Combating unethical publications in Iraqi higher education: A pre- and post-intervention programme assessment

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ABSTRACT

This study examines the Responsible Publishing Initiative (RPI), a new intervention programme developed under University of Babylon's academic research policy to combat unethical publishing among research students by addressing predatory or hijacked journals. The study aims to: i) examine the awareness and practise of scholarly publishing among research students before and after participation in the new intervention programme; ii) analyse the publication data of research students before and after participation in the new intervention programme. The results show that at least 37 per cent of students have published in predatory journals. After participating in the RPI programme, it was found that students' awareness had increased and the number of publications in predatory journals had decreased significantly. The initial success of the programme demonstrates the importance of educational interventions to promote academic integrity. The study also emphasises the need for continuous monitoring and evaluation to ensure the long-term effectiveness of the newly proposed initiative. This research contributes to the broader academic discourse on sustainable development and is in line with UN SDG Goal 4 (Quality Education) and Goal 16 (Peace, Justice and Strong Institutions) by promoting a culture of integrity and rigour in Iraq's academic publishing landscape.

Keywords: *Unethical publishing; Predatory publishing; Hijacked journals; Academic integrity; Higher education; University; Iraq; Academic research policy.*

INTRODUCTION

In recent decades, the academic publishing landscape has been increasingly threatened by unethical publishing practises due to the rise of predatory and pirated journals. Predatory journals are exploitative journals that charge authors substantial fees without providing the usual editorial and publishing services such as peer review and proper indexing, thereby jeopardising the integrity of scholarly work (Donev, 2020). Hijacked journals, on the other hand, are legitimate journals whose identities have been stolen by fraudulent websites that solicit submissions and fees from unsuspecting authors. These are fake websites that use

the title, logo, design and ISSNs of real, legitimate journals. Compared to predatory journals, hijacked journals are more likely to receive contributions from authors because they mimic reputable journals and usually claim the metrics that these journals have received on Scopus or Web of Science (Dadkhah, Maliszewski, & Jazi, 2016). Both practises undermine the credibility of scientific research and can incentivise researchers to publish in journals that do not meet acceptable standards of scientific communication.

The proliferation of predatory and hijacked journals poses major challenges for the academic community. Researchers, especially junior scholars and research students, are defenceless against these fraudulent practises as they lack awareness and experience in the publication process (Wilson, 2024). The consequences are far-reaching and ultimately affect the credibility of researchers' work, their academic careers and the wider scientific community's trust in published research. Addressing these issues is critical to maintaining the integrity of academic publishing, ensuring that research is published and disseminated through reputable channels, and protecting the interests of researchers.

Unfortunately, several recent studies have indicated that Iraq is among the top 3 countries with the highest number of publications in suspected predatory and/or hijacked journals (Macháček & Srholec, 2022; Abalkina, 2024). Against this background, Babylon University has recognised the need to combat predatory publishing practises and has introduced a comprehensive intervention programme named Responsible Publishing Initiative (RPI) as part of its academic research policy, which aims to improve the quality and integrity of research outputs. This RPI includes measures to educate research students about reputable publishing practises, identify predatory and hijacked journals, and provide support and resources to help students choose appropriate publication channels. The programme also includes ongoing monitoring and evaluation of research students' publication activities to assess the impact of these measures.

The aim of this study is to assess the current state of academic publishing at Iraqi universities using the University of Babylon as an example. It also aims to evaluate the effectiveness of the proposed PRI programme developed at the university as part of its academic research policy to reduce the incidence of predatory publishing among research students. This initiative aims to achieve UN SDG Goal 4 (Quality Education) and Goal 16 (Peace, Justice and Strong Institutions) as University of Babylon new research policy aims to improve transparency and accountability in the academic publication process. This policy strengthens institutional practises and ensures that students engage with credible and reputable journals by providing clear guidelines and resources to identify and avoid predatory journals, thus contributing to the development of a more effective and accountable academic institution. This study therefore aims to provide insights into the challenges faced by research students in the complex academic publishing landscape and recommendations to further improve the University's efforts to promote reputable research practises.

LITERATURE REVIEW

Over the past decade, a considerable number of studies have attempted to define predatory journals and their characteristics (Cobey et al., 2018; Taylor, 2019; Nisha, Das, & Tripathi, 2020; Pinto, Dias, & Semeler, 2021; Moses & Shem, 2022). Most of these scholars agree that predatory publishing is a phenomenon in which fraudulent and scam journals exploit researchers by charging publication fees without providing the usual editorial services associated with legitimate scholarly journals. These journals often lack rigorous peer review,

adequate editorial oversight and reliable indexing, leading to the dissemination of poor-quality research. The proliferation of predatory journals has increased with the advent of open access publishing models, where authors pay to make their work freely available.

Journal hijacking, on the other hand, has become an important topic in academia, but is less discussed than predatory journals (Jalalian & Dadkhah, 2015; Dadkhah & Borchardt, 2016). A hijacked version of a journal is a website that uses the ISSN and name similar to the original journal but has no relation to the original journal. Hijacked journals, also known as cloned journals, claim to be legitimate indexed journals and charge authors fees for publishing manuscripts (Hegedűs, Dadkhah, & Dávid, 2024).

Different approaches have been taken to provide a broader perspective on the practises of predatory and hijacked publishing. Bohannon (2013) conducted a sting operation by submitting a deliberately flawed paper to various open access journals. This revealed that a significant number of journals accepted the paper without proper peer review, showing the extent of predatory practises. Similarly, Taylor (2019) sought to understand and articulate current predatory publishing practises by examining the current practises of three known predatory journals officially blacklisted on Jeffrey Beall's list of predatory publishers. The investigation includes corresponding with the editors-in-chief of the journal in question, submitting scholarly work to the journal (under a pseudonym), receiving feedback after a peer review process, and inquiring about payment for open access of the journal article. The findings suggest that predatory publishers disguise publication fees, steal the identities of real scientists and position them as editors of predatory journals, mimic the website aesthetics of credible journals, and collect author information to further promote predatory publications and fake academic conferences.

The impact of predatory publishing on academic integrity is profound. It undermines the credibility of scientific work, dilutes the quality of academic literature and misleads researchers, funders and policy makers. Researchers who publish in predatory journals can expect their work to be disregarded by the scientific community, damaging their academic reputation and career prospects. In addition, the dissemination of unverified research results can contribute to the spread of misinformation, which can have serious consequences, particularly in areas such as medicine and public health.

Several studies have attempted to assess awareness and understanding of predatory printing among researchers. Rawas et al. (2020) examined nursing faculty members' experiences of publishing in predatory journals. Their study showed that publishing in a predatory journal has serious consequences, both professionally and personally, and emphasised the fact that anyone in academia can fall victim to these journals. They pointed out that despite the increasing knowledge of predatory publishing, there is still a lack of awareness of this dark side of publishing. Webber and Wiegand (2022) conducted a survey of faculty members at a mid-sized doctoral-granting university to assess faculty knowledge and attitudes toward predatory publishing. Their results showed that almost all faculty members had at least heard of predatory publishing and thought it was a problem. However, they expressed uncertainty about the impact predatory publishing has on their discipline and were reluctant to penalise colleagues for publishing in these journals. Furthermore, Schira and Hurst (2024) conducted a focus group analysis to assess university students' knowledge of identifying potentially predatory journals based on their previous investigation of PPJ citations in students' bibliographies (Schira & Hurst, 2019).

It has been observed that early career researchers and those from developing countries have difficulty distinguishing between legitimate and predatory journals (Abalkina, 2021; Nicholas et al., 2023; Schira & Hurst, 2024). This lack of awareness is often due to insufficient training in academic publishing and the deceptive practises of predatory publishers, such as falsified impact factors and lists of editorial boards. The impact of publishing in predatory journals goes beyond individual researchers. Hegedűs, Dadkhah and Dávid (2024) state that the proliferation of such journals threatens the integrity of academic publishing, creating a parallel system in which substandard research is circulated and potentially cited, misleading further research and policy decisions.

In response to the growing threat of predatory publishing, various institutions and organisations have taken measures to educate researchers and mitigate the impact of these fraudulent practises. These measures include developing guidelines to identify reputable journals, providing training on academic publishing, and conducting awareness campaigns about the dangers of predatory journals. Studies have shown that institutional policies can significantly reduce the incidence of predatory publishing. For example, Moher et al. (2017) found that institutions with clear policies and training programmes significantly reduced the number of researchers submitting to predatory journals. These findings emphasise the importance of institutional support in combating predatory publishing and maintaining the integrity of academic research.

Frandsen, Lamptey and Borteye (2024) conducted a follow-up study to their earlier initiative (Frandsen et al., 2022) to assess the effectiveness of the implementation of measures against unethical academic publishing by analysing 273 PhD applications submitted to the Kwame Nkrumah University of Science and Technology (KNUST) in Ghana. The results show that researchers at KNUST are submitting proportionally more publications to recommended outlets following the introduction of the new promotion guidelines, as the review process effectively discourages publication through such outlets.

The literature emphasises the urgent need for greater awareness and education of researchers about predatory publications. While individual efforts are important, institutional policies and support systems play a critical role in addressing this problem. Babylon University's new academic research policy is a proactive approach to combating predatory publishing by providing researchers with the necessary tools and knowledge to make informed publication decisions. One of the programmes under this policy is the Responsible Publishing Initiative, a training and awareness programme designed to help research students identify and avoid predatory publishing practises. It includes an orientation to the academic publishing process, guidance on recognising credible journals, practical tools for evaluating publication venues and education on ethical publishing standards. The programme is also in line with university policies to promote transparency and integrity, provides mentorship and institutional support, and is currently being integrated into graduate education in collaboration with the Iraqi Ministry of Higher Education and Scientific Research. Therefore, the aim of this study is to evaluate the effectiveness of the RPI programme, which is part of the above-mentioned policy to reduce the incidence of predatory publications and improve the overall quality of academic research.

METHODS

The Responsible Publishing Initiative (RPI) was launched by Babylon University's Academic Research Unit at the University of Babylon in the academic year 2022–2023 as a university intervention programme to address the growing threat of predatory publishing and to promote a culture of ethical research dissemination. The initiative is designed as a compulsory part of research training and is aimed at all master's and PhD students enrolled at the university from the 2022–2023 academic year. The RPI programme consists of four central training modules:

i. Fundamentals of academic publishing and research ethics
ii. Understanding and recognising predatory publishing practises
iii. Tools and criteria for selecting reputable journals and conferences
iv. Plagiarism, authorship and institutional support mechanisms

These modules were delivered through interactive lectures, practical workshops, group discussions and guided assessments of real publication scenarios. Students have access to curated resources, including journal and framework assessment checklists aligned with international guidelines.

The main aim of this study is to evaluate RPI as a new intervention programme to promote ethical practises in scholarly publishing among research students. To achieve this, the study was guided by the following specific aims:

i. To examine the awareness and practise of scholarly publishing among research students before and after participation in the new intervention programme
ii. To analyse the publication data of research students before and after participation in the new intervention programme.

The study was conducted in two main phases, comprising a pre- and post-programme assessment.

Sample

The University of Babylon was chosen as the sample size for several reasons. Due to its central location and prominent position in Iraqi higher education, the University of Babylon is known for its significant research achievements and academic contributions in Iraq. The university has a diverse academic landscape as it is a comprehensive institution offering a wide range of programmes in various disciplines including pure sciences, engineering and humanities. This diversity allows for a broad study of publishing practises in different fields, making the results more transferable to other Iraqi universities with similar academic offerings. The university also has a large number of research students and a diverse faculty, which is critical for capturing a representative sample of experiences and practises. This demographic diversity contributes to the study's ability to capture a wide range of perspectives and experiences related to academic publishing. As part of the study, a survey and follow-up interviews were conducted with research students before and after their participation in the study. In addition, their publication data was analysed in detail to assess their awareness and practises related to academic publishing.

Survey

A survey is being conducted at the University of Babylon among research students from various disciplines. The survey will collect quantitative data on students' awareness and understanding of predatory and hijacked journals and assess their experiences with academic publishing and their ability to distinguish between reputable and questionable journals. Selection criteria will include students who have not yet defended their dissertation and have published or attempted to publish research articles during their studies. Stratified

random sampling is used to ensure a representative sample of the research student population. The sample includes students from different disciplines, years of study and with different publication experiences. This approach helps us to capture a broad range of perspectives and experiences related to academic publishing. Data collection for the survey was conducted over a six-month period (July 2022 to December 2022). The survey was initially distributed to 300 research students. Of these, 277 agreed to participate in the survey, while 23 either declined or did not respond. Of those who started the survey, 21 participants dropped out halfway through for various reasons such as lack of time or interest. 11 responses were excluded due to incomplete or inconsistent data. The final number of completed surveys (n=245) used for the analysis resulted in a response rate of 82%.

Before the survey was carried out in full, a pilot study was conducted to ensure the validity and reliability of the study. A total of 20 students from different disciplines took part in the pilot study to obtain comprehensive feedback. The main objectives of the pilot study were to assess the comprehensibility of the questions, identify ambiguities and estimate the time required to answer the questions. Based on the participants' feedback and an initial analysis, several changes and adjustments were made. For example, the questions were reworded to improve clarity and avoid misinterpretation, particularly in relation to the distinction between predatory and hijacked journals.

Follow-up interview

Participants' knowledge of academic publishing and predatory journals was further explored through follow-up interviews with 45 research students enrolled in Masters and PhD programmes at the university in the academic year 2022–2023 (see Table 1). The sample was drawn proportionally from four broad academic disciplines to ensure a balanced representation of all fields of study and levels of academic experience: health sciences (10 participants), engineering (13), pure sciences (13) and social sciences (9), reflecting the distribution of the wider survey population. Of the total number of participants, 25 were Masters students and 20 were PhD students.

These interviews provided qualitative insights into the students' practise and the challenges they face in the publication process. The interview data was transcribed and analysed using thematic analysis. In doing so, the data was coded to identify common themes and patterns related to the experience of unethical publishing. The combination of survey and interview data provided a holistic overview of students' knowledge and experiences of academic publishing.

To comply with ethical standards and due to the sensitive nature of the study, participants were assured that their confidentiality would be strictly maintained, both about the identity of individual participants and the name of their departments. All data collection procedures were conducted in the privacy of the Academic Research Department and only the researchers had access to the data, which was stored digitally on an external hard drive.

Analysing the publication data

The analysis of publication data includes the screening and verification process for publications submitted by research students at the University. The review process was initiated because a significant discrepancy was identified between the number of publications recorded at the University and the actual number of publications associated with University of Babylon in databases such as Scopus and Web of Science (WoS), most likely due to predatory or unethical research practises. To address this, the Department of Academic Research in the University Registrar's Office has established a central database

documenting the publication practises of research students in detail, which will be recorded continuously over a fifteen-month period (1 July 2022 - 30 September 2023). The extracted dataset contains the name of the applicant, the research areas, the number of publications submitted, the title of the article, the journal or conference proceedings, the publication status (e.g. accepted or under review) and information on indexing in (e.g. WoS, Scopus or other specific databases).

Table 1: Participants in the follow-up interview

Participants Pseudonym (N=45)	Gender	Discipline	Study Programme	Participants Pseudonym (N=45)	Gender	Discipline	Study Programme
R1	Female	Social Sciences	Master	R24	Female	Engineering	Master
R2	Male	Pure Sciences	PhD	R25	Female	Social Sciences	PhD
R3	Female	Health Sciences	Master	R26	Male	Engineering	Master
R4	Male	Engineering	Master	R27	Female	Pure Sciences	Master
R5	Female	Pure Sciences	Master	R28	Male	Health Sciences	Master
R6	Male	Social Sciences	PhD	R29	Male	Engineering	PhD
R7	Female	Engineering	PhD	R30	Female	Pure Sciences	Master
R8	Female	Social Sciences	Master	R31	Female	Health Sciences	Master
R9	Male	Health Sciences	PhD	R32	Male	Pure Sciences	PhD
R10	Female	Engineering	Master	R33	Male	Engineering	PhD
R11	Male	Engineering	PhD	R34	Female	Engineering	Master
R12	Male	Health Sciences	Master	R35	Female	Social Sciences	Master
R13	Female	Pure Sciences	PhD	R36	Male	Pure Sciences	PhD
R14	Male	Pure Sciences	Master	R37	Female	Pure Sciences	Master
R15	Male	Social Sciences	Master	R38	Male	Health Sciences	Master
R16	Female	Health Sciences	PhD	R39	Female	Pure Sciences	PhD
R17	Male	Engineering	Master	R40	Male	Engineering	Master
R18	Female	Engineering	PhD	R41	Female	Health Sciences	PhD
R19	Female	Health Sciences	Master	R42	Male	Social Sciences	PhD
R20	Male	Engineering	PhD	R43	Male	Engineering	PhD
R21	Male	Pure Sciences	Master	R44	Female	Social Sciences	Master
R22	Female	Pure Sciences	PhD	R45	Male	Pure Sciences	Master
R23	Male	Health Sciences	PhD				

The data was analysed and assessed in terms of publication status (published/unpublished), type of journal (reputable/prime/photoshopped) and, if published, whether it is published on the (original/photoshopped) website and further indexed in databases such as Scopus or WoS. A detailed analysis is conducted to determine what type of predatory and hijacked journals were selected for publication. This was done by cross-referencing the publications against a list of journals and sources identified as hijacked journals by the University's Academic Research Unit. In addition, established databases, the Beall list and Cabell's Predatory Reports were used to identify suspected predatory journals/publishers. The aim is to quantify the extent of predatory publishing among students and to identify patterns and trends in their publishing behaviour. The data analysis was conducted in two phases:

i. Pre-RPI programme (1 July 2022 - 14 February 2023), a total of 779 articles

ii. Post-RPI programme (15 February 2023 - 30 September 2023), a total of 793 articles
The post-RPI programme was conducted to assess the effectiveness of the intervention programme in reducing the incidence of predatory publishing and improving the overall quality of students' research outputs. A detailed comparative analysis was conducted to identify changes in publication practises in predatory and hijacked journals.

RESULTS

i. Students' awareness of unethical publishing (pre- and post-programme assessment)

The survey sample consisted of 245 research students enrolled in Masters and PhD programmes at the university in the academic year 2022 to 2023. Participants were drawn from four major academic disciplines: health sciences (22%, n = 55), engineering (28%, n = 68), pure sciences (30%, n = 72) and social sciences (20%, n = 50). Of the total number of respondents, 138 were Master's students and 107 were doctoral students. Figures 2 and 3 below show the results of the first part of the survey (awareness of unethical publishing) before and after the programme respectively. The semi-structured interviews provided further details about the students' awareness of publishing and their practises, as explained in the following thematic analysis.

Figure 1 and Figure 2 show the responses from the pre- and post-programme surveys, which indicate that participants were initially only slightly familiar with the distinguishing characteristic of unethical publishing. For example, when asked if they understood Beall's List as a key tool for identifying predatory journals, only 15% of participants agreed, while 62% of research students indicated that they were unfamiliar with the term. Familiarity with the key characteristics of predatory journals was similarly low. Most responses were disagree (61%) and neutral (17%), indicating uncertainty and unfamiliarity with unethical publishing.

Although some students were aware of platforms such as Scopus and WoS, there was a general misunderstanding about the nature of journal indexing and the different publication models. Prior to participating in the programme, students indicated limited knowledge about the role of major indexing databases such as Scopus and WoS and their importance to journal legitimacy. For example, when asked if they could check whether a journal was indexed in Scopus or WoS, less than a quarter of participants agreed (22%), while almost half of them disagreed (48%). This indicates a significant knowledge gap in the use of indexing databases as a validation tool. There was also an almost complete lack of understanding of the implications of posting a journal to Scopus or WoS in the pre-programme responses. Most participants either disagreed (61%) or remained neutral (17%) when asked if they knew why a journal might be removed from such indexing systems. This lack of clarity about indexing standards and the consequences of removal left students vulnerable to non-credible publications.

After participating in the programme, participants showed an improvement in their familiarity with publishing models. For example, knowledge of the key characteristics of predatory journals increased significantly (45%). Respondents agree (38%) or strongly agree (7%) with the statement, which is a stark contrast to the pre-program responses. Familiarity with Beall's list has also improved (47% agree and 12% strongly agree), with again more than half of respondents admitting to knowing the list.

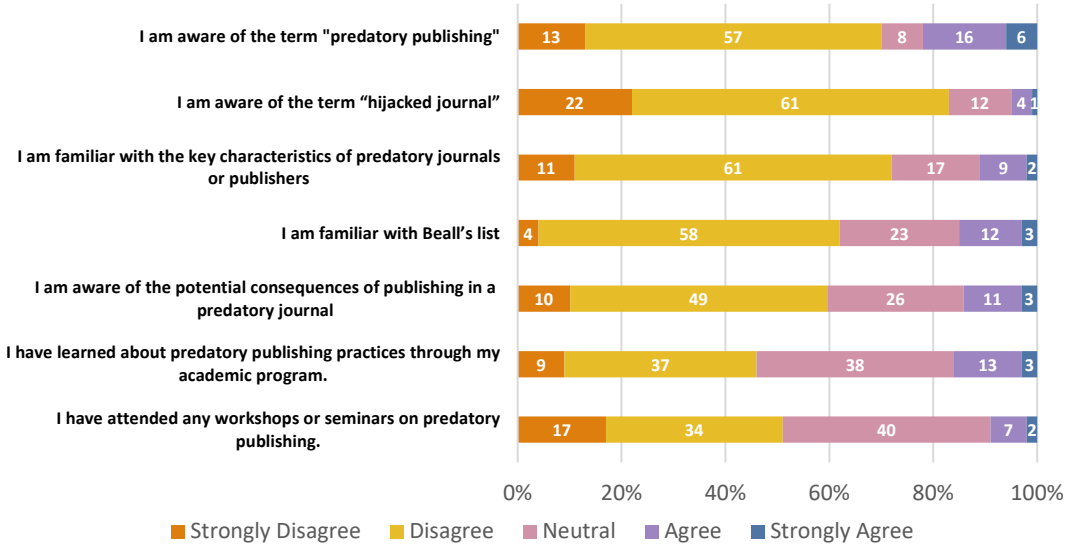

Figure 1: Awareness of unethical publications during pre-program assessment

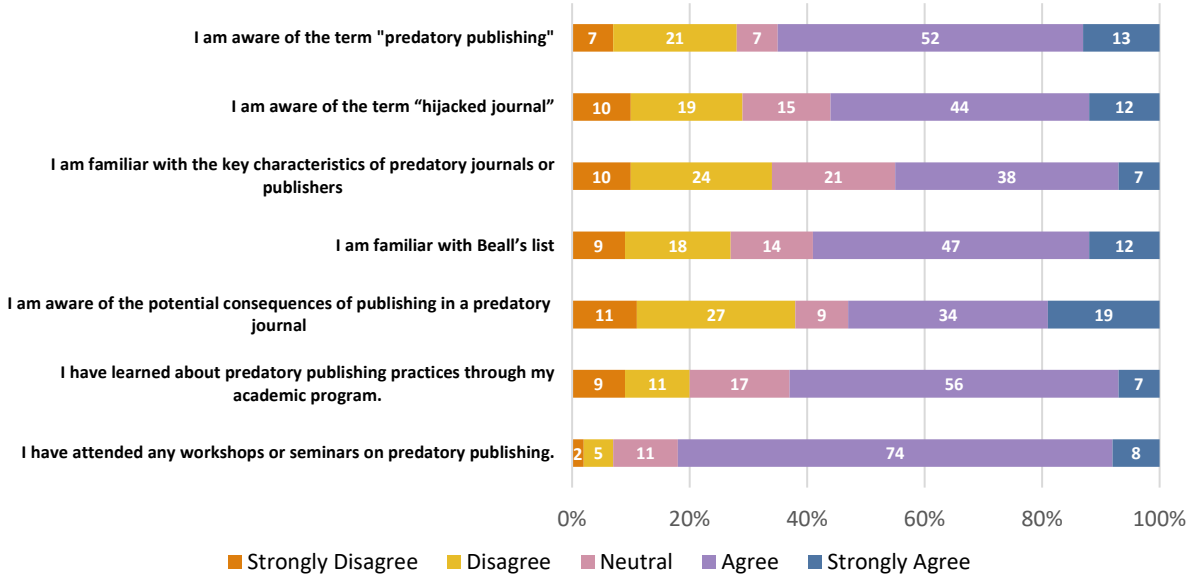

Figure 2: Awareness of unethical publishing during post-program assessment

ii. Pre- and post-program assessment on student publishing practises

Figure 3 and Figure 4 below illustrate participants’ self-reported practises of unethical publishing during the pre- and post-programme assessments. Prior to the intervention, a considerable proportion of participants admitted to engaging in risky publishing behaviour: 21% agreed and 8% strongly agreed that they had received unsolicited invitations to submit manuscripts. In addition, 43% said they were neutral and 36% agreed that they had been approached by journals promising rapid publication in exchange for a fee.

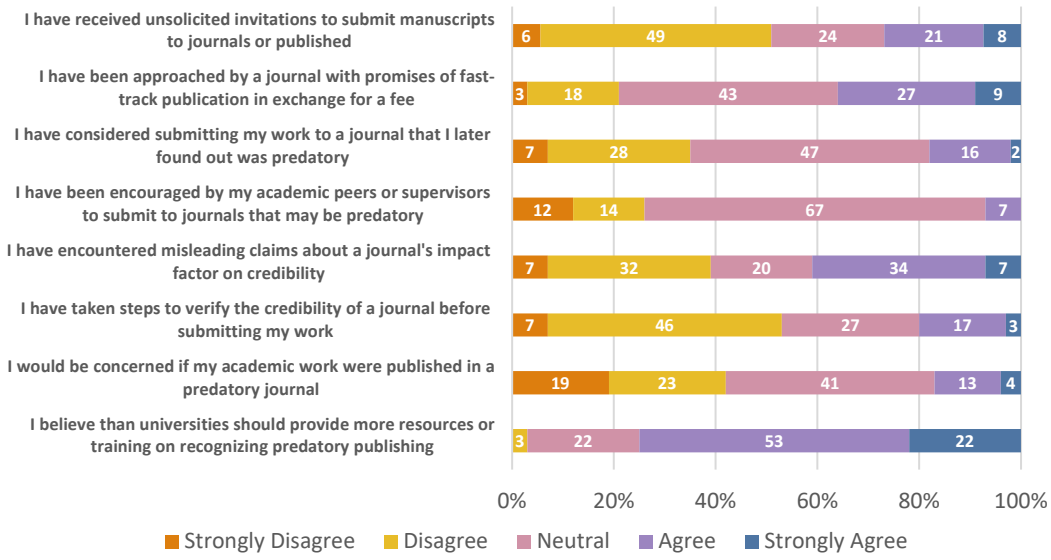

Figure 3: Practices in unethical publishing during pre-program assessment

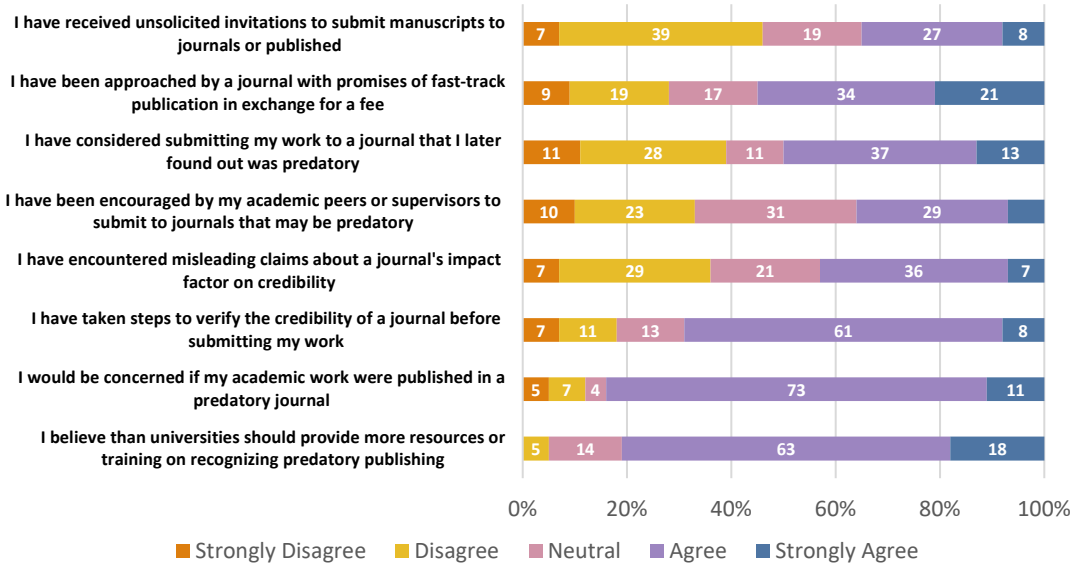

Figure 4: Practices in unethical publishing during post-program assessment

However, the result of the post-programme shows a positive change in awareness and behaviour. When comparing the combined rate of respondents who agreed or strongly agreed that they had considered submitting their work to journals they later recognized as predatory, the pre-programme assessment revealed only 18%. In contrast, the post-programme assessment showed more than double to 50% overall (with 37% agreeing and 13% strongly agreeing), indicating that participants had developed a heightened awareness and an improved ability to identify predatory publishers. Concern about publishing in predatory journals also increased significantly with 84% agreed at post- programme, compared to 17% at the pre-programme. In addition, the call for institutional support remained which 81% of respondents agreed that universities should provide more training to recognise predatory publishing practises.

The post-programme assessment showed that the majority of participants now agree (31%) or strongly agree (8%) that they know how to check the indexing status of a journal, which is more than double the pre-programme result. Knowledge of the reasons for discontinuing journals has also improved. Slightly less than half of participants (47%) confirmed that they understood the reasons (e.g. failure to meet peer review standards or breaches of publication ethics). The post-programme assessment showed an encouraging change in publication behaviour. The number of students who agreed that they could independently identify a reputable journal more than doubled (61% agree, 8% strongly agree).

A follow-up interview was conducted to gather detailed information about the participants' awareness and practises regarding unethical publishing (see Figure 5).

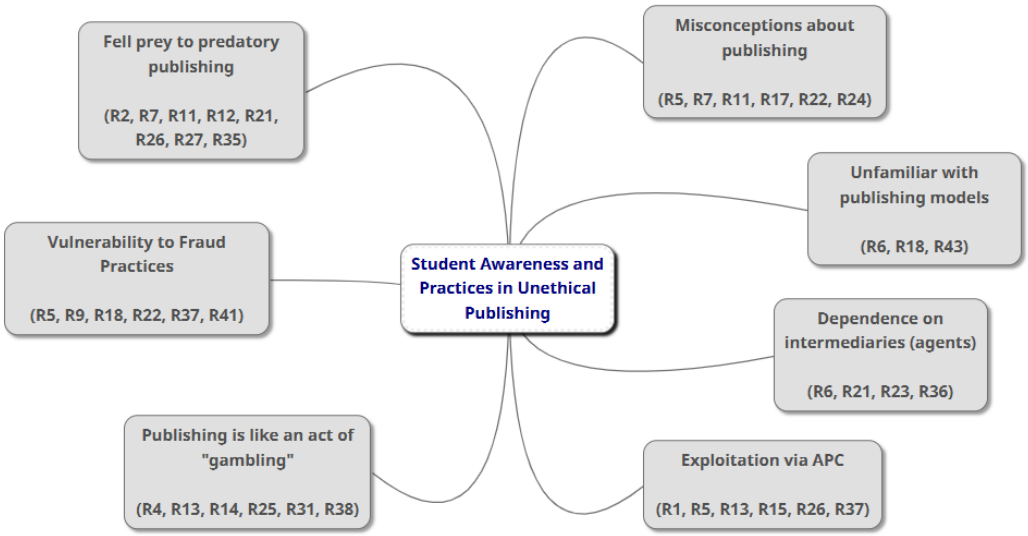

Figure 5: Thematic analysis of the follow-up interview

Theme 1: Limited awareness and misconceptions about unethical publishing

One student (R22) stated, “before the programme I honestly did not know what a predatory journal was. I thought if a journal had a website, it was reputable”. The programme prompted students to be more cautious when submitting their manuscripts for publication, as (R41) described, “I do not want to lose my work, time and money again, next time I will check the journal myself”.

Students only discovered that the journal they had published in was predatory or hijacked, which was usually done by a colleague or through the scientific committee, when they submitted their work to the department. One participant (R33) said, “I only found out that the journal was fake when my supervisor rejected it for the dissertation."

The interviews supported the survey findings by showing that students often viewed speed of publication as a positive attribute without recognising the potential for compromising quality. One participant (R7) stated, “I thought speed of publication meant that the journal

was efficient, not that it might be fake". Participants also showed a lack of understanding of hijacked journals and cloned websites. One participant (R24) expressed great surprise when he learnt of the existence of hijacked journals: "wait a minute, so the website can look real but the journal is not behind it at all?" The lack of such basic awareness makes students very vulnerable to exploitation, especially those who do not come from science subjects where the norms of academic publishing are less important.

It was also noted that many students had no understanding of peer review as a safeguard for research integrity. Participants who published their work through agents stated that the journal did not have a peer review process and that those who received some form of feedback on their submission made very superficial and/or general comments. One respondent (R8) described her experience: 'I did not realise there was supposed to be a peer review process. The agent just sent me my paper in PDF format and a few days later it was published. I thought that was normal". Very few participants were aware of the importance of peer review in the publication process, as the majority of students often viewed the speed of publication as a positive attribute without realising the potential loss of quality. One PhD candidate (R16) explained, "The journal gave me feedback by email, but it was only one or two lines saying that the paper was OK. I thought that was a good indicator that my work was well done". This lack of awareness related not only to the peer review process, but also to the general concept of publication ethics that journals and research should adhere to. This in turn led to a lack of understanding of the phenomenon of predatory and hijacked journals and the reasons for the removal of sources (journals) from major indexing databases such as Scopus and WoS. In addition, several participants (R4, R13, R14, R25, R31, R38) described the process of selecting a journal for publication as a pure "gamble", as they never knew whether the journal they had selected would still be indexed in Scopus and/or WoS at the time they submitted their thesis or dissertation.

The results of the survey showed that students' awareness of unethical publishing practises is significantly heightened, particularly in relation to complex issues such as pirated publications, hijacked journals and deletion from index databases. Many participants admitted that they did not even have a basic understanding of these concepts prior to the intervention programme. They were often unaware that some journals operate with questionable motives charging high publication fees without offering legitimate editorial or peer review services. This limited awareness made them vulnerable to misleading claims about a journal's impact factor, indexing status or credibility. Above all, hijacked journals were an unfamiliar concept for most. As a result, students were unable to critically evaluate the legitimacy of journals and often equated rapid publication and low rejection rates with quality without understanding the ethical and academic implications.

Theme 2: Unfamiliar publishing models and indexing standards

Another key theme that emerges from the qualitative data is ignorance of publication models and indexing standards. Respondents were surprised when they were informed that there are different forms of publication (open access, subscription, hybrid). They seemed to believe that all publications require APCs and that no APC-free journal can be authentic or reputable. One MA student (R35) said, "I thought every journal charged a fee. I did not realise there were journals that did not charge a fee and were still reputable.

The confusion between open access, subscription and hybrid journals became clear in the interviews. The idea that APCs were a guarantee of quality provided a breeding ground for researchers to be misled by predatory actors. Many participants assumed that all reputable journals charge fees, with one student (R6) claiming, "If it's free, it's probably not a real

journal". This belief led to the assumption that APCs were a universal requirement, which further clouded their judgement when evaluating the credibility of journals. One student (R43) recalled, "The agent told me it was $1000, so I was sure it must be a good journal"." Due to this lack of basic publishing knowledge, students were unable to judge whether a journal was reputable or met academic standards.

Theme 3: Dependence on middlemen

Prior to participating in the programme, several students reported that they relied on informal sources to determine the credibility of a journal, such as peer recommendations or information provided by publication agents. One participant (R6) confessed, "I thought if someone else has already published in the journal and thinks it's good, then it's probably safe"." After the training, participants expressed greater confidence in their ability to make informed publication decisions. This confidence was particularly evident in those who had taken advantage of the one-to-one counselling sessions. They felt more confident in their decisions after receiving tailored advice from experienced faculty members (R23), stating, "I felt confident when the team finally told me that the journal I was considering was genuine and reputable. The first two journals I had sent them previously both turned out to be fakes". Another student (R36) commented that "the feedback on the proposed journals was also useful for my colleagues in the lab as we intended to submit our article to the same journal" that no longer exists".

A disturbing pattern that emerged in the pre-programme interviews was that almost all participants who had some publishing experience mentioned that they did not submit their article to the journal themselves but submitted their articles to local publishing agents or intermediaries who sent the articles to the journals on their behalf. In the pre-programme interview, participants said, "I did not take any steps to check the credibility of a journal before submitting my work", highlighting the reliance on third-party providers. One participant (R21) admitted: "I did not even contact the journal; I left everything to the intermediary". When asked why they did not try to contact the journal themselves, one of the reasons given was that these intermediaries promised quick publication and offered "manageable publication fees".

The post-programme evaluation revealed that participants expressed a clear scepticism towards intermediaries who promise quick or guaranteed publication. They have a better understanding that not all reputable journals require APCs, reflecting a better understanding of open access and subscription models. One student commented, "If someone promises me publication in a fortnight, I now know that is a red flag and not a benefit" (R28). Another respondent said, "I no longer trust representatives who advertise on social media. Now I check the magazine myself on the Scopus website" (R39).

Theme 4: Lack of institutional support

Respondents indicated that there is a lack of institutional support and guidance to find reputable journals and that they rely heavily on peer recommendations and internet searches. This practise reveals a systemic problem: students are not adequately trained or supported to navigate the publication process. Without workshops, mentors or departmental resources, students resort to informal and often dangerous channels when they need academic publications. As one of the MSc students (R27) described, "No one in the department has ever told us how to find a good journal, we just ask each other or search online and hope for the best". Another (R33) said, "I found out that my final year colleague published her paper in a journal with a fake website, which our supervisor thought was the original journal website".

Theme 5: Publishing with APC

Participants reported how they were manipulated into believing that payment would guarantee publication. All participants who published their work through these agencies stated that payment of publication fees together with submission of the article guaranteed publication of the article in the respective journal. Payment was usually required in USD currency and ranged from 200 to 2100 USD per submitted article. Once payment was received, a letter of acceptance was issued, and a promise was made that the article would be published shortly afterwards. One participant (R21) said: “After I paid, I received the acceptance letter via WhatsApp the next day. I thought that the quick response and the fact that I had not requested any changes to my article meant that my work was good”."

Theme 6: Vulnerable to illegal publishing practises

The research students were susceptible to illegal publishing practises due to their collaboration with publication agents. The agents suggested a list of journals with their APC amount, all claiming to be reputable journals indexed in Scopus and/or WoS. The researcher is given no further guidance on the selection of the journal and no restrictions are placed on the scope of the journal. This resulted in researchers selecting the journal for their publication based on the cheapest APC and the lowest average publication time. One student (R42) reported that “my paper on Mesopotamian pottery was sent to a journal on optoelectronic laser technology and no one said it was a problem”.

The middlemen did not agree to be held accountable for the unethical practises, nor did they allow any form of reimbursement of the APC paid by the researchers. These middlemen often worked through social media and did not have physical offices for their clients to visit. Payments were often made via online payments (ZainCash) or bank transfers, and confirmation of acceptance is sent via WhatsApp or Viber numbers, which are changed and/or deleted from time to time. The contact persons did not provide any information about themselves or their full names, even pseudo names were used. One respondent (R4) said: “I never met the person. I only spoke to them via Viber. He said he was a professor at university ……, but when we enquired about him later, we realised that there is no such professor there. They used a fake name and when there was a problem, they just stopped answering." This made it even more difficult for the student to track down the middlemen. Despite the researchers' various attempts to resolve the situation, in almost all cases they eventually had to give up and publish a new manuscript in order to fulfil the requirements for submitting their thesis/dissertation to the faculty on time.

There are four scenarios described by participants after the APC payment was made, including the following:

i. The peer review process is superficial, if not non-existent. After acceptance, the student’s manuscript is published on the journal's website within a very short time as reported by R2, R7, R11, R12, and R27. Participant (R7) said: “I submitted the paper and received the acceptance email two days later. It said that my work was accepted, and no revisions were needed, there were no comments or corrections”. Similarly, R12 commented, “My work was in Arabic, so the agent just told me to pay for the translation and publishing fees, and he sent me the acceptance letter after a week. He did not say anything about the content of my work, so I thought it was okay.
ii. The journal has been hijacked, and the original owners of the journal's website no longer have access to the website or the manuscript submission platform. The website is controlled by a team of hackers and a temporary email address is provided for new submissions. After payment, a fake acceptance letter is issued and the student’s manuscript is eventually published on the original website of the hijacked journal,

either in the regular issue or in a so-called “special issue” (as reported by R5, R9, R18, R22, R37, R41). This situation often caused confusion among students, even if they were not convinced that their actions were unethical. One respondent (R18) argued, "I couldn’t believe there was such a thing as hijacking. I thought my department was messing with me because I checked my work and it was on the same link of the original journal”. In addition, one PhD student said, “I did not believe my supervisor that there was a hijacking case until my manuscript, which was on my Scopus author profile, was deleted by Scopus after the journal had not published in the last two years”.

iii. The journal has been hijacked and has a cloned website. The students are promised that their manuscripts will be published on the original website, but after receiving payment, the agents forward the articles to the fake website for publication. Several middlemen try to convince the students that this cloned website is the original, or they describe it as an “additional website” for international researchers (as reported by R21, R26, R35). The students (R21) describe that “the website looks exactly like the original, with the red header and the university logo. The head of department told me that only one letter is missing in the link to the website, so it is a fake website”.

iv. The original journal is highly regarded and indexed in major databases such as Scopus and WoS. After receiving full payment, the agent issues a fake acceptance letter claiming that the specified manuscript has been accepted for publication in the prestigious journal and will appear in the next issue. The agent has no access to the journal's original website or publication, nor is the acceptance letter linked to the specified journal. The article is not published anywhere, and the researchers are repeatedly promised that their article will appear in the next issue, of course without success (as reported by R6, R45). Participant (R45) said, “Every time I asked about publication, it was ‘next issue, next issue’ …but the article was never published, and when my department contacted the editor, the journal had no record of my name”.

iii. Publication data of the research students

The publication data was taken from the central database of the Academic Research Unit, which was continuously collected over a period of fifteen months (1 July 2022 - 30 September 2023).

The dataset includes (1572) research articles submitted by a total of (758) research students from the main disciplines: 19% (n=294) health sciences, 30% (n=467) engineering sciences, 32% (n=514) pure natural sciences and 19% (n=297) social sciences. The data set is divided chronologically into two groups, namely the period before the programme (1 July 2022 – 14 February 2023) and the period after the programme (15 February 2023 - September 2023). The articles submitted for both groups will initially be divided into four categories:

i. Valid publications, which are manuscripts submitted to reputable journals or conference proceedings, indexed in Scopus and/or Web of Science, and published on the original website
ii. Non-credible publications, which are manuscripts submitted to hijacked or predatory journals
iii. General publications submitted to local or international journals that are not indexed in the above databases but are also not problematic
iv. Non-localised submissions, which refer to submitted documents confirming acceptance of the manuscript in question, but which are not (yet) published anywhere online.

Of the manuscripts submitted by research students during the assessment period prior to the introduction of the new programme, a total of (37%) were published in non-credible

sources. These included hijacked journals, journals on the Beall's List, or journals categorised as predatory by the Academic Research Unit. The highest percentage of non-credible publications was found in the fields of medicine and health sciences (42%) and humanities and social sciences (37%), followed by pure sciences and engineering (28% and 9% respectively).

The non-credible publications submitted by research students in health and pure sciences indicate that they were predominantly published in predatory journals (62%), while the majority in humanities and social science programmes were published in hijacked journals (81%). In the engineering sciences, most publications were found in predatory journals, whose inclusion in Scopus was eventually discontinued, and only in two cases were publications made in hijacked journals.

Overall, 36% of the publications submitted by Master's students are not credible, while 37% of the documents were published in valid sources. In contrast, the proportion of non-credible publications among doctoral students is significantly lower (26%), while the proportion of valid publications is (47%). Following the introduction of the new academic research policy, significant changes were observed in the publication practises of research students over the following months, as shown in Table 2.

Table 2: Publication data of research students during pre- and post-program assessment

	Health sciences				Pure sciences				Engineering				Social sciences			
	pre		post		pre		post		pre		post		pre		post	
	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)	%	(n)
Valid	12	17	29	44	49	122	58	153	77	175	78	177	6	9	24	37
Non-credible	36	51	29	44	28	69	23	61	8	17	6	14	35	50	29	44
General	13	18	11	17	89	21	7	18	4	8	4	9	56	81	39	60
Not located	39	56	31	47	15	37	12	32	12	27	12	27	3	5	8	12

As shown in Table 2, the percentage of publications in non-credible journals, including hijacked ones, decreased after the programme in all disciplines, especially in health sciences (from 36% to 29%) and social sciences (from 35% to 29%). This indicates that students are more conscious and critical when selecting journals. At the same time, the percentage of valid publications, particularly those indexed in recognised databases such as Scopus and WoS, increased in all disciplines, with engineering increasing from 77% to 78% and pure sciences from 49% to 58%, indicating a positive move towards credible publication practises. In all disciplines, the number of valid publications has increased significantly due to the early detection of potentially unauthorised publication practises. Students enrolled in humanities or social science programmes have been found to opt for general publication sources, which is a sufficient first step towards more credible and reputable publication practises.

Figure 6 below shows the submitted publications of students enrolled in different postgraduate programmes (health sciences, natural sciences, engineering and social sciences and humanities), both before and after the introduction of the programme.

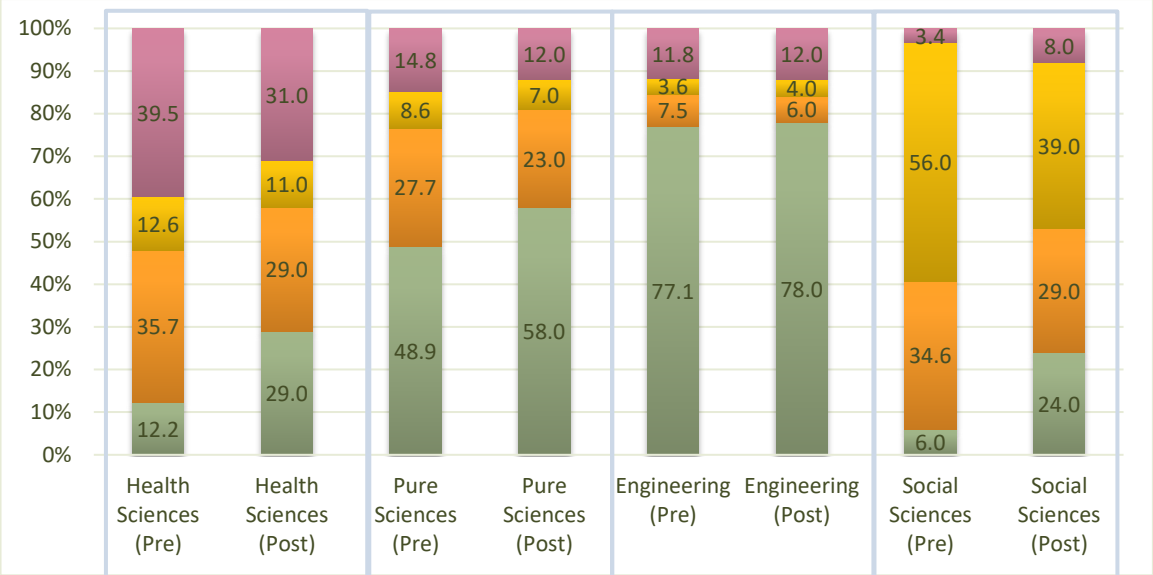

Figure 6: Submitted publications based on disciplines during the pre- and post-programme assessment

DISCUSSIONS

Awareness of unethical publishing

This study originally began as an attempt to understand the motivations of researchers who submit manuscripts to predatory and hijacked journals, in the expectation that the responses would surely reflect some of the issues raised. The results of the survey and interviews provide important insights into the current state of publication practises of research students at University of Babylon. The results show that students are not aware of the difference between reputable and predatory journals. Many students reported that they select journals based on the ease and speed of the publication process, often at the expense of academic integrity. The interviews further highlighted a pervasive uncertainty and confusion about the characteristics of predatory publishing, highlighting the urgent need for a targeted educational intervention programme.

A key finding of the survey indicated almost half of respondents (48%) admitted to publishing (or considering publishing) in journals that were later identified as predatory, hijacked or untrustworthy journals. This high prevalence suggests a systemic problem within academic culture, where the pressure to publish can overshadow the importance of quality and credibility. The interviews confirmed these findings. Many students expressed regret and frustration when they realised the predatory nature of their chosen journals. The lack of awareness has resulted in students losing both money and time by submitting their manuscript to a journal that does not actually publish their manuscript. As a result, they must republish the manuscript to meet the requirements of their research programmes. Research students also lose their scientific work and contribution as their valuable findings can hardly be retracted from the hijacked or fake website and therefore cannot be republished in its current state due to possible plagiarism issues.

This is consistent with the relevant literature, as Wilson (2024) found that the number of predatory and hijacked journals has increased remarkably in the last decade as a result of the "publish or perish" phenomenon associated with academia. "Publish or perish" is a term

used to describe the pressure academics are under to publish research papers in order to advance in their careers. When comparing the results of other studies, similar trends were observed in a study on the publication practises of academics in the Middle East (Rawas et al., 2020).

The confusion and regret expressed by students in this study mirror those reported globally and emphasise the urgent need for institutional intervention. In response, the implementation of Babylon University's academic research policy is in line with international best practises (Callaghan & Nicholson, 2020; Kumar, Siwach, & Devi, 2024), under which structured training programmes have been introduced to significantly reduce the incidence of unethical publication.

Wilson (2024) added that the experience of predatory publishing is shared by many early career and inexperienced researchers around the world, but is particularly common among researchers from low to middle-income countries, pointing to the difficulties associated with conducting research in countries with little academic infrastructure, as they often have to work in difficult conditions, sometimes with limited access to electricity and therefore limited access to the internet, as is the case in Iraq.

Unethical publishing practises

Considering the unethical research practises and predatory publishers observed in various countries, including Iraq, it was concluded that students need to be better trained to recognise predatory journals and understand why components such as peer review are so important to the publication process. The new RPI intervention programme being run at the University of Babylon aims to address these issues by providing clear guidelines and resources to identify reputable journals and avoid predatory practises. Initial feedback indicates that overall student awareness of the criteria for reputable publishing has increased. The programme's focus on education and training appears to be effective, as evidenced by a 21% decrease in reported instances of publishing in problematic sources compared to data prior to the implementation of the programme.

The introduction of the University of Babylon Academic Research Policy brought with it a robust pedagogical framework designed to combat the pervasive problem of predatory publishing. This framework included a series of mandatory workshops, online resources and one-to-one counselling sessions tailored to equip research students with the knowledge and skills required to navigate the complex academic publishing landscape. A key component of the University's education strategy was the delivery of workshops and seminars that focussed on ethical publishing practises. These sessions were held regularly and provided detailed instruction on how to recognise the red flags of predatory and hijacked journals, e.g. unclear peer review processes, lack of editorial transparency and exorbitant APCs.

This is consistent with Taylor (2019), who emphasises that predatory publishers actively exploit the academic community by concealing publication fees, stealing the identities of legitimate scholars to list them as journal editors, mimicking the design and appearance of legitimate journals, and misusing author information to promote other fraudulent activities, including fake academic conferences. These practises contribute to the erosion of trust in educational research and risk valid studies being presented as 'post-truth' or 'fake news' when disseminated via dubious platforms. This echoes the details reported in the research student follow-up interviews in this study and is therefore one of the priority topics that should be included in university training programmes.

The programme emphasised the importance of publishing in journals that are indexed by reputable databases such as Scopus and WoS. Students learnt how to check the indexing status of a journal and were given access to tools such as Cabell's Predatory Reports and Beall's List for cross-referencing. Sessions also covered broader topics related to publication ethics, including the importance of rigorous peer review, the consequences of submitting to predatory journals, and the ethical implications of authorship and research integrity. The programme was designed to be interactive, encouraging students to participate in discussions, analyse case studies and engage in exercises that simulated real-life scenarios. This hands-on approach not only increased engagement but also helped to reinforce the practical application of the knowledge gained. The introduction of mandatory workshops and seminars on academic publication standards was well received. Students reported that they better understood the importance of journal reputation and the potential consequences of publishing in questionable sources. This change in perception is critical to creating a culture of academic integrity and rigour.

In addition to the face-to-face workshops conducted in the programme, the University of Babylon provided an extensive range of online resources. These resources were accessible through the university's academic portal and included various tools such as step-by-step guides to selecting a journal for publication and checklists to help students evaluate the legitimacy and credibility of potential journals. Short, targeted videos are also provided to address common challenges in the publication process, such as avoiding predatory conferences and understanding the different types of open access models. The University ensured that all research students had access to databases such as Scopus and WoS, as well as plagiarism checking tools such as Turnitin. This access was accompanied by tutorials to teach them how to use these tools effectively for their research. The availability of these resources ensured that students could revisit the material at will, providing ongoing support for their research and publication activities.

Recognising that some students needed personal counselling, the University created the opportunity for one-on-one counselling by faculty members and library staff who specialise in academic publishing. These consultations offered students the opportunity to discuss specific challenges in selecting journals, understanding the peer review process, or dealing with potential predatory practises. This face-to-face support was crucial in helping students apply the principles learnt in workshops and online resources to their individual circumstances. In the future, the University plans to continue to refine and expand these educational programmes, considering feedback from students and faculty. Future initiatives could include advanced workshops for students with previous publishing experience, as well as collaborations with other institutions to share best practises and resources.

Challenges and further implications

The implications of this study are important for the academic community, particularly in the context of research training. As outlined in the previous section, the findings of this comprehensive study underscore the need for institutional policies that not only discourage predatory publishing, but also actively educate students and faculty about ethical publishing practises. By fostering a culture of integrity and rigour, universities can improve the quality of their academic output and protect the reputation of their research. For research training, our work emphasises the critical need for comprehensive training in research methods and publication standards. Incorporating these elements into the curriculum can equip students with the knowledge and skills they need to navigate the complex landscape of academic publishing.

Despite the positive results, this study was associated with some challenges and limitations. One major challenge was ensuring the accuracy and honesty of the self-reported data from the surveys and interviews. There is always a risk of response bias, were participants under- or over-report certain behaviours due to social desirability or fear of judgement. Another limitation was the relatively short time frame for assessing the impact of the new policy. While the initial results are promising, a longer observation period is needed to determine the sustained effectiveness of the policy. Future follow-up studies should aim to conduct longitudinal analyses to track the long-term impact on publishing practises.

This research contributes to the broader academic discourse on sustainable development and is closely linked to the United Nations Sustainable Development Goals (SDGs), in particular Goal 4 (quality education) and Goal 16 (peace, justice and strong institutions). The introduction of the Academic Research Policy at Babylon University represents a structural reform of academic education that makes students informed and responsible scholars rather than merely engaging them in publication metrics. Through the University's focus on mandatory workshops, individual consultations and accessible digital resources, the Responsible Publishing Initiative promotes inclusive and equitable quality education by equipping research students with the skills and knowledge necessary for ethical scholarly communication. The use of interactive, hands-on learning, such as real-world case studies and journal assessment exercises, supports SDG Goal 4.7, which advocates for education that promotes sustainable development and global citizenship.

In parallel, this study strengthens SDG 16 by addressing unethical publishing practises that threaten the credibility of institutions. By instilling academic integrity through training in research ethics, peer review standards and principles of authorship, the initiative supports target 16.6, which calls for effective, transparent and accountable institutions. Therefore, this project contributes to cultivating an academic culture based on rigour, responsibility and ethical behaviour, which are ultimately the key foundations for sustainable development in the higher education sector.

CONCLUSIONS

This study of the University of Babylon's efforts to combat predatory publishing by cracking down on hijacked journals by introducing a comprehensive intervention programme as part of its new academic research policy has yielded several important findings. The implementation of the new RPI has shown promising results. Students' awareness of the criteria for reputable publishing has improved significantly. In addition, the number of publications in predatory journals has decreased overall, indicating the initial effectiveness of the programme. The compulsory workshops and seminars introduced as part of the programme were particularly well received and contributed to a significant change in students' perceptions and behaviour towards academic publishing.

Due to its proven success in improving publication skills and reducing unethical publication practises, key components of the RPI were recently adopted by the Iraqi Ministry of Higher Education and Scientific Research as part of a similar project called Academic Skills Development for Research Students (ASDPS) in 2023-2024. Since then, it has become a mandatory national requirement for all research programmes at public universities in Iraq.

The results of this study have several important implications for academic policy and practise. First, the success of the new programme at the University of Babylon underscores

the importance of institutional measures to combat predatory printing. Policies that include educational components such as workshops and seminars can significantly improve students' awareness and understanding of ethical publishing practises. This study shows that well-structured and enforced academic policies can effectively curb the spread of predatory publishing. Second, the study emphasises the need for continuous monitoring and evaluation of academic policies. The positive initial results suggest that the proposed intervention programme is on the right track, but continuous evaluation is necessary to ensure its long-term effectiveness. Institutions must remain vigilant and adaptable and be prepared to update their policies and practises as new challenges and trends in predatory publishing emerge.

Based on the findings, several recommendations can be made for further policy development and enforcement:

i. Institutions should develop comprehensive training programmes that cover all aspects of academic publishing, including the detection of predatory journals, the importance of peer review, and the long-term impact of publishing in reputable journals.
ii. Regular audits of publication practises and feedback sessions with students can help identify ongoing issues and areas for improvement. This feedback loop is crucial for the continuous improvement of academic policies.
iii. Universities should work with academic societies, publishers and other institutions to develop standardised guidelines and resources for ethical publishing. This collaboration can provide students with a broader support network and more robust tools for identifying reputable journals.
iv. Enforcement mechanisms should be strengthened to ensure compliance with the new guidelines. This could include penalties for non-compliance and incentives for following best practise in publishing.

In summary, the University of Babylon new academic research policy is a significant step forward in addressing the problem of predatory publishing. The initial success of the policy demonstrates the importance of pedagogical measures and continued refinement of the policy. By adopting the recommendations and conducting further research, academic institutions can better protect the integrity and quality of their research outputs.

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CONFLICT OF INTEREST

The authors have no relevant competing interests to declare pertaining to the content of this article.

AUTHOR CONTRIBUTION

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