools encourage the use of animated e-books through computers and digital devices

4. Results and Analysis

4.1. Descriptive Analysis of Animated E-Book Use

To measure teachers' and learners' attitudes toward the implementation of animated e-books, descriptive statistics were used. The descriptive statistics focused mainly on three central aspects: educational relevance, students' engagement, and administrative support.

As presented in Table 3, respondents tended to concur that animated e-books are fun to read ($M = 3.82$, $SD = 0.798$), accommodate teaching requirements ($M = 3.60$, $SD = 0.966$), and are mildly promoted by academies ($M = 3.55$, $SD = 1.026$). This suggests a fairly favorable opinion about the pedagogic value of animated e-books among respondents.

Table 3. Mean Scores of Key Variables

Variable	Mean	Standard Deviation
E-books meet educational needs	3.60	0.966
Animated e-books are engaging	3.82	0.798
The school encourages e-book use	3.55	1.026

4.2. Perceived Engagement with Animated E-Books

In how animated e-books engage students' attention, the findings showed that 72.4% of the respondents agreed or strongly agreed that the learning materials are fascinating and captivating. A very small percentage (1.2%) disagreed with the statement. These findings imply that the animated materials boost learner engagement and motivation.

Table 4. Distribution of Responses on "Animated E-books Are Intriguing and Attention-Grabbing" ($N = 1034$)

Response Option	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	12	1.2%	1.2%	1.2%
Disagree	47	4.5%	4.5%	5.7%
Neutral	226	21.9%	21.9%	27.6%
Agree	580	56.1%	56.1%	83.7%
Strongly Agree	169	16.3%	16.3%	100.0%
Total	1034	100%	100%	100.0%

As indicated in Table 4, overall 72.4% of the respondents agreed or strongly agreed that the animated e-books are fascinating and captivating. This shows an extensive learner engagement with the visual and dynamic elements of the e-book format.

4.3. Perceived Learning Benefits

The participants were also asked whether the animated e-books supported their learning. As shown in Table 5, about 63.9% of respondents agreed or strongly agreed that these tools for learning something new supported them. This confirms the cognitive benefit of animation in simplifying intricate information.

Table 5. Animated E-books Make It Easier to Learn New Information

Response	Frequency	Percent
Strongly Disagree	5	0.5%
Disagree	45	4.4%
Neutral	324	31.3%
Agree	471	45.6%
Strongly Agree	189	18.3%

4.4. Institutional Support

Despite favorable attitudes towards the learning materials and learning facilitation, only 55.1% of participants believed that their institutions supported the use of animated e-books. This indicated a gap in institutional reinforcement or integration into informal learning environments, as presented in Table 6.

Table 6. Institutional Support for Animated E-books

Response	Frequency	Percent
Strongly Disagree	41	4.0%
Disagree	59	5.7%
Neutral	319	30.8%
Agree	387	37.4%
Strongly Agree	228	22.1%

4.5. Reliability Analysis

To ensure the reliability of the quantitative measure in the current study, Cronbach's Alpha was computed. The achieved aggregate value was $\alpha = 0.78$, indicating acceptable inter-method consistency among the survey instruments. The result indicates that the scale adopted to gauge perceptions of animated e-books on the dimensions of educational relevance, engagement, and technology usability was reliable for the exploratory study.

5. Discussion

The results of the current study indicate an overall favorable attitude toward animated e-books among Arabic-language instructors, particularly regarding educational value, engagement, and cognitive effectiveness. Consistent with the results of Wen et al. (2022) and Afriwardani et al. (2023), the current study established that multimedia and animation substantially support learners' motivation and understanding. However, unlike Haniah et al. (2023), whose study focused mainly on visual beauty, the current study emphasized the pedagogically inclusive integration and contextual design of the book into the Arabic language curriculum.

An important finding arising from the data is the agency of interactivity in increasing learner engagement. Since more than 63% of respondents reported that the use of animedia, such as animated e-books, simplified learning of new material, the study reaffirms the view that interactive material encourages intellectual engagement. In sync with Batool et al. (2018) and Suprpto et al.

(2022), who also concluded that interactivity increases metacognitive engagement, the current study, however, moves beyond their conclusions by placing the interactivity in the context of a culture-based linguistic mode, where, in addition to the stimulation of cognition, it also reinforces the culture.

Even as there was a favorable response toward the technology and pedagogy of animated e-books, the research showed a distinct dearth of institutional reinforcement. Only 55.1% of the respondents agreed that their respective institutions willingly celebrated the use of animated e-books. This revealed a gap in teacher preparedness and systemic ratification, resonating with Suyatna et al. (2018) and Kusumawati et al. (2022) in emphasizing the importance of administrative cheerleading and positive policy architecture in the success of digital integration.

Regarding the relevance of the content, the research shows that animated e-books can help align learning goals with cultural identity. The related elements in the case of cultural appreciation were relatively high, which translates into the ability of localised content to allow students to connect more closely with the topic under study. The result surprises Sarlita et al. (2024), who concluded that the maximum importance of incorporating local value and scientific literacy into digital learning instruments is to achieve greater learner resonance and cultural continuity.

6. Theoretical Contribution

Based on these findings, the study contributes a contextualized design framework that integrates pedagogically coherent multimedia learning principles with bespoke pedagogical alignment for Arabic learning. The framework revolves around three mutually related pillars—interactive design, culturally responsive relevance, and learner-centered pedagogy—each underpinning the broader development of digital literacy and cognitive engagement in early learning. The practice departs from existing models by bringing together user experience design and culturally responsive pedagogy.

Overall, the study verifies the radical potential of animated e-books, as channeled through an evidence-based, culturally responsive design model. By balancing pedagogically compatible and technically usable design, the study offers practical lessons for policymakers, designers, and instructors seeking to redesign early learning in the languages of the Arab world through digital innovation.

7. Conclusion

The present study examined the design framework, diffusion of learning, and user experience of the animated e-books in elementary-grade learning in the Arab language. To address the first research question, the study proposed a contextualized design framework grounded in interactivity, cultural adequacy, and learner-centered pedagogy. The framework synthesizes the principle of animation with pedagogy to facilitate productive engagement and recall of knowledge among early-grade students.

Regarding the second research question on educational impact, the findings indicated that animated digital books significantly improve vocabulary learning, students' motivation, and understanding. The combination of visual, motion, and interactivity supports deeper cognitive processing, and the pedagogical objectives align with the Arabic language curriculum. These findings confirm that animation, grounded in the principles of Instructional design, can serve as an active learning motivator and a catalyst for sustained attention.

In the third research inquiry into user perspectives, teachers expressed favorable views on the usability, visual quality, and cultural fit of animated e-books. The study, however, revealed the absence of institutional support and the availability of a few infrastructure-based facilities that inhibit mass adaptation. This puts in sharp focus the urgent necessity of policy-driven validation,

administrative cooperation, and teacher training to make the use of digital learning materials in the classroom sustainable and efficient.

Theoretically, the study contributes to the growing literature in educational technology by conceptualizing a localized design framework spanning multimedia learning theory and cultural contextualization. Practically, the study provides programmable outcomes to inform curriculum constructors and teachers, with an emphasis on the applicability of age-based animation, easy-to-use routing, and locally centered content, depending on users' linguistic and cultural realities. Teacher training packages also warrant the inclusion of digital content evaluation and adaptation modules to strengthen pedagogical preparation.

In conclusion, the productive integration of animated e-books into the Arabic language curriculum relies on the synthesis of innovative design, pedagogical purpose, and organizational ambition. Animated e-books, when supported by responsive policy and sustained professional learning, can be an exemplary transformative medium of learning—deepening linguistic, cultural, and cognitive development while providing the future of digital pedagogy in early learning with a sense of direction.

8. Recommendations

According to the results of the current research on designing and implementing animated active e-books for elementary-grade instruction in the Arabic language, the following are the proposed recommendations for instructors, designers, policymakers, and education technology parties:

1. Contextualize Design with Cultural and Linguistic Relevance

Animated future e-books must be produced in a locally suitable language, storyline, and imagery to enhance regional form and improve reception among young students of Arabic.

2. Integrate Pedagogical and Cognitive Design Principles

The designers and software builders must integrate animation and interaction mechanisms with learning theories such as cognitive load theory and multimedia learning principles to maximize understanding and minimize cognitive stress.

3. Enhance Institutional Support and Teacher Training

Education ministries and school institutions must strive to enable the use of vouched animated e-books by adopting infrastructure, in-service training programs for teachers, and rewards for incorporating the tools into the official curriculum.

4. Foster Collaborative Development Between Designers and Educators

Create interdisciplinary teamwork among content writers, curriculum specialists, and classroom teachers to make the end product as compliant with actual classroom requirements and learning objectives as possible.

5. Conduct Continuous Evaluation and User Feedback Integration

The development of an animated e-book should be an iterative process that incorporates students' and teachers' feedback through usability studies and classroom pilots to maximize usability and user satisfaction.

These opinions aim to promote a pedagogically sound, culturally appropriate, and learner-focused implementation of animated e-books in early instruction in the Arab world, coupling technological innovation with substantial educational value. Together, these opinions offer a pragmatic guide to the widespread implementation of animated e-books in the teaching of the Arab language.

Declarations

Author Contributions. The authors contributed equally to all stages of the research process, including the conceptualization, design, data collection, analysis, and manuscript preparation. Both researchers played an active role in performing literature synthesis, thematic analysis, and organizing the theoretical framework. All the authors read and accepted the final version of the paper.

Conflicts of Interest. The authors confirm that there are no conflicts of interest concerning the study.

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Ethical Approval. Since the current study is based on a systematic review of the available literature, no formal ethical clearance or informed consent was required. But all the studies reviewed were referenced and used in accordance with academic and publishing ethics.

Data Availability Statement. No new databases were collected for this research. All data presented in the current review are freely available and derived from scholarly publications.

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