

A Study the usage of augmented reality technology in advertising poster design to enhance product image

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Abstract

In the time of technology and the fourth industrial revolution the demand of new ways of advertising is needed than any time before to capture audience attention among the massive kind of ads that they see daily also the demand for engaging and personalized consumer experiences within advertising content is increasing every single day. This study explores the usage of augmented reality (AR) technology in advertising poster design to enhance product image in consumers' mind through attempting to answer the following research questions Q1. What is the impact of using AR technology in poster design on product image compared with traditional poster? Q2. What are the design principles of using AR technology in poster design? , The paper followed applied comparative research method by designing a single advertising poster in two versions the first one is a traditional static version and the second one is AR enhanced interactive poster ,This paper aims to evaluate the impact of using AR technology in poster design on enhancing the product image toward the recipients compared with the traditional poster design and to determine the design considerations of using AR technology to enhance the effectiveness of poster design to provide practical guidance for designers and advertisers seeking to merge technologies into visual communication strategies for stronger brand presence.the results of the paper revealed that the usage of AR technology in poster design enhance its effectiveness on product image compared with the traditional one.

Keywords

Interactive poster,
Product Image,
Augmented reality,
Visual
communication.

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Introduction:

Advertising posters are a vital tool for conveying messages and influencing consumer behaviour (Hassan et al, 2015). Traditional posters have served as static visual compositions that combine imagery, typography, and layout to capture attention and promote products or ideas effectively within a limited space (Scholz & Smith, 2016). However, with the rapid integration of digital technologies in design, augmented reality (AR) has emerged as a transformative medium that redefines user interaction and engagement in advertising design (Azuma, 1997; Javornik, 2016).

Augmented reality is a technology that merges digital content such as images, animations, or 3D models into the physical world in real-time, enhancing the viewer's experience (Rauschnabel et al., 2019). AR has the potential to transform a passive viewing experience of the advertising poster into an interactive one, enabling users to engage with brand content dynamically which can enhance memorability and enhance product image

(Scholz & Smith, 2016; Yim et al., 2017). This interactive capability aligns with the increasing demand for engaging and personalized consumer experiences within advertising. (Chylinski et al., 2020).

Therefore, this study investigates the impact of augmented reality in poster design as a tool to enhance product image. By comparing traditional static posters with AR-enhanced versions.

Research Problem:

- What is the impact of using AR technology in poster design on product image compared with traditional poster?
- What are the design principles of using AR technology in poster design?

Research Hypothesis:

- Using AR technology in poster design may enhance product image toward the recipients compared with traditional poster
- Taking into consideration the appropriate design principles While applying AR technology in poster design may increase its effectiveness.

CITATION

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Research Objectives:

- Study the impact of AR enhanced poster design on enhancing product image compared with traditional poster
- Determine the design consideration in using AR technology to enhance the effectiveness of poster design.

Research Methodology:

- Applied qualitative with a comparative design approach through focus group and questionnaire.

Literature review:

1- Introduction to AR in Advertising

Augmented Reality (AR) has emerged as a transformative tool in advertising, bridging the gap between physical and digital media to create interactive, immersive experiences for consumers. Unlike traditional advertising methods that rely on passive consumption of static visuals or videos, AR technology integrates computer generated elements such as animations, 3D models, and sound into the real-world environment when viewed through devices like smartphones or AR glasses (Yim et al, 2017). This integration enables users to interact with the advertisement, fostering active participation and deeper engagement.

Studies have shown that AR in advertisement enhances consumers' perceptions of brands by offering and engaging experiences, which positively impact attitudes toward products and increase purchase intentions (Javornik, 2016; Rauschnabel et al, 2019). The interactivity inherent in AR enhanced advertisements allows users to explore product features dynamically, leading to

stronger product knowledge, emotional connection, and memorable experiences (Poushneh & Vasquez-Parraga, 2017).

Moreover, AR aligns well with the increasing consumer demand for personalized and engaging content, supporting marketing strategies aimed to create unique brand experience. It enables brands to tell their stories in a layered and interactive manner, combining physical presence with digital enhancement to maintain the tactile familiarity of traditional media while offering the dynamic appeal of digital content (Yim et al, 2017).

2- AR Enhanced Posters compared with Traditional Posters:

Traditional posters are static and rely solely on visual elements to capture attention and deliver messages (Hassan et al., 2015). On the other hand, AR-enhanced posters can display animations, 3D models, and sound, creating a new interactive experience that facilitate deeper consumer engagement and recall for the brand (Scholz & Smith, 2016).

AR can transform a static poster into a dynamic one that can capture the attention of the recipients' through adding motion, sound, and interactivity. This development enhances the effectiveness of advertising posters by increasing its impact and enabling the display of additional contextual information in the poster without cluttering the physical design of it. (Javornik, 2016)

In Table(1) the author summarizes the main differences between traditional and AR enhanced posters:

Table (1) Comparison between AR enhanced Posters and Traditional Posters

Aspect	Traditional Posters	AR-Enhanced Posters
Nature	Static, two-dimensional poster.	Interactive, dynamic, combining physical and digital elements into the poster context.
User Engagement	Passive viewing; limited interaction; attention relies on visual hierarchy.	Active participation; users interact with animations, 3D objects, and additional content.
Information Capacity	Limited to printed content; clutter may occur if too much information is included.	Can display layered information (videos, 3D models, detailed product data) without cluttering the static design.
Interactive Experience	Visual only; depends on color, layout, and typography to capture attention.	visuals ,motion ,interactivity and sound in the AR enhanced posters can enhance emotional connection and immersion with the product design creating a new interactive experience.
Retention & Recall	Lower retention due to static presentation, especially in high-ad exposure environments like social media which includes a massive number of posters for different brands.	Higher retention; interactivity supports memorability of the information which enhances product image.
User Interaction	No interaction beyond physical proximity and viewing distance.	Users can scan, tap, explore, and navigate content, creating an exploratory experience.
Storytelling Capability	Limited narrative depth within static space; relies on visuals and slogans for messaging.	Enables dynamic storytelling through animations and contextual product demonstrations.
Technological Requirement	Requires only print/display space.	Requires AR-enabled devices and app for scanning and interaction.

Aspect	Traditional Posters	AR-Enhanced Posters
Suitability for Modern Audiences	May feel traditional; suitable for quick message delivery in some contexts.	Aligns with modern audience expectations for interactivity and digital engagement.
Brand Image Impact	Reinforces brand through visual consistency and design quality.	Enhances brand image by demonstrating innovation and offering engaging experiences tied to the product and brand.

3- Impact of AR in poster design on User Engagement and Product Image

- **Shaping consumer response:** AR enhanced posters can motivate recipients to engage beyond the message. By scanning the poster and accessing hidden layers of content, recipients are more likely to seek additional product information and retain the brand image longer compared to traditional poster (Rauschnabel et al., 2019).
- **Encouraging deeper engagement:** The interactive features embedded in AR enhanced posters such as animations, clickable icons, or immersive effects increase the perceived modernity and value of the product, while simultaneously building an emotional bond between the recipients and the brand (Poushneh & Vasquez-Parraga, 2017).
- **Supporting decision making:** Unlike traditional posters that only present a static image, AR-enhanced posters allow recipients to view the product in diverse contexts, examine details from multiple perspectives, and experience added functionalities through motion or sound. This reduces uncertainty about the product and helps recipients build trust, which making the AR enhanced poster an effective way in shaping purchasing decision (Scholz & Smith, 2016)

4- Design Principles of AR enhanced Posters:

Effective AR enhanced posters requires aligning technological capabilities with strong design foundations to ensure the interactive elements enhance the user experience. Successful AR enhanced poster design requires a careful balance between creativity and functionality, ensuring that interactivity enhances the message, strengthens product image, and creates a memorable and engaging experience for the recipients. The design considerations should include the following:

- **Simplicity in Layout:** The poster design should maintain a clean, balanced design to allow AR content to overlay seamlessly without creating visual clutter. The AR layer should complement the existing visual hierarchy in the traditional poster and adds a digital element in a complement way.
- **Colors:** Color schemes should be consistent between traditional and AR enhanced posters to maintain brand identity and aesthetic coherence

(Yim et al., 2017). AR content can utilize motion to draw attention to the important elements in the poster design.

- **Motion:** Animations should have a clear purpose, showing important product features and directing the recipients' focus while keeping a steady, engaging flow without confusing or overwhelming the recipient. (Scholz & Smith, 2016).
- **Sound Integration:** Music or sound effects can add emotional depth to the AR enhanced posters and should be aligned with product's tone and brand identity (Olsson & Salo, 2021).
- **User-Friendly Interaction:** AR interactions in AR enhanced posters should be intuitive, requiring minimal user instruction, allowing users to easily scan, tap, or navigate the content without frustration (Chylinski et al., 2020).
- **Contextual Product Presentation:** AR enhanced posters should be used to show the product in different scenarios or use cases, adding value to the receipt's understanding and helping to visualize product utility (Poushneh & Vasquez-Parraga, 2017).

Methodology:

The author conducted an Applied comparative study by designing an augmented reality (AR) poster to transform the product advertising experience into a more engaging and interactive way for recipients. The AR enhanced poster aims to improve users' perception of the product and strengthen brand image by creating an immersive layer over traditional poster content. a qualitative approach was applied with participants to measure the impact of the AR poster on enhancing message delivery, product recall, and user engagement compared to a traditional poster. Additionally, the study examined how interactive AR features support user interaction with the poster content, fostering a stronger connection with the product and the brand.

The AR enhanced poster allowed users to interact with dynamic content, animations, and 3D visualizations while maintaining the design identity of the original poster, adding an engaging element to the advertising experience. These interactive features were implemented to enhance user perception and provide an enjoyable and memorable product experience through AR technology in poster design.

Methodology Procedures:

The methodology procedures followed these steps:

- 1- Choose a brand to make the applied study depending on it in this study the author chose her brand it is called "Sera Zone" it's an

Egyptian Brand to design a headscarf by using authentic drawings like birds, plants and geometrical shapes.

The target audience for the brand mainly females from 16 to 40 as the design of the scarf is trendy with cheerful colors.



Fig (1) the logo of the brand

- 2- Choose the product line the author chose the bird line for the experiment to make the design more naturally inspired and to make it more cheerful.
- 3- Design two versions of the same advertising

poster the first version as a traditional static version for 4 products Fig (2) and the other version as an interactive AR-enhanced poster using Augmented reality technology Fig (3), Fig (8).



Fig (2) first version as a traditional static version poster for 4 products

The First version of interactive AR-Enhanced poster:



Fig (3) The first version as an interactive AR-enhanced poster for one product

Design Considerations of the first proposed AR enhanced poster design:

Table (2) The design considerations of the first proposed AR enhanced poster

Design Consideration	The visual Analysis	Images for the design
Colors	The colors were chosen to be related to the scarf colors and to give a calm feeling to the design to match the slogan which is “dreamy scarf” so pastel color with its variants were chosen to make harmony and on the other hand a dark blue color was chosen in the text which leads to more catchy design and achieves a strong legibility.	FADAC7 F8A587 3B99CF Fig (4) Harmony colors were chosen in the poster design
Motion	Some elements were chosen to be animated like leaves and the scarf itself to add dynamic feeling in the enhanced AR poster also dissolving animated effect was chosen to make a smooth transition between the images to give more details about the products and to display it in different context to enhance the product image and to add a dynamic feeling to the recipients while seeing the poster, also the logo was animated by make it bigger and smaller to grab the attention to it to enhance brand identity Fig (5)	Fig (5) The animated elements in the first AR enhanced poster
Typography	The typography designed to be elegant and simple to achieve a dreamy feeling in the design the main slogan was designed with sans -serif font and also in the call-to-action text to make it easier for the recipients to read it from the mobile screens	Fig (6) Sans serif font was used in the first AR enhanced poster for more legibility

Design Consideration	The visual Analysis	Images for the design
Layout	The layout designed to be simple by adding some illustrations inspired by the drawings in the scarf to make the good relation between the product and the poster and to create a dreamy effect when seeing the poster enhanced with AR technology. the layout of the poster designed following a basic grid system to achieve the visual consistency between the different poster images in the design by making repeated layout to display the product consistently to achieve simplicity in the design	 Fig (7) The layout of the first AR enhanced poster
Music	One of the key advantages of using AR-enhanced posters is the ability to incorporate music, which significantly enriches the interactive experience and creates an engaging, immersive atmosphere for the recipients. In this poster, a music track titled “Plain-Folks” by composers Edward Grenga, Charles Lawry, Douglas Stevens, and Michael McMahon was chosen to be integrated into the AR poster to add a warm, relatable, and dreamy tone, aligning with the product’s image while enhancing the emotional connection between the recipients and the advertisement. The inclusion of music not only attracts attention but also helps in creating a memorable user experience, supporting stronger retention of the product image in the recipients’ mind.	
New Interactive Experience	AR-enhanced posters provide an interactive experience that goes beyond the static nature of traditional posters. Through motion, and integrated music, AR enhanced posters capture attention and create an immersive environment that strengthens message retention.	

The Second version of interactive AR-enhanced poster:



Fig (8) The second version as an interactive AR-enhanced poster for one product

Design Considerations of the second proposed AR poster design:

Table (3) The design considerations of the second proposed AR enhanced poster

Design consideration	The visual Analysis	Images from the design
Colors	The colors were chosen to be related to the scarf colors and inspired by jungle colors to give the feeling of nature and confidence. Deep blue and orange colors were chosen to give a contrast in the design to grab the attention and to be related to the scarf. the two colors also were chosen to design the text to achieve appropriate legibility	 3A1FBE 00A8AB 97BB82 FFA434 Fig (9) complement colors were chosen in the poster design
Motion	Certain elements, such as the leaves and the scarf, were animated to introduce a dynamic aspect to the AR enhanced poster. A dissolving animation effect was applied to ensure smooth transitions between images of the products allowing for detailed product showcasing in various contexts to strengthen the product image and create a lively experience for recipients. Additionally, the logo was animated with a subtle scaling effect to draw attention and reinforce brand identity, Fig (10)	 Fig (10) The animated elements in the second AR enhanced poster
Typography	Sans serif fonts was chosen for the text with dark colors compared with the background to enhance legibility from the mobile screens	 Fig (11) Sans serif typography used in the first AR enhanced poster for more legibility
Layout	The layout designed to be simple following the basic grid system to achieve the visual consistency by making repeated layout to display the product in various contexts consistently	 Fig (12) The layout of the second AR enhanced poster

Design consideration	The visual Analysis	Images from the design
Music	For this AR enhanced poster, the “He Is on His Way” by Jincheng Zhang music track was chosen as a background music to add a feeling of enthusiasm and to enhance the whole interactive experience while seeing the product in a various context to enhance its image in recipients’ mind and to create a more engaging and immersive environment for recipients.	
New Interactive Experience	By scanning the static poster with the mobile application, the recipients can see the AR enhanced poster with a complete interactive experience that includes animations, music, and dynamic content, allowing them to engage actively with the product, view it from different perspectives, and gain a deeper understanding of its features in an enjoyable and memorable way.	

Procedures of the experimental study:

The purpose of this study is to examine how using augmented reality (AR) technology in poster design affects product image and user perception compared to traditional posters. It also aims to identify effective design principles for using AR technology in poster design to enhance user engagement, message retention, and brand connection. The author focused on investigating two main research questions:

- What is the impact of using AR technology in poster design on product image compared with traditional poster?
- What are the design principles of using AR technology in poster design?

Based on the highlighted research questions, this study attempted to test the following research Participants:

hypothesizes:

- Using AR technology in poster design may enhance product image toward the recipients compared with traditional poster
- Taking into consideration the appropriate design principles While applying AR technology in poster design may increase its effectiveness.

Data Collection Methods:

- **Focus Groups:** To explore user perceptions, emotions, and opinions regarding each poster.
- **Questionnaires:** Structured with Likert-scale from 1 to 5 as 1 is the lowest point and the 5 is the highest one in addition to open-ended questions to gather qualitative data on aspects such as perceived innovation, emotional engagement, clarity, and brand Image.

Table (4) characteristics of the chosen participants for questionnaire

	Age	Gender	Education	Reason of choice
Graphic design Specialists (10) participants	From 16- 40	Female	Graduates from faculties of fine or applied arts specialized in graphic design	Graphic design specialists have knowledge about graphic design and their answers on the questionnaire about the impact of usage AR technology and design considerations related to it in poster design will be on a strong scientific base so the results will be more accurate.
Normal Consumers (10)	From 16- 40	Female	Well educated	Normal recipients are consumers of the product so their answer will be from their perspective and will measure the impact of using AR technology to enhance poster design efficiency in improve product image towards them

The Purpose of the experimental study is to measure the following :

Table (5) The measurements of the experiment depending on Likert scale

Efficiency of using AR technology in poster design			
Motivation	New technological experience	Loyalty	Retention ability
The poster makes me interested in exploring more products from the brand.	The poster provided a modern and innovative experience.	The poster increases my trust and connection with the brand.	I can easily remember the product after viewing the poster.
Design consideration of using AR technology in poster design			
Diversity	Motion	Layout design	Music
The poster shows the product in a clear and diverse way.	The used motion in design keeps my attention focused on the product and added a sense of dynamic spirit in the design	The design of the poster (layout, colors, interaction) is suitable and effective for the content presented.	The music motivated me to be more engaged with the poster

Results: In order to take an accurate answer from the participants, the traditional poster were displayed to the participants and then the same poster were displayed with AR technology through a mobile screen then a questionnaire form was

distributed to the focus group participants to take an accurate result depending on Likert scale, The questions and the answers are displayed in the following table.

Table (6) the questions and the answers with the obtained results from the questionnaire form

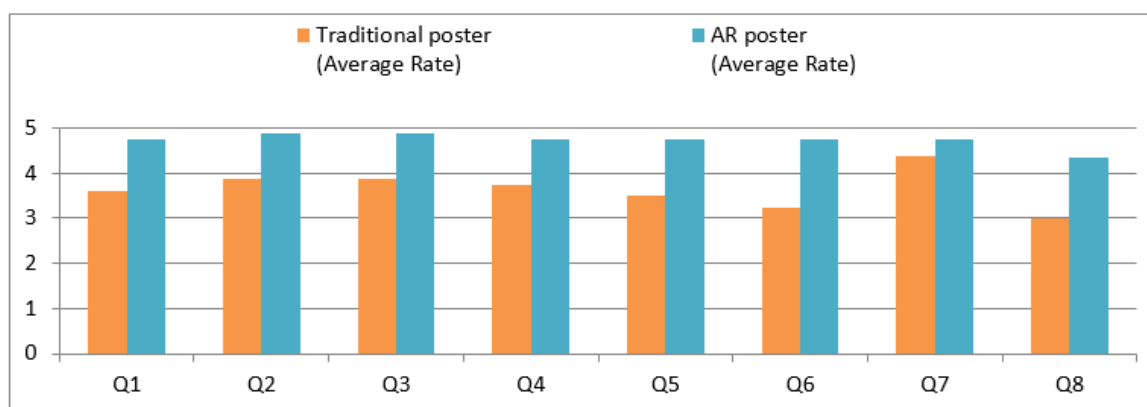
	Questions	Traditional poster (Average Rate)	AR poster (Average Rate)
Graphic design Specialists & Normal consumers (20 participants)	1- The poster makes me interested in exploring more products from the brand.	3.6	4.75
	The poster provided a modern and innovative experience	3.88	4.88
	3- The poster increases my trust and connection with the brand.	3.88	4.88
	4-I can easily remember the product after viewing the poster.	3.75	4.75
	5- The poster shows the product in a clear and diverse way.	3.5	4.75
	6-The used motion in design keeps my attention focused on the product and added a sense of dynamic spirit in the design	3.25	4.75
	7-The design of the poster (layout, colors, interaction) is suitable and effective for the content presented.	4.38	4.75
	8- The music motivated me to be more engaged with the poster	3	4.33
Open ended questions	8- What did you find most effective in the AR enhanced poster compared with the traditional poster? - Seeing more details of product - It Grabs attention easily - As it moves, it shows me the design and the application of the design on the model wearing it. - movement - I found that AR poster is more dynamic and diverse I found the product from different perspective I also like the way I saw the product on a model with the same poster context which a new experience for me - Very interesting that makes the viewer interact with it		

9- How could AR poster design be improved to enhance product image and user experience?

- Making animation with different styles based on brand and product
- Maybe a little bit faster while moving elements.
- seamless integration, clear visual hierarchy, interactive 3D elements, fast performance
- More smooth transitions
- creating a creative experience with good visual appeal
- It could be less in details as the motion is enough focus more on the product
- In my opinion its perfect, it's very simple and deliver the message clearly. It doesn't need to be complicated

10- Does using AR technology in poster design make you more likely to engage with the product? Why or why not?

- Yes, because I can see more details of product
- Definitely
- Yes
- Yes, it keeps me focusing on the product
- yes, as it shows every detail about the product rather than traditional posters that show a 2D image only
- Yes, as there are many diverse for the visuals its very interesting and different



Dig (1) Statistic to show the results of Likert scale to compare between the traditional poster vs AR enhanced poster

Discussion:

The comparative analysis between traditional and AR enhanced posters shows a consistent increase across all measured variables in favour of AR enhanced posters:

- **Motivation and Exploration:** AR enhanced posters scored 4.75 compared to 3.60, indicating a significant increase in recipients' interest in exploring more products from the brand using AR technology in poster design.
- **Modern Experience and Brand Trust:** The perception of modernity and innovation rose from 3.88 to 4.88, as did trust and connection with the brand, reflecting AR's ability to project an innovative brand image.
- **Product Memorability:** Memorability improved from 3.75 to 4.75, highlighting the role of AR's interactive elements in enhancing recall of the product which enhances the product image.
- **Clear and Diverse Presentation:** AR enhanced posters got (4.75) were perceived as

providing clearer and more diverse product views than traditional posters that got (3.50), aligning with AR's layered storytelling and dynamic display.

- **Motion and Dynamics:** A notable increase from 3.25 to 4.75 demonstrates AR enhanced posters strength in maintaining audience focus and adding an engaging dynamic spirit through animations.
- **Design Considerations:** the following design considerations were applied to the AR enhanced posters which make it still surpassed than traditional poster with average rate of (4.75)

Animation:

- Adds purposeful motion to highlight key features and sustain user attention in AR enhanced posters compared with traditional ones make the AR enhanced posters more effective
- Uses smooth transitions to avoid overwhelming the viewer while maintaining

engagement is a good way of using animation in AR enhanced poster

- Creates a dynamic, enjoyable experience aligned with the product's identity in AR enhanced posters is a very powerful way to enhance brand image.

Interactivity:

- Adding interactivity features in the AR enhanced poster increased its effectiveness by allowing users to explore more products dynamically.
- Encourages exploration in AR enhanced poster leads to increase motivation and retention of the product.
- Using interactivity in AR enhanced poster supports an engaging experience that transforms the poster from a passive visual into an active discovery tool

Music Engagement: The addition of music in AR posters increased engagement motivation from 3.00 to 4.33, supporting the multisensory enhancement that AR technology provides.

Results:

- These results demonstrate that AR enhanced posters significantly improve user engagement, perceived brand modernity, and product image compared to traditional posters. The findings indicating that AR technology increases interactivity, emotional connection, and recall of the product, making it a powerful tool in advertising and poster design to capture and sustain audience attention while enhancing brand identity.
- The use of motion, interactivity, and music within AR posters not only retains the viewer's focus but also adds layers of meaningful interaction that contribute to a stronger, memorable, and enjoyable brand experience. This supports the integration of AR technology in poster design as an effective method for enhancing product image and audience engagement.
- Unlike traditional posters, AR enhanced posters allows users to interact with content, explore additional product information, and engage actively with the advertisement, fostering a stronger connection with the product and brand while making the viewing experience more memorable.
- The comparative analysis highlights that AR enhanced posters provide a significantly richer and more engaging user experience than traditional static posters. While traditional posters depend solely on visual appeal for message delivery, AR posters add dynamic

layers such as motion graphics, and animations, which actively engage the recipients.

- Features like integrated music in AR posters create an immersive atmosphere that evokes emotions and enhances message retention, making the advertisement more memorable.
- AR posters strengthen brand perception and foster motivation to learn more about the product, ultimately contributing to a stronger product image in the recipients' minds, this dynamic engagement not only enhances message retention and product recall but also aligns with modern user expectations for interactive and innovative advertising. By enabling deeper product exploration,
- AR technology in poster design also enables users to interact directly with the content by gestures like tapping, scanning, or exploring additional product information which fosters active participation rather than passive viewing. This interactive engagement strengthens the connection between the user and the product, encourages curiosity to explore more offerings from the brand, and supports deeper understanding of product features within the same poster context by transforming the poster into an evolving digital experience,
- AR technology in poster design enhances the storytelling aspect of advertising, aligning with modern audience expectations for innovative and engaging communication while reinforcing the product's image and the brand's identity.

Conclusion:

- In this paper, the author examined the impact of applying augmented reality (AR) technology in poster design to enhance product image and user engagement. The study explored how interactive AR features, such as motion, animation, interactivity and music, contribute to increasing user motivation, retention, and deeper connection with the advertised product, making the experience more dynamic and memorable for recipients. Additionally, the research investigated the role of applying appropriate design principles such as layout, color harmony, and clear interactive flow when using AR technology in poster design, assessing their effectiveness in enhancing message delivery and maintaining user focus. The results revealed that the hypotheses H1. Using AR technology in poster design may enhance product image toward the recipients compared with traditional poster

- H2. Taking into consideration the appropriate design principles While applying AR technology in poster design may increase its effectiveness were not rejected.
- This study contributes to advancing the field of AR advertising by proposing a vision for utilizing AR and thoughtful design practices in poster design, demonstrating how these tools can improve the effectiveness of visual communication and strengthen product image in an engaging and enjoyable manner for the audience.

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