

## Paper Mills and Intellectual Prostitution in Pakistani Research: A Challenge to Scientific Integrity

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In recent years, the phenomenon of 'paper mills' has gained significant attention within the academic and scientific communities globally.<sup>1</sup> A paper mill refers to an organization or individual producing research papers, often fabricated or plagiarized, for authors in exchange for financial incentives.<sup>2</sup> This troubling practice has infiltrated various regions, including Pakistan, leading to a surge in research publications that lack genuine scientific merit. The underlying issue, particularly in Pakistan, is the growing tendency among academics to prioritize career advancement/promotions over contributing to knowledge or solving real-world problems.

According to a report published in the leading journal 'Nature', thousands of publications in academic journals have been linked to paper mills in China, Iran, Saudi Arabia, and Russia.<sup>3</sup> According to some estimates, the percentage of academic articles produced by paper mills is between 2 to 20%.<sup>4</sup> In 2023 alone, 10,000 research articles were retracted as a result of fake research and unfortunately, Pakistan was included among the list of countries with highest number of retractions.<sup>5</sup> There are serious repercussions for the authors, the journals, and eventually the country as a whole.<sup>6</sup>

### Intellectual Prostitution

In nearly all major cities of Pakistan, these paper mills maintain a formal presence through physical

offices, often situated near teaching hospitals and higher education institutions. Their primary business model revolves around providing article and thesis writing services, with pricing structures that vary based on the length, complexity, and nature of the subject matter. A significant part of their marketing strategy involves active social media presence to attract potential clients. These entities frequently promote opportunities for purchasing authorship positions in research articles, primarily through websites and social media platforms. This practice, a type of '*intellectual prostitution*', has regrettably become normalized within academic circles. Many students, who constitute the majority of these services' clientele, now perceive such actions as an acceptable or routine part of their academic journey.

The widespread use of these services not only undermines the integrity of academic work but also promotes a culture where academic dishonesty becomes increasingly prevalent. Such practices pose significant ethical challenges, compromising the credibility of academic institutions and potentially diminishing the overall quality of research outputs in the country.

### The Pressure for Promotions and Academic Standing

The academic system in Pakistan, like other countries, places significant importance to research output as a key metric for promotions, tenure, and professional recognition. The Higher Education Commission's (HEC) policies require faculty

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members to publish a specific number of papers in HEC-indexed journals (categorized as W, X, and Y) to qualify for career advancements.<sup>7</sup> This pressure has led to a "publish or perish" culture, encouraging many to prioritize quantity over quality.<sup>8,9</sup> Unfortunately, this has created a fertile ground for paper mills, which offer a quick and unethical solution for those looking to meet institutional demands without genuine scientific effort.

### **Exploiting Loopholes in the System**

One of the major contributors to the rise of paper mills in Pakistan is the presence of loopholes within academic and institutional frameworks. Journals, particularly predatory ones,<sup>10</sup> offer easy access to publication with little or no peer review, allowing researchers to bypass rigorous scientific scrutiny. These journals operate with profit as their primary motive and exploit researchers who need quick publications for academic progression. Paper mills capitalize on this by fabricating data or recycling research findings, providing ready-to-publish manuscripts to authors who have little involvement in the actual research.<sup>11</sup> Some authors have been known to suggest fake reviewers, often using emails they control. This enables authors to submit their own reviews, guaranteeing favourable outcomes and bypassing legitimate academic scrutiny. This not only undermines academic integrity but also a disgrace to the reputation of Pakistani research on a global scale.

### **Absence of Real-World Impact**

The rise in publications from paper mills often comes at the expense of real-world applicability. Many papers churned out through these mills are superficial, outdated, lacking innovation, are survey-based, and fail to address the pressing issues facing Pakistan that require scientifically driven solutions. The influx of fraudulent publications has led to an oversaturation of meaningless data that does little to advance knowledge or tackle societal issues. The fundamental goal of academic research is undermined by this shift in emphasis from original

research to publications that are primarily focused on quantity. Many academics are more focused on fulfilling promotion criteria than producing data that can aid in addressing major problems facing our community.

### **Ethical Dilemma and Long-Term Consequences**

The use of paper mills presents not just a professional but also an ethical dilemma.<sup>12</sup> Researchers who resort to these unethical practices are not only compromising their own integrity but also contributing to a broader culture of academic dishonesty. This undermines the trust placed in scientific publications and creates a cycle where students and junior researchers may be influenced to follow the same path. Further, the repercussions for publishing false research are often not severe enough to deter unethical practices. Even when fraudulent papers are retracted, the authors may not face professional consequences, and retracted articles sometimes remain accessible, continuing to influence the literature.

The long-term consequences of this phenomenon are dire. In addition to damaging the credibility of Pakistan's academic institutions, this focus on quantity over quality stifles the development of innovative ideas. Genuine researchers struggle to stand out in an environment flooded with low-quality work, leading to a potential brain drain where talented individuals leave the country for environments that value authentic, impactful research.<sup>13</sup>

### **Artificial Intelligence and Paper Mills**

Artificial Intelligence (AI) has rapidly evolved into a powerful tool across numerous sectors, including healthcare, finance, and education. In the context of scientific research and academia, AI has the potential to both mitigate and exacerbate the issue of paper mills.<sup>14</sup> In Pakistan, where the problem of paper mills has been increasingly linked to the pressures of academic promotions and career advancement, AI could play a pivotal role in addressing this growing dilemma. However, while AI

can be a tool for detecting fraud, it can also be misused to support unethical practices in academic writing. Paper mills may harness AI to automate the generation of research papers, making them harder to detect.<sup>15</sup> AI language models can now generate text that mimics human writing with a high degree of sophistication, potentially producing articles that appear authentic but lack genuine scientific data or insight. The use of AI to fabricate citations, create fictional data sets, or even simulate peer-reviewed structures could make it even more challenging for traditional methods of fraud detection to keep up.

### **Role of PMDC and HEC in Addressing Paper Mills**

The Pakistan Medical & Dental Council (PMDC)<sup>16</sup> and the Higher Education Commission (HEC)<sup>17</sup> hold significant responsibilities in shaping the standards and policies governing research and publication practices in the medical and higher education sectors in Pakistan. Both these regulatory bodies have their respective Journals Recognition Committees. Hence, these institutions are in a prime position in combating unethical academic practices and promoting a culture of genuine, impactful research. Both the HEC and PMDC need to emphasize the importance of ethical research from the early stages of academic and medical education. Both these institutions need to develop the capacity of academic journals and editorial teams to compete

at the global level. Likewise, a collective effort by these two regulatory bodies is essential for ensuring that academic research in Pakistan contributes to solving real-world problems, maintaining the integrity of scientific inquiry, and safeguarding the credibility of Pakistan's educational and medical institutions on the global stage.<sup>18</sup>

### **Moving Forward: Reform and Responsibility**

Addressing this issue demands coordinated efforts from universities, regulatory bodies, and policymakers to promote academic integrity and discourage the commercialization of intellectual labour. Academic institutions must implement stricter guidelines for evaluating research publications. Greater emphasis should be placed on the quality and impact of research rather than sheer numbers.<sup>19</sup> Peer-review processes need to be more rigorous, and predatory journals should be identified and blacklisted.

In conclusion, while the demand for research publications in Pakistan continues to grow, the reliance on paper mills is undermining the potential for meaningful contributions to science and society. Addressing this issue will require systemic reform and a renewed commitment to research integrity, ensuring that academic efforts are directed towards solving real-world problems rather than serving as mere steppingstones for career advancement.

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