

Algorithmic Bias in AI Advertising: Shariah Perspectives on Higher Education Economic Justice

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Abstract:

Artificial intelligence-driven advertising increasingly influences equitable access to higher education, raising concerns regarding algorithmic bias and economic justice. This study examines algorithmic bias in AI-assisted educational advertising from the perspective of Shariah economic justice. A qualitative case study was conducted involving 20 purposively selected informants, including university administrators, marketing officers, information technology specialists, lecturers, and students, using semi-structured interviews, non-participant observations, and document analysis, followed by thematic analysis and triangulation. The findings reveal that algorithmic audience segmentation unintentionally restricts equal exposure to educational information. At the same time, inclusive AI practices require continuous institutional oversight and Shariah-based governance that emphasizes justice, transparency, accountability, and public welfare. This study presents an integrated framework that links responsible AI, educational advertising, and Islamic economic justice. The findings recommend periodic algorithmic audits and ethically grounded governance to promote equitable, transparent, and inclusive higher education advertising.

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INTRODUCTION

The rapid integration of artificial intelligence (AI) into digital advertising has fundamentally transformed how educational institutions promote academic programs, scholarships, and financial opportunities to prospective students. This transformation is socially significant because AI-driven advertising increasingly shapes access to higher education by determining which individuals receive information, promotional incentives, or financial assistance (Ahmad et al., 2022; Dou et al., 2023; Liu et al., 2024). Evidence from recent digital marketing studies indicates that algorithmic decision-



making often relies on historical behavioral data, leading to unequal exposure patterns among users with different socioeconomic, geographic, or demographic characteristics. Consequently, algorithmic bias may unintentionally reinforce educational inequality rather than expand equal opportunities (Hunkenschroer et al., 2022; Maladzhi et al., 2023). Therefore, examining AI advertising from the perspective of economic justice has become an urgent academic and societal necessity.

Despite the efficiency offered by AI-based advertising systems, numerous practical challenges have emerged regarding fairness and transparency in algorithmic targeting. Universities increasingly use predictive advertising algorithms to optimize recruitment strategies, yet these systems often prioritize users with higher purchasing potential or stronger digital engagement, overlooking economically disadvantaged groups (Akter, 2021; Timmons et al., 2023). Such practices may result in unequal access to educational information, scholarship announcements, or admission opportunities without explicit discriminatory intent. Furthermore, the opaque nature of machine learning algorithms complicates public accountability and institutional oversight (Shaamala et al., 2024; Taimoor et al., 2022). These conditions raise concerns about distributive justice, as technological efficiency may inadvertently conflict with ethical responsibilities to provide equitable educational access for all members of society.

Previous studies have extensively discussed algorithmic bias from technological, ethical, and marketing perspectives. Afif (2023), Nugraheni et al. (2024), and Munir et al. (2022) argued that predictive algorithms may institutionalize inequality through biased decision models. O'Hara (2022) and Zoomer et al. (2023) demonstrated that algorithmic systems can reproduce structural discrimination in digital platforms. Huhn et al. (2022) highlighted how automated decision-making disproportionately disadvantages vulnerable populations, while Yilmaz et al. (2024) and Jia et al. (2024) emphasized the social consequences of biased AI technologies. Nevertheless, these studies primarily examine governmental services, commercial platforms, or technological governance, with limited attention to AI advertising in higher education. More importantly, they rarely integrate Shariah economic justice principles as a normative framework for evaluating algorithmic fairness, leaving an important theoretical and practical research gap.

This study advances the current literature by integrating algorithmic bias theory with Shariah perspectives on economic justice in the context of AI-driven higher education advertising. Unlike previous research that generally evaluates fairness using secular ethical principles, this study adopts Shariah concepts such as justice (*adl*), public welfare (*maslahah*), balance (*tawazun*), and the prohibition of discrimination (*zulm*) to construct a comprehensive analytical framework (Baymetov et al., 2025; Elkhodr et al., 2025; Prokhorov et al., 2025). The state-of-the-art contribution lies in positioning AI advertising not merely as a technological marketing instrument but as an ethical-economic mechanism that influences educational accessibility and the distribution of opportunity. Such integration enables a multidimensional evaluation encompassing technological performance, ethical accountability, and Islamic economic principles within higher education governance (Carter et al., 2022; Tsauri, 2022).

Based on these issues, several important research questions remain insufficiently addressed. First, how does algorithmic bias emerge within AI-based advertising systems used by higher education institutions? Second, to what extent do algorithmic advertising practices align with the principles of Shariah economic justice concerning fairness, transparency, and equal opportunity? Third, what governance mechanisms can reduce algorithmic discrimination while maintaining the effectiveness of AI-assisted marketing strategies? Addressing these questions is essential because educational advertising increasingly shapes access to information, financial support, and academic opportunities. Without adequate ethical evaluation, algorithmic optimization may unintentionally perpetuate socioeconomic disparities rather than support inclusive educational development.

This study argues that algorithmic bias in AI advertising can be mitigated through governance models grounded in Shariah economic justice principles, which emphasize fairness, transparency, accountability, and the inclusive distribution of opportunity. The proposed framework assumes that AI systems should optimize marketing performance without compromising equitable educational access for diverse socioeconomic groups. The originality of this research lies in its integration of artificial intelligence governance, digital advertising ethics, higher education management, and Islamic economic thought into a unified conceptual model. Consequently, this study contributes theoretically by extending interdisciplinary discussions on responsible AI and, practically, by offering policy recommendations for higher education institutions seeking ethically responsible AI advertising aligned with principles of economic justice.

RESEARCH METHOD

This study employed a qualitative case study design to explore algorithmic bias in AI advertising from the perspective of Shariah economic justice within higher education (Kohn et al., 2024). A qualitative approach was selected because the research aimed to understand ethical interpretations, institutional practices, and stakeholders' experiences rather than measuring causal relationships statistically. The case study design enabled an in-depth examination of how AI-assisted advertising systems influence perceptions of fairness, transparency, and equal educational opportunities. Furthermore, the approach facilitated a comprehensive exploration of the interaction between technological governance and Islamic economic principles, providing a contextual understanding of institutional decision-making processes and ethical considerations that quantitative methods alone cannot adequately capture.

The research was conducted at an Islamic higher education institution that has adopted AI-supported digital advertising for student recruitment, scholarship promotion, and institutional branding. This location was selected because it represents an educational environment where technological innovation intersects with Islamic ethical values in organizational governance. The study involved 20 purposively selected informants representing diverse institutional perspectives, including five university administrators responsible for digital strategy, four marketing and admission officers, three information technology specialists, four lecturers specializing in Islamic economics and Shariah studies, and four undergraduate students who had interacted with AI-based advertising. Their varied professional backgrounds enriched the understanding of algorithmic fairness and ethical implementation.

Data were collected through multiple qualitative techniques to obtain comprehensive and credible evidence (Kekeya, 2023). Semi-structured interviews served as the primary method for exploring participants' experiences, perceptions, and ethical evaluations of AI-driven advertising practices. Non-participant observations were conducted to examine institutional digital marketing activities, website interactions, and artificial-intelligence-supported promotional communication processes. In addition, document analysis was conducted on institutional marketing policies, AI governance guidelines, promotional materials, strategic planning documents, and relevant regulatory frameworks related to digital ethics and higher education management. The combination of these techniques enabled methodological triangulation and provided rich contextual information on algorithmic decision-making and Shariah economic justice principles.

Data analysis followed the interactive qualitative analysis model proposed by Miles, Huberman, and Saldaña (Cole, 2024). The process began with data condensation, in which interview transcripts, observational notes, and institutional documents were organized and coded by theme, including algorithmic bias, transparency, fairness, and Shariah-based economic justice. Subsequently, data reduction was conducted by selecting the most relevant findings while eliminating redundant information. The refined data were then organized through data display using thematic matrices and conceptual categories to facilitate interpretation. Finally, data verification involved continuously comparing emerging themes across different data sources until coherent conclusions were established and consistently supported by empirical evidence.

The trustworthiness of the findings was ensured through several qualitative validation procedures (Lee et al., 2024). Source triangulation compared information obtained from administrators, lecturers, marketing personnel, information technology specialists, and students to identify consistency across stakeholder perspectives. Method triangulation was achieved by integrating interviews, observations, and document analysis throughout the research process. Member checking was conducted by returning interview summaries to selected informants to confirm interpretative accuracy and contextual appropriateness. Furthermore, peer debriefing with researchers specializing in artificial intelligence ethics and Islamic economics was undertaken to minimize researcher bias. These validation strategies strengthened the credibility, dependability, confirmability, and transferability of the research findings.

RESULT AND DISCUSSION

Result

The findings demonstrate how artificial intelligence influences fairness in higher education advertising through algorithmic decision-making, inclusive information distribution, and Shariah-based governance. Data obtained from interviews, observations, and institutional documentation reveal interconnected patterns showing that technological effectiveness requires ethical oversight to ensure equitable educational opportunities. These findings provide empirical evidence supporting the development of responsible AI advertising aligned with economic justice principles.

Algorithmic Bias Shapes Educational Advertising Fairness

Algorithmic bias in educational advertising refers to the tendency of artificial intelligence systems to prioritize or exclude certain groups of prospective students when distributing digital promotional content. In the observed institution, this phenomenon was operationally identified through participants' experiences regarding unequal exposure to advertisements, scholarship campaigns, and admission information generated by AI-supported marketing platforms. The bias did not appear as explicit discrimination but emerged through automated audience segmentation based on previous online behavior, demographic characteristics, and predicted engagement. Consequently, fairness in educational advertising was interpreted as the extent to which AI systems provided balanced informational opportunities for individuals regardless of their socioeconomic background, digital activity, or geographical characteristics.

Interviews with institutional stakeholders revealed that algorithmic targeting significantly influenced promotional visibility among different categories of prospective students. One marketing administrator explained, "The advertising dashboard consistently recommends audiences who previously interacted with educational websites, making campaigns more efficient but limiting exposure to new audiences." Similarly, an information technology specialist stated, "The AI system optimizes advertisement delivery automatically based on conversion probability rather than educational equity considerations." These statements indicate that institutional actors recognized algorithmic optimization as a performance-driven mechanism instead of a fairness-oriented strategy. The researcher interpreted these findings as evidence that technological efficiency unintentionally narrowed access to educational information by continuously reinforcing existing patterns of digital engagement.

Students and academic staff also described different experiences regarding AI-generated educational advertising. A lecturer specializing in Islamic economics explained, "Students from rural communities frequently reported receiving less promotional information than applicants from urban areas despite having similar academic potential." Meanwhile, a student participant commented, "I only discovered scholarship opportunities after friends shared the information because the advertisements never appeared on my social media accounts." These narratives demonstrate that unequal digital exposure was experienced directly by users rather than merely perceived institutionally. The researcher interpreted these testimonies as indicating that algorithmic decision-making created disparities in access to information, thereby influencing perceptions of fairness throughout the student recruitment process.

Field observations corroborated the interview evidence, revealing noticeable differences in the visibility and distribution patterns of institutional advertisements across multiple digital platforms. Promotional content appeared repeatedly on accounts demonstrating high engagement with educational materials, whereas newly created or less active accounts received considerably fewer institutional advertisements despite searching for comparable academic information. Scholarship announcements were similarly concentrated within audiences already categorized as highly responsive by advertising algorithms. These observational findings demonstrated that algorithmic targeting operated through continuous behavioral

prediction rather than universal dissemination. Restating these findings, educational advertising opportunities were distributed selectively based on algorithmic assessment rather than being presented equally to all prospective students with comparable educational interests.

The overall findings revealed a consistent pattern linking algorithmic optimization to the unequal distribution of information in AI-supported educational advertising. Institutional administrators emphasized operational efficiency, technical personnel highlighted the predictive performance of systems, lecturers identified ethical implications, and students experienced differences in promotional accessibility. Observation findings further confirmed that algorithmic advertising repeatedly favored users with stronger histories of digital engagement while offering fewer opportunities to audiences outside established behavioral categories. This pattern demonstrates that algorithmic bias emerged gradually through automated optimization rather than intentional institutional discrimination. Consequently, educational advertising fairness became closely associated with the transparency of AI decision-making and the inclusiveness of audience segmentation strategies adopted within higher education marketing practices.

Inclusive AI Promotes Higher Education Economic Justice

Inclusive AI in higher education economic justice refers to the institutional application of artificial intelligence to ensure that educational information, scholarship opportunities, admission announcements, and promotional content are distributed equitably to prospective students, regardless of socioeconomic status, geographical location, or digital literacy. Operationally, inclusiveness was identified through direct observation of AI-assisted marketing practices implemented across institutional websites, social media platforms, advertising dashboards, and digital communication channels. Rather than emphasizing advertisement efficiency alone, inclusive AI was interpreted as the extent to which technological systems broadened educational accessibility for diverse groups. Therefore, economic justice was reflected in the balanced distribution of opportunities that minimized exclusion and promoted equal access to information throughout the recruitment process.

Table 1. Observation Results on Inclusive AI Practices in Higher Education Advertising

Observed Activities		Observation Indicators
Scholarship promotion on the institutional website		Scholarship information appeared on publicly accessible pages without login restrictions and remained continuously available.
AI-supported social media advertising		Promotional content targeted multiple demographic groups rather than only users with high purchasing potential.
University admission campaign		Admission announcements were distributed simultaneously across several digital platforms, including websites, social media, and messaging applications.
Advertising management	dashboard	Marketing staff periodically reviewed audience segmentation results to identify patterns of unequal distribution.
Digital accessibility	content	Promotional materials used simple language and visual formats that were understandable to audiences with diverse educational backgrounds.

Information dissemination channels	Educational information was consistently published across official institutional platforms to maximize accessibility among prospective students.
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The observational findings indicate that the institution incorporated several inclusive practices within its AI-assisted advertising activities, although implementation remained uneven across different promotional channels. Scholarship information was publicly accessible, while admissions campaigns used multiple digital platforms to expand their reach beyond conventional recruitment strategies. Periodic monitoring of audience segmentation also demonstrated institutional awareness of potential inequalities arising from algorithmic targeting. Restating these findings, inclusiveness was reflected in deliberate efforts to broaden access to educational information rather than relying solely on predictive advertising performance. The observations further suggest that inclusive AI requires continuous institutional supervision, as technological automation alone cannot guarantee equitable distribution of opportunity without ethical oversight and strategic intervention.

The observational data reveal a recurring pattern: inclusive AI depends primarily on institutional governance rather than algorithmic capability alone. Digital platforms that provide unrestricted access to scholarly information, diversified communication channels, and regular monitoring of advertising performance collectively contributed to broader educational accessibility. However, inclusiveness strengthened when institutional staff actively evaluated algorithmic outputs and adjusted promotional strategies based on equity considerations rather than engagement metrics alone. This pattern illustrates that economic justice was achieved through the interaction between artificial intelligence and responsible human decision-making. Consequently, inclusive educational advertising emerged not as an automatic outcome of technological innovation but as the result of continuous institutional commitment to equitable information distribution and transparent digital governance.

Shariah Principles Strengthen Ethical Advertising Governance

Shariah-based ethical advertising governance refers to the institutional framework that regulates the development and implementation of AI-assisted educational advertising in accordance with Islamic principles of justice (*adl*), public benefit (*maslahah*), transparency (*amanah*), accountability (*mas'uliyah*), and the avoidance of harm (*zulm*). Operationally, this sub-finding was identified through institutional documents demonstrating formal commitments to ethical AI governance in higher-education marketing activities. These documents included AI governance policies, digital marketing standard operating procedures, institutional codes of ethics, meeting minutes concerning AI implementation, and training records on ethical digital communication. Together, these documentary sources reflected the institution's systematic effort to integrate technological innovation with Shariah-oriented governance principles throughout educational advertising practices.

International Marketing Environment

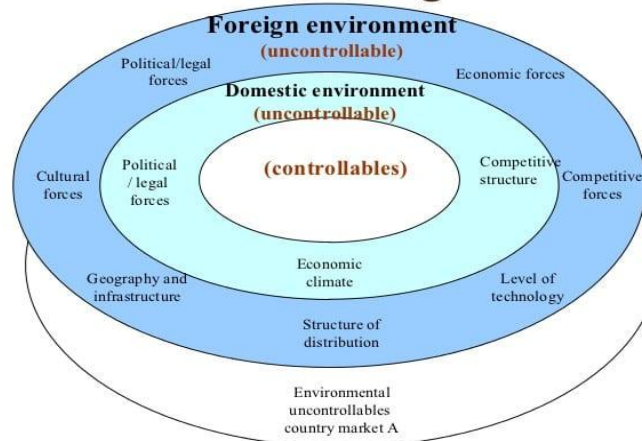


Figure 1. Standard Operating Procedure (SOP) for Digital Marketing

Documentary observations demonstrated that ethical governance was embedded within multiple institutional regulations governing AI-assisted educational advertising. The reviewed policies consistently emphasized transparency, fairness, accountability, and equal opportunity in the design of digital recruitment campaigns. Standard operating procedures required marketing personnel to evaluate advertising performance beyond conversion rates by considering the inclusiveness of audience segmentation. Meeting records further revealed periodic discussions concerning algorithmic accountability and the ethical implications of automated promotional strategies. Documentation from institutional workshops indicated continuous efforts to improve staff understanding of responsible AI implementation. These findings suggest that Shariah principles were translated into organizational procedures that guided practical decision-making rather than remaining abstract ethical ideals.

The documentary evidence indicates that ethical AI governance served as an organizational mechanism to balance technological efficiency with institutional responsibility. Formal policies, implementation procedures, evaluation reports, and staff development activities collectively established a governance structure supporting fair educational advertising practices. Restating these findings, the institution did not rely exclusively on algorithmic performance when managing promotional activities but complemented technological systems with ethical supervision and administrative accountability. The documentation demonstrates that Shariah values were operationalized through measurable organizational practices that guide marketing decisions, reduce potential discrimination, and strengthen transparency throughout the AI-assisted recruitment process.

The overall documentary findings reveal a consistent governance pattern in which ethical principles became increasingly institutionalized through interconnected policies, operational procedures, monitoring mechanisms, and continuous capacity-building activities. Rather than functioning independently, each document reinforced the implementation of the others, creating an integrated governance ecosystem for

responsible AI advertising. Ethical oversight extended beyond regulatory compliance to encompass organizational learning and the continuous evaluation of algorithmic practices. This pattern demonstrates that effective AI governance requires both technological capability and institutional commitment to ethical accountability. Consequently, Shariah principles strengthened advertising governance by providing a comprehensive normative framework that supported fairness, transparency, and sustainable economic justice within higher education digital marketing.

Discussion

The findings indicate that algorithmic bias primarily emerged through automated audience segmentation rather than deliberate institutional discrimination. This finding is consistent with Jung et al. (2024) and Lăzăroiu et al. (2022), who argued that predictive algorithms may reproduce structural inequalities by relying on historical behavioral data. Similarly, Oliveira et al. (2021) and Kotras (2020) emphasized that algorithmic systems frequently reinforce unequal digital visibility despite appearing technologically neutral. However, this study extends previous literature by demonstrating that algorithmic bias also affects educational advertising, particularly the distribution of scholarship and admission information. Theoretically, these findings broaden discussions on algorithmic fairness into higher education marketing. In practice, universities should regularly audit AI advertising systems to prevent unequal access to information.

The observation findings revealed that inclusive AI depends more on institutional governance than on algorithmic capability alone. This conclusion supports Varma et al. (2021), Santos et al. (2023), and Rehman et al. (2022), who maintained that technological systems cannot independently guarantee equitable outcomes without organizational oversight. Likewise, Pitardi et al. (2022), Abdelhamid et al. (2023), and Jedličková (2024) argued that responsible AI requires continuous human intervention to prevent technological discrimination. Nevertheless, this study differs in showing that inclusive educational advertising can be strengthened through diversified communication channels, transparent dissemination of scholarship, and routine evaluation of audience segmentation. The theoretical implication highlights governance as an essential dimension of AI inclusiveness and, in practice, encourages higher education institutions to integrate equity indicators into digital marketing performance assessments.

Another important finding demonstrates that Shariah principles strengthened ethical governance by institutionalizing transparency, accountability, fairness, and public benefit within AI-assisted advertising practices. This finding aligns with Ahmad et al. (2022) and Evans et al. (2021), who emphasized justice and social welfare as fundamental objectives of Islamic economic governance. Likewise, Kamali (2008) explained that Shariah governance should ensure accountability throughout organizational decision-making processes. However, the present study contributes a new perspective by integrating these normative principles into artificial intelligence advertising governance within higher education. Theoretically, this expands Islamic economic discussions to encompass digital governance, while, practically, providing universities with an ethical framework for responsible AI implementation (Harsanto et al., 2024; Supatminingsih et al., 2025).

The three findings collectively demonstrate that fairness in educational advertising cannot be achieved solely through sophisticated artificial intelligence technologies. Instead, fairness emerges from the interplay among algorithmic transparency, inclusive institutional practices, and ethical governance grounded in clearly articulated organizational values. This integrated perspective differs from many previous studies that examined algorithmic bias, inclusiveness, or ethical governance independently. The present findings, therefore, propose a more comprehensive conceptual relationship among these variables within higher education. The theoretical implication is the development of an interdisciplinary framework connecting artificial intelligence, educational marketing, and Islamic economic justice. Practically, institutional leaders should establish integrated governance mechanisms that simultaneously evaluate technological efficiency and ethical responsibility.

Finally, this study contributes to the growing literature on responsible artificial intelligence by positioning economic justice as a central objective of AI-assisted educational advertising rather than a secondary ethical consideration. Previous research predominantly evaluated AI in terms of accuracy, predictive performance, or technological efficiency, whereas the present findings demonstrate that fairness requires continuous organizational commitment, supported by Shariah governance principles. These results suggest that algorithmic accountability should become an integral component of higher education digital transformation strategies. Consequently, universities adopting AI-based advertising should implement transparent governance policies, periodic algorithmic evaluations, and equity-oriented performance indicators to ensure sustainable, inclusive, and ethically responsible educational promotion.

CONCLUSION

This study concludes that algorithmic bias in AI-assisted educational advertising primarily emerges through automated audience segmentation that unintentionally limits equitable access to educational information. At the same time, inclusive AI can be achieved only through continuous institutional governance supported by Shariah principles of justice, transparency, accountability, and public welfare. The study contributes theoretically by integrating algorithmic bias, responsible AI governance, and Shariah-based economic justice into a unified analytical framework for higher-education advertising. Nevertheless, this research was limited to a single qualitative case study, restricting broader generalization. Future studies should employ comparative multi-institutional designs, mixed-method approaches, and quantitative algorithmic auditing to evaluate fairness across diverse educational contexts and AI advertising platforms.

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