
Science, Education and Innovations in the Context of Modern Problems
Issue 2, Vol. 9, 2026

RESEARCH ARTICLE

# Artificial Intelligence Adoption in Academic Research: Empirical Evidence from Psychology Faculty in Palestinian Universities

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**Issue web link** https://imcra-az.org/archive/392-science-education-and-innovations-in-the-context-of-modern-problems-issue-2-vol-9-2026.html

**Keywords** Artificial Intelligence; Digital Research Skills; Psychology Departments; Palestinian Universities.

**Abstract**

This study underscores the pivotal role of faculty members within psychology departments in fortifying the scientific infrastructure through the strategic integration of Artificial Intelligence (AI) tools, which are employed to enrich scholarly inquiry and address contemporary knowledge gaps. The research sought to achieve three primary objectives: identifying AI tools applicable to scientific research, exploring optimal implementation strategies, and analyzing the most significant challenges researchers encounter in this domain. Adopting a descriptive-analytical methodology, the study utilized an electronic questionnaire administered to a sample of 188 faculty members from psychology departments across Palestinian universities. The empirical findings revealed that digital platforms and websites emerged as the most prevalent source for acquiring expertise in AI tools, cited by 53% of the respondents. Furthermore, the results indicated that Semantic Scholar is the most prominent tool for sourcing scientific literature, utilized by 55% of the sample, while Perplexity led the list of tools used for searching and analyzing data within files and texts, with an adoption rate of 48% among participants. In light of these findings, the study advocates for the institutionalization of financial and technical support to foster the adoption of AI technologies, as such measures are essential for augmenting the efficiency and productivity of researchers in navigating the evolving digital frontiers of academia.

**Citation**

Abdi Samira; Ali Lutfe Qashmar; Lutfe Ali Qashmar. (2026). Artificial Intelligence Adoption in Academic Research: Empirical Evidence from Psychology Faculty in Palestinian Universities. *Science, Education and Innovations in the Context of Modern Problems*, 9(2), 1-15. https://doi.org/10.56334/sei/9.2.55

| Received: 14.04.2025 | Accepted: 09.12.2025 | Published: 22.01.2026 (available online) |
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## Introduction

The accelerating integration of artificial intelligence (AI) into various aspects of contemporary life has significantly intensified the pace of technological advancement, exerting predominantly positive effects on scientific and knowledge-based fields worldwide. However, this rapid transformation has also generated psychological and social repercussions, most notably feelings of uncertainty and apprehension, particularly among individuals who lack adequate background knowledge of scientific research and its methodologies (Al-Rubaie, 2011).

In the twenty-first century, universities are increasingly compelled to continuously revise and develop their programs and strategic orientations in order to keep pace with rapid global changes across multiple domains, especially within the scientific and technological landscape. Within this context, higher education institutions have increasingly adopted and integrated artificial intelligence technologies across their core functions—namely teaching, scientific research, and community service—in an effort to enhance institutional performance and academic productivity (Al-Masri, 2022).

Artificial intelligence technologies are regarded as contemporary strategic tools aimed at advancing knowledge production through comprehensive knowledge management processes. These processes encompass knowledge acquisition, storage, processing, interpretation, and application in problem-solving and the delivery of innovative services. Moreover, AI technologies enable organizations to accomplish tasks more efficiently and within shorter timeframes, supported by advanced applications such as expert systems, artificial neural networks, fuzzy logic systems, and genetic algorithms, which play a critical role in supporting administrative and decision-making processes (Al-Tabaqa bint Rashid bin Ibrahim, 2021).

To fully harness the potential of these technologies, organizations must possess adequate expertise to design, implement, and manage AI-based solutions on a broad scale. Consequently, the pivotal role of organizations lies in adopting effective tools, operational processes, and strategic management practices that ensure the successful integration of artificial intelligence in achieving strategic objectives (Shehadatah, 2022).

As researchers in the field of artificial intelligence, our responsibility lies in unifying scholarly efforts to simplify scientific knowledge and enhance its accessibility and understanding. This endeavor aims to enrich academic discourse surrounding the central issues of our time and disciplinary fields through rigorous evidence-based research. Ultimately, such efforts contribute to bridging existing knowledge gaps and maximizing the benefits of the AI revolution, thereby serving the broader information society and advancing scientific research in particular.

## Research Problem

Faculty members in psychology departments continually seek advanced services capable of meeting their evolving research needs. In light of the growing prominence of numerous artificial intelligence tools that offer sophisticated solutions in the research domain, this study seeks to identify promising AI-based research tools, assess the extent of their use and perceived benefits among faculty members, and examine the challenges associated with their integration into the scientific research process.

Accordingly, the research problem can be articulated through the following question :

**What is the reality and what are the challenges of employing artificial intelligence in scientific research from the perspective of faculty members in psychology departments at Palestinian universities?**

## Significance of the Study

The significance of this study stems from its close association with scientific research, which constitutes a fundamental pillar for academic staff in particular and a primary driver of societal progress in general. Scientific research represents the nucleus and lifeblood of knowledge development and innovation within contemporary societies.

Furthermore, the importance of the study is enhanced by its focus on artificial intelligence tools and the advanced technological services they provide in supporting the research process. These tools offer substantial potential for application across diverse fields and scientific disciplines, thereby contributing to the advancement of research quality and efficiency.

## Objectives of the Study

This study aims to achieve the following objectives:

- To identify artificial intelligence tools that can be utilized in the scientific research process.
- To examine the extent to which faculty members in psychology departments employ AI tools in their research activities.
- To explore effective approaches for leveraging artificial intelligence tools in scientific research.
- To document the challenges faced by faculty members in psychology departments regarding the use and adoption of AI tools in scientific research.

## Research Questions

The study seeks to answer the following questions:

- What artificial intelligence tools can be utilized in the scientific research process?
- Which AI tools are currently used by faculty members in psychology departments in conducting scientific research?
- What are the most effective ways to benefit from artificial intelligence tools in scientific research?
- What challenges do faculty members in psychology departments encounter in using and benefiting from AI tools in scientific research?

## Scope of the Study

- **Thematic scope:** Artificial intelligence tools applicable to scientific research within psychology departments.
- **Population scope:** Faculty members in psychology departments at Palestinian universities.
- **Temporal scope:** The first semester of the academic year (2025/2026).
- **Spatial scope:** Psychology departments at Palestinian universities.

## Study Population

The study population comprises faculty members in psychology departments at Palestinian universities during the first semester of the academic year (2025/2026).

## Study Sample

The study sample consisted of 188 faculty members, randomly selected from the total population of psychology department lecturers at Palestinian universities during the first semester of the academic year (2025/2026). The sample was designed to adequately represent the various characteristics of the study population.

## Research Methodology

The study adopted the descriptive–analytical research design, given its suitability for the nature and objectives of the research. This approach facilitates the systematic collection, organization, and scientific analysis of data related to the study topic, enabling clear interpretation of findings and the derivation of results that may be generalized within the study population.

## Data Collection Instruments

Data were collected using the following instruments :

- A comprehensive review of relevant scholarly literature related to the study topic.
- A structured questionnaire.
- Semi-structured personal interviews.

## Theoretical Framework of the Study

Artificial Intelligence (AI) is considered one of the fundamental branches of computer science and a central pillar of the contemporary technology industry. The term is composed of two parts: *"intelligence"*, which refers to the ability to perceive new or changing situations, understand them, and learn from them—processes that constitute the core keys of intelligence, namely perception, comprehension, and learning. The second component, *"artificial"*, denotes everything that is manufactured or produced through human activity, distinguishing it from natural beings or phenomena that arise without human intervention. Accordingly, artificial intelligence can be broadly defined as the intelligence created by humans and embedded in machines and computer systems, making it a scientific field concerned with developing intelligent machines capable of simulating human cognitive abilities (Al-Aqel, Al-Azazi, & Al-Hajjaj, 2021).

Artificial Intelligence (AI) refers to a set of systems and devices designed to emulate human intelligence by performing specific tasks based on the processing of data and information collected from their surrounding environment (Al-Mas'ad & Al-Farani, 2022).

AI is a branch of computer science concerned with the design and development of systems and programs capable of simulating human intelligence, thereby enabling them to perform complex tasks—previously exclusive to humans—that require cognitive processes such as logical reasoning, learning, planning, and decision-making (Malik, Tayal, & Vij, 2019).

The role of artificial intelligence in scientific research and everyday life has been expanding steadily, occupying increasingly significant domains across various sectors. Owing to its rapid development and vast capabilities, AI demonstrates a remarkable capacity to support social stability and bridge digital divides, positioning it as a conduit toward achieving an inclusive society for all (Sheltout, 2023).

In recent years, AI applications that once seemed purely speculative have become tangible realities, with profound positive impacts across critical fields such as medicine, public health, scientific research, and education. This advanced standing qualifies AI to function as a fundamental and effective driver in shaping the future of humanity (Kebbani & Baden, 2021).

Scientific research, across its various disciplines, constitutes a cornerstone for meeting labor market demands by supplying qualified human capital equipped with diverse skills and capable of adopting development-oriented policies

and programs. In the context of accelerating technological change, the advancement of scientific research has become inconceivable without embracing the new models and frameworks generated by modern technological progress.
Within this context, artificial intelligence has emerged with the objective of developing systems that achieve levels of intelligence comparable to, or even exceeding, human intelligence. The rapid pace of technological advancement has significantly empowered the scientific research sector, enabling substantial qualitative leaps in recent years (Marr, 2023).
The characteristics of artificial intelligence reflect its fundamental objective of *"creating intelligent machines that simulate human behavior".* This simulation extends beyond mere behavioral imitation to encompass methodologies analogous to human problem-solving processes, coupled with an exceptional ability to process multiple hypotheses simultaneously with unprecedented levels of accuracy and speed. AI possesses several key features, including the ability to (Bruff, 2022):

**Cognitive and Mental Characteristics:**

❖ **Reasoning and perception:** Analyzing information and understanding logical relationships.
❖ **Learning from experience:** Acquiring knowledge from data and prior experiences, applying it, and continuously improving performance.
❖ **Generalization and adaptation:** Effectively applying previous knowledge and experiences to new situations and problems.
❖ **Responsiveness to change:** Rapid and effective adaptation to new and unforeseen circumstances.

**Operational and Applied Characteristics:**

❖ **Solving complex problems:** Logical analysis and handling of difficult, multi-variable scenarios.
❖ **Decision-making under uncertainty:** The ability to make effective decisions despite incomplete information or ambiguous situations.
❖ **Prioritization:** Identifying the relative importance of different elements and information within a given context.
❖ **Creativity and visualization:** Generating innovative ideas and solutions, as well as interpreting and understanding visual stimuli (computer vision).

**Supportive Characteristics:**

- **Decision-support:** Providing accurate and timely information and analyses to assist humans in making informed decisions.

Artificial intelligence is further distinguished by its ability to establish objective mechanisms for problem-solving within organizations, relying on precise, bias-free analytical processes. It also contributes significantly to enhancing the cognitive capacity of decision-makers by offering innovative solutions to complex problems that surpass the limits of traditional human analysis, all within remarkably short timeframes. Fundamentally, AI operates by studying logical patterns of human thinking and simulating them through computer-based systems. One of its most prominent advantages lies in its relative stability, as it remains unaffected by fluctuating human factors that may negatively influence performance, such as fatigue, forgetfulness, or personal biases (Zrouki, 2020).

**Applications of Artificial Intelligence Tools in Scientific Research**

Artificial intelligence tools are among the modern instruments increasingly relied upon by researchers in the preparation of scientific studies. These tools have diversified to include:

**Reference Search and Collection Tools:**

Recent years have witnessed significant advancements in AI-powered tools dedicated to searching for and collecting academic references. Among the most prominent are:

❖ **Google Scholar:** One of the most widely used platforms among researchers, distinguished by its ability to search trusted databases and academic institutions while presenting results ranked by relevance and scholarly impact. It also offers advanced features such as personal library creation, research update alerts, and automated citation generation in various referencing styles.
❖ **Elicit:** A specialized academic research tool based on natural language models, capable of summarizing relevant scholarly papers and extracting key information, thereby significantly reducing researchers' time and effort.
❖ **Publish or Perish (POP):** A tool used to analyze bibliometric indicators related to research outputs and authors, facilitating the evaluation of scholarly impact.
❖ **Semantic Scholar:** An intelligent academic search platform supported by the Allen Institute for AI. Beyond locating scholarly papers, it employs advanced techniques to understand the semantic context underlying research works. It provides concise automated summaries, highlights key contributions and methodologies, and visually maps relationships among studies and citations, enabling researchers to quickly grasp scientific content and situate it within a broader research context.

Numerous other tools also contribute to accelerating scientific research processes and enhancing their efficiency, rendering the tasks of reference collection and organization more accurate and streamlined (Patterson, 2023).

### Tools for Searching Within Files and Texts

Artificial intelligence tools specialized in searching within texts and documents are considered essential instruments for researchers and AI practitioners. These tools enable advanced search capabilities within documents and facilitate the extraction and aggregation of relevant textual segments based on keywords and contextual relevance. Among the most prominent of these tools are:

- **Data Search:** An advanced search engine that provides summaries and structured data from diverse research datasets. It is distinguished by its ability to read PDF files from the internet or personal computers, classify them systematically, and perform highly accurate searches using keywords and full paragraphs.
- **Scite:** A specialized academic analysis tool that assists researchers in evaluating the quality of citations and the strength of scientific evidence within research papers.
- **Perplexity:** A conversational search engine that combines the precision of traditional search engines with the power of large language models. It enables researchers to pose questions in natural language and receive comprehensive answers accompanied by reliable sources, such as scholarly articles and technical blogs. The tool is particularly notable for its ability to connect information across multiple sources and generate follow-up questions to deepen inquiry, making it highly effective for exploring new research topics or rapidly synthesizing information from diverse references.
- **Emergent:** A specialized tool for tracking, categorizing, and analyzing conflicting information and news narratives circulating across the internet.
- **Talk to Books:** An experimental tool developed by Google that allows users to search within books using natural language questions rather than conventional keyword-based queries.
- **Text Generation:** An advanced technology for text generation that supports content summarization and the extraction of key information from lengthy texts.

Collectively, these tools represent a qualitative shift in scientific research practices, as they enable researchers to extract relevant information from vast volumes of data within remarkably short timeframes, while ensuring accuracy and comprehensiveness of results (Al-Baz, 2023).

### Academic Writing and Paraphrasing Tools

Artificial intelligence tools for text generation and academic writing have become fundamental resources relied upon by researchers and AI specialists. These tools facilitate the generation of academic texts and articles based on provided keywords, while offering multiple stylistic and structural alternatives from which researchers can select the most appropriate. Among the most prominent of these tools are:

- **ChatGPT:** One of the most widely recognized AI-based text generation tools, supporting multiple languages including Arabic. It assists in drafting academic texts, summarizing content, and generating research ideas.
- **DeepSeek:** An advanced AI model that supports the Arabic language and is distinguished by its strong contextual understanding and precise academic formulation, making it particularly effective for Arab researchers.
- **Wordtune:** A specialized paraphrasing and text enhancement tool that helps researchers refine their sentences to achieve greater clarity, professionalism, and fluency.
- **Rytr:** An intelligent writing platform that supports the creation of high-quality Arabic content, offering multiple stylistic and tonal options.
- **Essay Bot:** A tool dedicated to academic essay and research writing, with support for the Arabic language.
- **Kattab:** A comprehensive Arabic smart writing platform specifically designed to meet the needs of researchers and Arabic content creators.

These tools are characterized by their ability to comprehend context and complex linguistic structures, enabling researchers to produce coherent and academically sound texts while significantly reducing the time and effort required for writing and editing. Moreover, their support for the Arabic language makes them an optimal choice for Arab researchers across various academic disciplines (Sheltout, 2023).

### Statistical Data Analysis Tools

Artificial intelligence tools for statistical analysis constitute a foundational pillar upon which researchers across various scientific disciplines increasingly rely. These tools have evolved substantially to become intelligent partners in the data analysis process. Among the most notable of these tools are:

- **Microsoft Excel:** One of the most widely used and fundamental analytical tools, offering an integrated suite of statistical functions ranging from descriptive statistics (means and standard deviations) to correlation and regression analyses. It also supports AI-powered add-ins that enhance its analytical capabilities.
- **IBM Watson:** A comprehensive AI platform that delivers advanced predictive statistical analysis solutions, capable of processing massive datasets and identifying complex patterns that are difficult to detect using traditional analytical methods.
- **Julius AI:** A specialized intelligent statistical analysis tool that enables researchers to analyze data using natural language commands, thereby making complex statistical analysis accessible to non-specialists in statistics.

❖ **SPSS Statistics:** The most widely recognized statistical package in academic environments, providing a comprehensive range of statistical tests from descriptive to inferential analyses, with user-friendly interfaces that facilitate complex analytical procedures.
❖ **SAS:** An advanced statistical analysis system extensively used for predictive and advanced analytics, particularly in medical and financial fields.
❖ **JMP:** A statistical analysis tool focused on visual data exploration, combining robust statistical power with ease of use through an interactive and intuitive interface.
These tools are distinguished by their capacity to process large-scale datasets, generate deep analytical insights, and produce accurate statistical reports, thereby enabling researchers to make informed decisions based on comprehensive and rigorous analyses (Al-Mas'ad & Al-Farani, 2023).

**Mind Mapping, Visualization, Presentation, and Indicator Tools**

Artificial intelligence tools for developing mind maps, data visualizations, presentations, and indicators constitute essential resources that support researchers in representing their research outputs in clear and simplified illustrative formats. These tools play a critical role in transforming abstract ideas and complex data into visually accessible knowledge representations. Among the most prominent of these tools are:
❖ **Gamma:** An intelligent presentation platform that utilizes artificial intelligence to transform textual content and conceptual ideas into professional presentations within minutes. It offers customized designs tailored to the scientific nature of the content.
❖ **Canva:** A comprehensive design platform that integrates AI capabilities for creating presentations, infographics, and mind maps. It provides a rich library of ready-made templates and design elements specifically suited for academic and research purposes.
❖ **Microsoft PowerPoint:** An advanced traditional presentation tool enhanced with AI-powered features such as *Designer* and *Ideas*, which automatically improve slide designs and suggest advanced visual layouts for presenting complex datasets.
❖ **MindMup / Mindly:** Specialized applications for creating interactive mind maps that assist researchers in organizing complex ideas and visually linking concepts in a structured and intuitive manner.
❖ **World Bank Data:** A global data platform that offers access to thousands of international development indicators, with functionalities for visualizing data through charts and interactive dashboards that can be seamlessly integrated into research outputs and presentations.
❖ **ContextMinds:** A specialized AI-powered tool for content discovery and mind mapping that helps researchers systematically organize ideas and establish conceptual linkages.
These tools are distinguished by their ability to convert complex data and abstract concepts into clear visual representations, thereby facilitating knowledge transfer and enhancing comprehension of sophisticated scientific ideas. Moreover, they significantly reduce the time and effort required by researchers to prepare accompanying visual materials for scientific research (Ali & Mahfouz, 2022).

**Language Editing and Proofreading Tools**

AI-powered language editing and proofreading tools are among the most important supportive instruments for researchers and academics in producing scientifically rigorous and professionally written texts. Notable examples include:
❖ **Grammarly:** One of the most widely used proofreading tools globally, providing comprehensive linguistic analysis of texts in terms of grammar, spelling, and style. While it offers advanced support for English, it has recently expanded its capabilities for Arabic language processing.
❖ **Hemingway Editor:** Focuses on improving text readability by analyzing sentence length and syntactic complexity, thereby enhancing clarity and strength of academic writing.
❖ **Wordtune:** Specializes in intelligent paraphrasing and stylistic enhancement, offering real-time suggestions to improve textual quality and fluency.
❖ **Microsoft Word:** Includes an advanced AI-powered built-in language checker that provides instant grammatical, spelling, and stylistic corrections.
❖ **QuillBot:** An integrated tool that combines proofreading, paraphrasing, and translation services, with increasing support for the Arabic language.
❖ **Sapling:** A smart proofreading platform designed specifically for researchers and professionals, offering advanced real-time writing suggestions.
These tools excel in contextual text analysis, nuanced semantic understanding, and intelligent improvement suggestions, enabling researchers to produce accurate, error-free academic texts while maintaining a formal scholarly tone. The continued enhancement of Arabic language support further increases their effectiveness for Arab researchers (Khalaf, 2023).

### Machine Translation Tools for Academic Texts

AI-powered translation tools are indispensable for researchers and specialists, as they enable access to the latest global developments in their respective fields and facilitate the integration of international scholarship into local research contexts. Prominent tools include:

❖ **DeepL:** Renowned for its exceptional translation accuracy, particularly for European languages, and for producing context-sensitive translations that preserve the original meaning of complex academic texts.

❖ **Google Translate:** The most widely used free translation tool, which has significantly advanced through neural network technologies, now supporting contextual translations and automatic corrections.

❖ **Reverso:** Provides accurate translations accompanied by rich contextual examples, aiding in understanding varied terminological uses across different contexts.

❖ **MemoQ:** A professional translation tool widely employed in academic and technical document translation.

❖ **Wordfast:** A professional translation suite that manages translation workflows and offers advanced tools for terminology management and large-scale projects.

❖ **Smartcat:** An integrated translation platform that combines machine translation with human intervention, ensuring high-quality academic translations.

These tools are characterized by their capacity to translate large volumes of text within short timeframes while preserving the scientific accuracy of specialized terminology. Consequently, they enable researchers to follow global scholarly production in their fields and contribute effectively to its development at both local and international levels (Fawzi, 2022).

### PDF Integration and Formatting Tools

Tools for handling PDF files are essential for researchers in organizing and managing their research documents efficiently. Key tools include:

❖ **Smallpdf.com:** A comprehensive platform offering a full suite of services, including merging, splitting, compressing, and converting PDF files, with a user-friendly interface.

❖ **I Love PDF:** A multifunctional tool that allows researchers to merge, split, compress, and convert PDF files across various formats while preserving document quality.

❖ **PDF24.org:** A free platform providing advanced PDF editing tools, digital signature integration, and password protection features.

❖ **Adobe Acrobat Pro:** The most comprehensive professional solution, offering advanced tools for editing, organizing, and enhancing PDF files, supported by sophisticated AI capabilities.

❖ **PDFescape:** An online tool that enables researchers to edit text, add annotations, and complete forms directly within PDF documents.

❖ **Soda PDF:** An integrated solution that supports complex operations such as converting PDFs to editable Office files and vice versa.

These tools streamline the management of research documents, save time, and ensure document quality throughout various processing stages, allowing researchers to focus on scientific content rather than technical formatting issues (Al-Suwaidi, 2023).

### Reference Management Tools

AI-powered reference management tools are fundamental to the research process, offering comprehensive solutions for organizing and citing scientific sources. Among these, **Mendeley** stands out as a leading platform that plays a pivotal role in assisting researchers with:

### Collecting and Organizing Research Sources

Mendeley enables the creation of a personal digital library that consolidates all required references and research materials, with flexible organizational options such as:

- Classification by subject
- Arrangement by author
- Categorization by publisher
- Organization by year of publication

### Utilizing Scientific Content

The platform provides advanced capabilities for full-text searching within references, rapid access to relevant passages and information, and the ability to annotate and add explanatory notes.

### Other Supporting Tools

- **Zotero:** An open-source reference management tool
- **EndNote:** A comprehensive citation and reference management system
- **Researcher:** A platform for tracking the latest publications across various disciplines

These tools are distinguished by their ability to unify researchers' efforts in managing sources, ensure citation accuracy, and save time and effort in organizational tasks, thereby positively impacting the overall quality of research outputs (Helmy, 2022).

### Publishing and Journal Selection Tools

AI-powered tools specialized in enhancing research quality and selecting appropriate journals for publication are essential for researchers. Prominent examples include:

### Journal Selection Tools

- **Journal Finder:** An intelligent tool that assists researchers in identifying suitable journals for publication based on full-text analysis of the manuscript.
- **Springer Journal Suggester:** An advanced tool developed by Springer that utilizes AI algorithms to recommend appropriate journals.
- **Journal Guide:** A comprehensive platform that helps researchers identify the most suitable journals by comparing multiple criteria.

These tools are characterized by their ability to analyze scholarly content and match it with extensive journal databases, enabling researchers to select appropriate publication venues, enhance the visibility of their research, and ensure alignment with journal scope and standards, while also supporting advanced linguistic and academic quality checks (Russell, 2021).

### Challenges in Utilizing Artificial Intelligence in Scientific Research

The past decade has witnessed an unprecedented revolution in the field of artificial intelligence (AI), with profound implications across various aspects of human life. This rapid advancement has compelled scientific institutions—particularly those engaged in research—to update their policies, methodologies, and strategies to align with the demands of this revolution. Such transformations have opened new horizons for scholars in psychology departments to enrich AI literacy across all stages of the research process.

AI is increasingly recognized as a primary driver of future progress and prosperity. Its innovations promise the establishment of a new world, which may seem imaginative in some aspects, although current indicators suggest its realization is approaching (Al-Mahdi, 2021). In this context, scientific research and future forecasting under the philosophy of AI become urgent priorities that should occupy a central place in the agenda of psychology department administrators.

### External Challenges

The following external challenges continue to influence the scientific research landscape:

- ❖ Rapid technological and informational development.
- ❖ Globalization requirements and democratic transformations.
- ❖ Social, demographic, environmental, and economic challenges.
- ❖ Geopolitical shifts in the region.

### Internal Challenges

Alongside these external pressures, internal challenges include:

- ❖ Transition to new academic models.
- ❖ Diversity of cultural and socioeconomic backgrounds within academic settings.
- ❖ Increasing professional pressures.
- ❖ Dominance of economic considerations over research priorities.
- ❖ Changing labor market requirements.
- ❖ Lack of digital infrastructure in academic institutions and research centers.

### Strategic Importance

Future-oriented thinking is critical to the sustainability of scientific research. Global forums emphasize the need to:

- ❖ Develop foresight studies.
- ❖ Disseminate proactive scientific culture.
- ❖ Promote interest in future studies within research institutions.
- ❖ Exploit digital advancements and AI applications to establish comprehensive strategic plans.
- ❖ Assess research priorities leveraging accumulated knowledge.
- ❖ Design realistic and ambitious scenarios capable of interacting with AI dominance.

### AI Literacy as a Core Requirement

Developing AI literacy among academics aims to:

- ❖ Empower individuals and deepen their understanding of AI applications.
- ❖ Enhance competence in designing AI applications.
- ❖ Prepare researchers to utilize AI outputs effectively.
- ❖ Enable continuous monitoring of technological developments.

Promoting AI literacy is thus considered a technological advancement for the academic community, as it strengthens technical culture and facilitates practical applications, serving researchers and specialists in the scientific domain.

### Challenges and Limitations of AI in Research

Despite the benefits of AI applications in research, several challenges may impede optimal utilization:

- ❖ High costs associated with adopting, updating, and maintaining AI tools.

- ❖ Ethical and behavioral concerns arising from dependency on AI systems.
- ❖ Limited adaptability of AI applications when repeatedly processing the same data, potentially rendering them ineffective in certain stages.
- ❖ Workforce displacement due to AI replacing human labor, increasing unemployment.
- ❖ Insufficient digital infrastructure in many research institutions, especially outside urban areas (Al-Mahdi, 2021).

**Review of Previous Studies**

A substantial body of literature has explored the adoption, potential benefits, and challenges associated with Artificial Intelligence (AI) in higher education and academic research. These studies provide insights into technological integration, institutional readiness, and strategic implications for educational development.

- ❖ **Sobhi and Al-Farhani (2020)** examined AI adoption in Saudi higher education, focusing on institutional capabilities, requirements, and barriers while forecasting AI's role in advancing education. The study analyzed key platforms, including *Mathematical Thinker* (an intelligent mathematics application), *Netex Learning* (an adaptive e-learning platform), and *Brainly* (a social learning network). The authors proposed a structured framework for localizing AI integration, incorporating stepwise methodologies, practical activities, timelines, and performance indicators. Their findings highlighted capability gaps, organizational and technical challenges, and outlined a roadmap for smart institutional transformation.
- ❖ **Ali Sardouk (2020)** investigated the strategic role of AI and intelligent robotics in enhancing university services. By reviewing global experiences, the study revealed that while libraries in Europe, the Americas, and Asia demonstrate advanced AI adoption, Maghrebian institutions lag significantly. Core applications identified included smart library services, automated academic advising, digital content management, and research support systems. The study underscored the necessity for national AI strategies, leveraging international best practices, fostering partnerships, and developing human capacity to bridge the adoption gap.
- ❖ **Kiszl and Winkler (2021)** explored perceptions of Hungarian university library managers regarding AI integration. Results indicated generally positive attitudes, viewing AI as a strategic opportunity rather than a threat. About 25% of respondents reported active adoption, primarily for information retrieval and routine data processing. The authors emphasized gradual implementation, focusing on practical applications and cultivating confidence in AI's supportive role in academic settings.
- ❖ **Abu Khutwah (2022)** investigated emerging technologies shaping the future of digital education, including immersive environments such as Virtual Reality (VR), Augmented Reality (AR), Mixed Reality (MR), Extended Reality (XR), and Metaverse platforms, as well as interactive AI systems like chatbots and adaptive learning applications. Additionally, data and communication technologies—including the Internet of Things (IoT), Big Data, and predictive analytics—were identified as transformative forces. The study emphasized the implications of these technologies on research methodologies, the emergence of multidisciplinary research areas, the redesign of educational models, the redefinition of teacher-student roles, and the integration of data-driven assessment metrics. Recommendations included developing new theoretical frameworks, training education technology researchers, designing practical programs, and conducting foresight studies to anticipate technological trends.
- ❖ **Ali and Mahfouz (2022)** examined AI's impact on research data management in university faculties through descriptive-analytical and foresight approaches. The study emphasized the significance of effective research data management, the provision of AI-supported services, and the demonstration of AI's added value in facilitating research activities. Recommendations included expanding AI utilization in data management, conducting further empirical studies, and organizing specialized workshops to enhance faculty competencies.
- ❖ **Mohamed and Ali (2023)** focused on practical applications of AI tools in research, covering bibliographic search tools, automated text analysis, reference management systems, data mining, information retrieval, and automated content summarization. The study provided a practical guide to AI integration, identified real-world challenges, proposed actionable solutions, and bridged the gap between technological capabilities and research practices.
- ❖ **Shahata and Nashwa (2022)** assessed AI adoption in higher education with an emphasis on technical, financial, human, security, and ethical challenges. Technical and administrative obstacles included insufficient expertise, weak data governance, and inadequate infrastructure. Financial and human resource barriers involved high costs and limited faculty competencies, while security and ethical concerns encompassed data privacy, cybersecurity, and responsible AI usage. The study recommended developing national strategies, investing in digital infrastructure, training academic and administrative personnel, and establishing regulatory and ethical frameworks to guide AI integration.

**Synthesis and Research Implications:**

Collectively, these studies underscore that while AI adoption offers substantial opportunities to enhance research efficiency, educational delivery, and institutional services, its integration is uneven, particularly in developing and resource-constrained contexts. Common challenges include limited technical skills, inadequate infrastructure, high implementation costs, and ethical considerations. Additionally, the literature reveals the importance of structured strategies, including formal training, policy development, and context-specific frameworks, to ensure effective, sustainable, and ethically responsible AI adoption in higher education.

**Data Collection Instrument: Questionnaire**

The study employed an **electronic questionnaire** as the primary data collection tool, structured into four sections:

1. **Basic demographic data.**
2. **AI tools applicable to scientific research.**
3. **Usage of AI tools by psychology department faculty in research processes.**
4. **Benefits and challenges of AI tool usage in scientific research.**

**Instrument Validation**

**Scientific Validation (Expert Review):**

- The questionnaire was reviewed by AI specialists from Palestinian universities.
- Experts provided recommendations that improved clarity, scientific relevance, and overall quality.

**Pilot Testing:**

- ❖ Conducted on a sample of 23 participants outside the main study.
- ❖ Aimed to assess reliability, validity, and clarity.
- ❖ Adjustments were made based on pilot results to enhance psychometric properties.

These rigorous procedures ensured methodological reliability and strengthened the credibility of the study findings in academic contexts.

**Personal Interviews**

Personal interviews conducted by the researcher with AI specialists constitute a methodological cornerstone in constructing both the theoretical and empirical framework of the study. These interviews yielded significant contributions to the research process.

**Value of Personal Interviews in the Research Process**

- ❖ **Building a comprehensive background:** The discussions facilitated a practical understanding of the current use of AI tools in scientific research.
- ❖ **Identification of actual tools:** The interviews helped to map the AI applications that specialists rely on in their research practices.
- ❖ **Development of the research trajectory:** Insights obtained from the interviews were continuously utilized throughout all stages of the study.

**Dimensions Covered in the Interviews**

1. **Diagnostic dimension:** Identifying the most frequently used and effective AI tools.
2. **Practical/application dimension:** Understanding the operational mechanisms of these tools within the research context.
3. **Foresight/future-oriented dimension:** Anticipating potential developments and future enhancements of these tools.

**Methodological Impact of the Interviews**

- ❖ **Enhancing credibility:** By relying on the perspectives of experts and practitioners.
- ❖ **Linking theory and practice:** Integrating theoretical frameworks with field-based practices.
- ❖ **Enriching research content:** Providing practical insights that deepened the researcher's analysis.

These interviews represent a model for field studies that integrate scientific methodology with applied practice, giving the research a realistic dimension and ensuring that its outcomes are relevant to the actual needs of the academic community.

**Study Results by Themes**

**Theme 1: Demographic Data**

**Table 1: Distribution of Study Sample According to Demographic Variables**

| Variable | Category | Frequency | Percentage |
|---|---|---|---|
| Academic Degree | Bachelor's | 15 | 8% |
| | Master's | 67 | 36% |
| | Assistant Professor | 86 | 46% |
| | Associate Professor | 13 | 7% |
| | Professor | 7 | 4% |
| Gender | Male | 88 | 47% |
| | Female | 100 | 53% |
| Workplace | Private University | 165 | 88% |
| | Public University | 23 | 12% |
| Place of Residence | City | 93 | 49% |
| | Village | 58 | 31% |

| | | | |
|---|---|---|---|
| | Camp | 37 | 20% |
| **Years of University Service** | Less than 5 years | 25 | 13% |
| | 5–15 years | 95 | 51% |
| | More than 15 years | 68 | 36% |

**Interpretation of the Demographic Data**

The study sample consisted of 188 participants, representing faculty members in psychology departments of Palestinian universities. Key observations include:

- **Academic degree:** Assistant professors and holders of a master's degree together constitute 82% of the sample, indicating a majority with advanced qualifications, though not the highest academic ranks.
- **Gender distribution:** There is a relatively balanced gender composition, with a slight predominance of females (53%).
- **Workplace:** The majority of participants are employed in private universities (88%).
- **Place of residence:** Approximately half of the sample lives in cities (49%), about one-third in villages (31%), and one-fifth in refugee camps (20%).
- **Years of university experience:** More than half have moderate experience (5–15 years), while over one-third possess long experience (>15 years).

These demographic insights provide a contextual foundation for interpreting responses regarding the use of AI tools in scientific research and highlight the diversity and characteristics of the sample population.

**Results of Themes 2–4: Use and Challenges of AI Tools in Scientific Research**

**Theme 2: Awareness of AI Tools in Scientific Research**

**Table 2: Faculty Responses on Awareness and Challenges of AI Tools in Scientific Research**

| Item | Response | Frequency | Percentage |
|---|---|---|---|
| Are you aware of AI tools used in scientific research? | Yes | 168 | 89% |
| | No | 20 | 11% |
| **Total** | | 188 | 100% |

**Sources of Knowledge about AI Tools** (participants could indicate multiple sources):

| Source | Frequency | Percentage |
|---|---|---|
| Websites | 112 | 53% |
| Self-learning | 42 | 20% |
| University/Research Center Workshops | 32 | 15% |
| Specialized Conferences/Seminars | 27 | 12% |
| **Total** | | 213 |

**Interpretation:**

The majority of participants (89%) reported being aware of AI tools applicable to research. The primary source of knowledge was websites (53%), followed by self-learning (20%), and university workshops (15%). This indicates that faculty members rely heavily on digital resources and independent learning to acquire AI competencies.

**Theme 3: Usage of AI Tools in Research**

| Item | Response | Frequency | Percentage |
|---|---|---|---|
| Do you use AI tools in research? | Yes | 124 | 66% |
| | No | 64 | 34% |
| **Total** | | 188 | 100% |

**Most Frequently Used AI Tools by Research Task:**

| Research Task | Tool | Frequency | Percentage |
|---|---|---|---|
| **Searching for sources** | Semantic Scholar | 112 | 55% |
| | Google Scholar | 54 | 27% |
| | Elicit | 36 | 18% |
| **Searching within texts** | Perplexity | 110 | 48% |

| | | | |
|---|---|---|---|
| | Scite | 75 | 33% |
| | Energent | 43 | 19% |
| **Academic writing & rephrasing** | ChatGPT | 96 | 54% |
| | Deep Seek | 58 | 33% |
| | Wordtune | 23 | 13% |
| **Statistical data analysis** | Excel | 123 | 67% |
| | IBM Watson | 32 | 18% |
| | Julius | 27 | 15% |
| **Mind maps, diagrams & presentations** | Gamma | 112 | 53% |
| | Canva | 76 | 36% |
| | PowerPoint | 21 | 10% |
| **Language proofreading** | Grammarly | 99 | 51% |
| | Hemingway | 62 | 32% |
| | Moda OiO | 34 | 17% |
| **Machine translation** | Google Translate | 143 | 69% |
| | Reverso | 42 | 20% |
| | DeepL | 23 | 11% |
| **PDF merging & formatting** | I love PDF | 84 | 41% |
| | Smallpdf | 76 | 37% |
| | PDFgo | 43 | 21% |
| **Reference management** | Mendeley | 62 | 43% |
| | Researcher | 44 | 31% |
| | Zotero | 37 | 26% |
| **Publishing & journal selection** | ResearchGate | 88 | 46% |
| | Trinka Journal Finder | 57 | 30% |
| | Springer Journal Suggester | 48 | 25% |

**Quality of AI Tools:**

| **Quality** | **Frequency** | **Percentage** |
|---|---|---|
| Good | 84 | 45% |
| Medium | 92 | 49% |
| Poor | 12 | 6% |
| **Total** | 188 | 188 |

**Interpretation:**

Approximately **two-thirds of the faculty (66%)** actively use AI tools in research. The most frequently used tools by task are:

- **Semantic Scholar (55%)** for source searching,
- **Perplexity (48%)** for text searching,
- **ChatGPT (54%)** for academic writing,

- **Excel (67%)** for statistical analysis,
- **Gamma (53%)** for mind maps and presentations,
- **Grammarly (51%)** for proofreading,
- **Google Translate (69%)** for translation, and
- **Mendeley (43%)** for reference management.

Half of the participants rated the tools as **medium quality**, suggesting room for improvement and optimization.

**Theme 4: Challenges in Using AI Tools in Research**

| Challenge | Frequency | Percentage |
|---|---|---|
| Lack of expertise and skills | 55 | 18% |
| Some tools are not free | 53 | 17% |
| Reliability of results | 48 | 16% |
| Choosing the most suitable tool | 45 | 15% |
| Privacy & data security | 41 | 13% |
| Intellectual property & academic integrity | 34 | 11% |
| Language barriers | 32 | 10% |
| **Total** | | 308 |

**Interpretation:**

The vast majority of faculty (87%) reported facing challenges when using AI tools. Key obstacles include lack of skills, cost of tools, and concerns about reliability, followed by difficulties in tool selection, privacy, intellectual property, and language. These results indicate the need for structured training, ethical guidelines, and access to cost-effective AI solutions in research.

**Theme 4: Benefits and Challenges of Using AI Tools in Psychological Research**

The analysis of responses in Theme 4 reveals a slight division of opinion regarding the endorsement of AI tools in research, with a marginal tendency in favor of their use. Concerning the perceived benefit of AI tools, more than half of the participants rated the usefulness as moderate. The majority of faculty members encounter challenges when using AI tools, the most prominent being:

- **Lack of expertise and skills (18%)**
- **Cost of some tools (17%)**

**Summary of Study Findings:**

From the comprehensive analysis of the study results, the following key points can be highlighted:

1. **High awareness but significant usage challenges:** Faculty members are generally knowledgeable about AI tools, yet face substantial obstacles in applying them effectively in research.
2. **Dependence on online resources:** The primary source of acquiring AI knowledge is electronic platforms and self-learning, emphasizing the importance of digital literacy.
3. **Diverse tools for different tasks:** AI tools are employed across various research functions such as source search, text analysis, writing, data analysis, and translation.
4. **Moderate evaluation of quality and benefit:** Participants generally rated both the quality of AI tools and their practical benefits as medium, indicating room for improvement.
5. **Technical, financial, and ethical challenges:** Obstacles include insufficient training, tool accessibility, reliability of outputs, privacy, and ethical considerations.

**Recommendations:**

1. **Develop Faculty Skills:**

Implement a comprehensive strategy that includes training programs for faculty members in AI-related fields, aligned with international standards. This will enhance their competencies, enable them to keep up with technological advancements, and ultimately elevate the quality of scientific research.

2. **Promote Collaboration and Curriculum Alignment:**

Strengthen collaboration and knowledge exchange between psychology departments in Palestinian universities, international counterparts, and leading AI companies. Additionally, review and update curricula to include specialized courses that reflect **current AI technologies and practical applications**.

3. **Invest in AI Research:**

Encourage researchers to conduct in-depth studies on AI applications and tools, fostering new interdisciplinary research areas. This investment will enhance the skillsets of researchers and ensure they remain up-to-date with developments in this vital field.

4. **Provide Infrastructure and Funding:**

Ensure the availability of **financial support and technical resources**, creating a suitable environment for adopting AI tools. Adequate infrastructure will enhance researchers' efficiency and improve the quality of outputs in psychology departments.

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