



EXPLORING THE IMPACT OF AUGMENTED REALITY-BASED ADVERTISING ON STUDENT ENROLLMENT IN PAKISTANI EDUCATIONAL INSTITUTIONS

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Abstract

This research investigates the effects of augmented reality (AR) based marketing on the likelihood of a Pakistani student to enroll in an educational institution. By a quantitative approach, data were gathered from 30 participants that answered a structured questionnaire. The factors both AR familiarity, AR-based ads engagement, perceived effectiveness of AR-based ads and enrollment intentions were described and inferred in a statistical analysis. The results showed a positive significant and strong correlation between subjective effectiveness of AR-based adverts and intentions to attend the university, which emphasizes the key role of efficient advertisements in selecting students. On the other hand, the frequency of AR usage and direct involvement with AR-based advertising was found to have little or no direct impact on

enrollment. The study reveals that AR advertising is nothing but a powerful marketing tool for attracting prospective students, though it is important for the researches to continue exploring the intricate relationships between the different factors impacting enrollment decisions. Provided suggestions are AR-based advertising campaigns investment, increasing AR technology familiarity, adapting advertisements to target audience, and partnering with AR technology providers.

Keywords: Augmented reality, Advertising, Enrollment, Educational institutions, Pakistan, Marketing strategies

INTRODUCTION

In the changing scene of education in Pakistan, getting the new students into educational institutions has become a quite hard task as there is a high level of competition (Salman et al., 2023). Modern advertising has developed to a higher level, which is more advanced and it is adopting the use of technologies such as Augmented Reality (AR). VR is a technology that shows virtual data in the real world. Therefore, it provides an interactive experience according to Kazmi et al. (2021). Pakistan has its learning institutions that are very close to being the best in the world, and Augmented Reality can be a great advertising opportunity for them. Using such technology, schools are able to showcase their services in a more 3D-like and interactive way and this could be the very thing that can help augment the likability of prospective students. While the utilization and the influence of AR advertisements by the education sector in Pakistan is taken for granted, being a neglected area, very less is known about it. The significance of the understanding of the influence and the impact of AR-driven advertising on this environment has become critical for tuition institutions as the education institutions are competing to attract students by the use of new technologies.

Research Objectives

- To assess the effectiveness of augmented reality (AR)-based advertising in attracting and engaging prospective students in Pakistani educational institutions.
- To understand the perceptions and attitudes of prospective students towards AR-based advertising and its influence on their enrollment decisions.

Research Questions

1. How effective is augmented reality (AR)-based advertising in attracting and engaging prospective students in Pakistani educational institutions?

2. What are the perceptions and attitudes of prospective students towards AR-based advertising, and how does it influence their enrollment decisions in Pakistani educational institutions?

LITERATURE REVIEW

Augmented Reality in Advertising

The rise of AR in advertising business is of benefit to the advertising businesses by making the medium more engaging and immersive for the consumers. AR virtualizes the real world by overlaying digital content over it and hence makes users experience extremely realistic and special (Kljun et al., 2020). In advertising, AR technology offers brands with innovations for the campaigns to be more interactive and get the attention of their target audience. Research has confirmed that attention and retention of the message are higher in AR-based ads than traditional methods of advertising (Yang et al., 2020). Consumer behavior becomes more active as they tend to interact with AR content which consequently results in brand awareness and purchase intentions. Various companies from the retail, automotive, and entertainment industries, among others, have launched AR-based advertising campaigns that have proved to be effective in terms of providing customers with an elevated experience as well as boosting sales (Moreno-Armendáriz et al., 2022).

Advertising in Educational Institutions

Advertising is a very powerful tool when it comes to bringing in prospective students to educational facilities through messages about programs, facilities, and campus atmosphere. Owing to the digital marketing strategies adopted by the educational institutions in the last few years, they have been able to connect and engage with their targeted audiences efficiently. Modern advertising blending the traditional media, like print ads and brochures, with digital avenues, which include social media, search engine optimization and email campaigns, is rapidly gaining popularity (Miotto et al., 2020). Although the competition for student enrolment has become tougher, education providers have been exploiting invention marketing strategies. The application of augmented reality (AR) technology is the latest educational trend which can be used for differentiation of educational institutions and would appeal to prospective students. Through the use of AR-based advertising, institutions can demonstrate what their campus looks like, what academic programs they have, and student life can be shown in an immersive and interactive manner; this way, more people can get interested in them (Usman & Ab Rahman, 2020).

Augmented Reality in Education

Augmented reality (AR) has been known to be a game-changing technology in education (Garzón, 2021). It is able to provide learners with a new kind of experience that combines the physical and virtual worlds. AR technology is the one that combines the technologies of a smartphone camera and digital content such as 3D models, videos, and animations and then adds it all into the real world so that students can learn more efficiently and can participate in interactive activities. The case studies of AR in education that a lot of teachers and researchers have offered include virtual lab experiments and interactive textbooks as well as augmented reality-enhanced expeditions. The outcomes of the studies have indicated that the use of an AR application results in positive student engagement, interest and learning outcomes (Geroimenko, 2020). Interactive and experiential learning will incorporate AR technology that might be the big thing in learning. It will be the critical part of the coming-to-be of the future Ways-of-Life of the Workplaces.

Theoretical Framework

The fundamental idea of the theory of advertising success can be understood through the extensive conceptual models that touch upon the customer attitude and the success of advertising. Take the case of the elaboration likelihood model (ELM), which is one of the types of attitude change models, which indicates that the efficacy of the advertising message is based on the degree of elaboration or cognitive processing by an individual. The ELM suggests a two-level information system of reception, where the intention and the ability of an individual to process the message determine whether they engage in central or peripheral processing of advertising messages (Srivastava & Saini, 2022). The next conceptual framework is the Technology Acceptance Model (TAM) which is focused on the factors that determine whether technology is adopted and used or not. In TAM, the researchers contended that perceived usefulness and ease of use are the two fundamental factors that drive a person to believe and have a positive attitude towards the use of new technologies such as AR (Davis & Granić 2024, p. 30). The researchers can be offered the opportunity to apply this theoretical framework so as to be able to identify the effectiveness and acceptability of AR educational advertising.

METHODOLOGY

Research Design

The research was configured descriptively based on the analysis of the present situation and the specific features of AR advertising which influence the student enrollment of the educational institutions of Pakistan. The study was based on filling out questionnaires with

information on participants' familiarity with AR, exposure to AR-based advertisements, engagement with ads, perceived effectiveness of the ads, enrollment intentions, and demographics was collected. By doing so, we will have a way of systematically conducting a study of these variables in order to understand their relationships and the implications for enrollment.

Development of Survey Instrument

The research questionnaire was structured to measure the public perception on specified aspects of AR advertisement and students' enrolment decision. The questionnaire was prepared of the questions to be used for the assessment of the level of knowledge of AR technology and the level of interaction with AR ads among the participants, the assessment of the effectiveness of the ads and the intention to join or enroll in educational institutions.

Sampling Procedure

For this research, the research population consisted of Pakistani students who were contemplating higher education options and were yet to finalize where to apply. The technique of convenience sampling was used in reaching the target population. Surveys were administered to 30 students through online platforms, social media sites and educational institutions' website.

Data Collection Process

The survey instrument distribution and data collection process was carried out through online means. Students were given a survey questionnaire and the responses were collected over a specified period. We briefed the participants on the survey completion procedure and guaranteed the confidentiality and anonymity of their answers. The communication was sent to remind the people and to encourage their participation and to get the highest response rate.

Data Analysis Techniques

Data collected by the survey in a quantitative form were analyzed through descriptive and inferential statistical methods. The descriptive statistics, including the frequencies, means, and standard deviations, were the tools to summarize the demographic data, familiarity with AR technology, and engagement with AR-based ads among the participants. More advanced inferential statistical methods like correlation analysis and regression analysis were used to uncover the relationships between variables, and to identify predictors

of enrollment intentions that are statistically significant. These analytical methods produced results regarding the efficacy and the outcomes of the AR advertising in the context of the Pakistani education sector.

Ethical consideration

Ethical issues were thought through at every stage of methodology of this research. Data collection was performed after all the participants provided informed consent and an understanding of the purpose of the research, rights of the participants and confidentiality of the answers was provided. Participants were promised privacy, and the identity of the respondents was maintained in secrecy during the survey. Furthermore, the research was carried out with great attention to the avoidance of any injuries or inconvenience of participants, and it conformed to the ethical rules which were established by the institutional review boards.

ANALYSIS

Descriptive Statistics

Table 1: Frequency of Gender

	Frequency	Percent
Female	15	50.0
Male	15	50.0
Total	30	100.0

The dataset shows an equal split between male and female participants, with each comprising 50% of the sample.

Table 2: Frequency of Familiarity with AR

Familiarity with AR	Frequency	Percent
Extremely familiar	6	20.0
Moderately familiar	6	20.0
Not familiar	7	23.3
Somewhat familiar	5	16.7
Very familiar	6	20.0
Total	30	100.0

Participant familiarity with augmented reality (AR) ranged from extremely familiar (20%) to not familiar (23.3%), with other categories including moderately familiar (20%), somewhat familiar (16.7%), and very familiar (20%).

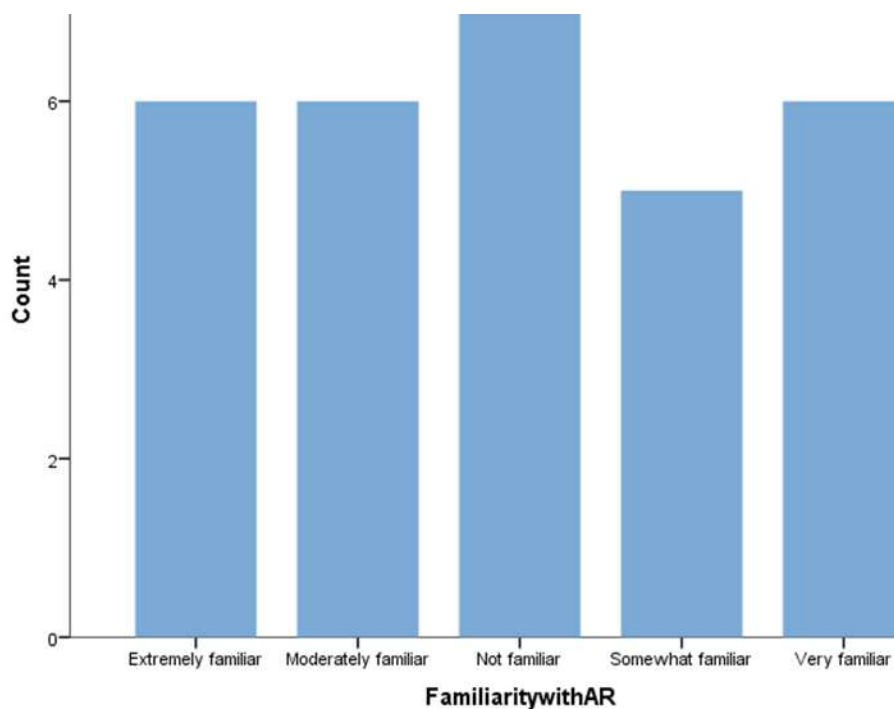


Figure 1: Line graph of Familiarity with AR

The Line graph shows that majority of participants reported being either not familiar or very familiar with AR.

Table 3: Exposure to AR-Based Ads

AR Based Ads	Frequency	Percent
Frequently	8	26.7
Never	6	20.0
Occasionally	8	26.7
Rarely	8	26.7
Total	30	100.0

Exposure to AR-based advertisements varied, with 26.7% reporting frequent exposure, 20% reporting never being exposed, 26.7% occasionally exposed, and another 26.7% rarely exposed.

Table 4: Engagement with AR-Based Ads

Engagement	Frequency	Percent
Extremely engaging	5	16.7
Moderately engaging	6	20.0
N/A	6	20.0
Not engaging	5	16.7
Somewhat engaging	4	13.3
Very engaging	4	13.3
Total	30	100.0

Engagement with AR-based ads varied among participants, with 16.7% finding them extremely engaging, 20% moderately engaging, 13.3% very engaging, and 20% not engaging. Some participants (20%) responded with N/A, while 13.3% found them somewhat engaging. Participants showed diverse levels of engagement with AR-based ads, with a notable proportion indicating N/A responses.

Table 5: Age Descriptive Statistics

	N	Mean	Std. Deviation
Age	30	24.567	2.9790

The descriptive statistics reveal that the average age of the participants is approximately 24.57 years, with a standard deviation of 2.98, indicating a relatively narrow spread of ages within the sample.

Inferential Statistics

Correlation

The correlation analysis revealed significant relationships between several key variables related to augmented reality (AR)-based advertising and prospective students' enrollment intentions in Pakistani educational institutions.

Table 6: Correlation

	Familiarity with AR	Engagement With AR-Based Ads	Perceived Effectiveness	Enrollment Intentions
Familiarity with AR	1	.652**	.787**	.749**

Engagement with AR based Ads	.652**	1	.947**	.929**
Perceived Effectiveness	.787**	.947**	1	.963**
Enrollment Intentions	.749**	.929**	.963**	1

Table 6...

** . Correlation is significant at the 0.01 level (2-tailed).

Specifically, strong positive correlations were found between familiarity with AR and enrollment intentions ($r = 0.749$, $p < 0.01$), engagement with AR-based ads and enrollment intentions ($r = 0.929$, $p < 0.01$), and perceived effectiveness of AR-based ads and enrollment intentions ($r = 0.963$, $p < 0.01$). The results show that citizens are more likely for hearing they want to go to schools that utilise these kinds of ads if they know more about AR technology along with are interested in and believe that AR-based ads work. These results show that AR-based promoting has a lot of ability to interest and attract possible students, which could change their mind about whether or not to enroll.

Regression

The regression analysis showed in more depth how to guess if a possible student will actually join in a Pakistani school.

Table 7: Regression

Model	Unstandardized		Standardized		
	Coefficients		Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	-.074	.287		-.259	.797
Familiarity with AR	.041	.148	.026	.275	.786
Engagement with AR-Based Ads	.250	.236	.193	1.059	.300
Perceived Effectiveness new	1.146	.337	.760	3.398	.002

R-squared of 0.930 showed that the model was very good at explaining things. It took into account how familiar people were with AR, how often they saw AR-based ads, and how effective people thought these ads were as separate factors. This indicates that approximately 93% of the variance in enrollment intentions can be explained by these predictor variables, suggesting a strong relationship between the predictors and the outcome variable.

Among the independent variables, perceived effectiveness of AR-based ads emerged as the most significant predictor of enrollment intentions, with a standardized coefficient (beta) of 0.760 ($p = 0.002$). This suggests that for every one-unit increase in perceived effectiveness, there is a corresponding increase of 0.760 units in enrollment intentions, holding other variables constant. This finding underscores the pivotal role of perceived effectiveness in shaping prospective students' intentions to enroll in educational institutions employing AR-based advertising strategies.

Additionally, familiarity with AR showed a positive but non-significant association with enrollment intentions (beta = 0.026, $p = 0.786$), implying that while familiarity with AR may influence enrollment intentions to some extent, its impact is not statistically significant in this analysis. Similarly, engagement with AR-based ads exhibited a positive association with enrollment intentions, albeit non-significant (beta = 0.193, $p = 0.300$), indicating that while engagement with AR-based ads may play a role in shaping enrollment intentions, this relationship did not reach statistical significance in this sample.

Overall, the regression analysis highlights the paramount importance of perceived effectiveness of AR-based ads in driving prospective students' enrollment intentions. Educational institutions seeking to enhance their enrollment rates should focus on designing AR-based advertising campaigns that are perceived as highly effective by their target audience.

DISCUSSION

The descriptive statistics reveal an equal distribution of male and female participants, with varying levels of familiarity with AR technology and engagement with AR-based ads. It was mostly people who said they were either unaware of a great deal about AR or as believed a lot with it. The period of time respondents spent looking at AR ads changed based on how often they were seen. Also, people had very different emotions to AR ads. A lot of them found them somewhat or not at all amusing. The study of correlations found strong links between understanding about AR, being enthusiastic about AR-based ads, believing that AR-based ads my job, and wanting to sign up. As possible students learn more about AR technology and interact with Ai-based ads, they are a greater probability to say they would like to attend campuses that use these types of ads. This is because they think these types of ads work better. The regression analysis also showed that how good people thought AR-based ads were was an excellent gauge of their plans to sign up. Being conversant with AR and reacting to ads that make use of AR were the linked to planning to join, but in this study, they didn't add much value.

SUMMARY OF THE RESULTS

The study shows a lot about how ads that use augmented reality (AR) might change people's plans to head to school in Pakistan. People who knew about AR were more likely to interact with AR-based ads, believe that AR-based marketing work, and make plans to register. It looks like AR technology might have been used as a good way to market in the schooling field. Other research has shown that AR can engage viewers and change the way people act. These results back that up. People's plans to sign up were strongly linked to how good they thought AR-based ads were. This shows just how vital it is to make ads that are intriguing and have an effect. Schools need to concentrate on strategies that make potential students convince them that AR-based marketing are more important and helpful. This will make it more likely for those students to enroll.

However, there were not any substantial linkages between knowing about AR, seeing AR ads, and plans to join. This shows that these factors may not directly lead to plans to join. There needs to be more research done in order to identify complicated factors that control or change how these elements relate to each other. In the end, the data show that ads using AR could help get more people to sign up for schools in Pakistan. Universities can become attractive and competitive by investing resources on new AR-based marketing tactics that are intended for a specific group. This will ultimately translate to elevated numbers of applicants and success for the school.

CONCLUSION

The outcome of this research offers some vital implications for AR-based advertising on the student intention towards the enrollment in the educational institutions of Pakistan. The analysis uncovered that there is a strong correlation between the fact that we are familiar with AR, the extent of our involvement with the AR-based ads, our perception of the AR-based ads effectiveness and the intention to enroll. The most powerful predictor of enrollment motives among students was a belief in the effectiveness. Thus, AR-based advertising has a very significant role in attracting students.

While the survey revealed encouraging results, factors like the level of familiarity with augmented reality or engagement with AR marketing were not found to have significant direct impacts on enrollment intentions. This implies the necessity of further investigation to demystify this phenomenon, and trying to identify other factors that may have a bearing on this decision.

RECOMMENDATIONS

Invest in Effective AR-Based Advertising Campaigns: A good practice for educational institutions is to invest in the development of AR-based advertising campaigns that are entertaining, informative, and thus, seen as effective by the audience of the ad. This can be

achieved by using AR technology that will bring the excitement and attract students to the educational services.

Enhance Familiarity with AR Technology: Institution should aim at raising students' awareness and familiarity with AR technology as they make application to join them. Educational resources, workshops, and demonstrations can be given to ensure that the students are furnished with the functionality and advantages of AR in order to boost the acceptance of AR-based ads by the students.

Continued Research and Evaluation: To carry out a deeper investigation in order to discover the intricate dialectics of familiarity with AR, engagement with AR-related ads, perceived effectiveness, and enrollment intentions, additional research is required. Longitudinal studies and qualitative research approaches can be the resources for gaining profound the real factors that affect enrollment decisions.

Tailor Advertising Strategies to Target Audience: In order to ensure their AR-based advertising strategies work, educational institutions must take the time to customize their messages to reflect the tastes and desires of their target audience. The knowledge about the demographics, needs and behaviors of the target students might be used for creating the personalized advertisements that are relevant and giving the clear message about the university program.

Collaborate with AR Technology Providers: Cooperative work with AR technology suppliers and specialists will make it possible to develop and implement advanced AR-powered advertising solutions. Extending the expertise of external institutions can contribute to the institutions staying ahead in the technological advancements and present prospective students with the latest advertising experience.

LIMITATIONS AND FUTURE RESEARCH

Given that the study sample is rather small, it may reduce the generalizability of the results to the whole population. Moreover, the self-reported data from questionnaires could be a source of bias and social desirability effects. The study's cross-sectional design is also limiting in terms to demonstrate causality between variables. Secondly, the research design that centers on AR advertising in the educational institutions of Pakistan might be without the generalization of the findings to different settings. Lastly, the analysis's failure to account for a variety of

external factors, for example, the socioeconomic status, or the institutional reputation, can interfere with the revealed relationships.

Research into augmented reality (AR) based advertising and its impact on Pakistani student enrollment in future could be extended to track long term impact, qualitative studies for in-depth observation of motivation, comparative research alongside traditional methods, segmentation to know about responsive demographics, experimental studies to establish cause-effect relationships, investigation on emerging technologies like virtual and mixed reality, cross-cultural research for broad insights, and research Through these directions, researchers can be part of a complex analysis of AR advertising's place in recruitment and create better marketing strategies based on the gained insights.

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