The Effectiveness of an AI-Based Training Program for Pre-service Kindergarten Teachers in Producing Educational Films to Teach Arabic Language Concepts

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Abstract:

This study aimed to assess the effectiveness of a training program based on artificial intelligence tools in enhancing educational film production skills among pre-service teachers majoring in Kindergarten Education. A quasi-experimental design with descriptive components was employed. The sample included 64 fourth year female students from the College of Education at Kuwait University, divided into a control group (n = 33) and an experimental group (n = 31). The experimental group received a structured AI based training program comprising five sessions (two hours each), using tools such as ChatGPT 4, MagicLight.AI, and Focal.AI. To measure the impact, the researcher developed and validated three instruments: the Educational Film Production Skills Scale, an Observation Checklist, and an Educational Film Quality Evaluation Form. The findings revealed statistically significant differences in post test scores in favor of the experimental group, indicating a marked improvement in their film production skills. Observation results rated their performance as "excellent," and the final films produced demonstrated high quality according to pedagogical, technical, and linguistic standards. The effect size was large, confirming the training program's substantial impact on students' practical competencies in digital educational media production. Based on these findings, the study recommends adopting and generalizing this training model in kindergarten teacher preparation programs, due to its effective role in empowering pre-service teachers to produce interactive digital content that supports language learning among preschool children.

Key Words: Artificial Intelligence, Educational Films, Kindergarten.

فاعلية برنامج تدريبي قائم على الذكاء الاصطناعي لمعلمات رياض الأطفال ما قبل الخدمة في إنتاج الأفلام التعليمية لتعليم مفاهيم اللغة العربية

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الملخص:

هدفت هذه الدراسة إلى تقويم فاعلية برنامج تدريبي قائم على أدوات الذكاء الاصطناعي في تنمية مهارات إنتاج الأفلام التعليمية لدى الطالبات المعلمات المتخصصات في رياض الأطفال. اتبعت الدراسة المنهج شبه التجريبي ذو المكونات الوصفية. تكونت العينة من (64) طالبة في السنة الرابعة بقسم رياض الأطفال بكلية التربية   جامعة الكويت، وجرى تقسيمهن إلى مجموعتين: تجريبية (31 طالبة) وضابطة (33 طالبة). خضعت المجموعة التجريبية لبرنامج تدريبي يتكون من خمس جلسات تدريبية بواقع ساعتين لكل جلسة، مستخدمًا أدوات الذكاء الاصطناعي مثل(ChatGPT 4 وMagicLight.AI و Focal.AI) ولقياس فاعلية البرنامج، طُوِّرت ثلاث أدوات بحثية هي: مقياس مهارات إنتاج الفيلم التعليمي، بطاقة ملاحظة الأداء، وأداة تقويم جودة الفيلم التعليمي. كشفت النتائج عن فروق دالة إحصائيًا بين متوسطي درجات المجموعتين في التطبيق البَعدي لصالح المجموعة التجريبية، مما يدل على تحسن ملحوظ في مهارات إنتاج الأفلام التعليمية. كما أظهرت نتائج بطاقة الملاحظة أن أداء الطالبات بلغ مستوى "ممتاز"، في حين اتَّسمت الأفلام المنتَجة بجودة عالية وفقًا للمعايير التربوية والفنية واللغوية. وقد أظهرت نتائج التحليل الإحصائي أن حجم الأثر كان كبيرًا، مما يؤكد التأثير التربوي القوي للبرنامج التدريبي في تنمية الكفايات الرقمية لدى الطالبات المعلمات في بيئات التعلم الذكية. وبناءً على هذه النتائج، توصي الدراسة بتعميم هذا النموذج التدريبي في برامج إعداد معلمات رياض الأطفال، لما له من أثر فعّال في تمكينهن من إنتاج محتوى رقمي تفاعلي يدعم تعلم اللغة لدى الأطفال في مرحلة الطفولة المبكرة.

الكلمات المفتاحية :الذكاء الاصطناعي، الأفلام التعليمية، رياض الأطفال.

1.Introduction:

The contemporary world is witnessing rapid transformations in the use of digital technologies across various aspects of life, with the education sector being one of the most positively impacted by these technological advances. The continuous developments in educational technology have produced new tools and strategies that have reshaped learning environments. Among the most prominent of these tools is Artificial Intelligence (AI), which is increasingly being used to enhance the educational process and transform it from a traditional model to one that is more interactive and creative (Shehata & Ahmed, 2021). Today, AI is regarded as a key driver for improving educational outcomes by enabling teachers and learners to produce rich, customized content that meets diverse learners' needs.

In light of this digital transformation, there has emerged a growing need for engaging digital learning tools that help achieve learning objectives, especially at the early childhood stage. Short animated educational films are among the most effective media that align with the developmental characteristics of this age group, due to their visual and auditory elements that capture children's attention and enhance their engagement with educational content. Studies indicate that these films effectively contribute to developing various skills in preschool children, particularly language skills, by presenting engaging, story based content within an appealing, imaginative framework (Al Zaben, 2020; Abu Sahmoud, 2018).

Research (Albukea, et al., 2017; Al Zaben, 2020) has demonstrated the effectiveness of short animated educational films in enhancing children's comprehension and engagement, thanks to their ability to simplify abstract concepts, stimulate attention, and foster sensory perception. This makes them an ideal tool for delivering educational content to preschool aged children. Furthermore, integrating AI technologies into the production of such films adds greater efficiency and effectiveness through advanced tools used for text generation, voice synthesis, and the design of interactive visual scenes, all in alignment with the developmental and cognitive characteristics of young learners.

Nikolopoulou and Gialamas (2021) indicated that AI supported digital media enhance opportunities for active learning among children, particularly in the field of learning language, where tailored educational content can be designed to develop listening, speaking, and early reading skills. Today, it is possible to use tools such as ChatGPT for text generation; Murf or ElevenLabs for audio production; Canva and Adobe Firefly for scene design; and video production tools like Pictory and Lumen5 to create integrated educational films that align with curriculum goals and learners' characteristics. These technologies provide flexible digital environments that help teachers prepare high quality audio visual language content that contributes to strengthening children's language skills (Holmes et al., 2019).

Kindergarten education faces significant challenges in providing effective educational resources that stimulate the development of Arabic language skills among children, for whom this stage represents the foundation for building their linguistic and cognitive abilities. In this context, short educational films emerge as an innovative instructional tool that meets children's needs in an interactive and engaging way (Ayu et al., 2024).

Therefore, it is essential to empower future kindergarten teachers to produce educational films by training them to use various AI tools, thus combining technical competence with pedagogical understanding of early childhood developmental characteristics.

Accordingly, designing a training program targeting Kindergarten Education students that focuses on developing their skills in producing educational films to teach Arabic language skills to children using AI tools represents a scientific and educational response to the needs of contemporary education. Zawacki et al. (2019) point out that training based on the use of AI tools in digital content production contributes to developing students' technical and pedagogical competencies and supports their ability to integrate these technologies in real educational contexts. Additionally, the study by Al Astal et al. (2021); Motairan and Al-Shammari (2025) demonstrated the effectiveness of AI supported instructional models in developing students' programming skills, highlighting the potential of these tools to be applied across diverse educational domains. Furthermore, Luo Q and Zhu (2025) confirmed the active role of AI in supporting teaching and training processes.

Based on the foregoing, and in response to the urgent need to prepare teachers capable of utilizing modern media to support Arabic language education in early childhood, this study aims to investigate the effectiveness of using the Artificial Intelligence model (ChatGPT, GPT 4 version) in developing the skills of Kindergarten Education students in producing short educational films designed to build preschool children's language skills. This, in turn, contributes to enhancing the quality of the educational process and aligns with the demands of the digital age.

Although discussions on digital literacy are widespread, there remains a clear shortage of training models that prepare pre-service kindergarten teachers to produce short Arabic-language educational films tailored to early childhood developmental needs. Specific challenges include: (a) aligning simplified Modern Standard Arabic with precise linguistic objectives (vocabulary, phonological awareness, sentence structures); (b) ensuring accurate sound-image mapping to support auditory-visual discrimination; (c) designing short narratives that fit within children's limited attention spans (3-7 minutes); and (d) achieving cultural relevance through familiar characters and contexts. Observations of current teacher-preparation curricula confirm the lack of systematic training in AI-assisted film production for Arabic language learning. This study directly addresses that gap by proposing and testing an AI-based training program that equips students with the skills to transform linguistic goals into high-quality audiovisual content for preschool children.

1.1. Research Problem:

Education today is undergoing a major transformation amid the rapid advancement of artificial intelligence tools, which now offer teachers unprecedented opportunities to produce interactive digital content whether through text generation tools such as ChatGPT, audio production tools like ElevenLabs and Murf, or visual design platforms such as Canva and Adobe Firefly. In light of these developments, equipping Kindergarten Education students at Colleges of Education with the skills to use these tools has become a necessity rather than a technical luxury.

However, the current educational reality reveals a clear shortfall in integrating these tools into pre-service kindergarten teacher training programs, particularly in the area of producing educational films aimed at developing Arabic language skills among preschool children, despite the critical importance of this stage in laying the foundations for early linguistic and cognitive development. Recent studies (Nikolopoulou & Gialamas, 2021; Zawacki et al., 2019) have shown that early childhood teachers often lack the technical expertise needed to design effective digital content, which limits the educational impact of AI technologies.

Some studies have highlighted this gap: for example, Al Hasan (2022) found that kindergarten teachers suffer from a notable weakness in educational video production skills, while Kara (2023) reported that Kindergarten Education students lack the technical capabilities to produce interactive media. Moreover, Holmes et al. (2019) emphasized that the effective integration of modern technologies requires comprehensive training that combines technical and pedagogical knowledge an aspect that is currently lacking in many teacher preparation programs.

Through the researcher's observation of the current state of kindergarten teacher preparation, it became evident that many students face difficulties in producing short AI supported educational films due to their lack of experience with these tools and the absence of training programs specifically designed for this type of educational production.

Relevant literature has called for activating the role of AI within university learning environments. Al Yajzi (2019) and Al Khubairi (2020) emphasized the importance of integrating AI applications into teacher preparation programs and developing digital content that meets children's needs. Studies such as Vanichvasin (2021), Luckin et al. (2016), and El Zaatari et. al., (2024) have also shown that the effectiveness of AI applications in improving educational content is closely linked to the availability of adequate training for both teachers and students.

Therefore, there is a clear need to develop training programs that aim to equip Kindergarten Education students with the skills needed to produce AI supported educational films, thereby contributing to supporting Arabic language acquisition among preschool children. Accordingly, the research problem centers on assessing the effectiveness of the proposed training program that employs AI tools to prepare students in this specialization to produce effective language focused educational content through short educational films.

The main research question can thus be formulated as follows:

1.2. Research Question:

The study is guided by the following main research question:

- *What is the effectiveness of the proposed AI based training program (using, ChatGPT 4, MagicLight.AI, Focal.AI) in equipping Kindergarten Education students with the skills to produce educational films for teaching Arabic to preschool children?*

 This overarching question is explored through the following sub questions:

1. What are the essential skills that Kindergarten Education students need to produce educational films aimed at enhancing preschool children's Arabic language skills?
2. To what extent do these students possess such skills prior to the training program?
3. What is the impact of the AI based training program on developing these skills?
4. What is the performance level of students in producing educational films using AI tools (ChatGPT 4, MagicLight.AI, and Focal.AI)?
5. What is the quality level of the films produced post training, based on educational, technical, and psychological criteria aligned with preschool children's developmental and linguistic characteristics?

 1.3. Research Hypotheses:

To address the above questions, the study tests the following hypotheses:

H1: There is no statistically significant difference at the 0.05 level between the pre-test mean scores of the control and experimental groups on the Educational Film Production Skills Scale.

H2: There is a statistically significant difference at the 0.05 level between the post-test mean scores of the control and experimental groups on the Educational Film Production Skills Scale, in favor of the experimental group.

H3: There is a statistically significant difference at the 0.05 level between the pre-test and post-test mean scores of the experimental group on the Educational Film Production Skills Scale, in favor of the post-test.1.4.

Research Objectives

This study aims to:

1. Identify the core skills required to produce AI supported educational films that foster Arabic language development in preschool children.

2. Design a comprehensive training program using AI tools to build students' capacity for educational film production.

3. Assess the effectiveness of the program in enhancing students' technical and pedagogical competencies and in improving the quality of the films they produce.

1.5. Significance of the Study:

This research is significant in several ways:

1. It contributes to enhancing pre-service teachers' digital content design skills using AI, preparing them to

2. meet labor market demands in early childhood education.

3. It provides a practical, replicable training model that can be integrated into teacher preparation programs.

4. It offers guidance for curriculum designers, educational technology experts, and training institutions seeking to implement similar AI based initiatives.

5. The study contributes to improving the quality of early learning environments by introducing AI supported, interactive instructional media tailored to children's cognitive and linguistic needs.

1.6-Operational Definitions:

-*Effectiveness*: Defined as the measurable improvement in students' ability to produce educational films, as assessed by an achievement scale, observation checklist, and film quality evaluation tool.

-*Artificial Intelligence (AI):* A set of digital tools (e.g., ChatGPT 4, MagicLight.AI, Focal.AI) used to support the design and production of educational films targeted at preschool children.

-*Educational Videos*: Structured digital films developed using AI tools to promote specific Arabic language skills (e.g., vocabulary, listening, speaking, visual/auditory discrimination) for preschool learners.

-*Skills for Producing Educational Films*: A set of competencies including idea development, scriptwriting, visual/audio editing, and the use of AI tools to produce engaging instructional content. These skills are measured via a validated achievement scale and observation checklist.

-*Kindergarten Education Students*: Fourth year pre-service teachers majoring in Kindergarten Education who were enrolled in the Graduation Project course (2024/2025- second semester), participated in the training program, and were assessed using pre and post intervention instruments.

2.Theoretical Framework:

This study is grounded in an integrated perspective based on three interrelated knowledge foundations that form the theoretical basis for designing the training program: Constructivist Learning Theory, Multimedia Learning Theory, and the Artificial Intelligence Approach in Education. These are explained as follows:

2.1. *Constructivist Learning Theory*:

This theory is based on the principle that the learner is an active agent in constructing knowledge through interaction with the environment, experimentation, and practical application. Building on this premise, the training program was designed to provide a learning environment that utilizes AI tools, enabling Kindergarten Education students to independently practice designing educational films, thereby enhancing their technical and pedagogical skills in an integrated manner (Habeeb, 2024; Kara, 2018).

2.2. *Multimedia Learning Theory*:

This theory emphasizes that learning effectiveness increases when information is presented through multiple channels (visual and auditory) in an organized and coherent manner. According to Mayer's theory, integrating text, audio, images, and motion in ways that align with learners' developmental characteristics contributes to better concept acquisition and understanding (Mayer, 2020). From this perspective, the production of educational films for preschool children takes into account their sensory and cognitive diversity, helping to enhance attention and reinforce language concepts.

2.3. *Artificial Intelligence in Education:*

Recent literature highlights that AI tools have become an essential component of university and training learning environments (Zawacki et al., 2019; Ma et al., 2024). Holmes et al. (2021) pointed out the importance of integrating AI in teacher preparation programs as a key requirement of the Fourth Industrial Revolution, given its impact on developing teachers' digital and pedagogical competencies. Accordingly, the program includes an intelligent learning environment that enables students to interact with content, carry out activities, and design educational films using tools such as ChatGPT 4, Canva, and Firefly.

In general, this theoretical framework provides a comprehensive scientific basis for understanding how the proposed training program operates. Constructivist Learning Theory deepens understanding and activates the student's role as a knowledge producer. Multimedia Learning Theory offers a design foundation for creating visual and auditory content suited to preschool children's characteristics. Meanwhile, AI serves as a supportive component that provides interactivity and flexibility to customize the learning environment and deliver immediate support, while empowering students to produce innovative educational media. Together, this theoretical foundation justifies adopting a training program based on AI technologies and strengthens the rationale for the hypotheses regarding its effectiveness in developing students' skills in designing educational films skills that, in turn, contribute to developing preschool children's language abilities through engaging, modern, and interactive content.

2.4. AI as a Constructivist Enabler:

From a constructivist perspective, meaningful learning requires learners to actively build knowledge through authentic tasks. Historically, the technical complexity of scriptwriting, video editing, and audiovisual synchronization has consumed students' cognitive resources, often diverting attention away from pedagogical objectives. Tools such as ChatGPT 4 (for generating developmentally appropriate language scenarios), MagicLight.AI (for transforming text into pedagogically coherent visual scenes), and Focal.AI (for animating characters and synchronizing audio) act as cognitive enablers by reducing this technical burden. In doing so, they allow pre-service teachers to redirect their focus toward core educational decisions such as defining learning goals, structuring narratives, and aligning media elements with children's developmental characteristics. This shift embodies the essence of constructivist learning, where technology supports learners in actively constructing pedagogical meaning rather than struggling with procedural tasks.

The theoretical framework of this study is grounded in two key dimensions relevant to early childhood education and digital pedagogy:

(1) The Role of Kindergarten in Developing Children's Language Skills:

Kindergarten represents a critical period for linguistic development, during which children acquire foundational skills in listening, speaking, comprehension, and expression. A rich classroom environment that incorporates both verbal and visual stimuli is essential to support this development (Ali, 2021). Play based activities such as storytelling, group discussions, singing, and role playing have been shown to foster oral communication and language thinking (Dashti & Habeeb,2020). Furthermore, interactions with peers and teachers, along with shared reading experiences, play a vital role in building vocabulary and improving syntactic structures (Wong & Neuman, 2023).

To maximize the effectiveness of these strategies, the learning environment must accommodate individual differences by integrating methods such as free conversation, language games, and dramatization (Gheshir, 2022; Hadley et. al., 2023). This calls for carefully designed language content grounded in scientific principles and the training of teachers in holistic, interactive approaches to language instruction. Within this context, digital media particularly educational films offer powerful potential by combining sound, visuals, and motion to create immersive learning environments. These tools not only support children's language responses but also underscore the importance of preparing teachers to produce such content using AI technologies that align with young learners' developmental needs.

(2) The Importance of Educational Films:

Multimedia resources are among the most effective tools in education, enabling dynamic content presentation and shifting learners from passive reception to active engagement (Al Zaben, 2020). Educational films, in particular, combine sound, imagery, and motion to enhance attention, motivation, and the comprehension of abstract ideas (Mayer, 2020). As such, they are well suited to early childhood settings, where audiovisual stimulation aligns with children's sensory and cognitive characteristics. These films present language concepts within engaging narrative structures, promoting vocabulary development and oral expression.

Research supports their impact: short animated films can stimulate sensory perception, enhance retention, and accommodate diverse learning needs through multimodal delivery. Moreover, they serve broader educational

functions by modeling Standard Arabic, reinforcing values, and fostering digital literacy (Al Zoq, 2014; Al Zaben, 2020). El-Ebiary et al., (2022) highlighted that when films are tailored to developmental stages, they significantly improve vocabulary acquisition and functional language use.

Educational films also contextualize language learning within authentic, social environments consistent with constructivist and experiential learning theories. Mayer's (2020) Cognitive Theory of Multimedia Learning posits that integrating visual and auditory channels enhances processing and understanding. This is supported by findings that link animated films to better retention of Arabic vocabulary and sentence structures (Al-Dawish, 2023; Kilag et al., 2023), improved pronunciation, and strengthened comprehension skills (Gheshir, 2022). Additionally, they promote storytelling, imagination, and curiosity, while offering accurate models of language use (Wahyuni, 2025; Mousa, 2023; Al-Ghamdi, 2024).

Given their proven benefits, integrating educational films into kindergarten curricula as culturally relevant and linguistically rich resources is essential. This shift requires empowering teachers with the full spectrum of production skills from scriptwriting to editing and visual/audio integration using modern AI tools. Preparing pre-service teachers in educational media production is thus a necessary component of digital literacy in early childhood teacher training programs.

(3)Skills for Preparing and Producing Educational Films to Develop Preschool Children's Language Skills
The literature indicates that the skills needed for preparing and producing educational films can be summarized as follows:

First: Planning and Preparation Skills: These skills involve analyzing the characteristics of preschool children (age, language maturity, cognition, and interests), which is essential for designing content that aligns with their abilities. Defining clear language goalssuch as specific vocabulary or simple structures facilitates guiding the script toward measurable outcomes (Tsang et al., 2025). Selecting familiar topics such as animals and colors supports engagement and immersion in the content. It is also important to include simple, engaging elements within a story based scenario to capture the child's attention (Navarrete et al., 2023).

Second: Educational Content Production Skills: These skills relate to using short and simple language delivered in a cheerful tone, accompanied by visual support through illustrations and icons to reinforce learning (Navarrete et al., 2023). Repetitive educational audio elements and light background music can increase attention, while songs help repeat vocabulary in an appealing format (Tsang et al., 2025). Interactive activities such as vocal repetition and role play can also be integrated to make the child an active participant rather than a passive recipient.

Third: Linguistic Skills: These skills involve developing the audio visual script to enhance listening skills through narration and dialogue. Children's vocabulary is enriched by presenting new words within clear scenes, and correct pronunciation is ensured through clear modeling of letter sounds (Muftah, 2023). Children are encouraged to express themselves orally through activities like describing scenes or retelling stories, with understanding reinforced through simple questions after each scene (Muftah, 2023).

Fourth: Artistic and Technical Directing Skills: These skills relate to designing simple, colorful illustrations and controlling the film's duration to be between 3-7 minutes, given the short attention span of young children

(Tsang et al., 2025). Variety in scenes and activities helps prevent boredom, and it is preferable to use suitable design software such as Animaker or Toonly, which support visual interactivity.

Fifth: Evaluation and Revision Skills: These skills involve testing the film with an experimental group of children to measure engagement and responses (Muftah, 2023). Analyzing observations such as attention and repetition helps refine ineffective content, while linking the film to subsequent classroom activities enhances the achievement of educational goals (Navarrete et al., 2023).

Sixth: Supporting Pedagogical Skills: These skills relate to integrating educational values such as cooperation and respect indirectly within the film's content. Family interaction is also encouraged by having parents watch the film with their child, which supports language practice at home, especially when the child shares the experience with an adult. Individual differences are addressed by diversifying methods and activities and using simplified Standard Arabic free of complex structures to ensure understanding (Wong & Neuman, 2023).

(4)-Standards for Educational Film Design:

To ensure educational effectiveness, films must adhere to established pedagogical, psychological, technical, linguistic, and cultural standards:

-Educational and Pedagogical Standards:
- Clearly defined language objectives aligned with early childhood needs.
- Gradual skill progression from vocabulary to full sentences.
- Instructional strategies suitable for children's developmental stages.
- Focus on core skills (listening, comprehension, pronunciation, expression) (Zeece, 2009).

-Psychological and Motivational Standards:
- Use of attractive elements (colors, characters, movements).
- Inclusion of prompts for verbal/physical interaction.
- Application of positive reinforcement (visual/audio feedback).
- Accommodation of individual attention spans and processing rates (Mayer, 2020; Linebarger & Vaala, 2010).

-Technical and Artistic Standards:
- High audio clarity and correct pronunciation.
- Clear, consistent, non distracting visuals.
- Duration under 10 minutes to match preschoolers' cognitive load.
- Coherent and simple visual design (Close, 2004).

-Linguistic Standards:
- Use of developmentally appropriate Standard Arabic.
- Correct grammar and morphology.
- Strong sound image associations.
- Repetition of targeted vocabulary/structures (Rasulova, 2023).

-Value Based and Sociocultural Standards:

Inclusion of values (e.g., honesty, cooperation, respect).

Cultural relevance with familiar characters and settings.

Real life language situations simulating children's everyday contexts (El-Ebiary et al., 2022).

(5) The Importance of Artificial Intelligence in Producing Educational Films:

1. The Role of Artificial Intelligence in Educational Film Production:

Artificial Intelligence (AI) has revolutionized the education sector by transforming how digital content is created and delivered. In early childhood education, particularly at the kindergarten level, AI has facilitated the development of interactive, personalized learning environments that respond to individual learner needs (Al-Olayan, 2024, Holmes et al., 2019).

Educational films are among the most promising domains for AI application. AI tools now enable automation in key production processes, including scriptwriting, animation generation, voice synthesis, and video editing (Orak, & Turan, 2024; Luo & Zhu, 2025). These technologies allow teachers especially pre-service educators to produce high quality educational content without requiring advanced technical skills. Tools for text, image, and audio generation enhance the creation of language rich films that promote vocabulary acquisition and comprehension in engaging audiovisual formats (Zawacki et al., 2019).

A key advantage of AI tools is their accessibility many are free or low cost allowing teachers to engage in self directed learning and content creation. This aligns with contemporary pedagogical shifts toward multimedia use, project based learning, and teacher empowerment (Holmes et al., 2019). Moreover, AI integration streamlines production, offers immediate feedback, and enhances content accessibility, all of which are critical in digital learning environments (Luckin et al., 2016). In the early childhood context, AI supports the creation of visually and auditorily rich content embedded in realistic language scenarios. Baskara (2023) found that AI boosts teachers' creativity, enabling them to produce innovative resources that develop listening and speaking skills. Accordingly, international organizations such as UNESCO (2023) recommend embedding AI competencies in teacher preparation programs, particularly in early childhood, where sensory engagement is key to learning.

2. The Potential of ChatGPT 4 in Early Language Education:

Among the most advanced generative AI tools is ChatGPT 4, which offers significant potential in designing and producing educational content. This model supports Kindergarten Education students in generating developmentally appropriate scripts and linguistic content tailored to young learners' cognitive levels (Gao et al., 2024).

ChatGPT 4 facilitates the writing of educational film scripts, character dialogues, and repeated vocabulary structures in coherent, child friendly language. It enables real time editing, tailoring of content to instructional goals, and linguistic refinement, thereby improving the quality of outputs while saving time (Holmes et al., 2019; Xu et al., 2023). Additionally, it serves as a linguistic assistant, ensuring grammatical accuracy in the Arabic language an essential factor in building preschoolers' language competence. Integrating ChatGPT 4 into teacher education enhances pre-service teachers' digital competencies and creative capabilities, enabling them to produce innovative learning materials. Recent studies confirm that generative AI boosts educational quality by fostering creativity, improving interaction with language, and facilitating efficient content development (Zawacki et al., 2019; Baskara, 2023).

3. The Importance of Training in AI Based Film Production:

Despite AI's potential, theoretical knowledge alone is insufficient. Kindergarten Education students require systematic training that combines conceptual understanding with hands on experience in using AI for educational film production (Holmes et al., 2019). Such training bridges the gap between available

technologies and pre-service teachers' actual capabilities, equipping them to design content aligned with young children's linguistic and developmental characteristics (Luo & Zhu, 2025).

Well designed training programs foster digital confidence, enhance the quality of educational films, and stimulate motivation for technology integration. Studies affirm that interactive, project based training cultivates creativity, collaboration, and positive attitudes toward AI use in education (Zawacki et al., 2019; Kilag et al., 2023). Conversely, a lack of practical experience hinders the ability to produce effective visual language content (Darling Hammond *et al.*, 2020).

The quality of educational films is directly tied to teachers' mastery of digital tools (Fisch & Truglio, 2019; Zhou & Xu, 2022). Therefore, building these skills in Kindergarten Education students transforms them into creators of purposeful, engaging media that support children's language acquisition. In this context, UNESCO (2023) calls for the integration of digital design skills into early childhood teacher education, considering them essential for modern learning environments.

4. Synthesis and Implications:

The theoretical framework affirms that language development in early childhood depends on a combination of pedagogical and technological factors. Kindergarten classrooms offer fertile ground for language enrichment, and educational films particularly those enhanced by AI serve as powerful tools to deliver language content in multisensory, interactive formats.

Integrating sound, image, and motion through narrative structures improves vocabulary retention, expression, comprehension, and pronunciation. AI strengthens this process by automating content creation and allowing teachers to tailor educational films to children's needs.

In summary, advancing kindergarten language education requires a multifaceted approach that includes: Rich, interactive classroom environments; The use of multimedia, especially educational films; Strategic integration of AI tools like ChatGPT 4; And practical training for pre-service teachers. This integrated model supports the shift toward digital learning and positions teacher preparation institutions to meet the evolving demands of early childhood education in the digital age.

2.4.The Proposed Training Program:

First: Program Title:

A Proposed Training Program for Equipping Kindergarten Education Students with the Skills to Use Artificial Intelligence Tools (ChatGPT 4, MagicLight.AI, Focal.AI) in Producing Educational Films to Develop Arabic Language Skills among Preschool Children.

Second: Program Details:

- Target Group: Kindergarten Education students at the College of Education (Fourth year pre-service teachers majoring in Kindergarten Education who were enrolled in the Graduation Project course).
- Program Duration: Five training sessions × two hours per session (one session per week), totaling ten training hours.
- Type of Training: Practical training application of AI tools, project-based learning.
- Training Approach: Workshops, cooperative learning, digital simulation, formative and self-assessment.

Third: Program Rationale:

The need to develop the competencies of kindergarten teachers in utilizing AI technologies to produce educational films that are appropriate for children in terms of language, visuals, and sound, in order to improve Arabic language skills among preschool children.

Fourth: Program Objectives:

By the end of the program, the student is expected to be able to:

• Analyze the language skills appropriate for preschool children.

• Plan the production of an educational film aimed at developing Arabic language skills for preschool children.

• Use ChatGPT 4 to generate educational language-based scenarios and stories.

• Employ MagicLight.AI to convert text into AI generated visual film scenes.

• Use Focal.AI to generate and animate characters according to the educational scripts.

• Produce a digital educational language film targeted at preschool children.

• Evaluate the quality of the produced film according to pedagogical and technical standards.

Fifth: Components of the Training Program: The training program consists of five sessions, each lasting two hours, designed to train students on the skills needed to prepare educational films. The detailed structure of the program is presented in Table (1) below.

Table (1): Detailed Structure of the Proposed Training Program

Session	Title	Operational Objectives	Content	Activities	Tools
1	Introduction to Arabic Language Skills in Early Childhood and Educational Film Design	Analyze language skills (listening, speaking, vocabulary). Identify the features of educational films appropriate for preschool children.	Language skills for preschoolers. Elements of children's educational films. Principles of designing content for ages 4-6.	Analytical discussion Watching and critiquing sample films. Workshop for generating story ideas.	Video presentations Worksheets Display screen
2	Using ChatGPT 4 to Generate Educational Stories for Children	Generate an educational story using simple language. Edit stories to suit children's age group.	Introduction to ChatGPT 4. Strategies for generating children's texts. Educational review of generated stories.	Generate a story with ChatGPT 4 for a specific language skill. Linguistic and structural editing workshop.	Computer ChatGPT 4 Plus account Guided worksheets
3	Transforming Text into Educational Scenes Using MagicLight.AI	Convert the story into scenes using AI. Select backgrounds and colors suitable for children. Arrange the sequence of scenes.	MagicLight.AI platform for creating visual scenes. Educational image standards. Saving scenes.	Practical application with the produced story. Create 4-6 main scenes for the story.	MagicLight.AI platform - AI images Storyboard templates
4	Designing and Animating Educational Characters Using Focal.AI	Use Focal.AI to generate animated characters. Synchronize audio with animation. Adjust scene timing.	Focal.AI tools for AI based character animation. Voice generation. Arranging audio scenes.	Create a complete scene (image + character + audio). Combine clips using a simple editing tool.	Focal.AI platform Animation tools. Video editing. software
5	Producing, Presenting, and Evaluating the Final Film	Combine scenes into a complete film. Evaluate the film based on linguistic and educational standards. Provide constructive feedback.	Video merging tools. Evaluation standards (language, interaction, sound clarity, image suitability).	Project presentations. Group and individual evaluation. Final reflections.	Display screen Evaluation cards. Student samples.

Sixth: Evaluation Tools:

To ensure the effectiveness of the proposed training program, a set of specific evaluation tools was developed to measure students' acquisition of practical and technical skills and the quality of the final educational films.

- Student Performance Observation Checklist: To monitor students' practical performance while executing assigned tasks during the training sessions.
- Educational Film Evaluation Card: To assess the final film based on clear criteria (message clarity, language appropriateness, visual appeal, and character content alignment).

These tools are presented in **Table (2)** below.

Table (2): Program Evaluation Tools:

Phase	Evaluation Tool	Purpose
Before Training	Pre test (knowledge+practical scenarios)	To assess students' prior knowledge and skills.
During Training	PracticalPerformanceObservation + Digital Product Evaluation Card	To monitor progress and track skill development throughout the training sessions.
After Training	Final Educational Film Project + Analytical Report.	To measure students' level of mastery and the quality of the final output.

Seventh: Expected Outputs:

An educational language story for preschool children generated using ChatGPT 4.

A set of visual scenes produced with MagicLight.AI.

- A short-animated film created using Focal.AI.
- A complete student produced project (1-2 minutes long).
- A digital portfolio for each student documenting the stages of production.

3. Research Methodology:

The study employed a mixed methods approach, combining both quantitative and qualitative methods in a manner appropriate to the nature of the research problem and its objectives. Two primary methodological approaches were utilized:

Descriptive Analytical Method: This method was used to build the theoretical framework by analyzing relevant literature on the applications of artificial intelligence in education and the design of educational films. It was also employed to develop an initial list of related concepts and skills based on a content analysis of scientific sources.

Quasi Experimental Design: This method was applied to measure the effectiveness of the proposed AI based training program in developing the skills of Kindergarten Education students in producing educational films. An experimental design involving two groups (experimental and control) with pre and post testing was used, as illustrated in the following model.

Controlling Extraneous Variables: To ensure the internal validity of the quasi experimental design, the researcher took specific measures to control for extraneous variables, particularly any prior experience related to digital media production.

Pre Test Verification: A pre-test was administered to both the experimental and control groups using the Educational Film Production Skills Scale. The results indicated no statistically significant differences between the groups' mean scores ($p > 0.05$), confirming that the students' initial skill levels in using AI tools for producing educational films were equivalent.

Educational Background Confirmation: In addition, the researcher verified that all participants had not previously enrolled in any specialized courses, workshops, or training programs related to multimedia production or AI based design within their academic curriculum.

Together, these procedures ensured that any improvements in the post test results could be attributed solely to the AI based training program, rather than to any pre existing differences in relevant knowledge or experience. The experimental design is illustrated in Table 3 below, which outlines the distribution of the pre test, intervention, and post test phases for both groups.

Table 3: Research Design

Group	Pre Test	Intervention	Post Test
Control Group	Educational Film ProductionSkills Scale.	Conventional learning approach.	Educational Film Production Skills Scale.
Experimental Group	Educational Film Production Skills Scale.	Proposed AI Based Training Program.	Educational Film Production Skills Scale+PerformanceObservation Checklist.

3.1. Research Instruments

To achieve the research objectives, the following instruments were employed:

First: Educational Film Production Skills Scale

This scale was developed based on a review of relevant literature and previous studies related to designing and producing educational films. The scale consists of 20 items distributed across six main dimensions that collectively represent the conceptual framework of the skills required to prepare and produce an educational film:

-Planning the educational film; Producing audio and visual scenes; Using artificial intelligence tools; Pedagogical and linguistic aspects; Interaction and evaluation; Confidence and self efficacy.

-The items were formulated to measure students' level of skill mastery, using a five point Likert scale with the following ratings: (5) Strongly Agree   (4) Agree   (3) Neutral   (2) Disagree   (1) Strongly Disagree.

-Purpose of the Scale: To measure the extent to which Kindergarten Education students possess the skills to employ AI tools throughout all stages of preparing an educational language film, both before and after the training program.

-Scoring Method: The scale comprises 20 items, each scored from 1 to 5, resulting in a total score range of 20 to 100. To determine the students' level of skill mastery, the following classification benchmark was adopted :

Table 4: Benchmark for Classifying Students' Level of Mastery of Educational Film Production Skills:

Performance Level	Total Score Range
Very High Level of Skill Mastery	86　100
Good Level of Skill Mastery	71 85
Moderate Level (Needs Reinforcement)	61 70
Low Level (Needs Training)	50 60
Lacks Skills (Needs Intensive Training)	Less than 50

3.2.Validity of the Scale

The validity of the scale was verified using two methods:

Content Validity: The scale was reviewed by four experts specializing in Educational Technology and Curriculum and Instruction at the College of Education, Kuwait University. The experts confirmed the clarity of the items and their appropriateness for achieving the intended objectives.

Criterion Related Validity: To avoid misinterpretation, it should be clarified that criterion-related validity was not established by linking pre-test scores with post-intervention measures. Instead, during the pilot validation phase, students' scores on the Educational Film Production Skills Scale were compared with their performance ratings on the Observation Checklist and the Film Evaluation Rubric. These instruments were applied in the same pilot context to ensure concurrent measurement, not across different phases of the main experiment. This procedure confirms that the scale is externally valid without conflating baseline measures with post-intervention assessments.

Internal Consistency Validity: The final version of the scale was administered to a pilot sample of 36 students outside the main study sample. Pearson correlation coefficients were calculated between each item and its respective dimension, as well as between each dimension and the total score. The correlation coefficients ranged from 0.735 to 0.886, all significant at the 0.01 level, indicating strong internal consistency among the scale's components.

3.3. Reliability of the Scale:

Reliability was verified by calculating the Cronbach's Alpha coefficient for the responses of the pilot sample to estimate the scale's reliability. The coefficient reached 0.923, which is a high value indicating a strong level of internal consistency and reliability.

Second: Performance Observation Checklist

The researcher developed a Performance Observation Checklist to evaluate students' actual performance while executing the skills required for preparing educational films. The checklist consists of 16 items focusing on the level of performance related to educational film production skills.

Performance levels were defined according to four descriptive categories:

- Poor: The behavior did not appear.
- Acceptable: The behavior appeared partially or inconsistently.
- Good: The behavior appeared clearly and was relatively well executed.
- Excellent: The behavior was highly mastered and demonstrated effectively in an educational context.

The criteria for interpreting the total scores were determined as shown in Table (5) below.

Table (5): *Criteria for Interpreting Scores on the Performance Observation Checklist*

Performance Level	Actual Score (out of 64)	Percentage of Total Score
Excellent	58 64	90% and above
Very Good	58 Less than 48	75% less than 90%
Acceptable	48 Less than 38	60% less than 75%
Poor	Less than 38	Less than 60%

Validation and Reliability of the Checklist:

- **Validity:** The Performance Observation Checklist was reviewed by a panel of specialized experts to ensure its suitability for measuring the outcomes of the training program. The experts confirmed that the items were appropriate and clearly stated.

- **Reliability:** The reliability of the checklist was verified by calculating the percentage of agreement among the experts on the items, which reached **100%**, indicating a high level of reliability.

Third: Educational Film Evaluation Rubric:

The researcher developed an Educational Film Evaluation Rubric to assess students' actual performance in producing educational films. The rubric consists of 11 items focusing on the overall quality of the film. The performance levels were defined according to four descriptive categories:

- Poor: The quality did not appear.
- Acceptable: The quality appeared inconsistently.
- Good: The quality appeared relatively well executed.
- Excellent: The quality was highly achieved.

The benchmark for interpreting the total scores was determined as shown in Table (6) below.

Table (6): Benchmark for Assessing the Quality of Students' Projects

Quality Level	Actual Score (out of 44)	Percentage of Total Score
Excellent	40 - 44	90% and above
Very Good	33 less than 40	75% less than 90%
Acceptable	27 less than 33	60% less than 75%
Poor	Less than 26	Less than 60%

3.4. Research Sample:

The main sample consisted of 64 students majoring in Kindergarten Education at the College of Education, Kuwait University. All participants were enrolled in the Graduation Project course during the second semester of the 2024/2025 academic year. The sample was divided into two groups:

-The Control Group (33 students): These students did not receive any training related to the skills of preparing educational films.

-The Experimental Group (31 students): These students participated in the training program based on the use of artificial intelligence for preparing and producing educational films.

3.5. Statistical Methods:

The data were analyzed using a set of statistical methods appropriate to the nature of the data and the study objectives, including:

-Means and standard deviations to measure students' skill levels.

-Independent samples t test and paired samples t test to examine the significance of differences between pre test and post test results.

-Eta squared (η^2) to measure the effectiveness of the proposed training program.

-Effect size (Cohen's d) to estimate the strength of the program's impact.

4. Results:

4.1.The first research question "*What are the skills required for Kindergarten Education students to prepare educational films to improve preschool children's Arabic language skills*?" was answered in the theoretical section of this research. The following sections present the results related to the remaining research questions and the testing of the study hypotheses.

4.2. Answer to the Second Question: To answer the second question "*To what extent do Kindergarten Education students possess the skills to use AI tools in preparing educational films prior to implementing the training program?*" the means and standard deviations of the students' responses on the pre test version of the skills scale were calculated. Table (7) shows these results.

Table (7): Mean Scores of the Control and Experimental Groups on the Skills Scale Before Implementing the Training Program

Group	Mean Score	Percentage
Control Group	54.70	54.7%
Experimental Group	54.65	54.65%
Total	54.675	54.68%

To ensure clarity and facilitate interpretation, the raw mean scores presented in Table (7) and subsequent tables are explicitly linked to the predefined performance benchmarks established during instrument development (see Tables 4-6). For instance, a mean score of approximately 55 falls within the "Low/Needs Training" category (50-60), whereas a mean score above 86 corresponds to the "Excellent" category. This alignment allows the quantitative results to be directly interpreted in qualitative terms (Excellent, Very Good, Acceptable, Poor), thereby enhancing the transparency and educational relevance of the findings.

The pre-test results on the Educational Film Production Skills Scale indicate that Kindergarten Education students demonstrated a low level of mastery of these skills, as reflected in the mean scores falling within the 50-60 range, which corresponds to the "Low Level (Needs Training)" category according to the benchmark used in this study.

This low level of skill acquisition can be attributed to several factors, including the students' limited prior experience with tools for producing educational films, the lack of systematic training in relevant technical skills within their major coursework, and the limited opportunities for practical application in the university setting. These factors collectively contributed to the observed low level of competence in this area prior to implementing the training program

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Verification of the First Hypothesis:

The first hypothesis stated that:

"*There is no statistically significant difference at the 0.05 level between the mean pre-test scores of the experimental and control groups on the Educational Film Production Skills Scale related to AI-based film creation.*" To verify this hypothesis, an independent samples t test was conducted. Table (8) shows the results.

Table (8): Results of the Independent Samples t Test for the Pre Test Mean Scores of the Control and Experimental Groups

Group	N	Mean (M)	Standard Deviation (SD)	t value	df	p value
Control Group	33	54.70	3.25			
Experimental Group	31	54.65	3.31	0.061	62	0.952

M: Mean ; SD: standard deviation; df: degrees of freedom

The results of the independent samples t test examining the difference between the mean scores of the control and experimental groups on the pre test of the Educational Film Production Skills Scale showed that there was no statistically significant difference between the two groups. This conclusion is supported by the calculated t-value (t = 0.061), which is not significant at the (0.05) level. This result indicates that the two groups started at an equivalent skill level, providing an appropriate baseline for implementing the proposed training program and ensuring an objective assessment of its impact in the post test stage.

Verification of the Second Hypothesis:

The second hypothesis stated that:

"*There is a statistically significant difference at the 0.05 level between the post-test mean scores of the experimental and control groups on the skills of preparing and producing short AI-based educational films, in favor of the experimental group."*   To verify this hypothesis, an independent samples t test was conducted for the post test results. Table (9) presents the results.

Table (9): Results of the Independent Samples t Test for the Post Test Mean Scores of the Control and Experimental Groups.

Group	N	Mean (M)	Standard Deviation (SD)	t value	df	p value
Control Group	33	56.15	3.19			
Experimental Group	31	91.80	3.37	43.477	62	0.0001

The results of the independent samples t test examining the difference between the mean scores of the control and experimental groups on the post test of the Educational Film Production Skills Scale indicate that there is a statistically significant difference between the two groups. This is evidenced by the calculated t-value (t = 43.477), which is significant at the (0.05) level, with the difference in favor of the experimental group.

Verification of the Third Hypothesis:

The third hypothesis stated that:

"*There is a statistically significant difference at the 0.05 level between the pre-test and post-test mean scores of the experimental group on the Educational Film Production Skills Scale, in favor of the post-test."*   To verify

this hypothesis, a paired samples t test was conducted for the experimental group's scores in the pre   and post tests. Table (10) presents the results.

Table (10): Results of the Paired Samples t Test for the Experimental Group on the Pre Test and Post Test

Test	N	Mean (M)	Standard Deviation (SD)	t value	df	p value
Pre Test	31	54.65	3.31			
Post Test	31	91.80	3.37	43.788	30	0.0001

The results of the paired samples t test examining the difference between the mean scores of the experimental group, which participated in the AI based training program, in the pre test and post test on the Educational Film Production Skills Scale indicate that there is a statistically significant difference in favor of the post test. This is confirmed by the calculated t-value (t = 43.788), which is significant at the (0.05) level.

3.3. Answer to the Third Question:

The third research question stated: "*What is the effect of the AI based training program on developing the skills of Kindergarten Education students in preparing educational films?*" To answer this question and to confirm the effectiveness of the training program in enhancing the skills of the experimental group, the eta squared (η^2) and effect size (Cohen's d) were calculated. Table (11) presents the results.

Table (11): Eta Squared (η^2) and Cohen's d Values Indicating the Effectiveness of the Training Program for the Experimental Group

Measurement	N	t value	df	Eta Squared (η^2)	Cohen's d
Pre Test vs. Post Test	31	43.788	30	0.9846	15.99

The results presented in Table (11) clearly indicate the effectiveness of the implemented training program in equipping students with the skills needed to prepare and produce educational films. This is supported by the calculated eta squared value (η^2 = 0.9846), which means that the program explains 98.46% of the variance and improvement observed in the performance level of the experimental group. This value represents an effect size of Cohen's d = 15.99, which, according to statistical references, is considered an exceptionally large effect size. These findings reflect the substantial impact of the proposed AI based training program on enhancing students' practical and technical competencies**.**

Note: The 95% Confidence Interval for the difference in means between the pre test and post test scores for the experimental group was [36.35, 37.95], reinforcing the statistical significance and precision of the observed effect.

3.4. Answer to the Fourth Question:

To answer the fourth research question: "*What is the level of students' performance in the skills of preparing educational films using AI technology (ChatGPT 4) and tools (MagicLight.AI and Focal.AI)*"؟ the Performance Observation Checklist was used to monitor and evaluate students' actual performance while implementing these skills during the training program. The results are presented in Table (12) below.

Table (12): Students' Skill Performance Levels According to the Observation Checklist During the Training Program

Skill Area	Score (Out of 64)	Performance Level
Identifies a precise linguistic goal appropriate for developing a specific language skill for preschool children	62	Excellent
Uses ChatGPT 4 to generate educational ideas and formulate a clear film objective	64	Excellent
Writes a simplified educational scenario for children with the help of ChatGPT 4	64	Excellent
Uses AI tools (MagicLight.AI / Focal.AI) to prepare the visual concept and initial content of the film	64	Excellent
Plans the film scenes (scripts, images, audio) in an organized, child appropriate way	61	Excellent
Uses Focal.AI or similar tools to generate expressive educational images suitable for the age group	64	Excellent
Uses MagicLight.AI to convert texts into visual scenes or initial video clips	64	Excellent
Integrates elements (text, audio, visuals) into a complete educational film serving the linguistic goal	62	Excellent
Ensures sound and language quality using tools that support Standard Arabic when needed (e.g., ElevenLabs, Murf)	60	Excellent
Demonstrates ability to use simple video editing tools to produce a final version ready for presentation	60	Excellent
Provides a linguistically sequenced content appropriate for preschool children	58	Excellent
Uses accurate, simplified Standard Arabic suitable for the target age group	56	Very Good
Considers clear linguistic objectives in the content (vocabulary, structures, sounds, letters)	56	Very Good
Demonstrates consistency between the film content and the predetermined linguistic objectives	58	Excellent
Incorporates within or after the film interactive or assessment activities (e.g., entrance/exit questions, Edpuzzle)	54	Very Good
Links the film content to a potential linguistic impact on the child (e.g., improving pronunciation, enriching vocabulary, enhancing comprehension)	60	Excellent
Overall Mean	60.44	Excellent

The results of the observation checklist indicate that the students' performance levels in the skills of preparing educational films were generally rated as excellent, demonstrating a clear improvement in the Kindergarten Education students' mastery of these skills within the experimental group after participating in the training program based on AI applications (ChatGPT 4, MagicLight.AI, Focal.AI).

4.5. Answer to the Fifth Question:

To answer the fifth research question:"*What is the level of quality of the educational films produced by the students after implementing the training program, in light of the educational, technical, and psychological standards appropriate to children's developmental characteristics and linguistic needs*"؟ The students' projects in the experimental group were evaluated based on the criteria defined in the Educational Film Evaluation Rubric developed for this study. The results are presented in Table (13) below.

Table (13): Evaluation Results of the Educational Film Projects Produced by the Experimental Group

Criterion	Element	Score (out of 44)	Quality Level
Image clarity and filming quality		42	Excellent
Lighting and color balance	Image Quality	41	Excellent
Sound clarity and absence of noise		43	Excellent
Synchronization of audio and visuals	Sound Quality	42	Excellent
Accuracy of the Arabic language used in the film		40	Excellent
Appropriateness of vocabulary for preschool children	Educational Content	42	Excellent
Activation of Arabic language skills (pronunciation, vocabulary, structures)		40	Excellent
Character design and color scheme	Child Appeal	41	Excellent
Use of animation and background music		40	Excellent
Clarity of educational objectives	Content Clarity and Comprehensibility	42	Excellent
Ease of child comprehension of content		40	Excellent
Overall Mean		41.18	Excellent

The results of the Educational Film Evaluation Rubric demonstrate a clear and substantial improvement in the level of the experimental group's competence in producing high quality educational films after participating in the training program based on AI tools (ChatGPT 4, MagicLight.AI, Focal.AI). This finding reflects the effectiveness of the program in enabling the students to acquire and apply the necessary technical and pedagogical skills to produce educational films that meet high standards of educational, technical, and developmental appropriateness.

To further illustrate these results, Figure 1 and Figure 2 present sample screenshots from student-produced educational films.

Figure 1: *Sample screenshot from student-producted educational film.*

5. Discussion:

The overall results of this study clearly demonstrate the high effectiveness of the proposed training program based on the integration of artificial intelligence tools (ChatGPT 4, MagicLight.AI, and Focal.AI) in developing Kindergarten Education students' skills in preparing and producing educational films. The initial

pre test results revealed a general weakness in students' mastery of these skills, which reflects the lack of systematic training and the limited practical applications within existing coursework, as previously discussed. This finding aligns with Holmes, Bialik, and Fadel (2021), who emphasized the persistent gap between the technological demands of modern education and what is actually provided in teacher preparation programs.

The results of the first hypothesis confirmed that there were no statistically significant differences between the control and experimental groups in the pre test, supporting the homogeneity of students' educational backgrounds and reinforcing the internal validity of the experiment by ensuring an equal baseline for both groups. This conclusion is consistent with the recommendation by Alhazbi (2015), who highlighted the importance of establishing initial equivalence before implementing any training intervention.

In contrast, the results of the second hypothesis were statistically significant in favor of the experimental group in the post test, highlighting the clear and effective impact of the training program. This improvement can be attributed to the program's emphasis on practice based learning, interactive activities, and immediate formative feedback practices identified by Bell (2019) as strong drivers for acquiring practical skills. Moreover, the integration of generative AI tools, such as ChatGPT 4 for scenario development and MagicLight.AI and Focal.AI for visual content design and production, played a key role in simplifying the learning process and boosting students' engagement levels.

For the third hypothesis, the results confirmed a significant difference between the pre test and post test scores within the experimental group, favoring the post test. This demonstrates a substantial growth in practical skills, suggesting that the training program was not merely an information delivery session but rather a comprehensive approach that effectively combined theoretical foundations with hands on practice in an engaging learning environment. The exceptionally large post-test gains can be partly explained by this constructivist mechanism: AI tools lowered the technical barriers and reallocated students' cognitive resources toward pedagogical design decisions such as vocabulary selection, sequencing of audiovisual cues, and narrative flow. This redirection of attention toward meaning-making aligns with the Cognitive Theory of Multimedia Learning, which emphasizes the importance of integrating auditory and visual channels to enhance comprehension and retention in early language education. This aligns with Mayer (2021), who emphasized that the use of interactive digital media significantly enhances active learning, especially when combined with project based and problem solving instructional methods.

Furthermore, the findings related to the third research question strongly support this conclusion. The exceptionally large effect size ($\eta^2 = 0.9846$; Cohen's $d = 15.99$) far exceeds typical averages reported in educational research, reflecting the strong impact of the program design, which focused on making educational film production tools accessible, aligning with students' developmental needs, and applying AI technologies in a practical manner. Importantly, this result is not an anomaly but rather reflects the specific learning context. Participants entered the program with a very low baseline of skills, as evidenced by the pre-test scores clustered in the "Low/Needs Training" category. This created substantial scope for growth once systematic training was introduced. In addition, the program provided intensive, hands-on practice with AI tools that dramatically reduced technical barriers. When combined with immediate formative feedback and collaborative workshop activities, these conditions created an environment in which rapid skill acquisition was both possible and

measurable. Thus, the magnitude of the effect is best understood as the product of (a) a very low starting point, (b) the efficiency gains enabled by AI-supported tools, and (c) the high alignment between the training tasks and the assessment criteria. This outcome supports the perspective of Luckin et al. (2016), who argued that the integration of AI in education should aim to augment and enhance human creativity, rather than replace it.

The results related to the observation checklist (Research Question 4) also revealed a significant improvement in students' performance levels after completing the training program, reaching an "Excellent" level. This outcome can be attributed to the program's reliance on project based learning strategies, supported by smart technological tools that provided an engaging, interactive experience for participants. This finding aligns with Voogt and Roblin (2012), who emphasized the importance of integrating technology with active pedagogy to foster key 21st century skills such as critical thinking, digital production, and collaborative work.

The results addressing Research Question 5 further support the overall conclusion, as they demonstrated a clear improvement in the quality of the films produced by the students. The films were evaluated based on comprehensive multi dimensional criteria (educational, psychological, and technical) that accounted for children's developmental characteristics. This indicates that the training program went beyond merely developing technical production skills; it also strengthened students' awareness of the pedagogical and developmental standards required for creating appropriate content for young children. Robin (2008) similarly highlighted that producing educational videos should not only consider technical aspects but also ensure that pedagogical and emotional factors are incorporated to guarantee suitability for the target audience.

Taken together, the findings of this research provide compelling evidence that well designed training programs, when grounded in sound theoretical principles and enhanced with artificial intelligence tools, can lead to a transformative improvement in pre-service teachers' competencies. This study underscores the positive impact of combining AI applications with active, practice based learning in developing students' digital production skills, particularly in the context of producing educational films an increasingly essential competence for modern educators in today's digital learning landscape. Therefore, these results call for the adoption and institutionalization of this training model within teacher preparation programs in colleges of education and recommend its adaptation to suit local contexts and diverse educational needs.

Qualitative Insights Supporting the Quantitative Results:

The strong quantitative gains reported in the observation checklist and project evaluation rubric are reinforced by the qualitative reflections collected during the training. Students consistently reported that AI tools made the creation process "easier and more creative" and that the workshops "boosted their confidence." These perceptions are not anecdotal; they function as causal mechanisms. By lowering cognitive load, AI tools shifted students' focus from technical struggles to pedagogical and creative decision-making. This cognitive relief enhanced engagement, fostered positive attitudes, and directly translated into the high performance levels documented in both the checklist scores and the final project evaluations.

Justification of the Large Effect Size:

The exceptionally large effect size observed (Cohen's d = 15.99) can be explained by several factors inherent in the study context. First, the participants had minimal prior exposure to AI tools and digital film production, as confirmed by the low pre test scores. This low starting point allowed the targeted training program to have a substantial impact on skill acquisition. Second, the intensive, practice based nature of the training combining interactive workshops, real world project production, and immediate formative feedback maximized student engagement and mastery of the targeted skills. Third, the relatively small sample size and the focus on a homogeneous group of students amplified the effect size by minimizing extraneous variance. These factors together justify the high impact metrics observed in this experimental setting.

6. Conclusion:

The findings of this study highlight the significant role of integrating artificial intelligence tools into pre-service kindergarten teacher training, specifically in equipping students with practical and technical skills for producing high quality educational films tailored to the developmental and linguistic needs of young children. The proposed AI based training program demonstrated a strong positive impact on enhancing students' abilities to design and produce interactive digital content, positioning them to meet the demands of modern digital education. Based on these results, it is recommended that similar training models be incorporated into teacher preparation curricula and expanded to cover other educational domains. Future research is encouraged to explore the broader applications of AI in developing interactive educational media and to examine its impact on children's learning outcomes, creativity, and language development. Such efforts will contribute to improving the quality of early childhood education and aligning teacher preparation programs with the evolving requirements of the digital age.

7. Recommendations:

Based on the findings of this research, the following recommendations are proposed:

-Integrate dedicated study units focused on teaching educational film production skills within the academic preparation program at Colleges of Education.

-Embed visual design modules into the "Instructional Design" course, with an emphasis on skills related to producing educational films.

-Develop specialized training programs for faculty members on the effective use of artificial intelligence tools in producing educational films.

-Organize regular workshops and training sessions for students to develop their competencies in using AI supported   educational film design tools.

-Promote a culture of educational media production by launching student competitions and creative initiatives linked to academic courses, supported by the Ministry of Education, to transform course content into educational media.

-Strengthen the technological infrastructure of Colleges of Education by providing modern computer labs, high speed   internet access, and diverse design software tools.

-Allocate appropriate budgets to ensure the availability of devices, tools, and software necessary for implementing AI   technologies within the university's learning environment.

-Provide qualified technical staff for equipment maintenance, software updates, and support for implementing training programs in classrooms and laboratories.

-Establish dedicated technical support and consultancy units within Colleges of Education to offer guidance and technical   assistance for the use of intelligent visual design tools.

8. Suggestions for Future Research:

In addition to the practical recommendations, the researcher proposes that future studies explore the following areas:

-Investigate the challenges and barriers associated with employing artificial intelligence in the production of educational films, including aspects related to infrastructure, human resources, and students' cognitive and technical readiness.

-Conduct experimental research with students from various academic disciplines to measure the impact of integrating AI   tools on their academic achievement and life skills development.

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