

# VIBE: The Practical Benefits of an Interactive E-Book for Art Education in Egypt

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## Abstract

The Art Education subject in Middle school in Egypt has been somewhat neglected, without receiving adequate focus for its development in line with the modern demands of the current era. One of the primary sources of education for students in schools is textbooks. The existing school Art Education textbook lacks content, presentation, and design, requiring substantial improvement. The "Visual Interactive Book for Art Education" (VIBE) project aims to revolutionize the way Egyptian Art is taught in middle school classrooms. By transforming the content of the traditional Art Education textbook into an interactive electronic book, VIBE offers a more engaging, accessible, and effective learning tool for students seeking to develop their artistic sensibilities. VIBE showcases the works of renowned Egyptian artists and highlight their artistic techniques to enhance students' artistic abilities while improving accessibility and convenience for learning the material through expanded ways for communicating the knowledge. Through the incorporation of high-quality images, videos, and games, VIBE provides a dynamic and immersive learning experience. This paper offers a comparative analysis of the visual elements of the original printed textbook and VIBE to illustrate the research and design process. VIBE provides a better learning experience, accessible and intuitive design to navigate for middle school kids than the printed textbook. By leveraging cutting-edge technology and innovative design, VIBE offers a more engaging and effective learning tool for students to develop their artistic sensibilities and to foster cultural appreciation through art education topics. Plus, this solution costs less to produce and distribute, making it an easily adoptable solution for schools and educators to take on.

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## 1. Introduction

The significance of Art Education in nurturing creativity and fostering cultural appreciation among students is well-established. However, in developed countries, the criticality of Art Education is usually overlooked and there are persistent issues that hinder its effectiveness and accessibility (Lewis, 2000). Also, the increase in people using smartphones, tablets, and popular social media sites has led to new ways of sharing and teaching information (Wu, 2023). To build better understanding of these issues, we held a meeting with an Art Education's representative from the Egyptian Ministry of Education. During that meeting, two primary issues were identified (Should this have a citation? Where is this information coming from?). First, since 2005, the ministry has ceased printing the Art Education school book due to budget constraints, while maintaining that the current curriculum is satisfactory. Teachers and students used to print an old copy of the textbook using black and white photocopiers. As a result, the low quality of the printed version of the textbook prevents students from fully appreciating the artistic value of the presented materials. Second, the lack of engaging and accessible images further reduces the book's effectiveness, leading to disinterest among students. The poor resolution of printed images exacerbates this problem.

To address these challenges, our approach involves redesigning a chapter of the textbook using computer graphic programs to create the designs and the interactions. This strategy aims to resolve the problems by

significantly reducing its cost. The "Visual Interactive Book for Art Education" (VIBE) project will overcome the problem of printing in large numbers for all students, and this will reduce the problem of the limited budget for printing the schoolbook and making it available to students. Also, VIBE targets to enhance the quality of the visual elements, and incorporating engaging, interactive components such as control buttons, zoomable images, photo album, educational videos, and games into the Art Education book chapter. That makes VIBE an engaging and immersive learning experience for middle school students.

## 2. Methodology

We conducted extensive research on the current state of Art Education in middle schools in Egypt. This involved reviewing existing literature on the subject and analyzing data from the Ministry of Education regarding the Art Education curriculum. Based on the research conducted, we identified two primary issues: the absence of the Art Education textbook and the lack of engagement among students due to poor design and resolution of printed images.

To address these challenges, we developed a strategy to redesign the Art Education textbook. The strategy included redesigning a single chapter of the existing Art Education textbook as an interactive, digital chapter? As a proof of concept, this strategy focused on redesigning this chapter from the original textbook that described the works of renowned Egyptian artists and highlighted their artistic techniques. We focused on improving the visual quality of the images, incorporating interactive elements such as videos and games, and enhancing the overall design of the chapter. The selected chapter was redesigned with a focus on improving engagement and the learning outcomes.

Finally, we conducted a comparative analysis of the visual elements of the original printed textbook and the newly redesigned book chapter. This analysis aimed to illustrate the research and design process and highlight the improvements made from the redesign process.

## 3. VIBE Design

### 3.1 Cover Design

The cover of the original printed version of the Art Education textbook in Figure 1 lacks unity in its design due to the placement of multiple images on top of each other, which made the design less engaging and not expressive of the book's content.

To address this issue, the e-book cover has been designed to include an Arabic Typography of the book's title, along with other important information (Chen, 2012). The new design in Figure 2 incorporates important elements that are essential for the unity of design, making the cover more engaging and inclusive. Additionally, the new design includes buttons that link the cover page with inside pages and background music, which enhances the overall user experience. For example, if the student clicks on the "Start" button or the word "Art" in the Arabic typography, that will open the next page, which is the first page of the chapter.

Overall, the new cover design offers creative solutions to the lack of artistic aspects in the original printed version of the textbook. By incorporating important elements for the unity of design, the new design enhances the overall user experience and makes the book more readable and engaging in its content.

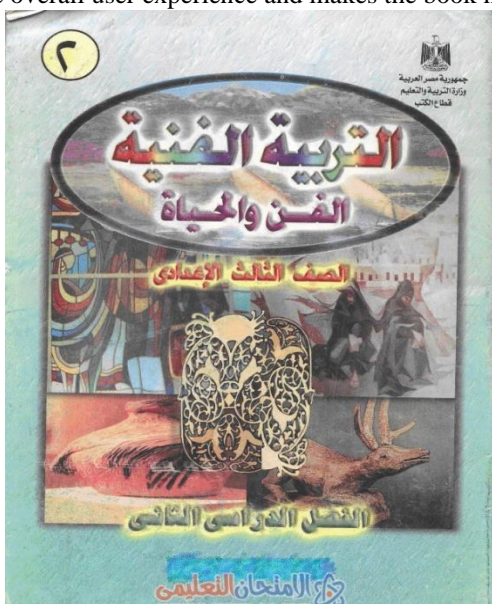


Figure 1: Original cover design of the textbook



Figure 2: VIBE cover design

### 3.2 Internal Content Design

The traditional Art Education textbook in Figure 3 suffers from several design issues in its internal pages, including poor layout, color scheme, lack of balance between figures/elements, and excessive white space. These issues hinder the book's effectiveness in engaging students and presenting the content in an attractive and expressive way. Studies found young students find technology attractive and fun although the electronic book matches the printed book in the content (Cavanaugh 2014). For instance, some pages contain three or more images that are randomly located, leading to a lack of balance in the general page layout design and unnecessary blank areas. Additionally, the printed colors are poor and do not accurately show the details of the images, which differ from the original copies in terms of color groupings.

#### 3.2.1 Layout Design

The redesign process of the Art Education textbook in Figure 4 involved experimenting with multiple ideas and was iterative before arriving at the final design of the internal pages. The goal was to achieve design unity while retaining most of the book's essential elements.

To achieve this goal, the background was redesigned, while the title and control tab were retained in their original locations. This enables users to handle the book more easily while browsing through it using the control list provided on the far right of the book's pages. Moreover, the images and texts were distributed non-identically to achieve asymmetry, which is essential for balance through contrast. Informal balance was achieved by distributing different elements that have equal visual weight, providing equal weight to the elements without being identical (Tersiisky 2004).



Figure 3: Two original interior pages designs of the art education textbook

#### 3.2.2 Interactive Features

The redesigned Art Education e-book offers various interactive features that make it an engaging and interesting electronic book for users. The e-book includes four control buttons that allow users to navigate directly to the four lessons in the content pages. Additionally, all images can be zoomed in or out, and provide additional information when clicked, enhancing the user experience, and understanding of the content.

The e-book also includes a photo album and link to an electronic museum to display the artworks of famous Egyptian artists. These features allow users to explore more artworks related to the lessons' content but not found in the main content of the e-book. Furthermore, the e-book contains numerous educational videos that supplement the content and provide an additional learning experience.

Perhaps most importantly, VIBE contains a range of educational games, such as Drag & Drop and drawing games, which help students to recall what they learned from the content of the e-book. These interactive games enhance engagement and retention of the material, making the e-book a more effective learning tool. According to Leu (2000), using eBook as a type of technology to teach young children introduces them to the necessary experience to use technology in the 21<sup>st</sup> century.

Overall, the inclusion of various interactive features such as control buttons, zoomable images, photo album, educational videos, and games, make VIBE an engaging and immersive learning experience for middle school students. The results of Bickel's research (2017) confirmed that the electronic book increases the student's

comprehension of the written information as an essential part of the e-book elements.



Figure 4: Two interior pages of VIBE

#### 4. Results:

##### 4.1 Research hypothesis

The integration of interactive elements, high-quality visual content, and innovative design in the "Visual Interactive Book for Art Education" (VIBE) offers a more engaging, effective, and cost-efficient medium for middle school students in Egypt to learn and appreciate art education compared to traditional printed textbooks.

To verify this hypothesis, the researcher went through testing, analysis, and revisions. The eBook design has been tested by 23 art educators and book designers in Egypt. Their recommendations and views have been considered in the process of revision, and summarized and documented here:

##### 4.2 Research testing

In the testing phase of our research, we developed a comprehensive evaluation form to assess the effectiveness of VIBE. This evaluation form, designed to be meticulous and straightforward, was distributed alongside the prototype of VIBE to a select group of art educators tasked to evaluate the proposal. The form encompasses eight main criteria, each targeting a specific aspect of the electronic book. First, it examines the artistic values achieved in the design of both the cover and inner pages. Second, it assesses the design of the electronic book screens, focusing on layout and user interface. The third criterion evaluates the color schemes used throughout the book, while the fourth and fifth criteria consider the quality and effectiveness of static and animated images, and educational video clips, respectively. The sixth criterion is concerned with audio effects and how they enhance or detract from the overall learning experience. The seventh criterion evaluates the readability, relevance, and educational quality of the texts included. Finally, the eighth criterion is dedicated to examining the interactivity aspect of the book, evaluating how engaging and user-friendly the interactive elements are. This structured evaluation approach ensures a thorough and systematic assessment of our proposal, allowing for constructive feedback that can guide subsequent refinements.

##### 4.3 Analysis:

In the analysis phase of our research, we systematically evaluated the data collected from the evaluation forms during the peer-review process. We utilized Cooper's Equation, an Agreement Ratio Formula, to calculate the percentage of agreement between the reviewers on each of the eight distinct criteria. This step allowed us to quantify the consensus among reviewers for each separate item, providing a clear and measurable indication of agreement regarding various aspects of our interactive electronic book proposal, as shown in Table 2.

Cooper's Equation:

$$\text{Agreement Ratio} = \left( \frac{\text{Number of Agreements}}{\text{Total Number (Agreement + Disagreement)}} \right) \times 100$$

No.	Criteria	Agreement Ratio between the Judges
1	Artistic values achieved in designing the cover and inner pages:	
	- Balance	100%
	- Rhythm	100%
	- Repetition	75%
	- Diversity	100%
2	Design of electronic book screens:	
	- Use of suitable grids	100%
	- Design suitability for student age	100%
	- Background design relevance	100%
	- Cohesion between the front and back cover designs and inner pages	100%
3	Colors:	
	- Emphasizing titles and paragraphs using appropriate colors	100%
	- Color appropriateness for the book's subject and student age	100%
	- Role of color contrast in text clarity	100%
	- Color harmony among page elements	100%
4	Images (static and animated):	
	- Avoiding colors that cause color blindness on interactive screens	75%
	- Relevance to book topics	100%
	- Not overcrowded on a single page	100%
	- Clarity and expressiveness	100%
5	Video clips:	
	- Accompanied by a caption on the same page	87.5%
	- Image variety (static and animated)	100%
	- Clarity of the displayed video	100%
	- Appropriate playback speed	100%
6	Audio effects:	
	- Video is displayed in a separate window	87.5%
	- Opportunity for the learner to replay the video multiple times	100%
	- Volume control	75%
7	Texts:	
	- Clarity and purity	100%
	- Generally related to the content	100%
	- Equal and harmonious word size relative to the page	100%
	- Word clarity	100%
8	Interactivity:	
	- Proper text distribution on the page	100%
	- Combining text and image in one frame	87.5%
	- Using appropriate font size for main titles	75%
	- Ability to explore displayed information	100%

Table 1: shows the percentage of agreement between the reviewers on each item separately.

Following this calculation, we computed the Average Agreement of Reviewers, as shown in Table 2. This entailed averaging the percentage of agreement across all eight criteria to yield a single summary statistic, representing the consensus of **96.05%** among the reviewers. This rigorous analytical approach highlighted areas of strength and potential improvement in our proposal, based on a robust, quantitative evaluation by experts in the field.

$$\text{Average} = \frac{\text{Sum of Scores of each Item}}{\text{Number of Items}} \%$$

No.	Evaluation Criteria	Average Reviewer Agreement
1	Achievement of artistic values in the design of both the cover and internal pages	95%
2	Design of electronic book screens	100%
3	Colors	95%
4	Images (static and animated)	97.5%
5	Video clips	96.8%
6	Sound effects	91.6%
7	Texts	92.5%
8	Interactivity	100%

Table 2: Average Agreement of Reviewers

#### 4.4 Interpretation of Results:

After applying the equations to the quantitative estimates of the peer-review process in the evaluation form, we found that the agreement rate between the reviewers reached 96.05% for the total items of the evaluation card. An agreement rate exceeding 80% indicates that the experiment achieved its intended objectives, which is to enhance the artistic value of the school art book by digitizing it.

The outcomes of VIBE project were successful and overwhelmingly positive based on the community reaction. The dean of the Art Education Faculty at Minia University, Egypt, wrote a letter of recommendation stating that the project's idea should be shared with neighboring Arabic countries, not just Egypt. Furthermore, the dean sent a letter and a copy of the project to the Egyptian Minister of Education, urging him to consider the project when implementing future improvements to the textbooks.

The positive feedback from the community demonstrates the potential impact of the Art Education e-book project in improving the accessibility and effectiveness of art education in middle schools. VIBE's new designs and interactive features have the potential to revolutionize the way art education is taught and learned. By gaining recognition and support from the community and academic leaders, the project has the potential to influence education policies and practices beyond its immediate context.

#### 5. Future Work:

Our research primarily focuses on the intersection of technology, education, and design, aiming to address specific challenges in the realm of art and design. We are currently in the process of developing a user interface and user experience design for a mobile game application. This application is intended to assist undergraduate students majoring in art, allowing them to practice and internalize various art principles in a novel and engaging manner. Another key research-based initiative we are pursuing is the creation of a platform dedicated to the practice and study of visual balance techniques.

#### 6. Conclusion:

In conclusion, VIBE project offers a new and innovative approach to teaching and learning art education in middle schools in Egypt. The project addresses several critical issues, including the low quality of the printed version of the textbook, lack of engaging design, and limited accessibility due to budget constraints. VIBE redesigns the traditional Art Education textbook into an interactive electronic book that offers a more engaging, accessible, and effective learning tool for students. The new e-book design incorporates interactive features such as control buttons, zoomable images, a photo album, educational videos, and games, making the learning experience more immersive and engaging. The redesign also improves the visual quality of images and enhances the overall design, achieving unity and balance in the presentation of the content.

The positive response from the community, including academic leaders and the dean of the Art Education Faculty at Minia University, Egypt, demonstrates the potential impact of the project in improving art education in Egypt and beyond. The innovative approach and use of interactive media has the potential to influence education policies and practices beyond the immediate context of the project.

## 7. References

- Bickel, J.M. (2017). Electronic books or print books for increased reading comprehension and vocabulary acquisition in third grade students, Master of Arts in Education, Humboldt State University, USA.
- Cavanaugh, T. W. (2014). Ebooks for Elementary School. United Kingdom: ABC-CLIO.
- Donna Terskiisky (2004). The Elements and Principles of Design, retrieved from <http://NWRAIN.NET/~TERSIIISKY/DESIGN/BALANCE.HTML>
- Heller (2002), The graphic design reader, published by Allowrth press, New York.
- Hsuan-An Chen (2012). Re-cover: Dynamic E-Book Cover Design, Master of fine Arts. Purdue University.
- Leu, D. (2000). Our children's future: Changing the focus of literacy and literacy instruction. Reading Teacher, 53(5), 424-29.
- Lewis, T. (2000). Technology Education and Developing Countries. International Journal of Technology and Design Education 10, 164.
- Wu, Ting-Ting, Yi-Chen Lu, and Yueh-Min Huang. (2023). "Effect of Multimedia E-Book Use on the Information Literacy of Nursing Students and Health Communication in Student-Led Large- and Small-Group Community Health Education Sessions" Sustainability 15, no. 9: 7408