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AI Revolution in Digital Media: Opportunities, Challenges, and the Future of Journalism in Pakistan

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Article Details

ABSTRACT

Keywords: AI Revolution, Digital Media, Opportunities, Challenges, Journalism Future

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Artificial Intelligence revolution has changed the digital landscape of journalism offering new insights and opportunities. AI revolution has brought some serious challenges into the media field including deep fakes, filter bubbles and privacy concerns. AI on one hand if reduced the labour, on the other hand it has created the risk of unemployment. Artificial Intelligence is both beneficial and hazardous. This study main focus is the revolution of AI in digital media creating several opportunities along with challenges in Pakistan. Technological Determinism Theory proposed by Marshall MacLuhan is employed in this deductive study which claims that technology is the fundamental driver of societal transformation. This study adopted a cross-sectional and quantitative research methodology. The Population of this study comprises of journalism department students in different cities across Pakistan. The sample size of this study is 350 journalism students. Convenience sampling technique is used to collect data. Likert type rating scale questionnaire is employed to assemble data from the students. Descriptive statistics of male and female counts and percentage is utilized to scrutinize the demographic statistics and are presented in pie charts for readers, researchers and policy makers clear and easy understanding. Findings of this study revealed that Artificial Intelligence has opened the doors for multiple new opportunities in journalism while on the other hand serious challenges has also taken place like job displacement, privacy concerns, ethical issues and data quality. Conclusively, the future journalism seems to be brighter and most advanced in the domains of content creation and automation, ease of accessibility, newsroom transformation, and suggesting solutions to every problem while deep fakes, legal issues, unauthorized data collection, and lack of awareness are still the challenges faced by journalism in this artificial intelligence revolution era.

Introduction

The fastest advancement in Artificial Intelligence (AI) has transformed numerous industries across the world, with journalism and digital media at the forefront of the technology wave. AI technologies are transforming production, dissemination, and consumption of information, such as machine-generated news and data journalism, audience measurement data, and content personalization. In Pakistan, where the media sector is being digitalized at a lightning speed, advancement in AI tools is of the highest potentiality and urgent task.

While modernization and efficiency in news gathering activities like live news, multimedia news production, and newsroom automation were brought in by AI. These, besides bringing news broadcasting improvement in terms of accuracy and speed, also enable media organizations to reach heterogeneous audiences more effectively. But the same technologies bring horribly serious ethical, social, and professional issues. Deep fakes, disinformation, filter bubbles, algorithmic bias, and the loss of journalism jobs are now serious issues in this new digital media paradigm.

In the case of Pakistan, where journalism is the force behind masses' opinion-making and the strengthening of the democratic process, it is relevant to observe the effects of AI. The current study is interested in the effects of the AI revolution on the online journalism of Pakistan. It presents the two balanced threads of its effect ranging from revolutionary scale to multi-faceted challenges. The study being on the students of journalism of some of the universities of Pakistan, it tries to portray the perception, awareness, and readiness of the future media practitioners towards this revolutionary phenomenon.

This research is deductive, cross-sectional, and quantitative survey based on Marshall McLuhan's Technological Determinism Theory based on centrality of technology as a source of change in society. Statistical inference is constructed based on data gathered through systematic questionnaires. The aim of the research is to construct findings that can guide educators, policymakers, and media practitioners on the future of journalism in the era of AI in Pakistan.

Background

Globally, media sources like The New York Times, Reuters, and The Washington Post are already leveraging AI technologies to assist with automated reporting, audience analysis, and content personalization. The technologies increase productivity, eliminate human error, and construct effective user experiences. Misinformation problems, ethics problems, job loss, and algorithmic control stoked concerns regarding long-term effects of AI on the media. (Tanveer et al., 2024)

In Pakistan, AI journalism is still in its infancy but developing very rapidly. Newsrooms already started testing AI-based projects in data excavation, auto-translation, transcription hubs, and content suggestion modules. With Pakistani media turning digital, AI has promising opportunities for efficiency, innovation, and accessibility particularly bridging off-grid or remote communities through local media.

But the Pakistani media sector is not exempt from issues as well. These include weak technical infrastructure, weak awareness among journalists about AI tools, ethics, and job loss and weak regulatory policies on AI deployment in the media sector. Public trust in journalism is also lost due to deep fakes and AI-based disinformation campaigns.

In attempting to reverse such trends, it is necessary to see how AI is transforming journalism in Pakistan both technologically and to the degree that professional practice, ethical limits, and socio-political processes are concerned. The present study attempts to examine these facets in the context of future professionals as student journalists so that we can examine how they see and are going to approach the AI-driven future of their profession.

Problem Statement

The development of Artificial Intelligence (AI) as a new media has induced revolutionary transformation of the journalism profession, transforming news production, exchange, and reception. While offering unmatched potential for the automation of monotonous and repetitive activities, real-time data analysis, enhanced content tailoring, and enhanced newsroom efficiency, AI poses serious concerns as well. They are ethics challenges of the moral kind, disinformation, absence of a human touch, algorithmic prejudice, deep fake material, and the automation of journalists.

In Pakistan, the media shift is slowly but certainly moving towards digitization, but AI adoption is random and negligible. Although AI technologies are being extensively applied across the world in journalism, Pakistani media organizations do not have infrastructure, sensitization, education, and policy frameworks in place to leverage the potential of AI in a positive and ethical manner. Journalism students, the future generation of journalists, are also in this terra incognita with limited exposure to AI-based technologies and inadequate academic training.

There is clear empirical gaps in research that takes into account Pakistani journalism students who are looking at the AI revolution in emerging media, its benefits and risks, and its impact on their own future as journalists. Without us, it is not possible for educators, the media, and policymakers to make knowledgeable decisions to address challenges and opportunities offered to journalism by AI usage.

This research thus attempts to explore how the AI revolution is transforming digital journalism in Pakistan, its advantages and disadvantages, and measuring awareness, readiness, and concern among journalism students pursuing this rapidly evolving professional line of work.

Gap

Despite growing literature on the application of Artificial Intelligence (AI) in digital media and journalism, there remains a huge research gap, particularly in the context of Pakistan's media. Although there have been foreign research works on the application of AI in media organizations, it is evident that there remains a perceived lack of special research on how exactly such technologies are transforming Pakistani journalism. New research is still miles away from the unique challenges and advantages AI poses to the context of a developing country like Pakistan, where infrastructural constraints, political realities, and social dynamics are at play.

Over the past few decades, there has been an increase in scholarly interest in analyzing how news media in various nations cover emerging and new technologies. The news media regularly portrays developing technologies in a way that highlights either their benefits or drawbacks, or sometimes both, which has a significant impact on how the public views and understands them. This framing acts as a heuristic to assist individuals understand complex technological concepts, particularly those with limited expertise (Scheufele and Lewenstein, 2005).

Besides that, the majority of the studies focus on the technical use of AI technologies and not on the mental state and readiness of the future journalists. Pakistani journalism students, who in the near future will be professional journalists, have not been researched to the extent that they know the AI technologies, what they anticipate the impact to be on the profession, or how ready they are to adjust to the changes.

Moreover, the professional and ethical issues raised by AI-based media are not adequately researched in Pakistan. While there is ample international discussion about deep fakes, disinformation, privacy, and media career replacement happening, these issues have not been adequately researched to their impact on Pakistani media professionals and students. (Tanveer et al., 2025)

In addition, research is not applying models such as Marshall McLuhan's Technological Determinism Theory in a conventional sense to ascertain the extent to which AI is responsible for social change, in this instance,

that of the media. The theory, founded on the assumptive generalization that technology is responsible for social change, is characteristic of the general societal impact of AI in the news but is yet to be applied in the specific Pakistani context.

This study attempts to fill in these lacunae by analyzing the potential and constraints of the AI revolution in digital media from the perspectives of Pakistan's journalism students. This study therefore attempts to shed new insight into the way the AI revolution is revolutionizing journalism in Pakistan and a point of reference for future policymaking and research thereon.

Objectives

1. To investigate how Artificial Intelligence (AI) has affected digital journalism in Pakistan, in line with consideration of respect for the opportunities and challenges it offers the media sector.
2. To present the knowledge and awareness of Pakistani journalism students about AI technology and how they can utilize them in mass communication and journalism.
3. To examine to what extent Pakistani journalism students are equipped to make use of AI tools in their professional lives ahead, i.e., in terms of capability, knowledge, and ethics.
4. To recognize the most urgent issues and concerns of employing AI in Pakistani media, such as misinformation, deep fakes, privacy, and algorithmic bias.
5. In order to research the likely impact of AI on Pakistan's journalism career in terms of job replacement, the redefinition of work, and the future of a journalism career.
6. To investigate the potential application of AI to generate journalism content in Pakistan, i.e., content creation, automatization, audience interaction, and newsroom management.
7. To investigate the part being played by AI in reshaping journalism's credibility and public trust in the context of shifting media reality of Pakistan.
8. To recommend to media outlets, teachers, and decision-makers in Pakistan the implementation of AI in journalism in an ethical fashion and the creation of plans to overcome the challenges and ethics of AI technologies.

Research Questions

1. What Challenges and opportunities in Pakistan do journalism students associate with the rise of AI in digital media?
2. How do you perceive the influence of AI on your future career in Pakistani journalism?
3. To what extent you are used to with AI tools?
4. What's your view on ethical concern and credibility issues of AI in Journalism?

Significance

The significance of this research is that it will be capable of providing significant lessons into the constantly changing interface of Artificial Intelligence (AI) and internet journalism in Pakistan. Researchers are also investigating the potential benefits of AI in addressing global health and environmental issues. Meanwhile, these discussions are still dominated by concerns about ethics, accountability, data privacy, and monitoring (Jobin et al., 2019). up an attempt to fill up the above identified research gaps, this study examines how news media around the world cover AI.

For instance, Donk et al. (2012) found that nanotechnology was positively depicted in German media, with a focus on its medicinal and economic benefits. Notably, since 2000, a wide range of digital platforms and emerging technologies have received substantial media coverage. For example, Arceneaux and Schmitz Weiss (2010) examined early media coverage of Twitter (now X) in the United States and found that it was generally positive, emphasizing the platform's capacity for rapid and succinct communication. Negative aspects like

information overload and unexpected results received comparatively little media attention.

While AI technologies continue to revolutionize the media across the world, knowing how they impact the Pakistan journalism sector makes one capable of understanding the new challenges and opportunities that will continue to emerge for Pakistani journalism. This particular research is timely, where the integration of AI into Pakistani online media is in its infancy, and the implications of moving towards this direction become relevant to journalism in Pakistan for years to come.

1. Contribution to the Academic Literature

The present study will be useful in filling a significant gap in the existing literature on AI in journalism in that it will focus solely on the Pakistani context. While the majority of studies on AI in the media have been conducted in the Western world, little research has been conducted that specifically deals with the challenges, opportunities, and ethics of embracing AI in Pakistan that are different from the developed world. In responding to the voice of journalism students, the present study adds one more thing to the preparedness of future professionals to cope with AI in the media sector.

2. Shaping Journalism Education and Training

The findings of the present study will give an understanding of the prevailing level of awareness. The outcome of this study will give an insight into the awareness and readiness of journalism students towards AI at present. This is significant to the schools and instructors so that they can develop particular curricula to ready the students for the skills they will require to succeed in the AI-based media environment. The study will inform education reform and curricula to ready journalists for a digital-first world by establishing areas of knowledge deficit and areas of training required.

3. Building Media Institutions and Policymakers

As AI becomes increasingly active in the media sector, Pakistani policymakers and media institutions would do well to learn about the implications of using AI. Media institutions will be provided with instructions on how to use AI technology ethically and reduce ethical issues and risk management such as disinformation and employment displacement. The study's results can also lead policymakers to craft regulations that are pro-innovation but ensure public interest and media integrity.

4. Social and Ethical Implications

The issues of ethical misuse of AI by media, invasion of privacy, disinformation, and deep fake grow with more significance to the globalized media. This research will help in the debate of how Pakistani journalists can address these issues on an ethical level. Through this examination of the ethical concerns from the student's perspective, it can refer to the need for sensitivity and regulations among the journalistic community to utilize AI ethically.

5. Effects on Media Industry Employees and Employment

The research will also tell us about how AI affects jobs in Pakistan's media industry. As automation and AI technologies continue, it would be important to find out the degree to which journalism students worry about losing their jobs and reorganizing work tasks to create employment protection, training, and innovation generation in the media industry.

6. Pakistan's Journalism in the Future

By examining the ways in which AI can re-envision journalism, this research will provide a glimpse into the future of the Pakistani media. By examining the ways in which AI can transform the nature of journalistic work like content production, automation, and interaction with users, media practitioners will be taught how to implement such technology to facilitate their practice and counter challenges from an evolving digital media landscape.

Hypotheses

1. H1: Pakistani students of journalism regard AI as the possibility of online news becoming creative and effective.
2. H2: Pakistani students of journalism have not yet absorbed the ethical risk (e.g., fake news, privacy invasion) of using AI in journalism as a whole.
3. H3: AI in journalism will create a sense of fear of job loss among Pakistani journalism students.
4. H4: Student journalists know that AI can create content, automation, and audience interaction in the newsroom.
5. H5: There are gender differences in terms of willingness of Pakistani journalism students to embrace AI technologies in the profession.
6. H6: Pakistani journalism students are optimistic about the future of AI but have varying levels of knowledge depending on exposure to AI ideas.
6. H7: Journalism students see AI as a threat to traditional journalistic work and human supervision.
7. H8: Journalism students realize that AI can be used to solve journalism problems but do not know about its ethical concerns.

Delimitations

1. Geographical Scope: It is conducted among journalism students of Pakistan, i.e., of different universities, restricting its geography to other places.
2. Population: Only journalists are targeted, not media professionals, limiting conclusions to industry best practices.
3. Emphasis on technology: The study is confined to AI technologies of online journalism and excludes other new technologies.
4. Time Period: The information will be collected over a specific time frame, giving a snapshot and not a longitudinal view.
5. Sample Size: The sample size is 350 students and cannot be generalizable to all the students of journalism in Pakistan.
6. Perception-Based: The research is perception-based and aims at student perceptions and awareness towards AI but without technical analysis or usage of AI in the newsroom.
7. Exclusion of AI Developers: AI developers or media AI tool technicians' view is not encompassed in the research.

Literature Review

Since how AI is portrayed in the news media can affect whether technology is accepted or rejected in everyday life, journalists have a critical role in serving as a conduit between public information and technical growth (Vergeer, 2020). Researchers have also examined how AI is framed in the media in a number of countries, including the United States (Chuan et al., 2019; Cools et al., 2022), the United Kingdom (Brennen, 2018; Moran and Shaikh, 2022), the Netherlands (Vergeer, 2020), Germany (Kostler and Ossewaarde, 2022), South Africa (Brokensha and Conradie, 2021), Turkey (Sarisakaloglu, 2021), and China (Zeng et al., 2022). All things considered, the findings of these studies demonstrate that news organizations prioritize highlighting the potential and benefits of artificial intelligence technologies.

Additionally, 49% of Wall Street Journal articles portrayed AI favorably, with 25% concentrating on three distinct ideas: AI as a replacement, an outperformer, or a personified creature. Conversely, The Guardian and The Daily Telegraph had positive framing rates of 29% and 31%, respectively. A different study by de-Lima-

Santos and Ceron (2022) found that the development of AI applications for the news industry is concentrated in the Americas (43.01%) and Europe (39.78%). Only 5.38 percent of the cases were in Asia, compared to 2.15 percent in Oceania.

The ubiquity of AI rapidly evolved in the mid-2010s, and the news discourse became more critical over the preceding decade, according to Nguyen and Hekman's (2022) trend analysis of four international newspapers: The NYT, The Guardian, Wired, and Gizmodo. They also found that Wired and Gizmodo were much more bullish about AI than The NYT and The Guardian were.

Due to historical disparities in the use and development of technology, societies in the Global South are worried about artificial intelligence (AI) and its many applications in resolving challenging issues (Okolo et al., 2022). News stories about these technologies may therefore offer fresh insights into how societies are responding to these novel advancements, significantly impacting scholarly conversations on artificial intelligence. Two important talks focused on the adoption of AI technologies in the global North and South and how this divide can exacerbate already-existing global disparities in technology adoption (Khan et al., 2024).

Habib et al. (2023) also looked at how Facebook was framed in US newspapers in relation to conspiracy theories. They came to the conclusion that Facebook was generally portrayed as a venue for disseminating conspiracies and misleading information. The media usually reports on current occurrences. Weaver et al. (2009) studied the framing of nanoscale science and technology in the top 10 U.S. newspapers from 1999 to 2008. They found that early discussions on nanotechnology focused mostly on advancement and broad dangers, undervaluing the roles and responsibilities of specific players.

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The news media play a crucial role in normalizing the progressive use of these technologies.

Since AI has its own set of unknowns and concerns, just like every major innovation, it is crucial to examine how the media present it. As more viewpoints from a variety of stakeholders—including academics, governments, corporations, and the general public—address the media, it is expected that conversations on AI will become more dynamic, diversified, and complex (Sun et al., 2020). In recent years, scholars have been more interested in AI due to its revolutionary effects on the digital world. This change has sparked discussions regarding AI uses, regulations, impacts, and concerns among governments, businesses, legislators, scientists, politicians, the media, and the general public.

Media coverage has a significant impact on public perceptions and opinions regarding AI (Brewer et al., 2022; Choi, 2024; Cui and Wu, 2021). Cui and Wu (2021), for example, found that Chinese people's opinions on AI were more favorable than unfavorable. This is most likely a result of government pressure on the media to present AI in a positive light, demonstrating that regulations encourage the development and application of AI technologies. Scholars have examined how news organizations in various countries portray artificial intelligence.

Additionally, the study discovered that societal effect framing and episodic issue framing were more commonly used when talking about AI.

Presenting news stories that highlight particular incidents, events, or people rather than more general societal issues or patterns is known as episodic framing. Instead of focusing on specific instances or occurrences, societal impact framing highlights the problem's wider ramifications for society (Holton et al., 2014)

Some have focused on how AI is typically phrased, some have analyzed news coverage trends, and some have conducted comparison research. According to Chuan et al. (2019), who examined how AI was presented in five major US newspapers, technology and business were the primary topics of news coverage. They found that more people discussed the positive aspects of AI than its negative aspects.

Research Design

The research employs a quantitative, cross-sectional research design to explore Artificial Intelligence (AI) effects on digital journalism in Pakistan. The research will concentrate mainly on the awareness and perceptions of journalism students about AI technology and its implications for the journalism of the future.

A descriptive survey design will be utilized with a structured questionnaire to collect data from 350 journalism students from various universities in Pakistan. Descriptive statistics will be used to analyze the data and Likert-type scale items to measure student attitudes, awareness, and concerns regarding AI in journalism.

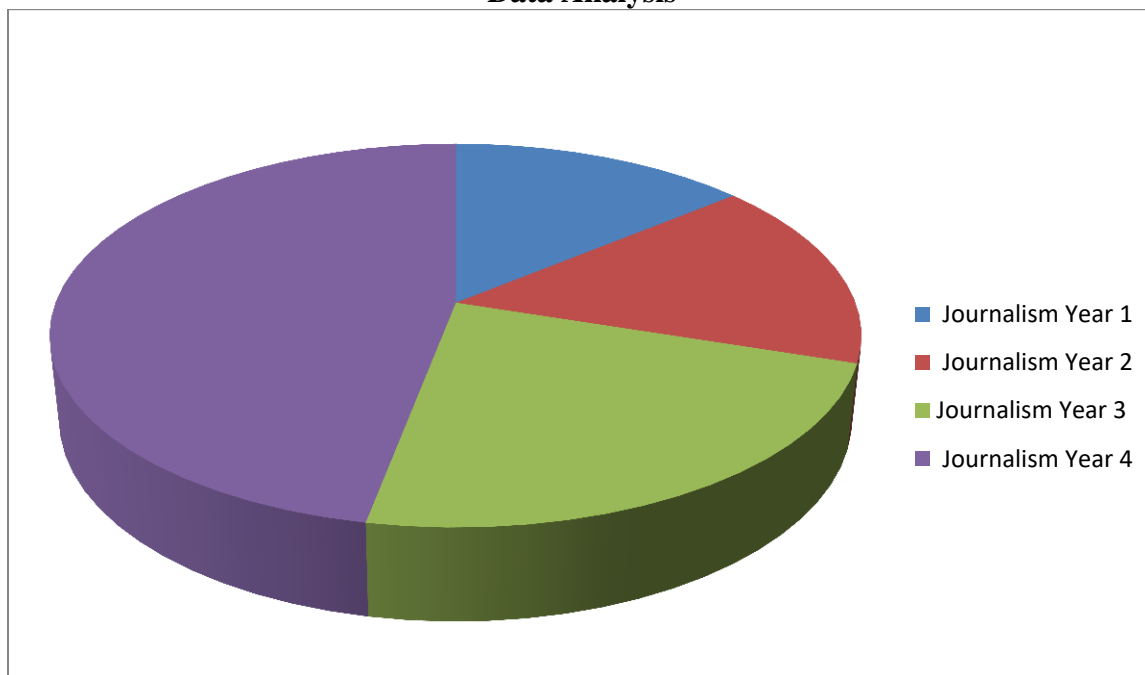
The research will employ Technological Determinism Theory to analyze how AI influences the development of journalism in Pakistan and how students view its influence on the media.

The research utilizes a quantitative research approach based on a cross-sectional survey to investigate the effect of AI on digital journalism in Pakistan. The data will be gathered using a standardized questionnaire that is used to measure the awareness, perception, and concern of journalism students about AI technologies.

The population under focus are journalism students from different Pakistani universities, of which a sample of 350 students will be selected by convenience sampling. A Likert-type scale item in the questionnaire will be used to assess students' attitudes towards the use of AI in journalism, ethical issues, and employment replacement.

Data is described using descriptive statistics, i.e., Pie Charts, graphs, frequency counts or percentages, to gain a proper idea about the impression and preparedness of the students toward AI in the media sector.

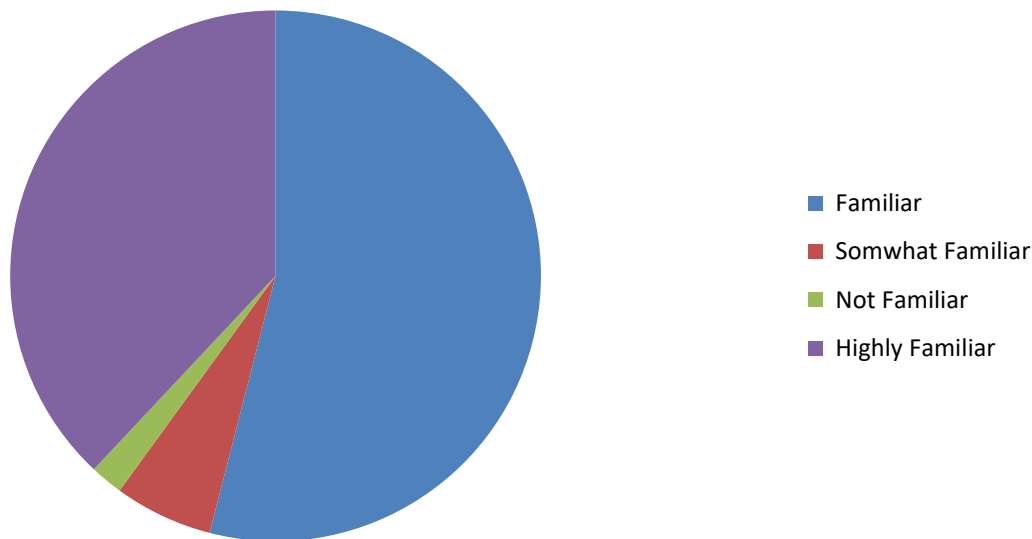
Data Analysis



1. Demographic -Journalism Students Study Year level

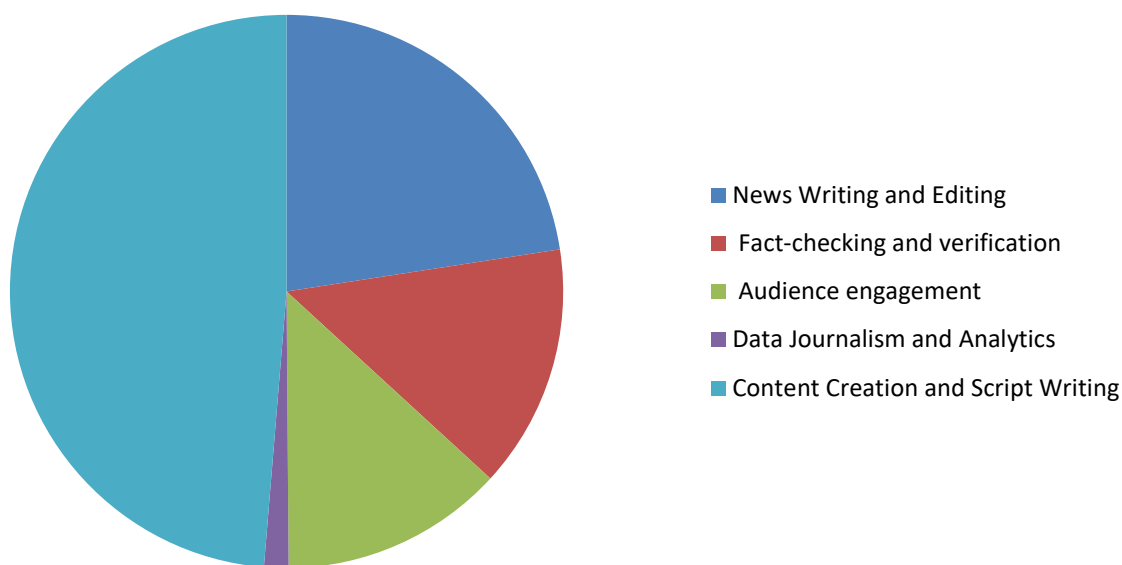
Discussion: The demographic data of this study includes majority of the senior journalism students of final year or final semesters while mid-level journalism students of second and third years also participated in this study, however a junior level journalism students of first two semesters has also given an opportunity to offer their insights regarding journalism and AI integration in Pakistan.

2. Familiarity Level



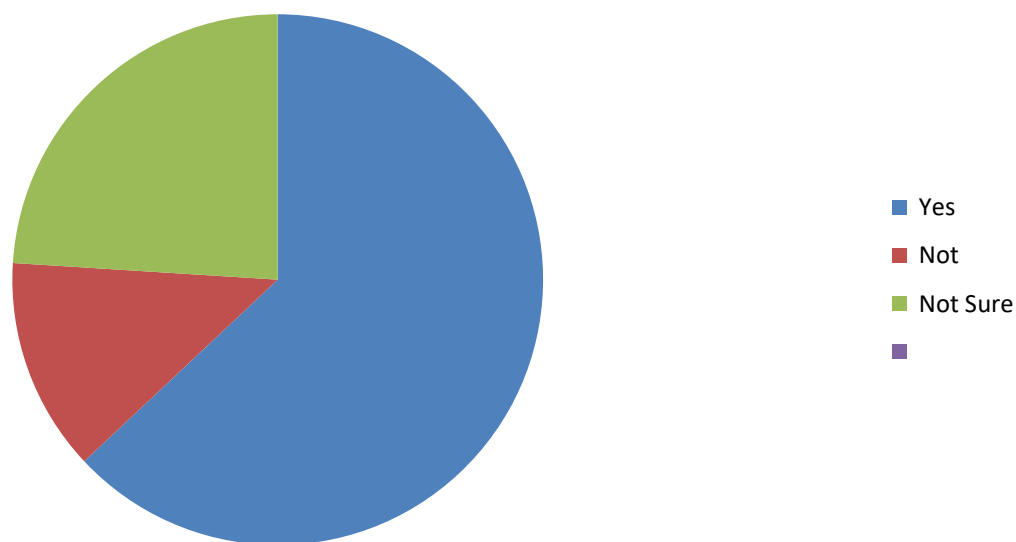
Discussion: Journalism students in Pakistan are well aware of artificial intelligence and its integration in the media industry. They contributed to the study regarding their literature based understanding of practical approaches in the media.

3. Journalism Improvement By AI



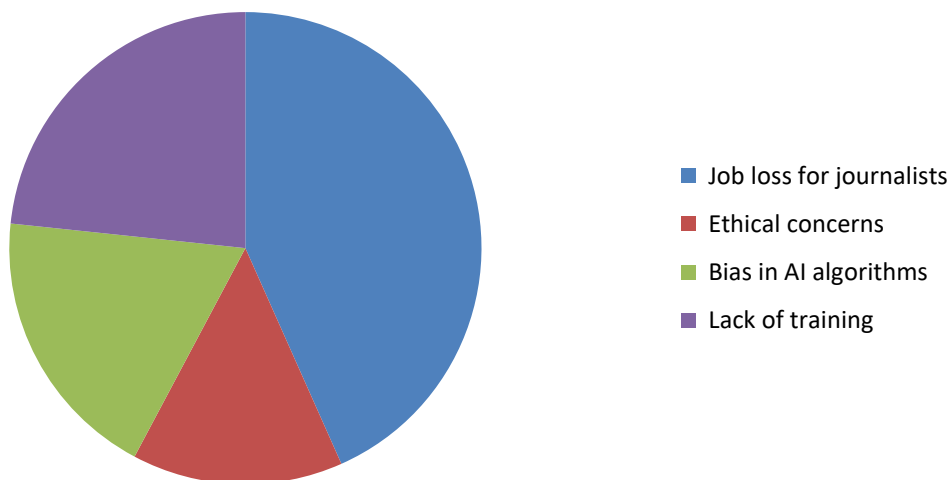
Discussion: The students of journalism claims that artificial intelligence plays a significant role in news writing, editing, fact checking, verification, audience engagement, data journalism, analytics, content creation, and script writing while the study found that content creation and script writing is most perfectly utilizable ground for journalists, while it can be utilized perfectly for news writing and editing.

4 . AI Replacing Journalists



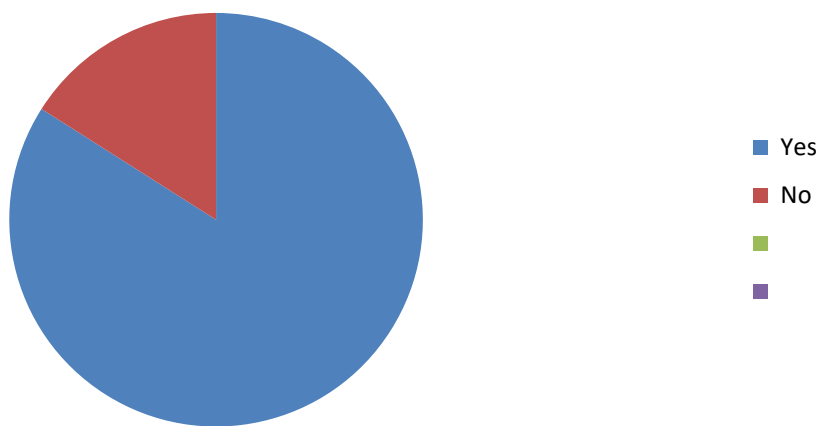
Discussion: Journalism students strongly believe that artificial intelligence will replace the human journalists with machine or robotic journalists, however some of the pupils disagree this and others are not sure and can not predict the future with the current practices

5. Challenges Association with AI Use in Pakistan's Journalism



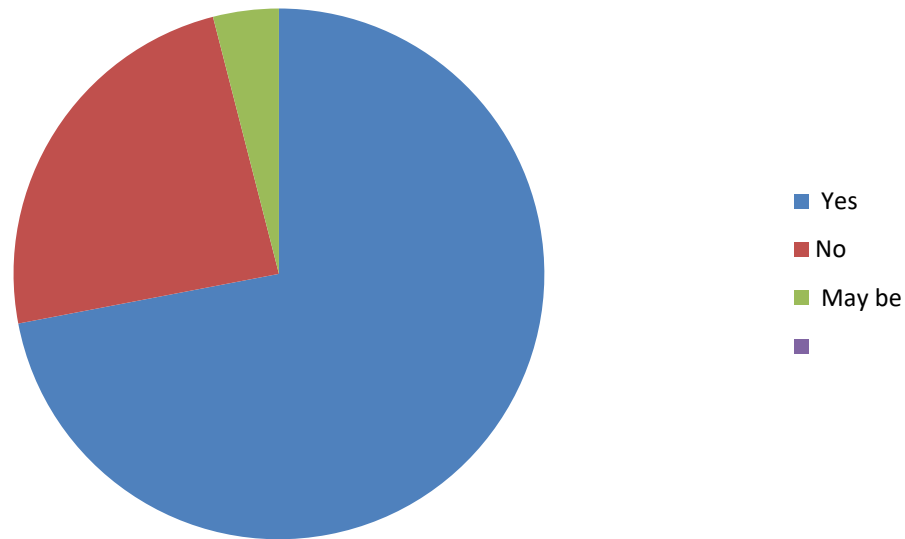
Discussion: Job loss for journalists is the higher risk assessment from current scenario by journalism students that would start their career in journalism and media industry soon while they also claims the bias in AI algorithms with ethical concerns and lack of training.

6. Trained Acquired To use any AI-based tools for journalistic purposes e.g., ChatGPT, Grammarly, AI video editors?



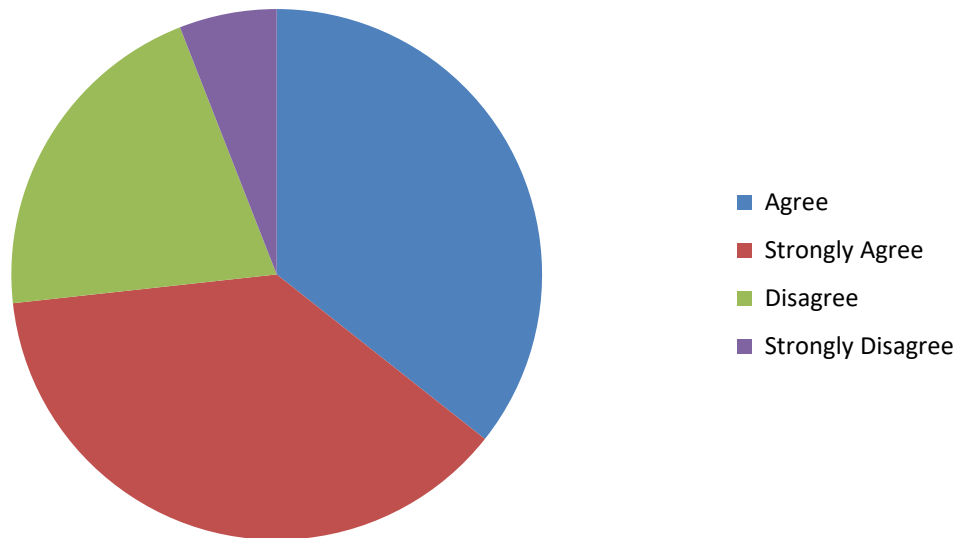
Discussion: Pakistan being underdeveloped country is also prepared to adopt the technologies. More than 80% of journalism students have somehow acquired trainings regarding AI based tools for journalistic purposes while some of the students are left acquiring such trainings.

7. AI in Curriculum



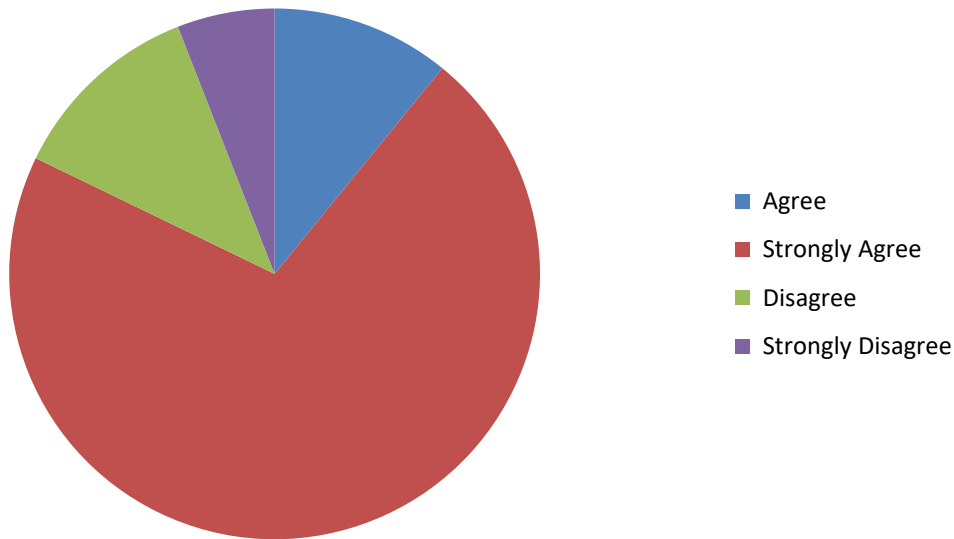
Discussion: Journalism students in Pakistan in the view of dynamic shift in technological advancements are willing to include artificial intelligence in their curriculum.

8. Negative Effects of AI on Journalism



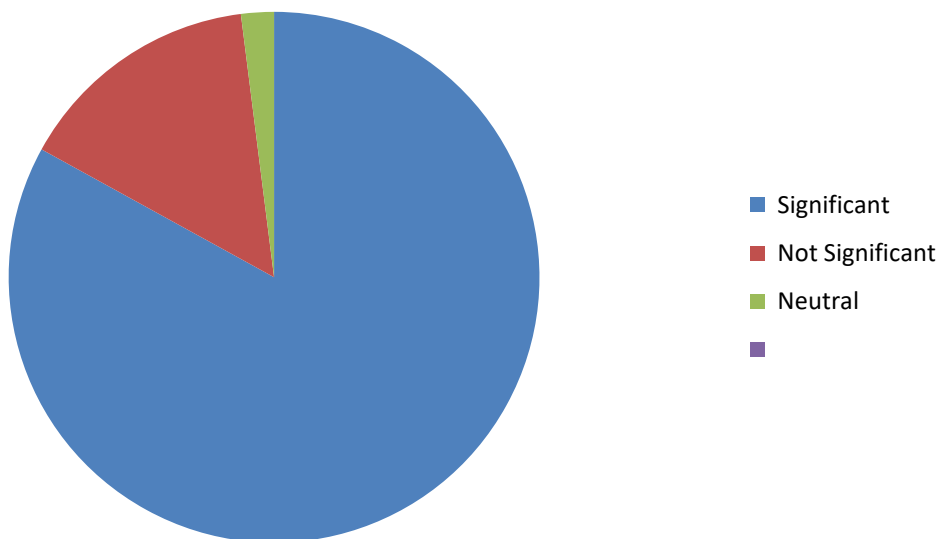
Discussion: Artificial intelligence having advanced the journalism also bears some negative consequences in the field and academia as well, the study found that adverse effects of AI on journalism are still dominant as it is dominant on all others disciplines of social sciences and pure sciences.

9. Advancement By AI in Journalism



Discussion: Artificial Intelligence brought advancement in Journalism and it had revolutionized the media industry in Pakistan. In several ways it advances the field like content creation, data analytics, script and editing.

10. Future of AI in Journalism



Discussion: Artificial intelligence will significantly contribute to journalism in future as well; the statement is drawn from the response of journalism students during conducting data collection process.

Findings

1. Awareness of AI: Most of the journalism students in Pakistan are aware of AI technologies to some extent but lack deep knowledge about their use in journalism.

2. Opportunities: Students envisage the potential of AI to enhance content production, enable the automation of repetitive tasks in newsrooms, and increase engagement with audiences. Most of the students envision AI having a significant impact on the future of journalism in Pakistan.
3. Ethical Concerns: Even though students recognized the benefits of AI, some of the students expressed ethical issues like misinformation, privacy violation, and job loss.
4. Preparation: There is a disparity of formal education with respect to AI articulated in the findings through most students without training and full course direction about AI tools and technology from their journalism courses.
5. Influence on the Labour Market: More than half of the students expressed fear of potential loss of jobs through AI for careers in conventional journalism, despite some of the students expressing positive expectations toward AI bringing in new jobs founded on it.

The study reveals that even though there are a number of opportunities which AI presents towards increasing the general journalism practice in Pakistan, it also raises a serious set of issues, which are mainly concerned with ethical issues and the effects on jobs. Journalism students mainly view AI as a new trend in the profession but, with their little training and knowledge, are a limitation in bringing its maximum potential. The future of Pakistani journalism seems to stand at a juncture, where AI has the power to transform the vocation but needs to be finely tuned with ethics guidelines, employment assurances, and regulatory solutions.

Recommendations

1. Integration of Courses in Curriculum: The Pakistani media schools must make provisions for the incorporation of AI courses in the curriculum so as to prepare the students better according to the emerging scenario of the digital media sector. AI-related tools and ethical implications should be given due weight.
2. Ethics Guidelines: Media institutions, along with policymakers, must draft strict guidelines and policies to help mitigate the unethical front of AI, especially of disinformation, privacy, and deep fakes.
3. Workforce Adjustment: Media organizations need to invest in reskilling the workforce to adapt to AI-based tools and investigate the creation of new employment opportunities that AI will introduce, providing employment and career prospects for journalists.
4. Public awareness: Journalism students and media professionals need to be trained on long-term effects of AI technologies, such as its impact on public trust, credibility of content, and privacy.
5. Future Research: The future of research should be on the role of AI in media organizations and its impact on the traditional ways of journalism as well as how it is being incorporated into Pakistan's local media policy and legislation.

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