

## Research Article

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## Artificial Intelligence in Gifted Education Institutes in Jordan: Effects, Roles, Practices, and Transformations

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**Abstract**

**Background/purpose.** The qualitative study discusses applications of artificial intelligence (AI) in Jordanian schools for the gifted. This research accounts for how AI is thought to influence teaching procedures, learning outcomes, and the development of the gifted education profession.

**Materials/methods.** A qualitative design was utilized, and data were gathered using semi-structured interviews with six experienced teachers in King Abdullah II Schools for Gifted Students. Thematic analysis was used to highlight significant findings regarding AI practice and its impact on education.

**Results.** The study finds that AI positively impacts gifted education through solving system issues, personalized learning, real-time feedback, and large-scale learning analytics. The respondents cited the capacity of AI to bring about change by automating repetitive administrative tasks and facilitating personalized learning as the most frequently occurring theme.

**Conclusion.** AI is a driver for innovation in gifted education, facilitating critical thinking, creativity, and adaptive problem-solving. Some of the top practices include virtual reality, augmented reality, intelligent content generation, and adaptive tutoring systems. The study outlines how AI can promote reform in gifted education towards more inclusive, efficient, and student-centered learning environments.

## 1. Introduction

The technological advances of the last decades have rapidly changed education systems globally. Artificial intelligence (AI) has been one of the key drivers of learning space design, educational personalization, and teaching quality improvement (Baidoo-Anu & Owusu Ansah, 2023). In the 1960s and 1970s, AI began to focus on knowledge representation systems, and accordingly, there was a massive boom following Japan's fifth-generation computer project (Chen et al., 2020).

AI is a branch of computer science dedicated to creating intelligent systems that can perform activities that require human thought in most situations, such as decision-making, learning, and reasoning (Alam, 2022). AI offers personalized instruction in the learning situation, mechanizes the delivery of feedback and tests, and enables the identification of the learners' strengths and weaknesses domains (Akgun & Greenhow, 2021).

According to the U.S. federal government's definition, gifted children require unique methods of instruction to meet their greater abilities for learning and reach their optimum capacity (Ali & Abdel-Haq, 2021). Typical curricula do not meet such requirements. Studies emphasize the necessity of adapting instruction methods with the assistance of AI to enable gifted students to succeed (Sun et al., 2021; Lustigova, 2014). For instance, AI can create learning environments that adapt to gifted students' interests and behavioral patterns.

In Jordan, the Ministry of Education has improved provision for identifying and supporting talented students in enriched schools and enrichment programs. Nevertheless, a number of studies indicate ongoing imbalances in access, resources, and specially designed services—especially in disadvantaged areas (Tedre et al., 2021; Hwang et al., 2020; Zhran et al., 2023). These disparities underscore the need for innovative, technology-enabled educational interventions.

This research explores putting AI into practice in Jordanian gifted education institutions. More specifically, it examines how AI is transforming the way it teaches, how AI is contributing to rethinking learning experiences, and the rules to follow when using AI technology when working with gifted children.

## 2. Literature Review

### 2.1. Artificial Intelligence and Gifted Learners

The use of artificial intelligence (AI) in gifted education has garnered much attention as it promises greater learning and addressing the unique needs of the gifted. Hodges and Mohan (2019) demonstrated how machine learning algorithms, such as neural networks, were utilized in gifted identification, promising AI to make the traditional identification process simple.

Gifted students have greater problem-solving ability and greater social problem sensitivity, and they can come up with creative solutions (Lee et al., 2022). They are also highly suited to using information technology to learn and examine data, forming strong thinking patterns and building strong knowledge bases (Kong, 2020). Such skills suggest that talented students can utilize AI-based learning programs that can support multiple learning styles they adopt, i.e., visual, auditory, and kinesthetic modes.

The large-scale application of technology to everyday life means the need for technological skill development among students, primarily talented ones. Information literacy came to the limelight with respect to enabling students to operate digital equipment and navigate the net effectively. To illustrate, postgraduate students did not exhibit information literacy concerning electronic research management as reference materials per Sayyad Abdi (2017). In addition, Ghali et al. (2019) presented a study that demonstrated how AI technologies successfully developed various skills among students and believed that AI could be the most significant instrument for developing technological capabilities

among capable students.

Based on these results, new technological strategies need to be adopted to equip brilliant students with advanced online research skills. Application of AI technologies in gifted education can enable customized learning experiences, analytical reasoning, and conditioning students to evolve and become engaged in an increasingly digital world.

## **2.2. AI in Jordan**

Jordan has taken certain strategic initiatives towards Artificial Intelligence (AI) implementation in its education and government sectors. The Ministry of Digital Economy and Entrepreneurship (MoDEE) launched the "AI Raising Awareness for Public Employees" program in partnership with the Jordan Design and Development Bureau (JODDB). It aims to educate 3,000 government officials from 100 institutions for one year to augment AI skills and optimize efficiency in the public sector. The project aligns with Jordan's AI Strategy (2023–2027), which seeks to make Jordan a regional center for AI by developing an enabling legislative and technological environment (MoDEE, 2024).

The University of Jordan opened the Department of Artificial Intelligence in the King Abdullah II School of Information Technology at the university level in the 2022–2023 academic year. The department offers AI and Data Science courses, indicating how the nation seeks to ensure education can keep up with the needs of the Fourth Industrial Revolution (University of Jordan, 2024).

Besides, Jordan has established cooperation with external partners to facilitate the integration of AI. A case in point is the signing of a Memorandum of Cooperation between Japan's Digital Agency and Jordan's MoDEE to share the best practices of digital government, including discussions on AI, data governance, and smart cities (Digital Agency, 2023).

These initiatives reflect Jordan's strategic initiatives to implement AI in its government and education sectors, with the aim of having a technologically capable workforce and improving innovation across sectors.

## **2.3. Previous Studies**

Ucar et al. (2017) had carried out research in an analysis of the influence of force feedback haptic applications (FFHA) constructed within virtual reality environments (VREs) upon engagement in learning by gifted learners within chemistry class lessons. It was established in the findings to provide a high-level link between advanced learning equipment like that and behavioral actions on the part of students. Likewise, Zimlich (2017) averred how technology is used as both an enablement device and another type of behavior trap. He asserted that in cases where curricula include complex issues, they contribute to self-reflection, critical thinking, creativity, and exposure to mentorship, gifted children become greatly enriched. This calls for teachers' potential to apply technology in the appropriate way in an attempt to address the specific needs of gifted education programs.

Chen et al. (2013) suggested the "enable, enhance, and transform" model for assessing past and prospective uses of technology in gifted education, including activity designing and planning. They highlighted technology's capacity to manage web-based software, support learning communities, and share materials. They also identified various means of enriching the curriculum through technology, including group training exercises and investigations of real problems.

Potts (2018) conducted a case study on how gifted students view virtual programs. Five gifted children participated in a virtual writing program, and data were collected using interviews, classroom observation, and online focus groups. The participants appreciated ongoing communication with instructors and other peers but emphasized a lack of social contact.

In Saudi Arabia, Alnafea (2020) determined how artificial intelligence (AI) was utilized in enrichment programs of talent centers. The research established that 84.3% of the respondents were

on the same wave regarding AI use, and 80.2% accepted current challenges. Disagreements were not observed in relation to variables such as the education sector, experience, or qualification. The research proposed using AI methods and overcoming challenges to enhance gifted education.

Potts and Potts (2017) posed ten questions to ascertain the readiness of gifted children to learn online based on skills such as computer literacy, time management, flexibility, reading, and communication. They emphasized the importance of careful consideration by parents and students before online learning.

Zimlich (2015) examined determinants of education technology adoption by talented students, including teacher attitudes, availability of resources, instructional decisions, and composition of student groups. Kim et al. (2020) developed a responsive web-based learning system for elementary informatics education for talented students. The study showed significant increases in the students' interest and attitude towards informatics, thus confirming the effectiveness of the system.

Alabbasi (2025) researched activating AI applications within enrichment programs among talented students in Yanbu and Jeddah. Conducting a descriptive survey study involving 29 program implementers, the study indicated an equally divided agreement on issues and recommendations to activate AI applications. The study implied continued improvement and capacity development in AI applications, development of curricula, and implementation of AI-based smart environments for teaching and learning.

### **3. Methodology**

This study utilized a qualitative study design. A qualitative tool was utilized to obtain empirical information in order to learn more about the role of information technology (IT) in gifted and talented education. To be precise, eight Jordanian educators working in schools specializing in gifted education participated in semi-structured interviews. This allowed for acquiring broad understandings and drawing meaningful conclusions. The convenience sampling method was used to obtain participants for the interview. The convenience sampling method is the collection of data from individuals who are readily accessible to the researcher (Etikan et al., 2016). Eight teachers offered themselves to be interviewed based on a semi-structured interview guide that had been prepared by the researcher. The researcher only had few volunteers, but no reasons were stated. Their unwillingness to participate was assumed to be due to insufficient time or having already taken part in the experiment or questionnaire. A face-to-face meeting was thus organized with all teachers who were willing to participate to coordinate the interview schedule.

Six male and female teachers volunteered to take part. Six interviewees were considered an adequate sample size for interview-based research (Guest et al., 2006), as they argued that "at least six participants are suitable for phenomenological studies." Conceptually, data saturation is generally considered the optimum point of data collection (p. 61). The interview transcripts were also analyzed subsequently using the coding process, wherein the text is labeled and grouped to facilitate the identification of themes (Creswell, 2017). Thematic analysis was employed for the data collected from the interview sessions since thematic analysis is a flexible and pragmatic research tool. Thematic analysis can provide a general description of the data with rich detail in its complexity (Smith, 2024). The interviews were conducted in Arabic and then translated.

#### ***3.1. Demographic Details of the Teacher***

Six teachers of gifted schools in Jordan participated in this research. Six volunteers came forward to be interviewed. The following table displays the code of renamed participants, gender, and academic status.

**Table 1.** Profile of Teachers.

| No. | Name/Code | Gender/Age | Qualification | Academic Position | Years of experience |
|-----|-----------|------------|---------------|-------------------|---------------------|
| 1.  | Teacher 1 | M/ 21 – 30 | Master        | Teacher           | 5                   |
| 2.  | Teacher 2 | M/ 27      | Masters       | Teacher           | 9                   |
| 3.  | Teacher 3 | M/ 31      | Masters       | Teacher           | 5                   |
| 4.  | Teacher 4 | F/ 31      | PhD           | Teacher           | 6                   |
| 5.  | Teacher 5 | F/ 30      | Masters       | Teacher           | 4                   |
| 6.  | Teacher 6 | M/ 41      | Degree        | Teacher           | 11                  |

*Note.* The table shows the Distribution of the Study Sample According to the Variables of Age, Experience, Gender, and Specialization Related to the Director of Education of Central Amman. Al-bawaleez and R. Turkey, (2023).

## 4. Findings and Results

This section explains the outcomes of the study. The results are stated in four parts, which match the research questions and the problems explored in the interviews. For the identification of these practices, semi-structured interviews were conducted with experts from the domains of artificial intelligence and gifted education. From the findings of using AI in gifted education, the following recommendations and suggestions were put forth by experts after performing a thematic analysis of the interviews.

### 4.1. The Effect of AI on Gifted Students' Learning Process

Artificial intelligence (AI) can potentially dominate the process of learning by capable learners to a larger extent, either favorably or unfavorably. Though AI is also becoming a priority in the field of education policy, the incorporation of AI into the education of capable learners is also impossible to avoid. Even as AI can make learning more individualized by pre-adapting content to address the specific requirements of each student, thus driving greater engagement and supplementing the learning of higher-order skills, it also introduces some challenges. On the contrary, there is concern that excessive dependence on AI will slow down the development of critical thinking skills and problem-solving skills because students will depend too much on technology to show answers rather than going in-depth into the content. It is, therefore, imperative to utilize it wisely to ensure maximum technological benefits and the development of key intellectual skills.

#### 4.1.1. Addressing Persistent Challenges in Gifted Education

The transformative power of emerging technologies, and more particularly artificial intelligence (AI), is no stranger to changing fields, including education. For gifted education, AI promises the potential for rethinking learning environments and enhancing learning outcomes. However, the hype must be tempered by a recognition of AI's limitations and the complexity of its implementation. As one expert notes, "Technology can appear to provide revolutionary solutions to old problems when a new and glamorous technology appears, and particularly when the technological constraints and difficulty of working with the technology are perhaps not yet well understood." One of the most significant challenges facing the use of AI in gifted education is that at present, there are no suitable experts possessing AI expertise and pedagogical experience. This shortfall typically promotes over-

reliance on technological solutions at the expense of pedagogical design. Designers unwittingly embed their own learning and practice theory into AI systems, and this leads to a drift from traditional educational objectives. For example, in machine learning, learning is likely to be approached as an issue of straightforward mapping of system inputs to outputs, with no consideration for the multidimensionality and complexity of human learning processes.

#### **4.1.2. Large-Scale Learning Analytics**

Artificial intelligence (AI) is promising to undertake massive learning analytics, particularly in an environment where a teacher is teaching a large number of high-achieving pupils remotely. Measuring with precision a student's learning in such an environment is a tall order, however.

The supporters claim that AI can objectively measure test scores without teacher prejudice and accurately assess students' learning. Machine learning software and neural networks, for instance, can be trained to sort students into cohorts based on the marks obtained, provided there is a sufficient human-labeled data set. However, the accuracy of test scores as true measures of learning is debatable. As per Hodges and Mohan (2019), even though machine learning models can forecast student performance, their validity and interpretability should be taken into consideration.

Apart from this, tracking individual students over time might be more informative than relying on average test scores to facilitate learning. AI tools such as IBM's Watson Classroom aim to provide cognitive tools in favor of learning personalization through giving teachers an insight into individual learning patterns, interests, and strengths of students (IBM, n.d.). The resources can assist teachers in tailoring instruction to address the individual needs of high-ability students, thus improving learning outcomes.

#### **4.1.3. Cognitive Development**

Lev Vygotsky stressed that the development of higher-order thinking skills has its roots firmly established in their social utility, and such skills may have little intrinsic value to learners. For example, the shift from spoken to written language may be difficult for young children who are good at spoken language, with written forms seeming seemingly abstract and less natural at first. Similarly, conception systems of complexity, such as those employed in mathematics, are rendered meaningful primarily through use in sophisticated social practices and contexts.

Artificial Intelligence (AI) has great potential to match educational materials to the unique characteristics and study habits of gifted learners. It should, however, be approached with caution. While AI may be employed to enhance personalized learning experiences, the automation of inferior pedagogic practice is risked if carelessly introduced. Over-reliance on AI technology has the unintended consequence of diminishing emphasis on fundamental cognitive competencies essential for critical thinking and problem-solving.

Further, as AI technology advances, some of the functions of the cognitive abilities of people will change according to their relative value or use. For example, with technology that can smoothly translate speech to text and vice versa, ubiquitous challenges associated with dyslexic disorders may become minimized, redirecting their influence on learning as well as on communication. Though pedagogically speaking, one will still have to use AI as an ancillary tool which is used to assist in acquiring competence to solve the kind of problem rather than allowing AI to render such fundamental intellectual abilities obsolete. This middle position guarantees that the use of AI complements human cognition, augmenting growth and development without subverting basic intellectual functions.

#### **4.2. Role of AI in Education**

With international technology advancements, AI's impact on gifted education has kept

increasing. The acceptance and use of AI can also increase in the education system.

#### **4.2.1. Providing Access**

Artificial Intelligence (AI) plays a pivotal role in making education accessible and generating dynamic and interactive teacher-student relationships. With reference to individual learning backgrounds, AI adapts learning content in terms of existing knowledge, learning speed, and personal goals of individual learners. Personalized learning ensures that students are educated in a way that addresses their individual learning experience, hence ensuring engagement and understanding. Compared with the traditional learning processes, AI never simply examines a student's study history and identifies his/her weaker areas to further provide special classes or study materials accordingly to facilitate the learning. With such a forceful process, other than filling gaps in learning, even students are given autonomy in dealing with study procedures, and as a result, more efficient and satisfactory learning outcomes are obtained.

#### **4.2.2. Tutoring**

Artificial Intelligence (AI) is increasingly becoming a force of education reform, especially in tutoring. AI-based tutoring systems like chatbots and intelligent tutoring systems (ITS) offer personalized instruction to students beyond the walls of a conventional classroom setting. These systems break down individual learning patterns and tailor learning material to address particular strengths and weaknesses, enhancing student interest and comprehension.

For educators, AI instructors provide numerous advantages in terms of minimizing repetitive tasks and providing students with instant feedback. In this manner, instructors get more time to plan the class and monitor the activity level of the learners. Moreover, AI instructors are capable of emulating one-to-one instruction in which the learning plan is adapted in line with the pace and learning tendency of each student, a feature of which is particularly favorable to students of exceptional talents receiving higher or professional instructions.

However, the use of AI tutors in education is not issue-free. The concerns are the possible over-reliance on technology diminishing the critical thinking capacity of learners. The other concern is to have precision and appropriateness of AI-created material to maintain education integrity.

Briefly stated, AI tutorial systems have the potential to assist learning significantly through personalized, user-friendly, and efficient support of students and instructors alike. All this is necessitated by well-directed application with regular observation for balancing issues thereof in an endeavor to utilize education best with the aid of AI.

#### **4.2.3. Timely Response**

Artificial Intelligence (AI) has greatly enhanced the efficiency of the learning environment by providing immediate answers to students' questions. AI-based tools such as virtual assistants and chatbots assist in answering frequently asked and redundant questions, thereby freeing up time for students and unloading the workload on teachers. This unloads the teachers' workload so that they can focus more on instructional work, while students have immediate access to information, therefore yielding to a highly responsive and interactive learning process.

In addition, AI enables automating scholarly and administrative tasks, personalized learning, and unrestricted access to course materials. With these streamlined procedures, AI makes the education system more efficient and effective and capable of satisfying the divergent needs of learners and enhancing learning outcomes across the board.

### **4.3. Cross-Disciplinarity**

The application of Artificial Intelligence (AI) in talent education is central in that it necessitates

interdisciplinary interfaces. Through the use of AI-based learning materials, teachers can develop adaptive curricula that adjust to various patterns and learning speeds, thereby enriching the experience of gifted students.

Also, AI can be applied to support individualized instruction that addresses the highly individual needs of highly gifted students without overwhelming instructors. Individualization can enable all learners with material that addresses his or her own very own distinctive level of knowledge and skill set, thus inspiring more effectively and to a greater degree.

Interdisciplinary secondary school instructors, even though they instruct alongside instructors of a discipline, play a significant role in effectively integrating AI into the curriculum. Curriculum design while teaching AI by interdisciplinary secondary school instructors has been discovered to produce effective ways of integrating AI tools into course materials and improving learning.

Finally, interdisciplinary implementation of AI in gifted education possesses huge potential for differentiated instruction, motivation, and re-definition of critical thinking capability. Since AI enables inter-professional collaboration between training professionals of varied backgrounds, the teachers themselves have a greater scope to introduce AI into practice and bridge shortcomings like restricted exposure to new curriculum and individual teaching requirements.

#### ***4.4. AI Transformation of Gifted Education***

Artificial Intelligence (AI) will also transform gifted education holistically by automating routine education processes, individualizing instructional materials, and altering information-seeking mechanisms. AI-powered grading systems can continue independently to speed up the grading process, make it efficient and unbiased, and conserve instructors' time. Moreover, AI facilitates easy tailoring of instructional content to address individual learners' unique learning requirements, making adaptive learning activities responsive to differences in learning style and pace. Beyond that, AI has also transformed learning and how one learns and engages with and gains information, for instance, individualized tutors and interactive experiences enabling learning. As a result of the incorporation of AI in learning processes, successful learners can now receive real-time feedback, one-on-one instruction, and adaptive learning spaces and, consequently, improve their learning processes and outcomes.

#### ***4.5. Practices of Using Artificial Intelligence in Gifted Education***

Implementation of Artificial Intelligence (AI) into gifted education has transformed classical models of pedagogy with newer solutions for extremely old questions. AI is presently making it possible to offer one-on-one learning opportunities despite locations of gifted students.

Artificial intelligence-based adaptive learning systems also monitor student responses individually in an effort to identify individual strengths and weaknesses. The curriculum continuously adapts within this data-based system, challenging and rewarding high-ability students at all times. Personalization prevents disengagement and boredom that follow traditional schooling.

In addition, AI enables us to construct virtual learning environments where students can learn by interacting with intelligent systems without the social limitations of the traditional classroom. It creates an empowering arena for gifted students to select their areas of interest in depth and freely and intellectually completely dominate.

Briefly, AI in gifted education addresses a number of unavoidable problems, including the absence of trained teachers, the lack of access to higher-level school programs, and the physical constraints of classrooms. Owing to the technologies of AI, teachers have an opportunity to access other potential of human resources in talented individuals and provide them with means and opportunities for further development during education.

## 5. Discussion

Artificial intelligence (AI) is no longer an option but a constituent element of teaching today. It offers smarter solutions to monitoring, process control, optimization, tutoring, communication, analysis, marking, and assessing students. Students and teachers now rely increasingly on AI technologies to perform mundane tasks, and as such, these technologies must be able to communicate effectively and deliver meaningful user experiences.

Education AI is an interdisciplinary research area in itself that addresses numerous problems which are outside the purview of traditional school institutions. For instance, AI offers education accessibility in geographies where traditional classroom instruction is not feasible, provided that appropriate AI technologies are employed within specified learning objectives. With the minimization of geospatial and distance restrictions, AI enables schools to have dispersed and diversified student bodies. In contrast to human teachers, AI systems approach each student individually, offering individualized guidance that is tailored to his or her unique needs and levels of understanding.

Above all, AI allows students to learn independently because such computer programs are designed to monitor and adapt according to individual learners' level of understanding to facilitate future interactions. This form of customized interaction allows learners to interact with the system without compulsion or stress as might possibly emanate in a traditional class, which is important for learning processes to be effective. Other than that, AI courses never have a limit when it comes to joining; one-on-one personal instruction is provided to every student based on his or her own expertise and interests. Intelligent systems also mechanize tasks like grading, attendance, and assignment analysis, thus minimizing outside inputs and admin load.

Artificial intelligence (AI) has, in many ways, transformed the education sector tremendously by enhancing some aspects of teaching and learning. In teaching, AI-powered systems deliver personalized guidance, which helps students understand tougher topics easily and relieves instructors from the repetitiveness of the traditional approach. When it comes to grading students, AI performs the work of grading, relieving instructors from the tedious part of the traditional approach and allowing them to interact more with students on an individual basis. At the administration level, AI technology has been used to de-bureaucratize and simplify school and university administration. Further, AI makes the global classroom possible through its instant translation capacity and subtitle functionality, allowing students with varying language backgrounds to communicate openly and participate in a vast diversity of international learning contexts.

Intelligent tutoring systems depend on students interacting with adaptive interfaces that customize learning opportunities to their individual needs and prior knowledge. Data-driven AI systems are best at managing complex data streams in real-time, which demands user interfaces that can collect real-time behavioral data from learners, in addition to earlier data for learner modeling. This emphasizes the necessity of user interfaces (UI) coupled with AI, adhering to the principle of "no AI without UI." Integrating data from various learner-related sources, such as social media and gaming systems, and applying various UI and sensor technologies in classrooms hold immense commercial and educational promise.

While many intelligent tutoring systems have been developed based on cognitivist traditions and didactic pedagogies, other learning frameworks have gained more visibility. The image of technology scaffolding learning and acting as a reliable guide has been very compelling. Social learning and knowledge creation research have also influenced this sector, causing a paradigm shift from teacher-centered to more student-centered approaches, including facilitation of peer-to-peer social learning, as constructivist and constructionist theories have gained popularity. Teachable conversational agents are one area where educational AI startups are likely to pursue new opportunities, with the commercial availability of conversational natural language systems.

AI has revolutionized education notions, as evident through smart content development—from e-textbooks to individualized digital learning spaces—at every educational level. This kind of change involves the automation of fundamental education tasks such as grading and homework classification. In addition, AI-driven tools enable tracking of students' progress, alerting instructors on performance issues and providing timely feedback, making trial-and-error learning less frustrating.

Gifted assessment can be achieved with various forms of assessment instruments, including tests that are designed to identify talents and abilities, continuous assessment of learning gain, and effect of gifted programs. Zimlich again asserts that gifted students are being served by curriculum that offers challenging content, applied learning, creativity, self-concept, critical thinking, and access to guides, all of which can easily be attained through the utilization of technology. However, he cautions that technology is not merely an empowerment tool but also a likely barrier. Thus, educators must strategically employ technology to serve talented children's requirements and meet the objectives of gifted education programs.

## 6. Concluding Remarks

This study investigated the impact of artificial intelligence (AI) on education of gifted learners in Jordan via qualitative data collection and analysis. Results show that AI has a significant impact on the education of gifted learners by simplifying routine operations such as grading and classification, along with the ability to personalize study programs based on the requirements of a learner. Best practices mentioned include the use of virtual reality (VR) and augmented reality (AR) technologies to replicate diverse experiences, thereby tapping students' potential to generate innovative ideas and solutions. AI also assists in developing problem-solving strategies and instilling reflective and critical thinking among talented students. The study recommends increased investment on the part of the Jordanian government in AI in gifted education and also provides training workshops to the teachers and students for improvement in the use of AI. While the findings are guaranteed to be valid, the study itself acknowledges some shortcomings in the methodology; future studies should investigate both teachers and students and consider experimental implementations of AI in gifted education classrooms.

## Declarations

**Author Contributions.** Both authors contributed equally to the conceptualization, design, data collection, analysis, and writing of this research.

**Conflicts of Interest.** the authors declare no conflict of interest.

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**Ethical Approval.** The relevant ethics committee has reviewed and approved this study. The research adhered to all ethical guidelines, ensuring full respect for participant privacy and data confidentiality. Informed consent was obtained from all participants prior to their involvement, and their identities remain confidential in accordance with ethical research standards.

**Data Availability Statement.** All data used to justify this study's outcomes are provided fully within the study paper and supplement materials. Readers and researchers interested in knowing may refer to the paper for overall information, data analysis, and results. One does not require any extra data beyond what this report has reported.

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