

The Role of Artificial intelligence Tools in Empowering Nutrition Professionals

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Abstract

Artificial Intelligence (AI) is reshaping the professional landscape of nutrition by improving how data is analysed, interpreted, and translated into personalised guidance. Over time, several studies have demonstrated that AI greatly enhances accuracy, reduces the bur-den of manual work, and supports stronger evidence-based decisions. For instance, AI technologies can automate nutrient calculations, minimise recall-related inaccuracies, and make dietary assessments more dependable. Additionally, AI-driven platforms can enhance patient engagement and improve the outcomes of nutrition counselling.

Information and Communication Technology (ICT) serve as the basis for integrating AI into nutrition practice. ICT systems enable real-time data collection, remote monitoring, and digital counselling services. When combined with AI, these systems can track eating pat-terns, nutrient gaps, and health indicators with high precision, allowing nutrition professionals to make well-informed and timely decisions. AI-based writing tools, such as ChatGPT Extensions, Gamma AI, and GravityWrite, further support educators, students, and clinicians by producing educational materials, research summaries, clinical notes, and other communication resources with enhanced clarity and efficiency.

Research tools like Elicit help nutrition professionals access scientific studies more rapidly, reducing the time spent on manual literature searches. Visualisation tools such as Word-Clouds highlight recurring themes in text-based data, while Venngage simplifies the presentation of scientific information by transforming it into visually appealing infographics.

Overall, the use of AI and digital tools has expanded across content creation, data inter-pretation, teaching and learning, and research assistance. These advancements enhance edu-cational quality, improve research productivity, and promote clearer communication. As AI continues to evolve, its use in Food Science and Nutrition will lead to greater innovation, efficiency, and improved health outcomes.

Keywords: Artificial Intelligence (AI) in Nutrition, Digital Nutrition Tools, Nutrition Education Technology, Personalized Dietary Guidance

1. Introduction

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The integration of Artificial Intelligence (AI) into nutrition marks an important shift in how health, wellness, and disease prevention are addressed. Traditionally, the field relied heavily on general dietary guidelines and manual tracking of food intake methods often affected by human error, memory bias, and

limited personalisation. With the emergence of AI technologies, nutrition practice is transforming into a highly data-driven and individualised system[24]. In this evolving context, AI-supported tools such as Word-Clouds, ICT systems, ChatGPT Extensions, Gamma AI, GravityWrite, Elicit, and Venngage help nutrition professionals work more efficiently, strengthen research, and communicate information more effectively.

Information and Communication Technology (ICT) provide the foundation for integrating AI within nutrition practice. ICT-based nutrition management platforms support real-time data sharing, patient monitoring, and online counselling. When AI is incorporated into these systems, they can accurately track dietary habits, blood glucose trends, and nutrient deficiencies, enabling quicker and evidence-based decision-making [8]. AI writing assistants such as Chat-GPT Extensions, Gamma AI, and GravityWrite help professionals create clear and high-quality educational materials, clinical summaries, and research documents. According to [4], these tools improve clarity, save time, and support educators in preparing lesson plans, diet charts, patient handouts, and digital learning resources. AI tools focused on research, such as Elicit, help users access scientific literature quickly and reduce the manual effort involved in literature review [19]. Visualisation tools play a significant role in nutrition education and communication. WordClouds high-light common ideas in textual data, while Venngage converts complex information into visually appealing infographics and charts, making learning easier for students, patients, and the general public [3].

Given this background, the present study examines the application of AI tools within Food Science and Nutrition and evaluates their practical relevance [24]. These tools offer significant benefits in teaching, re-search, and patient care by facilitating personalised nutrition guidance and supporting evidence-based learning. As AI continues to advance, its integration into nutrition practice is expected to foster innovation, efficiency, and better health outcomes.

2. Methodology:

2.1 Selection of AI Tools

A total of six AI tools WordClouds, ICT, Chat-GPT Extension, Gamma AI, GravityWrite, Elicit, and Venngage were selected to assess their applications within Food Science and Nutrition. Their usefulness was examined across four core areas.

- Content Development
- Data Interpretation
- Teaching and Learning
- Research Support

3. Word Clouds

WordClouds are visual tools that illustrate the frequency and importance of words within a dataset. In Food Science and Nutrition, they provide a quick and accessible way to summaries qualitative information from surveys, research articles, reports, and public discussions. By highlighting frequently occurring terms, WordClouds help nutrition professionals identify major themes and trends[12],[22].

In content development, WordClouds support the creation of engaging educational materials, dietary guidelines, and food safety visuals. They are also used to identify common nutritional issues during awareness campaigns. Additionally, food product developers use WordClouds to analyse consumer preferences regarding flavours, ingredients, and sensory attributes[14]. For data interpretation, WordClouds

help summarise open-ended survey responses and reveal themes emerging from nutrition interventions or awareness programmes[30]. Researchers also use them to identify new areas of interest within nutrition research. In teaching and learning, WordClouds facilitate classroom discussions, strengthen comprehension of nutrition concepts, and help educators assess student understanding[5],[23]. In research, WordClouds assist in identifying dominant keywords, complement qualitative analysis, and enrich research presentations[7].

4. ICT Chat-GPT Extension Tool

The ICT ChatGPT Extension combines Information and Communication Technology with Artificial Intelligence to enhance learning, research, and data management in Food Science and Nutrition [31],[9]. Since it can process both qualitative and quantitative data, it supports technological advancement in nutrition education and research. The tool also enables interactive learning, provides timely feedback, and strengthens evidence-based decision-making. It simplifies complex scientific concepts and improves communication [15].

In content development, ChatGPT assists educators in creating accurate and engaging learning materials, such as lesson plans, study guides, and awareness content. It can also transform complex nutrition topics into simplified educational outputs, including brochures and campaign messages[26].

For data interpretation, the tool can summarise interviews, dietary recalls, and research findings, making reporting more concise and clearer[28]. It also supports statistical interpretation and scientific writing[18]. In teaching and learning, ChatGPT promotes personalised learning, generates interactive quizzes, and helps develop digital learning modules[13].

As research support, the tool helps prepare literature reviews, research proposals, manuscripts, and identify new research trends, contributing to overall research productivity[27].

5. Gamma AI

Gamma AI is an advanced AI tool that assists in creating attractive and interactive content, including documents, reports, and presentations. It uses AI to transform scientific information into clear and visually appealing materials[9]. In Food Science and Nutrition, Gamma AI is especially beneficial because it turns technical data into easy-to-understand visual content[16]. By integrating AI with ICT, this tool enhances creativity, saves time, and supports digital skill development in both teaching and research[31]. In content development, Gamma AI helps nutrition professionals create high-quality digital materials such as lecture slides, learning modules, infographics, and public health communication tools[1],[11]. It can also summarise lengthy reports into clear and visually appealing presentations[13].

For data interpretation, Gamma AI summarises and visualises large datasets from dietary surveys and laboratory analyses by generating dashboards, charts, and trend summaries. This makes it easier to identify patterns and relationships within data[28].

In teaching and learning, Gamma AI supports the creation of interactive lessons and visual summaries, helping students grasp complex topics such as nutrient metabolism and food processing[15]. Students can also create professional-quality presentations and projects, which enhances creativity and digital literacy[25].

For research support, Gamma AI assists in summarising literature, preparing posters, and visualising data from studies involving nutrient composition, sensory testing, product development, and nutrition interventions.

6. Gravity Write

GravityWrite is an AI-based writing tool designed to help users create well-organised academic and professional content. It is particularly useful in Food Science and Nutrition because it supports the development of reports, study materials, research summaries, and scientific documents. The tool simplifies complex concepts, improves technical accuracy, and enhances clarity while saving time.

In content development, GravityWrite helps teachers, students, and nutrition professionals prepare lesson plans, study materials, newsletters, and public awareness documents. It generates structured and evidence-based content on various topics, including nutrients, food preservation, balanced diets, and food safety.

For data interpretation, GravityWrite summarises research articles, survey results, and experimental findings, presenting essential points clearly for dissertations, publications, or presentations.

In teaching and learning, the tool supports the preparation of lecture notes, assignments, and assessments. Students can use it to refine grammar, para-phrase content, and strengthen scientific vocabulary.

For research support, GravityWrite assists in drafting research proposals, summarising literature, preparing manuscripts, and writing abstracts, enhancing the quality and organisation of research output.

7. Elicit

Elicit is an AI-powered research assistant that automates the process of finding, organising, and analysing scientific literature. It uses language models and machine learning to support literature review, data summarisation, and evidence synthesis. In Food Science and Nutrition, where research depends heavily on continuous review of scientific publications, Elicit provides a more systematic and efficient approach to analysing research[29].

In content development, Elicit helps educators prepare accurate and updated learning materials by retrieving and summarising research on nutrition, diet planning, food technology, and public health[1].

For data interpretation, Elicit assists researchers in analysing large textual datasets, extracting relevant information, and comparing findings across multiple studies. It identifies trends, recurring results, and research gaps in areas such as dietary interventions, nutrient absorption, and food safety[19].

In teaching and learning, Elicit supports students by helping them locate and summarise scientific literature, strengthening their critical thinking and research skills. For research support, Elicit aids in conducting systematic reviews by identifying relevant studies, summarising key findings, and organising citations. It is particularly helpful for research on dietary behaviour, food processing, and sustainability[2].

8. Venngage

Venngage is an online infographic and data visualisation tool that allows users to create professional-quality posters, charts, and reports. It is particularly valuable in Food Science and Nutrition because it translates complex dietary information into clear and visually engaging formats[21].

In content development, Venngage helps create educational materials such as infographics, posters, and awareness materials on balanced diets, nutrient functions, food preservation, and dietary guidelines. Its templates make information visually appealing and easy to understand[17].

For data interpretation, Venngage helps visualise datasets from nutrient analysis, sensory evaluation, and dietary surveys through charts and dashboards. This makes it easier to identify patterns and compare data[6].

In teaching and learning, Venngage enables educators to create concept maps, process charts, and lesson visuals. Students can also use it to create infographics and presentations, enhancing creativity and digital skills[20].

For research support, Venngage assists in creating visual abstracts, research posters, and graphical summaries, improving data storytelling and public communication[10].

9. Conclusion

The integration of AI-based tools such as Word-Clouds, ICT ChatGPT Extension, Gamma AI, GravityWrite, Elicit, and Venngage has significantly transformed Food Science and Nutrition education, research, and professional practice. Each tool contributes uniquely to content development, data interpretation, teaching–learning enhancement, and research support, creating a technology-enabled academic environment.

Collectively, these tools improve clarity, accessibility, and accuracy of nutrition-related information. They simplify the handling of qualitative and quantitative data, enhance evidence-based learning, encourage creativity in visual communication, and strengthen scientific writing. By automating tasks such as literature review, content creation, data visualisation, and academic writing, AI tools allow professionals to focus more on analysis, innovation, and application.

Overall, the combined use of these AI tools advances digital literacy, enriches the learning experience, and supports effective knowledge dissemination in Food Science and Nutrition. Their adoption not only modernises educational practices but also equips professionals to address global nutrition challenges with greater precision, efficiency, and impact.

10. References

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