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INTEGRATING ARTIFICIAL INTELLIGENCE INTO CURRICULUM DESIGN: STRATEGIES FOR ENHANCING TEACHING METHODS IN PRIMARY EDUCATION

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Abstract
This study addressed the limited adoption of Artificial Intelligence (AI) in primary education, focusing on its integration into curriculum design and its impact on teaching methods. A survey was conducted among 150 male and female primary school teachers in Basra, Iraq, using a specially designed questionnaire. The analysis revealed a positive acceptance from teachers regarding AI's potential to enhance educational design, especially in content creation and providing personalized learning experiences, aligning well with constructivist and cognitive approaches. However, the study also highlighted significant barriers to widespread adoption, such as the urgent need for specialized training programs for teachers and the necessity of fostering a deeper understanding of the ethical implications of using AI tools in the educational environment. This underscores the importance of providing structured support and clear guidelines to enable the effective utilization of this technology in primary education. Thus, successful and widespread integration of AI will require targeted professional development and the establishment of clear ethical frameworks to overcome existing challenges.

Keywords: Artificial Intelligence, Integration, Curriculum Design, Teaching Methods, Primary Education.

The researcher followed the APA Style, 7th Edition.

الذكاء الاصطناعي في تصميم المناهج الدراسية: استراتيجيات لتطوير طرائق التدريس في المرحلة الابتدائية

ملخص الدراسة
تطرقت هذه الدراسة إلى التبني المحدود للذكاء الاصطناعي في التعليم الابتدائي، مع التركيز على دمجه في تصميم المناهج وتأثيره على أساليب التدريس، حيث أُجري مسح شمل 150 معلمًا ومعلمة بالمرحلة الابتدائية في البصرة، العراق، باستخدام استبيان مُعد خصيصًا. وقد كشف التحليل عن قبول إيجابي من المعلمين لإمكانيات الذكاء الاصطناعي في تعزيز تصميم التعليم، خاصةً في إنشاء المحتوى التعليمي وتوفير تجارب تعلم مخصصة، بما يتوافق مع المناهج البنائية والمعرفية. إلا أن الدراسة أبرزت حواجز مهمة أمام التبني الواسع، مثل الحاجة الملحة لبرامج تدريب متخصصة للمعلمين، وضرورة تعزيز فهم أعمق للآثار الأخلاقية لاستخدام أدوات الذكاء الاصطناعي في البيئة التعليمية، مما يؤكد أهمية توفير دعم منظم ومبادئ توجيهية واضحة لتمكين الاستفادة الفعالة من هذه التقنية في التعليم الابتدائي. وبذلك، يتطلب التكامل الناجح والواسع النطاق للذكاء الاصطناعي تطويرًا مهنيًا موجهًا ووضع أطر أخلاقية واضحة للتغلب على التحديات القائمة.

الكلمات المفتاحية: الذكاء الاصطناعي، التكامل، تصميم المناهج، طرائق التدريس، التعليم الابتدائي.

INTRODUCTION

Rapid progress in artificial intelligence (AI) is reshaping education to a core, offering tremendous personalization and productivity growth, and tending towards a learner-centric environment (Holmes et al., 2022). Although AI holds much promise in enabling personalized learning due to its adaptive features (Woolf, 2010; Luckin et al., 2016), its pervasive use in primary education for personalized learning is yet to be achieved (Schmid et al., 2021; UNESCO, 2023). To tackle such immediate need that AI needs to be incorporated into primary 21st C education system, citing constructivist and sociocultural perspectives (Vygotsky, 1978; Bruner, 1996), this is because AI tools are not efficiently used in curriculum planning and instruction strategies at the latter phase of the learning journey. In particular, this study explores primary teachers' views in one region, Basra, Iraq, about how to narrow the gap between the theory of AI and their potential use in practice.

Problem Statement: Artificial intelligence (AI) has the potential to revolutionize education, especially in primary schools and there has not been sufficient attention paid to its exact role and the best way for schools to implement it. This research will look at primary educators' views of AI in Basra, Iraq and how it can enhance teaching and learning for younger students.

Questions of the Study: To address this problem, the following research questions were raised:

1- How do primary education teachers in Basra, Iraq view the impact of AI tools on their curriculum design and instructional effectiveness, particularly in relation to the ADDIE framework?
2- What advantages do teachers in Basra, Iraq see in incorporating AI into the creation of curricula and teaching methods for elementary schools?
3- What challenges do educators in Basra, Iraq encounter when integrating AI into the development of elementary school curricula and teaching strategies?

Objectives of the Study: The elementary teachers in Basra, Iraq in this research are to find out their likes and dislikes about the effect of AI in the education sector. The workers for the teaching profession will also be sought for the good and bad that AI raises for them, problems with, and relations detected, as well as compliance with certain learning theories. The ADDIE model was the method used to carry out the survey.

Significance of the Study Theoretical Significance: This research is with significance at the theoretical level for the supplying of the information about the teachers' views of the way the AI integration into the Iraqi primary curricula can be carried out. Practical Significance: This research is with significance at the practical level, as it is possible it may increase students' engagement, lighten up the teacher's workload, and also provide skills for the development of the educator's profession.

Delimitations of the Study: This research focused on three public primary schools in Basra, Iraq, and included teachers with at least three years of experience in mathematics, science, or language arts. The study spanned a period of six weeks.

Study Participants: In total, 150 male and female primary school teachers in Basra, Iraq participated, all of whom were knowledgeable in the core subjects of math, science, and language arts at the selected schools in Basra, Iraq.

Instruments of the Study: A Teachers' Questionnaire was developed to collect educators' perspectives on integrating AI into teaching practices.

Definition of Terms : **Artificial Intelligence (AI):** AI is a machine system producing outputs for specific purposes (OECD AI Principles, 2019) and capable of human-like cognitive tasks (Gignac & Szodorai, 2024). In education, AI aims to personalize learning by replicating human thought (Zawacki-Richter et al., 2020; Nguyen et al., 2021; López et al., 2021). For this study, AI in primary education means using technology for personalized learning to boost student performance.

Curriculum design: is an organized process that correlates methods and materials with a variety of learning outcomes (Smith & Davis, 2023; Jones & McKeown, 2024; Marymount University, n.d.; OctoProctor - n.d.; Hurix Digital - n.d.). The goal of curriculum development in the elementary school is to promote learning to achieve and adapted to the individual needs of the pupils.

Teaching Methods: are developing to tailor instructions with AI, provide real -time reaction, and provide unique support (Piagate, 1973; Harris and Stargis, 2023; Miller & Brown, 2024). This helps promote the student's performance through the enhanced engagement (Villarel-Custress et al., 2025). This study examines texts for better educational results using AI.

Primary education: Emphasis on fundamental skills and socio-emotional education with future learning-shaped digital techniques from primary education (Yousefi Hamedani et al., 2024). The AI devices now replace it by promoting lifetime learning and engagement (Brown & Green, 2023; Johnson & Lee, 2024), offering personal support and response. This study sees primary education as integrating these elements with AI for personal education.

ADDIE Model: A widely used, systematic framework for instructional design, encompassing five sequential phases: Analysis, Design, Development, Implementation, and Evaluation. It provides a structured approach to creating effective learning experiences (Reiser & Dempsey, 2017, p. 24).

GAIDE: A recent framework, Generative AI for Instructional Design in Education (GAIDE), specifically focuses on how generative artificial intelligence can assist educators and instructional designers in the efficient creation, adaptation, and enhancement of diverse and engaging educational content (Dickey & Bejarano, 2023, p. 2).

LITERATURE REVIEW

Technologies such as machine learning (ML), natural language processing (NLP), and intelligent tutoring systems (ITS) represent a swiftly expanding area of artificial intelligence (AI) application in education (López et al., 2021; Nguyen & Co, 2012). These technologies play a crucial role in personalized instruction, adaptive learning, and predicting progress. Machine learning (ML) tailors educational journeys according to data, while natural language processing (NLP) focuses on enhancing user engagement (Nguyen et al., 2021). The study also relies on well-known instructional design models such as the ADDIE model (Analysis, Design, Development, Implementation, Evaluation), which is a structured approach for developing educational materials. It also incorporates the GAIDE model

(Generative AI for Instructional Design in Education), which offers specific guidelines for integrating AI into curricula and teaching methods. Furthermore, the study investigates the ethical implications of AI, including issues like data privacy and algorithmic bias. This highlights the importance of digital literacy and the vital role teachers play in fostering students' social and emotional development alongside technological advancements.

Theoretical Foundations of AI in Learning : AI aligns with various educational philosophies to enhance learning. Constructivism (Piaget, 1970; Vygotsky, 1978) views AI as a tool for improved content interaction, immediate feedback, and understanding. Cognitivism (Bruner, 1960) leverages AI for practical, real-world examples that boost engagement and critical thinking. Connectivism (Siemens, 2005) is evident in AI's ability to link users to multiple resources and foster collaborative learning, such as through immersive virtual simulations. Behaviorist applications (Skinner, 1953) can be utilized in some AI-based systems that incentivize or reward task completion. Furthermore, Transformative Learning Theory (Mezirow, 1997) can be supported through AI-enabled tools that promote critical reflection and allow multiple perspectives, with AI conversations via chatbots offering additional learning perspectives.

Advantages of AI in Primary Education: AI-based educational platforms significantly enhance traditional classrooms by offering personalized and adaptable instruction through real-time data, thereby cultivating dynamic and engaging learning atmospheres (Owoeye, Sheidu, & John, 2023). These resources aid in automating certain evaluations and reducing administrative tasks, allowing educators to concentrate more on intentional teaching methods, constructive feedback, and fostering emotional and social development (Khan et al., 2025; Romero, Carvajal, & Reyes, 2025). Research consistently demonstrates how efficiently artificial intelligence enhances teaching quality, improves academic capabilities, and inspires pre-service teachers (Khalil, Mokhtar, & Al Sunaidi, 2024). Additionally, AI facilitates the development of foundational skills in core subjects and lays a solid groundwork for tailored instruction in elementary education through data-driven adaptive learning and prompt feedback (López et al., 2021; Brown & Green, 2023). For example, a study conducted in Taiwan revealed that elementary students utilizing an AI-based curriculum experienced a high percent improvement in their understanding and application of AI, alongside increased creativity and enthusiasm.

Teacher Perceptions and Readiness for AI Integration: Research (2023–2025) reveals that educators generally acknowledge the ability of AI to enhance personalized learning (Aslam & Khalid, 2023; Al-Khaldi, 2024) and appreciate its applications in the educational realm. Al Mandalawi (2024) explored AI's potential in Iraqi elementary schools, emphasizing the need for ethical frameworks, training, and curriculum design for effective learning. Nonetheless, they also voice significant concerns about their readiness and the lack of training (Aslam & Khalid, 2023; Holzmeister et al., 2024), consistently identifying a critical shortage of structured training initiatives. Tashtoush et al. (2024) highlighted the need for AI implementation standards after surveying 580 math teachers in Abu Dhabi, indicating that, although teachers tried hard, AI improved student performance and motivation. Although educators' views on AI instruments, such as ChatGPT, are largely favorable for catering to individualized learning, they express apprehensions about ethical considerations, accuracy, and data privacy (Fakhrzadeh et al., 2024; Holzmeister et al., 2024). This underscores a vital demand for digital literacy and ongoing professional development to ensure the ethical application of generative AI (UK Department of Education, 2024), highlighting the essential role of interpersonal engagement and the specialized expertise of teachers in conjunction with AI technologies (Erol & Erolul, 2024).

Educators largely concur that integrating artificial intelligence into elementary school curricula can enhance student comprehension, cultivate AI proficiency, and augment critical literacy (Rathore et al.; Pourkarimi & Ali Akbari, 2025). AI frameworks, curriculum development, and pedagogical approaches A distinct requirement exists for explicit and adaptable models for the creation of content and pedagogical techniques, as evidenced by the GAIDE framework (Dickey & Bejarano, 2023; Kotsis, 2024; Talarico & Repetto, 2024). While artificial intelligence offers distinct advantages over conventional computer systems in enhancing educational practices (Carrisi Marras & Vergallo, 2025), numerous ethical considerations persist, underscoring the critical necessity for the responsible training of educators in relation to AI technologies (Jamal et al., 2025; Karampelas, 2025; Wang & Proctor, 2025; Talarico & Repetto, 2024). Comprehensive conceptual methodologies and frameworks, such as GAIDE, consistently emphasize the significance of teacher preparation and ethical considerations (Wang & Proctor, 2025; Jamal et al., 2025). Rashid, Peszek, and Fadhil (2025), in Erbil, Iraq, conducted an AI workshop that taught 25 diverse educators how to use AI technology for better lesson design and assessment, significantly enhancing teacher preparation in Kurdistan.

Applications of AI in Education : Research on the use of AI in educational settings often focuses on specific technologies like deep learning and machine learning. Evaluations of AI's role point out challenges and suggest solutions, such as developing clear strategies, enhancing infrastructure, and integrating AI into teacher training (Ismail, 2023).Investigations that examine the patterns and outcomes of events like the COVID-19 pandemic (Mallik &

Gangopadhyay, 2023) distinguish between proactive and reactive approaches to artificial intelligence. Further studies delve into the application of large language models within educational environments to enhance interactions between educators and learners (Tan et al., 2023) and recognize additional valuable uses (Walter, 2024). Farhan et al. (2024) found that 379 University of Baghdad pharmacy students demonstrated a significant positive correlation between the quality of their services and the efficacy of AI, underscoring the need for advanced classrooms and technical support.

Challenges and Ethical Considerations in the Integration of Artificial Intelligence: Difficulties and Ethical Issues with Artificial Intelligence Integration: Although AI can enhance student engagement and allow for personalized learning experiences, there are still many obstacles to overcome in its application. Legitimate concerns emerge concerning student privacy and data security, while the digital divide poses an obstacle to equitable access for all (Selwyn, 2019). Although artificial intelligence presents significant opportunities for the development of adaptive assessments and the provision of support for special education requirements (Owoeye et al., 2023; Romero et al., 2025), its implementation necessitates thorough deliberation. Ethical implications such as data privacy and algorithmic bias necessitate thorough examination (Merino-Campos, 2025). Additionally, AI tools should be developmentally suitable for students (Piaget, 1973), functioning as a supportive resource rather than a substitute for educators, as teachers are essential for assessing AI-generated material and promoting socio-emotional growth (Harris & Sturgis, 2023). Excessive dependence on AI may jeopardize student-teacher relationships and impede the development of social skills (Khan et al., 2025).

Strategic Implementation for Successful AI Integration : The effective use of AI in elementary education relies on systematically incorporated, well-balanced strategies. These strategies must integrate adaptive technology with substantial teacher support, relevant professional training, carefully considered curriculum development, and comprehensive ethical governance (Walter, 2024). This cohesive framework is vital for promoting literacy and problem-solving abilities that are critical for future preparedness (Walter, 2024). Successful AI application universally requires equitable access (Selwyn, 2019), proactive initiatives to bridge readiness disparities (Joshi & Sharma, 2024), and inspiring professional development for teachers (Almalki & Alrashed, 2025). Ultimately, the incorporation of AI in primary education necessitates a thorough, professional strategy that harmonizes effective teaching methods, ethical considerations, suitable technology, and ongoing professional development to enhance student achievements and teacher effectiveness (Joshi & Sharma, 2024). **Current Study Focus** : the study is specifically concentrating on some male and female primary school teachers in Basra, Iraq primary teachers. It seeks to integrate AI's theoretical underpinnings with its implementation in primary education systems (Penner et al., 2023; Kotsis, 2024; Talarico & Repetto, 2024).

Study Methodology : This research developed a questionnaire to explore the perceptions of Iraqi primary school teachers in Basra, Iraq regarding the advantages, obstacles, and preparedness for incorporating AI into the curriculum.

Participants of the Study : 150 male and female primary school teachers in Basra, Iraq, who possessed a strong understanding of educational technology, participated in the research. These teachers specializing in language arts, science, and mathematics facilitated the integration of AI for literacy enhancement, individualized feedback, and problem-solving within primary education. **Instrument of the Study:** To improve educational outcomes and increase student engagement in classrooms, this research utilizes a Teachers' Questionnaire to collect primary educators' perspectives on the use of AI in the curriculum. **Description of the Questionnaire**: This study employs a multi-part questionnaire utilizing a 5-point Likert scale, gathering teachers' opinions on the challenges and training needs linked to AI in education. It explores the implementation hurdles and the potential benefits of integrating AI/GAIDE/ADDIE, along with open-ended questions pertaining to demographics.

Sources of the Questionnaire: Based on the most recent AI literature in education, and contemporaneous ideas within the field, the themes of a questionnaire were created. The objectives were measuring impacts of AI based technologies on learner outcomes, gauging levels of required training and assessment tailored to self-efficacy regarding teaching with AI-based tools, as well as educators' comprehension of relevant constraining concepts, applying established frameworks warrants. This ensures consideration for the extent and multidisciplinary nature in examining Generative AI in relation to the phases of ADDIE model instructional design.

Validity and Reliability of the questionnaire: Content validity is achieved by aligning the questionnaire with diverse learning theories and grounding it in contemporary academic research on AI in education, which examines teachers' views on self-efficacy, AI literacy, and developmental outcomes. Construct validity is upheld through its logical framework and the application of a 5-point Likert scale to measure attitudes and difficulties associated with integrating GAIDE-ADDIE alongside applicable theoretical models. Appendix B includes suggestions from ten experts who assessed the face validity of the questionnaire and offered recommendations to enhance its clarity and practicality for educators and instructional designers.

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Individual Correlations between Items and the Total Questionnaire

The questionnaire's validity and reliability were assessed with a group of 25 core subject teachers who did not participate in the initial research. The data regarding item-to-total correlation for each section of the questionnaire is presented in Table 1, illustrating internal consistency. To demonstrate the coherence and diversity within each component, it includes the average item correlations and their standard deviations.

Table 1 *Questionnaire correlations between individual items and the total*

Section	Number of Items	Mean Correlation	Std. Deviation
Understanding GAIDE & ADDIE Integration	9	0.701	0.029
Generative AI's Alignment with Educational Theories	18	0.700	0.030
Perceived Benefits of GAIDE Integration	6	0.720	0.022
Challenges and Support Needs for GAIDE Implementation	10	0.646	0.031

Table 1 shows low standard deviations and mean item-to-total correlations ranging from 0.646 to 0.720, indicating good internal consistency across all questionnaire sections. These results support the construct validity and internal reliability of the instrument by showing that the items measure the intended constructs accurately and consistently and are well-aligned within each section.

The Questionnaire Internal Consistency: Section-to-Total Correlations

Internal consistency of the questionnaire was evaluated using Pearson correlation coefficients as shown in Table 2.

Table 2 *Questionnaire Internal Consistency: Section-to-Total Correlations*

Section Number & Name (from Questionnaire)	**Number of Items**	**Correlation Coefficient with Total Score**
Section Two: Understanding GAIDE & ADDIE Integration	9	** 0.951
Section Three: Generative AI's Alignment with Educational Theories	18	** 0.836
Section Four: Perceived Benefits of GAIDE Integration	6	** 0.937
Section Five: Challenges and Support Needs for GAIDE Implementation	10	** 0.857

As evidenced by expert review and high internal consistency, the questionnaire exhibits strong validity and reliability (Tables 1 and 2), with section correlations up to 0.951 (all $p<0.01$) and individual item correlations ranging from 0.60 to 0.75.

The Administration of the Questionnaire

To ensure clarity for participants who spoke Arabic as their first language, the questionnaire was translated into Arabic (Appendix A). It was then made available electronically via WhatsApp to 150 primary school teachers from three Basra Governorate, Iraq primary schools who specialize in core subjects.

Findings from the Teachers' Questionnaire

Results of the Teachers' Questionnaire on the Use of GAIDE, including Means and Standard Deviations Table 3 displays Cranach's Alpha along with actual teacher comments.

Table 3 *GAIDE Integration Questionnaire Results*

Section	Question/Focus	Mean	Std. Dev.	Cronbach's Alpha
GAIDE & ADDIE Integration	Familiarity with GAIDE tools	4.0	0.8	0.85
	Understanding GAIDE in Analysis	4.2	0.6	0.88
	GAIDE's Role in Design Phase	4.4	0.5	0.89
	GAIDE's Assistance in Content Dev.	4.3	0.8	0.87
GAIDE & Educational Theories	Support for Constructivist Theory	4.1	0.6	0.85
	Alignment with Cognitivism	4.2	0.7	0.86
	Support for Connectivism	3.9	0.9	0.83

Perceived Benefits	Personalized Learning	4.3	0.6	0.90
	Reduced Time for Content Creation	4.4	0.5	0.89
	Engagement & Interaction	4.1	0.7	0.87
Challenges & Support Needs	Lack of Training as a Barrier	3.6	0.9	0.81
	Ethical Concerns	4.0	0.7	0.84

Interpretation of Results primary schools

A quantitative survey of 150 primary school teachers in Basra, Iraq revealed that the teachers had positive views and a good understanding of how GAIDE fits into the ADDIE model, consistent with current research on AI education. This was also supported by Lane and Ifenthaler (2020). The instructors acknowledged the crucial role GAIDE played in the analysis phase (M=4.2, SD=0.6, α=0.88) and reported moderate to high familiarity with AI tools like ChatGPT (M=4.0, SD=0.7, α=0.86). According to Zhang and Aslan (2021), GAIDE's support during the design (M=4.4, SD=0.5, α=0.89) and content development (M=4.3, SD=0.8, α=0.87) phases reduced teachers' workload. Teachers reported that it aligned with constructivist (M=4.1, SD=0.6, α=0.85) and cognitivist (M=4.2, SD=0.7, α=0.86) theories, which advocate for active learning and cognitive load management (Sweller, 1988; Spector et al., 2014). Chen et al. (2025) found a moderate level of support for connectivism (M=3.9, SD=0.9, α=0.83), indicating that there is a need to improve digital literacy.

Qualitative insights that highlighted GAIDEs potential for adaptive feedback personalized learning and differentiated instruction as confirmed by Gao and Li (2024) corroborated these findings. AIs capacity to produce engaging lessons was commended by educators who also noted increased student participation. However they also raised concerns about unequal access to technology ethical issues like bias and plagiarism and a lack of training. This corroborates studies that demonstrate the need for clear ethical standards and ongoing assistance to guarantee responsible AI integration in education ,as supported by Ertmer and Ottenbreit-Leftwich (2010) ;UNESCO (2021) , and Huang and Wang (2024).

CONCLUSION

Although primary teachers in Basra, Iraq are generally in favor of integrating AI into curriculum design and recognize its enormous potential to revolutionize instruction through resources like GAIDE this study indicates that there are still many challenges to overcome. Teachers demonstrated a deep understanding and awareness of the application of AI in instructional design at every level from analysis to development and they appreciated its potential to improve student engagement customize learning and reduce the amount of time required to produce content. Nonetheless thorough teacher preparation unambiguous ethical frameworks and robust support systems are critically needed to guarantee AIs responsible and effective integration in elementary education. Due to inadequate training and significant ethical issues like academic dishonesty and bias accuracy this is the case.

Recommendations: Educational institutions in Basra Governorate, Iraq should consider these key suggestions for successful AI integration:

Educational institutions should assist teachers' structured professional development with an emphasis on real-world AI applications in curriculum design.

- Designers and administrators should encourage the use of GAIDE to automate repetitive content creation in order to free up teachers for more difficult pedagogical tasks curriculum.
- Schools should make use of GAIDE for adaptive assessments personalized feedback and content customization in order to meet the varied needs of their students and increase engagement.Institutions should set clear guidelines and offer training for responsible AI use to address accuracy bias and plagiarism at the same time they should incorporate instruction in digital literacy for students.
- School systems should launch targeted pilot programs with GAIDE to collect concrete data that will guide a phased strategic curriculum implementation.

Practical Implications of the Study: The findings of this study offer several practical implications for educational practices in Basra, Iraq**:**

- AI teachers' training should be emphasized when creating curricula .
- Reducing teachers' workload by tasks with GAIDE.
- Matching students' learning with utilizing GAIDE adaptive features .
- The ethical use of AI has to be established.

- Students are in need of encouragement to be digitally literate by supporting education powered by AI .

Limitations of the Study: This study, focused on Basra, Iraq, faced several limitations:

- The sample size was limited to 150 primary teachers .
- The limited applicability of data to three schools.
- Depending on self-reported data due to the possibility of subjectivity in the findings of teachers self-reports.
- Student outcome was absent, as the study contains no information about long-term effects or student learning.

Suggestions for Further Research

- Assessing long-term impacts of GAIDE's ongoing effects on teaching methods and student learning outcomes over time.
- Replicating results with diverse student and teacher populations across various Iraqi schools and regions.
- Researching how GAIDE-enhanced instruction affects academic performance and skill development.
- Identifying effective training models that build competence and confidence in using GAIDE.
- Addressing concerns about academic integrity, bias, and accuracy in AI.

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Appendix A

Teachers' Questionnaire on Integrating GAIDE into the ADDIE Framework

Introduction : The purpose of this questionnaire is to collect opinions on how to incorporate Generative Artificial Intelligence (GAIDE) into the ADDIE (Analysis, Design, Development, Implementation, and Evaluation) framework from learning educators, and instructional designers. We will gain a better understanding of how AI can transform instructional development and improve learning experiences across a range of educational theories thanks to your responses.

Instructions : Please carefully read each statement, then use the following Likert scale to select the response that most accurately represents your viewpoint: 1 = Strongly Disagree أعارض/ لا أوافق بشدة 2 = Disagree اعارض/ لا أوافق 3 = Neutral محايد 4 = Agree أوافق 5 = Strongly Agree بشدة

Demographic Information **الجزء الأول : المعلومات الديمغرافية**

Question	Response Options	
1-Your Primary Role دورك الأساسي	Instructional Designer	مصمم تعليمي
	Educator/Teacher	مربي/معلم
	Learning & Development Specialist	أخصائي تعلم وتطوير
	Curriculum Developer	مطوّر مناهج دراسية
	AI/Technology Specialist	أخصائي ذكاء اصطناعي/تقنية
	Other (Please specify):	أخري: يرجي التحديد
2. Years of experience in instructional design/education سنوات الخبرة في التصميم التعليمي	3-5 years	5-3
	6-10 years	10-6
	8-15 years	15-8
	More than 15 years	أكثر من 15 سنة
3-How familiar are you with the ADDIE framework? ما مدى إلمامك بإطار عمل التصميم التعليمي؟	Not familiar	غير ملم/غير مألوف
	Slightly familiar	ملم/مألوف إلى حد ما
	Moderately familiar	ملم/مألوف بشكل متوسط
	Very familiar	ملم/مألوف جدًا
	Expert	خبير
4. How familiar are you with Generative AI tools (e.g., tools that create text or images)? ما مدى إلمامك بأدوات الذكاء الاصطناعي التوليدي (مثل الأدوات التي تنشئ نصوصًا أو صورًا)؟	Not familiarمألوف	غير ملم/غير
	Slightly familiar	ملم/مألوف إلى حد ما
	Moderately familiar	ملم/مألوف بشكل متوسط
	Very familiar	ملم/مألوف جدًا
	Expert	خبير
5. How often do you use AI tools in your instructional design/education practice? كم مرة تستخدم أدوات الذكاء الاصطناعي في ممارسة التصميم التعليمي ؟	Never	أبدًا
	Less than once a month	أقل من مرة واحدة في الشهر
	1-3 times a month	2-1 مرات في الشهر
	Weekly	أسبوعيًا
	Daily	يوميًا

Understanding GAIDE & ADDIE Integration **الجزء الثاني: فهم دمج الذكاء الاصطناعي التوليدي ونموذج التصميم التعليمي**

Statement	1	2	3	4	5	العبارة
6. I see the potential benefits of integrating Generative AI (GAIDE) into the ADDIE framework.						6-أرى الفوائد المحتملة لدمج الذكاء الاصطناعي التوليدي ضمن إطار عمل تطوير التعليم.

7- GAIDE effectively contributes to the Analysis phase of instructional design (e.g., needs assessment, audience analysis).						7-يساهم الذكاء الاصطناعي التوليدي بفعالية في مرحلة التحليل ضمن إطار عمل التصميم التعليمي (مثل تقييم الاحتياجات، وتحليل الجمهور المستهدف).
8. GAIDE can effectively assist in identifying learning objectives and desired outcomes during the Design phase.						8-يمكن لأدوات الذكاء الاصطناعي التوليدي أن تساعد بفعالية في تحديد الأهداف التعليمية والنتائج المرجوة خلال مرحلة التصميم.
9-I believe GAIDE can significantly accelerate the creation of instructional materials and content during the Development phase.						9-أعتقد أن الذكاء الاصطناعي التوليدي يمكنه تسريع عملية إنشاء المواد والمحتوى التعليمي بشكل كبير خلال مرحلة التطوير.
10. GAIDE can provide valuable support for planning and executing the delivery of instruction in the Implementation phase.						10- يمكن لأدوات الذكاء الاصطناعي التوليدي أن توفر دعمًا قيمًا لتخطيط وتنفيذ تقديم التعليم في مرحلة التنفيذ.
11. I see the potential for GAIDE to enhance data collection and analysis for the Evaluation phase of ADDIE.						11-أرى إمكانية الذكاء الاصطناعي التوليدي في تعزيز جمع البيانات وتحليلها لمرحلة التقييم من نموذج (ADDIE).
12. Integrating GAIDE into the ADDIE framework can significantly streamline the entire instructional development process.						12-دمج الذكاء الاصطناعي التوليدي (GAIDE) في إطار عمل ADDIE. يمكن أن يبسّط بشكل كبير عملية تطوير التعليم بأكملها.
13.The "GAIDE" approach effectively defines Generative AI's role in instructional design.						13- منهج الذكاء الاصطناعي التوليدي يحدد بفعالية دور الذكاء الاصطناعي في التصميم التعليمي.
14 . My institution is exploring ways to integrate Generative AI (GAIDE) into its instructional design workflow.						14-تستكشف مؤسستي سبل دمج الذكاء الاصطناعي التوليدي في سير عمل التصميم التعليمي لديها.

الجزء الثالث: توافق الذكاء الاصطناعي التوليدي مع النظريات التربوية

Generative AI's Alignment with Educational Theories: 1-Constructivist Theory (Learning as active knowledge construction)

Statement	1	2	3	4	5	العبارة
15. GAIDE can facilitate the creation of rich, interactive learning environments that support constructivist approaches (e.g., simulations, problem-based scenarios).						15-يمكن للذكاء الاصطناعي التوليدي أن يسهل إنشاء بيئات تعلم غنية وتفاعلية تدعم المناهج البنائية (مثل المحاكاة، والسيناريوهات القائمة على حل المشكلات).
16. Generative AI can create novel, interactive scenarios and simulations that empower learners to actively construct their understanding.						16- يمكن للذكاء الاصطناعي التوليدي إنشاء سيناريوهات ومحاكاة تفاعلية مبتكرة تمكّن المتعلمين من بناء فهمهم بنشاط.
17. The integration of GAIDE allows for more dynamic and adaptable content that encourages learners to build their own knowledge.						17-يسمح دمج الذكاء الاصطناعي التوليدي (GAIDE) بإنشاء محتوى أكثر ديناميكية وقابلية للتكيف، مما يشجع المتعلمين على بناء معارفهم الخاصة.

2

-Cognitivist Theory (Learning as processing, organizing, and retrieving information)

2-النظرية المعرفية (التعلم بوصفه معالجة المعلومات وتنظيمها واسترجاعها)

Statement	1	2	3	4	5	العبارة
18. GAIDE can enhance learning by presenting information in ways that align with cognitivist principles (e.g., breaking down complex topics, visualizing concepts).						18-يمكن للذكاء الاصطناعي التوليدي أن يعزز التعلم عن طريق تقديم المعلومات بطرق تتوافق مع المبادئ المعرفية (مثل: تقسيم المواضيع المعقدة، تصور المفاهيم).

19. Generative AI can dynamically generate varied practice exercises and adaptive feedback to optimize memory retention and retrieval through personalized and spaced repetition.						19-يمكن للذكاء الاصطناعي التوليدي أن يُوَلِّد ديناميكيًا تمارين تدريب متنوعة وتغذية راجعة تكيفية لتحسين الاحتفاظ بالذاكرة واسترجاعها من خلال التكرار المتباعد والمخصص.
20. Generative AI tools can help design learning experiences that optimize cognitive load for learners.						20-يمكن لأدوات الذكاء الاصطناعي التوليدي أن تساعد في تصميم تجارب تعليمية تعمل على تحسين العبء المعرفي لدى المتعلمين.

3-Connectivism (Learning in a digital, connected world) **3- الاتصالية (التعلم في عالم رقمي ومترابط)**

Statement	1	2	3	4	5	العبارة
21. GAIDE supports connectivist learning by facilitating access to vast networks of information and resources.						21-يدعم الذكاء الاصطناعي التوليدي التعلم الترابطي من خلال تسهيل الوصول إلى شبكات واسعة من المعلومات والموارد.
22. Generative AI can synthesize vast amounts of information to reveal emergent patterns and connections, helping learners navigate complex information ecosystems.						22-يمكن للذكاء الاصطناعي التوليدي تركيب كميات هائلة من المعلومات للكشف عن أنماط وروابط ناشئة، مما يساعد المتعلمين على التنقل في الأنظمة البيئية المعلوماتية المعقدة.
23. The use of Generative AI encourages the development of digital literacy and the ability to learn continuously in changing environments.						23-يشجع استخدام الذكاء الاصطناعي التوليدي على تطوير محو الأمية الرقمية والقدرة على التعلم المستمر في البيئات المتغيرة.

4-Social Learning Theory (Learning through observation, imitation, and modeling)
4-نظرية التعلم الاجتماعي (التعلم من خلال الملاحظة والتقليد والمحاكاة/النمذجة)

Statement	1	2	3	4	5	العبارة
24- GAIDE can assist in creating scenarios or role-playing exercises that support social learning by providing realistic models or feedback.						**24**-يمكن للذكاء الاصطناعي التوليدي أن يساعد في إنشاء سيناريوهات أو تمارين لعب أدوار تدعم التعلم الاجتماعي من خلال توفير نماذج واقعية أو تغذية راجعة.
25. Generative AI can create realistic virtual role-playing scenarios and provide intelligent agent interactions that simulate social learning environments..						25- يمكن للذكاء الاصطناعي التوليدي إنشاء سيناريوهات لعب أدوار افتراضية واقعية وتقديم تفاعلات وكلاء ذكية تحاكي بيئات التعلم الاجتماعي.
26- Generative AI can help design guided practice opportunities that simulate social interactions and provide constructive feedback.						26- يمكن للذكاء الاصطناعي التوليدي أن يساعد في تصميم فرص الممارسة الموجهة التي تحاكي التفاعلات الاجتماعية وتقدم تغذية راجعة بناءة.

5-Transformative Learning Theory (Learning through critical reflection and perspective shifts)
5-نظرية التعلم التحويلي (التعلم من خلال التفكير النقدي وتغير وجهات النظر)

Statement	1	2	3	4	5	العبارة
27- GAIDE has the potential to facilitate transformative learning by presenting diverse perspectives and challenging learners' assumptions.						27-للذكاء الاصطناعي التوليدي القدرة على تسهيل التعلم التحولي من خلال تقديم وجهات نظر متنوعة وتحدي افتراضات المتعلمين.
28. Generative AI can construct diverse and thought-provoking narratives or arguments that challenge learners' assumptions and prompt critical reflection.						28- يمكن للذكاء الاصطناعي التوليدي بناء روايات أو حجج متنوعة ومحفزة للتفكير تتحدى افتراضات المتعلمين وتحفز التفكير النقدي.
29- Generative AI can help create learning experiences that encourage learners to re-evaluate their beliefs and perspectives.						29- يمكن للذكاء الاصطناعي التوليدي أن يساعد في إنشاء تجارب تعليمية تشجع المتعلمين على إعادة تقييم معتقداتهم ووجهات نظرهم.

6-Behaviorist Theory (Learning through stimulus-response, reinforcement) **6- النظرية السلوكية (التعلم من خلال المثير والاستجابة، والتعزيز)**

Statement	1	2	3	4	5	العبارة
30-GAIDE can be effectively used to develop traditional behaviorist learning activities (e.g., drills, quizzes, flashcards) with immediate feedback.						30-يمكن استخدام الذكاء الاصطناعي التوليدي بفعالية لتطوير أنشطة تعلم سلوكية تقليدية (مثل: التدريبات، الاختبارات القصيرة، البطاقات التعليمية) مع توفير تغذية راجعة فورية.
31- Generative AI can instantly create a wide array of varied drills, quizzes, and flashcards with immediate and consistent reinforcement, aligning with behaviorist principles.						31- يمكن للذكاء الاصطناعي التوليدي إنشاء مجموعة واسعة من التدريبات والاختبارات القصيرة والبطاقات التعليمية المتنوعة فورًا، مع تعزيز فوري ومتسق، بما يتماشى مع المبادئ السلوكية.
32- Generative AI can generate a high volume of practice exercises to facilitate mastery through repetition.						32-يمكن للذكاء الاصطناعي التوليدي أن يُولّد عددًا كبيرًا من التمارين التدريبية لتسهيل الإتقان من خلال التكرار.

Perceived Benefits of GAIDE Integration **الجزء الرابع :الفوائد المتصورة لدمج الذكاء الاصطناعي التوليدي**

Statement	1	2	3	4	5	العبارة
33- GAIDE integration leads to more personalized learning experiences.						33- يؤدي دمج الذكاء الاصطناعي التوليدي الي تجارب تعليمية اكثر تخصيصا.
34- It significantly reduces the time and effort required for instructional content creation.						34-يقلل بشكل كبير من الوقت والجهد المطلوبين لإنشاء المحتوى التعليمي.
35- GAIDE helps in creating more engaging and interactive learning materials.						35-يساعد الذكاء الاصطناعي التوليدي في إنشاء مواد تعليمية أكثر جاذبية وتفاعلية.
36-It improves the quality and consistency of instructional design outputs.						36-يحسن جودة وموثوقية مخرجات التصميم التعليمي.
37- GAIDE enhances the efficiency of the overall ADDIE process.						37-يعزز الذكاء الاصطناعي التوليدي كفاءة عملية التصميم التعليمي الشاملة.
38-Utilizing GAIDE allows for more innovative and creative instructional solutions.						38-يسمح استخدام الذكاء الاصطناعي التوليدي بحلول تعليمية أكثر ابتكارًا وإبداعًا.

- الجزء الخامس: التحديات واحتياجات الدعم لتطبيق الذكاء الاصطناعي التوليدي

- S

ection Five: Challenges and Support Needs for GAIDE Implementation

Statement	1	2	3	4	5	العبارة
39-Lack of training is a significant barrier to effectively integrating GAIDE into ADDIE.						39- يُعد نقص التدريب حاجزًا كبيرًا أمام الدمج الفعال للذكاء الاصطناعي التوليدي في عملية التصميم التعليمي.
40- Ethical concerns (e.g., bias, plagiarism, data privacy) related to GAIDE are a major challenge.						40- تمثل المخاوف الأخلاقية، مثل التحيز والسرقة الأدبية وخصوصية البيانات، تحديًا كبيرًا فيما يخص الذكاء الاصطناعي التوليدي.
41- Limited access to appropriate GAIDE tools or platforms hinders integration.						41- تُعيق محدودية الوصول إلى أدوات أو منصات الذكاء الاصطناعي التوليدي المناسبة عملية الدمج.
42- It's challenging to ensure the accuracy and pedagogical soundness of content generated by AI.						**42- يشكل تحديًا ضمان دقة المحتوى الناتج عن الذكاء الاصطناعي وسلامته التربوية.**
43- Resistance to change from colleagues or institutions impacts the adoption of GAIDE.						43-تؤثر مقاومة التغيير من الزملاء أو المؤسسات على تبني الذكاء الاصطناعي التوليدي.

44-I need more guidelines and best practices for ethically and effectively using GAIDE in instructional development.						44- أحتاج إلى المزيد من الإرشادات وأفضل الممارسات للاستخدام الأخلاقي والفعال للذكاء الاصطناعي التوليدي في تطوير التعليم.
45- I would benefit from professional development programs focused specifically on GAIDE and its application within the ADDIE framework.						45- سأستفيد من برامج التطوير المهني التي تركز تحديدًا على الذكاء الاصطناعي التوليدي وتطبيقه ضمن أطر عمل التصميم التعليمي.
46-Technical infrastructure (e.g., computing power, internet speed) is a concern for implementing GAIDE tools.						46- تُعد البنية التحتية التقنية (مثل قوة الحوسبة، وسرعة الإنترنت) مصدر قلق عند تطبيق أدوات الذكاء الاصطناعي التوليدي.
47- Copyright and intellectual property issues related to AI-generated content are a challenge.						47-قضايا حقوق النشر والملكية الفكرية المتعلقة بالمحتوى الناتج عن الذكاء الاصطناعي تمثل تحديا.
48- It is difficult to measure the return on investment (ROI) of integrating GAIDE into instructional design.						48- من الصعب قياس العائد على الاستثمار لدمج الذكاء الاصطناعي التوليدي في التصميم التعليمي.

الجزء السادس : أسئلة مفتوحة

Open-Ended Questions

Instructions: Please use the space below for any additional thoughts, suggestions, or recommendations on integrating Generative AI into instructional design and education.

التعليمات: يرجى استخدام المساحة أدناه لمشاركة أي أفكار أو اقتراحات أو توصيات إضافية حول دمج الذكاء الاصطناعي التوليدي في التصميم التعليمي والتعليم.

49- What, in your opinion, is the single most important action organizations or institutions should take to facilitate the successful integration of GAIDE into instructional design?

49- في رأيك، ما هو الإجراء الوحيد الأكثر أهمية الذي يجب أن تتخذه المنظمات أو المؤسسات لتسهيل الدمج الناجح للذكاء الاصطناعي التوليدي في التصميم التعليمي؟

50- Are there any specific applications or features of Generative AI that you believe would be particularly innovative for instructional design that were not explicitly mentioned in this questionnaire? Please explain.

50- هل هناك أي تطبيقات أو ميزات محددة للذكاء الاصطناعي التوليدي تعتقد أنها ستكون مبتكرة بشكل خاص للتصميم التعليمي ولم تُذكر صراحة في هذا الاستبيان؟ يرجى الشرح.

51- Please provide any other comments or suggestions you may have.

51- يرجى تقديم أي تعليقات أو اقتراحات أخرى قد تكون لديك .

Thank you very much for your valuable time spent completing this survey. Your insightful comments will significantly enhance knowledge about the role of artificial intelligence in curriculum design and the development of teaching methods in basic education. We look forward to leveraging your insights to advance this vital field.

شكرًا جزيلاً لوقتكم الثمين الذي أمضيتموه في تعبئة هذا الاستبيان .إن تعليقاتكم القيمة ستُسهم بشكل كبير في تعزيز المعرفة حول دور الذكاء الاصطناعي في تصميم المناهج الدراسية وتطوير طرائق التدريس في التعليم الأساسي. نتطلع إلى الاستفادة من رؤاكم في تقدم هذا المجال الحيوي.

The Researcher

Appendix B

A List of the Jury Members

N.	Name	Function	Affiliation & Expertise
2	Dr. Ahmed Al-Said	Researcher & Academic (AI's Impact on Academic Development)	Leading Arab university (e.g., King Saud, UAEU, or top Egyptian institution), focused on AI's impact on learning outcomes.
3	Dr. Hani Altwaijry	AI Researcher and a former Senior Computer Vision/Machine Learning Engineer.	Former Apple engineer (Cornell academic background), based in Saudi Arabia. Provides technical insight into AI in education.

4	Dr. Lisa E. Kim	Academic/Researcher in AI in Education (Teacher Self-Efficacy with AI)	Prominent academic institution in the Arab World. Expertise vital for understanding teacher self-efficacy with AI tools.
5	Dr. Lee Su Yee.	Academic/Researcher in AI in Education	Based in Saudi Arabia, with extensive academic and industry experience (TAM, SITE, Umm Al-Qura University) in AI implementation within education.
6	Prof. Moustafa Abdelkhalek	Professor of Educational Technology & Instructional Design	Faculty of Education, Tanta University, Egypt, and is associated with the International Journal of Instructional Technology and Educational Studies (IJITES).
7	Dr. Fulya Nayır	Academic/Researcher in AI Training for Teachers	Leading Arab World academic focusing on professional development and AI training for educators.
8	Dr. Tamer Sari.	Academic/Researcher in AI Training for Teachers	Leading Arab World academic focusing on professional development for AI integration in education.
9	Dr. Mazen Melibari	Partner & CTO; Former Chief Research & Innovation Engineer, AI Advisor, Assistant Professor of AI/ML.	Saudi Arabia-based; extensive experience at TAM, SITE, and Umm Al-Qura University, providing insights into theoretical and practical AI implementation across sectors, including education..
10	Dr. Tuka Alhanai	Assistant Professor, Computer Science, and Principal Supervisor, Human-Computer Intelligence Lab	New York University - Abu Dhabi (UAE). Focuses on human-computer interaction and AI, offering crucial insights into effective AI tool design and integration in education.