Using artificial intelligence in digital video production: A systematic review study

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Highlights	Abstract
• How Artificial Intelligence affects the use of digital video. • There is a need to design codes of ethics for digital content, create laws and protect users' identities and personal data. • Digital videos produced with artificial intelligence can be used for many different purposes.	Advancements in artificial intelligence (AI) have tailored computer systems to meet user needs, thereby enhancing user experience. The application of AI technology in the production of digital videos, particularly in education, is becoming increasingly prevalent. This study aims to explore trends in the use of AI technology for digital video production. To achieve this, a systematic literature review was conducted across the Web of Science, ERIC, Taylor & Francis, Education Full Text EBSCO, and ScienceDirect databases. Studies were selected following the PRISMA flowchart, adhering to inclusion criteria aligned with the study's objectives. Consequently, 21 international studies were analyzed. The findings indicate that AI supports the creation of diverse digital content, which can serve various purposes such as general guidance, knowledge reinforcement, design and experimentation, and personalized experiences. However, it appears that AI's full potential has not yet been efficiently harnessed. Therefore, it is recommended that future research focus on developing digital content that caters to individual differences, enhances social interaction, includes enriched features, and is adaptable to various environments.
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1. Introduction

Today, fundamental changes are taking place in the field of education due to technological developments (Susilo et al., 2023). These changes enable the use of different tools and methods to enrich students' learning experiences, support teachers to teach effectively, and increase the efficiency of educational institutions (Susilo et al., 2023). In the context of these changes, educational technologies are frequently used in education to support and strengthen teaching methods. They help students learn effectively and make the educational experience interactive, engaging and personalized. Teachers and educators can use educational technologies to create learning materials that better suit students' learning styles and needs (Major et al., 2021). In addition, the effective use of educational technology can integrate technology in line with pedagogical principles and enable students to see technology as a part of learning, not just a tool (Pittas & Adeyemi, 2019). It is important to adopt student-centered approaches in the use of educational technologies and to encourage students' active participation in the learning process. Therefore, educational technologies can support students' learning processes, enrich teachers' teaching activities and increase the success of educational institutions.

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Educational technologies can be used effectively in online learning, which makes it possible for students to receive education at any time and place they want thanks to the opportunities offered by the internet and digital tools (Gamage & Perera, 2021). The use of educational technologies in the learning process is important for students to use technology efficiently in a business-oriented way in terms of learning-teaching processes (Turan et al., 2022). Educational technology aims to use developments in science and technology and inventions in education and training activities (Stadlinger et al., 2021). As a result, it is ensured that individuals who follow technological innovations and adapt to innovations are raised. As a matter of fact, technology has an important role to ensure progress in education and therefore educators need to combine technology with their own fields of study. Efficient education can be realized with applications based on the understanding of contemporary educational technology, and the prerequisite for applications based on this understanding is that teachers and educational administrators are trained in educational technologies. In addition, educational technologies can also be used by teachers to monitor students' progress (Admiraal et al., 2018). Educational technologies facilitate the integration of artificial intelligence into education and provide students with an independent learning experience (Tapalova, Zhiyenbayeva & Gura, 2022). AI-supported teaching tools can instantly assess student performance, provide feedback to teachers, and help them better understand students' strengths and weaknesses.

Today, there is a close relationship between education and technology, and educational materials can be created and delivered through technology (Susilo, Sulisworo & Beungacha, 2023). Artificial intelligence is being integrated in education to provide self-study experience, provide instant feedback to teachers, and organize educational content (Guan, Mou & Jiang, 2020). Artificial intelligence can be used to make the process of creating digital videos and other educational materials more efficient. In addition, artificial intelligence plays an important role in personalizing digital video content according to students' interests and learning needs. AI also provides many benefits to make digital videos more easily and quickly accessible. For example, functions such as automatic addition of subtitles, language translation and editing of video content provide wider access to viewers of different language and ability levels (Ingavélez-Guerra et al., 2022). Therefore, through artificial intelligence, digital educational content can be created that better adapts to the needs of each individual learner, captures their attention more, and is easier to access.

1. Artificial Intelligence

In 1955, John McCarthy first mentioned artificial intelligence as a concept at the Dartmouth Conference (Russell & Norvig, 2010). In 1950, researchers at the MIT Artificial Intelligence Laboratory developed a program called ELIZA that could produce simple responses to text input (Taluğ & Eken, 2023). In the 1960s, the United States Department of Defense began training computers to mimic basic human functions. In 1968, SHRDLU, a natural understanding of computer language, was developed. In 1973, the first artificial intelligence research center in Europe was established. In the same year, AARON was developed by Harold Cohen and a significant progress was made in the field of artificial intelligence (Cohen, 2016; Taluğ & Eken, 2023). Google launched a neural network program called DeepDream in 2015. This program, which has the ability to process images and produce creative content, has been described as a revolutionary development in the field of artificial intelligence.

With the development of technology, natural language processing is defined as a revolutionary technology thanks to human-computer interaction in areas such as artificial intelligence. Thanks to NLP, computers have started to understand the written and verbal communications of humans and answer the questions asked (Fırat, 2020). Personal assistants and online innovative technologies benefit from advanced technologies such as natural language processing. In other words, natural language interaction is seen as a personal assistant that can easily perform a wide range of tasks that humans can perform. NLP automatically analyzes and classifies very large datasets and also analyzes the data it processes. Provides significant benefits in areas such as knowledge management, marketing strategies and customer relations by classifying and analyzing data (Hirschberg & Manning, 2015; Khurana et al., 2017). Human-generated

content, text summaries or story creation can be easily recreated with the automatic detection of natural language processing. NLP also provides many benefits in processes such as users answering questions as if there were a human being in front of them, automatically translating texts from one language to another language easily, and converting voice-generated speech texts into written form (Amirhosseini, 2019; Bala et al., 2018).

Developments in the field of technology have led to an increase in digital content and the accumulation of data in the background. Therefore, it has become an important issue to get rid of this data pollution, to draw meaningful conclusions and to analyze the data. The best solution to this situation is the use of image processing algorithms. Image processing algorithms are used in many areas such as selecting useful information; making sense of text, image, audio files; face recognition, license plate detection, object detection (Luo et al., 2014). Deep learning, a sub-discipline of artificial intelligence, can be used in large data sets to predict outputs with the given data set. In this respect, machine learning is made possible. It is frequently used in areas such as information retrieval, object recognition and computer vision, multi-model and multi-task learning, visual perception, speech and voice recognition (Deng & Yu, 2014). Deep learning can create new models using data sets, analyze the models and predict the possible outcomes of the models (Ilyas et al., 2022). Deep learning technology provides successful results in the design of digital content, entertainment and media, e-commerce and security (LeCun et al., 2015).

Advances in artificial intelligence have changed the way we interact with computers. Human-centered interaction experiences are constantly being developed to enable users to interact with computers in a more natural and intuitive way. In particular, AI-based speech and language processing systems such as voice assistants or chatbots help users interact with computers more effectively and efficiently (Russell & Norvig, 2010). Therefore, with the rapid development of artificial intelligence technology, human-computer interaction has increased and humans have become less involved in the production of digital content (Singh & Dhandayuthapani, 2022). Systems developed within the scope of artificial intelligence can make predictions, offer suggestions or make decisions in both real and virtual environments to help people achieve their goals. In addition, these systems become a part of our lives and have an impact on our environment. Generative AI is defined as artificial intelligence systems with human-like language capabilities (Platt & Platt, 2023). They are usually trained in many areas such as text generation, text analysis and classification, text transformation and rewriting, video creation and editing, using deep learning and neural networks, and can process data and make sense of, produce or transform it.

2. *Artificial Intelligence in Education*

Student-centered tutoring systems can use detailed diagnostic assessment models that comprehensively analyze the student's proficiency level and misconceptions (Taufik & Nurjanah, 2019). Individual needs play a significant role in the learning process as they do in every stage of life. Accurately identifying the individual needs of the learner ensures an efficient learning process. In this context, tutoring systems allow for the fulfillment of educational tasks in accordance with the individual needs of the student (Kostolányová, 2017). Tutoring systems encompass a variety of methods including advanced teaching strategies such as instructional materials, digital tools and interactive activities (Holmes, 2009).

In recent years, the design of specialized online platforms and the use of digital tools based on students' individual needs have increased and play an important role in the development of tutoring systems (Guan, Mou & Jiang, 2020). Tutoring systems can be used for different purposes in many areas. They can be used in special education to make students ready for life in individual, social and academic terms and to meet their needs in the best way possible by keeping them together with their peers without special needs (Akay et al., 2014). It can be used in academic education to increase success in disciplines where abstract concepts are predominant and students have difficulty in understanding (Steenbergen-Hu & Cooper, 2014). It can be used in language education to enable students to acquire speaking, writing, reading and listening skills in many foreign languages such as English, French and Arabic (Yung, 2015). It can be used in vocational education to improve students' skills in specific vocational fields such as technology

use, programming and work experience (Pratami & Mirfani, 2020). In addition to these uses, developments in the field of artificial intelligence can create educational systems that can meet student needs (Ezzaim et al., 2023). Artificial intelligence technologies are used in tutoring systems to make teaching processes more interactive and enable students to receive education without the need to be physically present in the classroom (Bayne, 2015). These technologies enable the development of learning materials by identifying students' learning styles, speeds and needs (Mousavinasab et al., 2018). In addition, through the use of artificial intelligence, students' progress can be monitored, learning processes can be optimized, and lesson plans can be updated according to student needs.

Developments in the field of artificial intelligence continue to affect every aspect of our lives. Social robots have become an integral part of our lives as a result of these developments and have great potential to be used as an educational technology. These robots can recognize people and each other, monitor behavior and communicate (Genç & Çelik, 2022). Social robots can provide learning experiences in accordance with the individual needs of students (Belpaeme et al., 2018). They can also organize course content and teaching methods by establishing a realistic interaction with students, increase students' motivation by providing social activities, and encourage their participation in the learning process (Belpaeme et al., 2018; Bourguet et al., 2020). Another feature that enables the use of social robots in education is the diagnosis, treatment and educational activities of students in need of special education (İsmail et al., 2021; Şen, 2021). It can be said that the use of social robots in the context of special education is a very careful approach. It is very important that the individual in need of special education feels safe and agrees to cooperate. Many factors can affect the results, from the characteristics of the learner or the robot used, the content of the scenarios, technical features to the experience of the educator (Genç & Çelik, 2022). In addition, social robots are also used in education to provide classroom management and direct student behavior (Woo et al., 2021). As a matter of fact, it optimizes the learning environment while reducing the workload of teachers. Therefore, social robots, which are designed to increase students' participation in the educational process, represent an innovative and effective approach provided by technology in education.

Artificial intelligence stands out as one of the important developments in education using information technologies and applications (Chen et al., 2020). The use of AI in teaching and learning in education is increasing day by day. From face-to-face classroom environments to online education and personalized learning experiences, AI offers students opportunities to learn more effectively and efficiently (Chen, Chen & Lin, 2020). By identifying students' needs and predicting their individual learning paths, AI systems improve learning outcomes by better adapting teachers' lesson plans and materials. AI-supported learning offers students virtual learning experiences where students can learn together by providing content that suits their interests and learning styles, transforming traditional classroom environments (Jian, 2023).

3.   Using Artificial Intelligence in Digital Video Production

Video content created in digital environments is described as digital videos. This content is created through digital cameras or digital video recorders and then stored, edited and shared in digital formats (Pérez-Navarro et al., 2020). Digital video has a long history. Interest in digital video began in the mid-20th century, when the first digital video experiments were made, but analog video continued to be widely used. In the 1960s and 1970s, the first research on digital video technologies was conducted to realize video recordings in analog formats. In the 1980s, the first digital video recording experiments took place and video principles were developed. In the 1990s, computer-based software was developed for digital video editing and post-production processes based on CD-ROM, interactive TV and internet technologies, and digital videos became more easily accessible. In the same period, digital video storage and distribution formats such as Digital Versatile Disc (DVD) began to develop. In the 2000s, high-definition digital video standards such as MPEG-2 and MPEG-4 were developed (Campbell & Cox, 2018). These standards made it possible to store and transmit high-definition digital video. In the

2010s, 4K (Ultra HD) and 8K video technologies were developed that improved video quality by offering higher resolutions.

In recent years, technological advances in artificial intelligence have greatly impacted the creation and processing of digital video. AI technologies can be used to create, edit and analyze digital video at a level indistinguishable from human-generated content. AI technologies are also being used to make people's jobs easier and help them publish more accurate, fast and effective digital videos. For example, natural language processing technology can produce digital video based on text input. Similarly, machine learning and deep learning technologies can analyze a lot of data and create digital videos based on the analysis results.

Digital videos created by artificial intelligence have many uses. It can be used in the film industry by incorporating visual effects and dynamic animations (Li, 2021). This allows for more impressive digital video content. It can be used as course content for educational purposes (Leiker et al., 2023). Instructional digital videos, interactive educational materials and entertaining video content can support the learning process. It offers students a more effective learning experience by concretizing abstract concepts. They can be used as advertising videos customized for the target audience (Campbell et al., 2022). This makes content such as product promotion videos or brand stories effective. It can be used to produce character animations, backgrounds and other visual elements in the game development process (Wu et al., 2023). This offers game studios a faster and more efficient production process. In the medical field, it can be used as training videos, surgical simulations and patient education materials (Park et al., 2022). In addition, by analyzing the data obtained with medical imaging techniques, informative videos can be produced again for diagnosis and treatment processes. AI-powered digital videos can detect dangerous situations or analyze certain behaviors by analyzing content recorded by security cameras (Balti et al., 2023). This can be used to improve security in public spaces. In this way, AI-powered digital video production provides an important transformation in the fields of creativity and productivity.

There are various studies in the literature on artificial intelligence and digital videos. Each research focuses on specific topics, elements and digital video production tools for different purposes. For example, Zhai et al. (2021) conducted a systematic review focusing on trends in educational AI technologies and tools and emphasizing engineering aspects. Bozkurt et al. (2021) explored trends in the study of AI in education, including subject areas, geographic distribution, and patterns in textual data. There are also studies on the effects of video on learning (Noetel et al., 2021; Poquet et al., 2018) and video-based programming in mathematics education (Santagata et al., 2021). However, there is no systematic literature review on the use of artificial intelligence in digital video production. Therefore, it is important to examine the studies in which artificial intelligence is used in order to find answers to the questions of whether there are situations where artificial intelligence technology is underutilized or which aspects of its use in digital videos should be improved. The study aims to integrate how artificial intelligence technology shapes digital videos under one roof. In line with this purpose, the following research questions were sought to be answered.

1. What is the distribution of studies on the use of artificial intelligence in the production of digital videos according to their types?

● How is the distribution according to their types?

● How is the distribution according to years of publication?

● How is the distribution according to the place of publication?

● How is the distribution according to the subject?

● How is the distribution according to the artificial intelligence technology used?

● How is the distribution according to the variables analyzed?

● How is the distribution according to keywords?

● How is the distribution according to the benefits provided?

2. Method

In this study, the systematic literature review method was used following the PRISMA flowchart guidelines (Page et al., 2021). Systematic literature review is defined as a comprehensive review method based on examining studies on a topic according to certain criteria (Mengist et al., 2020). In addition, through this method, the current situation related to the researched topic can be determined and the topics can be presented in a holistic manner (Kitchenham, 2004). Scientific studies on the use of artificial intelligence in digital video production, which is the aim of the study, can be examined by systematic literature review method and appropriate gaps can be identified for future studies. The studies to be examined within the scope of this study were carried out by following the PRISMA flowchart guidelines of (1) identification, (2) screening, (3) eligibility and (4) inclusion (Crossan & Apaydin, 2010). The PRISMA flowchart and the selection of studies are presented in Figure 1.
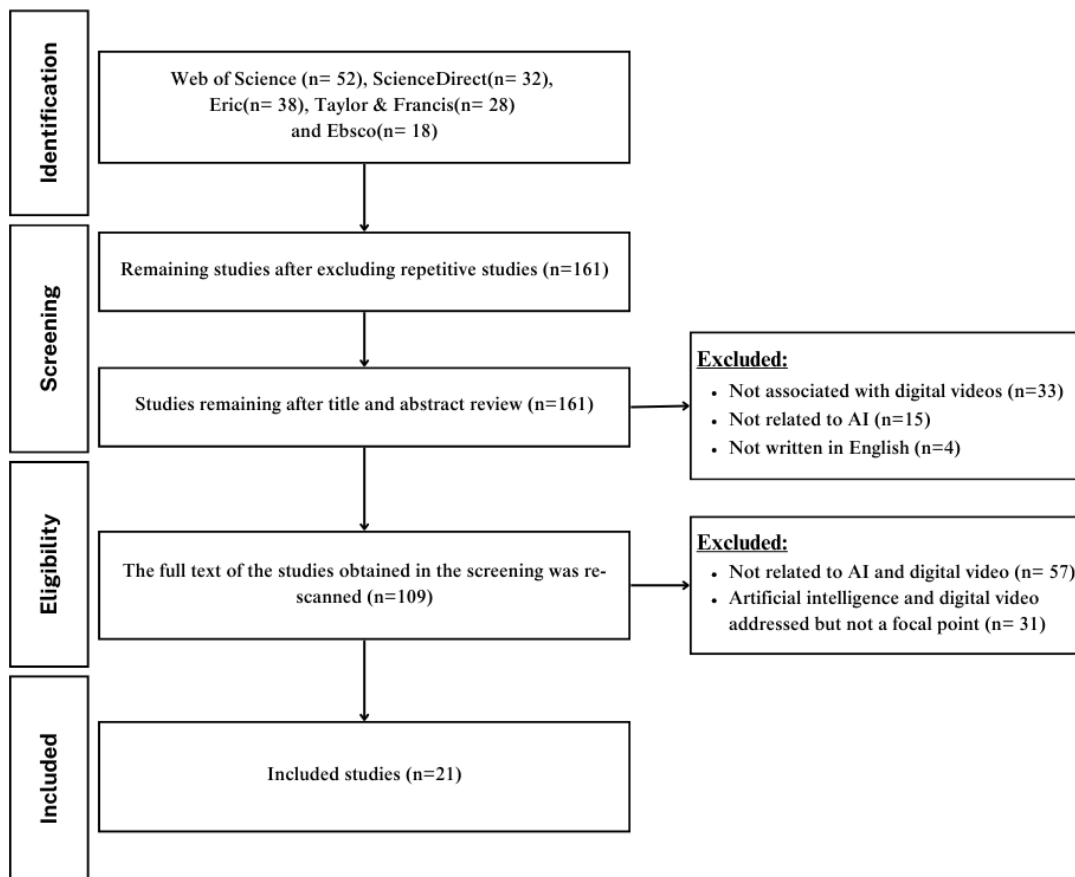

Figure 1. PRISMA Flowchart

2.1 Identification

This phase consisted of a search and distribution strategy that helped define an appropriate search criteria and identify relevant databases to compile the studies to be analyzed in the systematic literature review. The literature search was finalized in November 2023 using five widely known databases, as shown in Table 1. These were: **(1)** Web of Science, **(2)** ERIC, **(3)** Taylor & Francis, **(4)** Education Full Text EBSCO and **(5)** Sciencedirect. In the first article search phase, the titles and abstracts of the publications obtained for each keyword were selected by examining whether they were relevant to the topic. A total of 168 studies were retrieved in the first phase of the systematic review process. The results were then imported into a table in an Excel sheet for saving. After importing the results, a feature of MS Excel was

used to automatically eliminate duplicates. Overall, 7 studies were removed due to duplication and the remaining 161 studies were reviewed later in the screening phase.

Table 1.

Distribution of Identified Studies between Sources and Search Criteria

Database	Number of Records	Search Criteria
Web of Science	52	
ERIC	38	Title-Summary-Keyword: "digital videos created by artificial intelligence" or "artificial intelligence and digital videos" or "creating instructional videos with artificial intelligence" or "multimedia design with artificial intelligence" or "ai-generated videos" or "artificial intelligence videos" or "ai-generated instructors" or "ai-generated-video content" or "ai-generated educational videos" or "ai-generated instructional videos" or "video production by ai"
Taylor & Francis	28	
Education Full Text EBSCO	18	
Sciencedirect	32	
Total	**168**	

2.2 Screening

In the screening phase, studies that were not relevant to the subject of the study were removed. The remaining 109 studies were examined by the researchers according to the inclusion criteria specified in Table 2. First, the titles and abstracts of the studies identified and labeled as inclusion in Table 2 were reviewed according to the inclusion criteria. Since artificial intelligence is an up-to-date field and it is aimed to reach more studies, no year limit was set while screening the studies. In the screening and eligibility phase, studies classified as indexed studies, conference proceedings, book chapters and full text published in English were included. In addition, only studies published in the context of AI-generated digital videos were selected to achieve the research objectives. The search resulted in 109 studies that were evaluated for the third stage.

Table 2.

Inclusion Criteria

- Original articles published in SSCI, SCI-E or SCI in journals (including ESCI indexed studies, conference proceedings, book chapters).

- Written in English.

- It is carried out using any technology related to the production of digital content with artificial intelligence.

● Artificial intelligence or digital video is introduced.

● Academic studies in which artificial intelligence technology is used as an intervention.

● Artificial intelligence is focused on understanding digital videos through the use of technology.

2.3 Eligibility

The third stage of the systematic literature review identified an in-depth manual evaluation of all relevant studies based on the researcher's main topics of the research. Studies describing the creation of digital videos with artificial intelligence were included. All studies that met the inclusion criteria were independently evaluated by two reviewers. A total of 88 studies were excluded from the database because they were not "related to AI and digital video" and "AI and digital video were addressed but not the focus". As a result, 21 studies were included in the systematic review.

2.4 Inclusion and Analysis

The remaining 21 studies were examined and analyzed and answered according to the research questions. The studies included in the scope of the research were analyzed by one of the researchers. The other researcher also checked the analysis to increase the reliability of the research. For each study, a form created in Microsoft Word and the content analysis method used for the data were used. This form includes sections that answer the research questions. The studies were read carefully and the form was filled in separately for each study. Then, the data in the form were transformed into codes, categories and graphs using Microsoft Office Excel program. The data obtained from the analyzed studies were presented descriptively.

The stages of the systematic literature review were taken into account in conducting this research and preparing the report; **(1)** formulating the research question and preparing the protocol, **(2)** extensive literature review, **(3)** determining the inclusion criteria, **(4)** evaluating the quality of the studies, and **(5)** analyzing and interpreting the data.

3. Findings

In line with the above-mentioned criteria, 21 studies on the use of artificial intelligence in digital video production were reached and these articles were analyzed and the findings were presented under headings depending on the research questions.

3.1 Trends in Studies on the Use of Artificial Intelligence in Digital Videos

3.1.1 Distribution of Studies by Type

The distribution of studies on the use of artificial intelligence in digital video production according to their types is shown in Figure 2. It is seen that 4 of the studies on the subject are conference proceedings and 17 of them are articles published in scientific refereed journals.
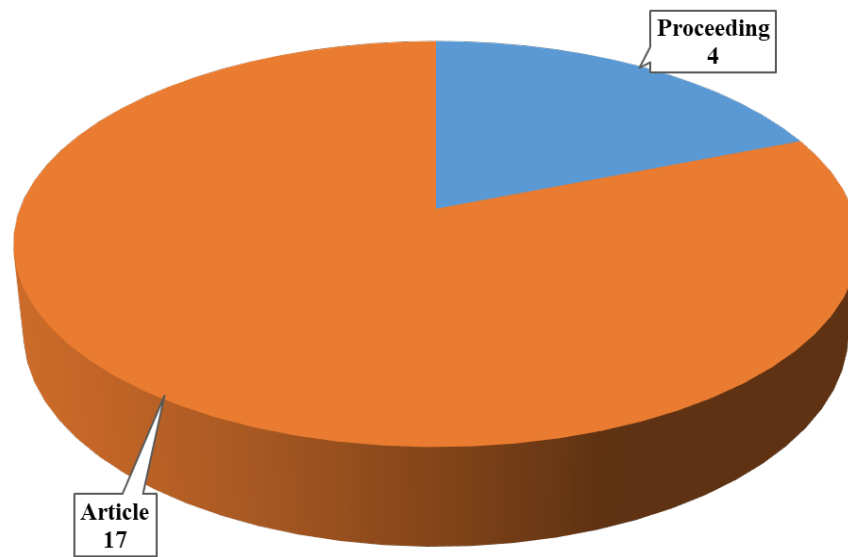
Figure 2. Distribution of Studies by Type

3.1.2 Distribution of Studies by Year

The distribution of the analyzed studies according to the number of journal articles, conference papers and total number of studies is shown in Figure 3. It is seen that the first study was published as a conference paper in 2002 and the studies have continued to increase rapidly until today. It was determined that there was an increase especially in 2022 (n=7) and 2023 (n=6).
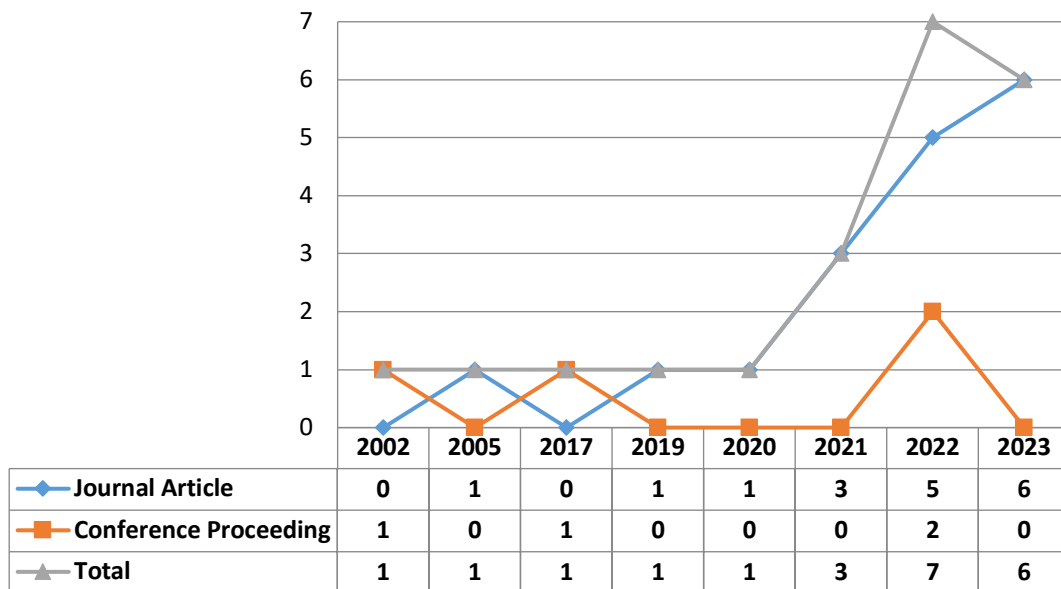

	2002	2005	2017	2019	2020	2021	2022	2023
Journal Article	0	1	0	1	1	3	5	6
Conference Proceeding	1	0	1	0	0	0	2	0
Total	1	1	1	1	1	3	7	6

Figure 3. Distribution of Studies by Years

3.1.3 Distribution of Studies According to Place of Publication

The distribution of the journals in which the analyzed studies were published and the conferences in which they were presented as papers is presented in Figure 4. It is seen that the analyzed studies were published in different international journals and conferences.
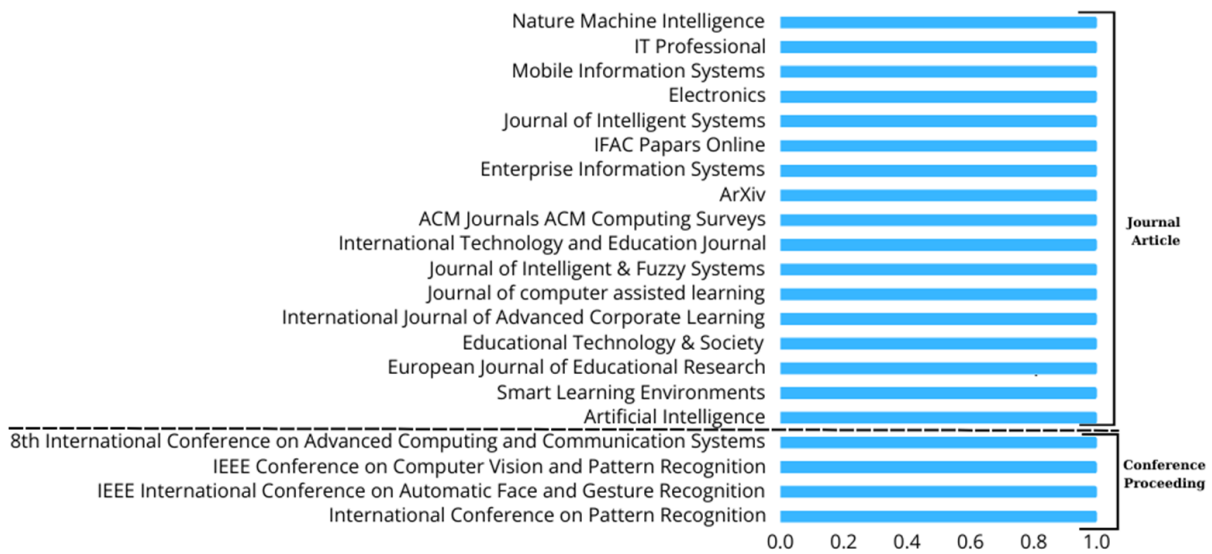
Figure 4. Distribution of Studies According to Place of Publication

3.1.4 Topics Investigated in the Studies

The list of topics studied in articles and papers in the international literature on the use of artificial intelligence in digital video production is presented in Table 3. In Table 3, it is seen that the studies examined within the scope of this research conducted research on the creation of content for digital media through different tools and methods.

Table 3.

List of the Subjects Analyzed in the Studies

Study Subject	Study Type
Analyzing the vocalization of textual expressions by virtual characters generated by artificial intelligence	Article
Examining the structure of AI-generated deepfake and synthetic media	Article
Creating short news video based on artificial intelligence	Article
Design a human-computer interaction system framework including speech recognition, text-to-speech, dialog systems and virtual human generation	Article
Identifying rumor information in news media and film and television media and reorganizing it with artificial intelligence intelligent algorithms	Article
To show how AI can be used for creative purposes and to produce an AI-generated music video for the song "Initiation"	Article
Producing interactive digital story video by AI	Article
Comparing student- and AI-generated video learning content	Article
Creating persuasive video powered by AI	Article

Generating educational videos from visual content by artificial intelligence	Article
Designing a digital media video display system driven by artificial intelligence and big data	Article
AI-powered text-to-speech video production using human voice and AI image	Article
Producing audio and text videos with correct and valid questions from previous training videos	Article
To examine whether AI-generated digital videos accurately assess student performance and learning behaviors	Article
Creation of presentation slides with artificial intelligence to introduce the course topics	Article
Automatic subtitling in AI-powered digital videos	Article
Automated cinematography and dynamically producing video documentaries	Article
Investigate the creation of synthetic images from human images	Proceeding
Explain how to create a generative, video realistic and speech animation module with AI techniques	Proceeding
Generating video from text by artificial intelligence	Proceeding
Smart devices produce video from static or dynamic data	Proceeding

3.1.5   Artificial Intelligence Technologies Used in the Studies

Artificial intelligence technologies discussed in the studies on the use of artificial intelligence in digital video production are presented in Table 4. When Table 4 is examined, it is seen that the most common artificial intelligence technologies are natural language processing (n=15), followed by speech recognition (n=5) and deep learning (n=5).

Table 4.

Artificial Intelligence Technologies Used in the Analyzed Studies

Technology Used	f	Source
Natural Language Processing	15	Aktay (2022), Callaway et al. (2005), Denny et al. (2023), Forkan et al. (2023), Gareev et al. (2022), Kumar et al. (2022, March), Li (2022), Malakul & Park (2023), Mazaheri & Shah (2022, August), Miyaji (2019), Pataranutaporn et al. (2021), Pi et al. (2022),Wang & Li (2022), Zhang & Wilker (2022), Zheng et al. (2023)
Deep Learning	5	Callaway et al. (2005), Ezzat et al. (2002), Huang et al. (2023), Lee et al. (2021), Li (2022)
Speech Recognition	5	Ezzat et al. (2002), Huang et al. (2023), Malakul & Park (2023), Pi et al. (2022), Zheng et al. (2023)
Computer Vision	4	Whittaker et al. (2020), Varol et al. (2017), Huang et al. (2023), Liu & Yu (2023)
Games and Entertainment	2	Liu & Yu (2023), Gareev et al. (2022)
Suggestion Systems	1	Wang & Li (2022)

3.1.6 Distribution of Studies According to the Variables Analyzed

The variables examined in the studies conducted in the international literature on the use of artificial intelligence in digital video production are presented in Figure 5. It is seen that the most examined variable in the studies is digital video creation (n=6). This is followed by synthetic media (n=3), speech recognition (n=3), human-computer interaction (n=3) and image recognition (n=3).
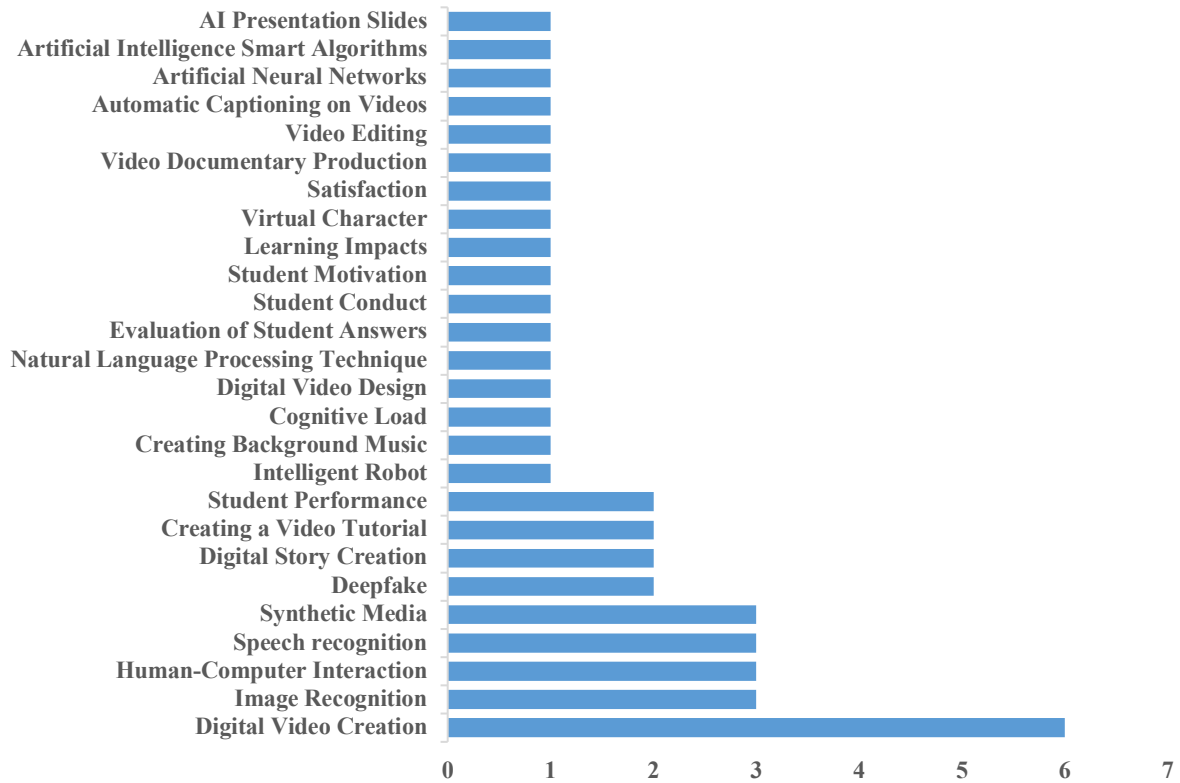

Figure 5. Variables Analyzed in the Studies

3.1.7 Distribution of Studies According to Keywords

The keywords used in the studies analyzed in the international literature on the use of artificial intelligence in digital video production are presented in Figure 6. When Figure 6 is analyzed, it is seen that the most commonly used keyword in the studies is artificial intelligence (n=10).
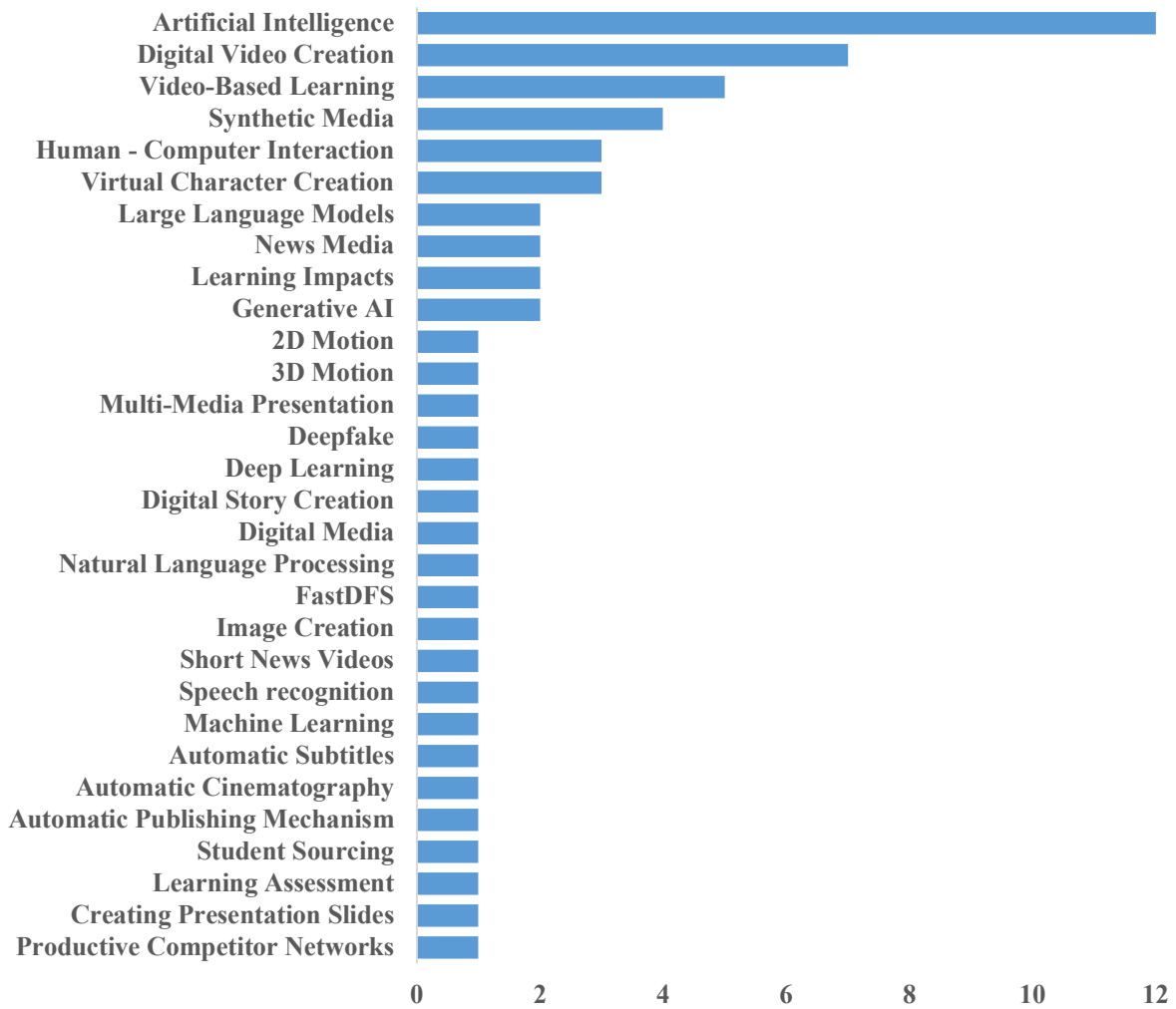
Figure 6. Keywords of the Studies

3.1.8   Breakdown by Benefits Provided

The benefits revealed as a result of examining the studies on the use of artificial intelligence in digital video production are presented in Figure 7. Figure 7 shows that the most frequently identified benefits are visual effects and animation (n=16).
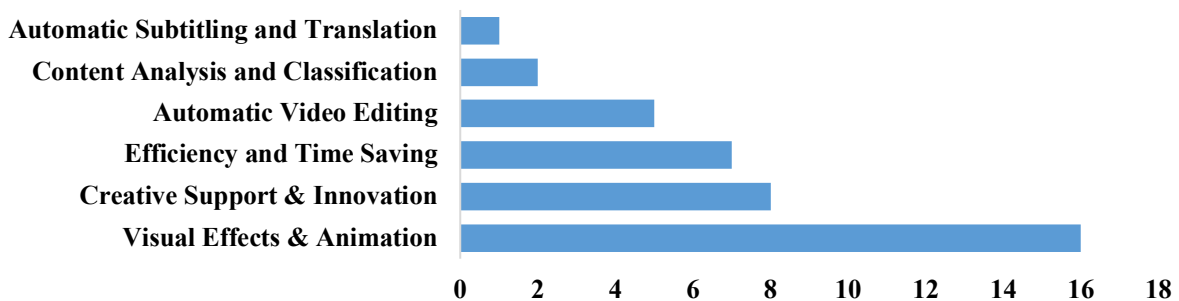

Figure 7. Benefits Provided

4. Discussion and Conclusion

Studies on the use of artificial intelligence in digital video production have shown a remarkable increase since 2002. This increase in the number of studies can be interpreted as the fact that the research trends are in this direction, the method used is up-to-date and the various advantages offered by artificial intelligence. In support of this finding, it is seen that there are studies on the increased use of digital content created by artificial intelligence (Shibata & Omura, 2020) and developments in artificial intelligence technology (Sokolov, 2019). When the studies in the literature on the subject are examined, it is seen that the studies conducted in the early years were mostly on scientific endeavors and basic investigations, while the studies in recent years have focused on the development of applications using artificial intelligence technology within the scope of human-computer interaction (Lv et al., 2022; Naik & Shinde, 2022; Sivakumar et al., 2023). In his study, An (2023) emphasizes that developments in artificial intelligence algorithms have accelerated the process of digital video creation, making it effective and innovative and leading to an increase in the number of studies.

When the included studies on the use of artificial intelligence in digital video production are analyzed, it is seen that the number of studies has increased starting from 2002 until today. It can be said that technological developments in the field of artificial intelligence, the increase in users' demand for digital content, the need for personalization of content, and the fact that digital video production is a current method are the main reasons for the increase in the number of studies. Artificial intelligence has developed phenomenally and its use is increasing worldwide (Sokolov, 2019). Developments such as advanced artificial intelligence algorithms, natural processing techniques, deep learning and machine learning attract the attention of many researchers and lead to scientific studies. In this direction, it is seen that the studies carried out in the early years are on scientific curiosity and basic investigations related to artificial intelligence, while the studies carried out in the following years are mostly aimed at providing application and practice (Lv et al., 2022; Naik & Shinde, 2022; Sivakumar et al., 2023). In his study, An (2023) emphasizes that developments in the field of artificial intelligence have accelerated the digital video creation process, making it effective and innovative.

It was seen that the analyzed studies were published in different journal articles and conference proceedings. It can be said that the fact that the studies were published on different platforms in this way depends on the target audience that the researchers want to deliver their studies. Journal articles and conference proceedings basically serve different purposes and generally present scientific studies on the subject to the target audience. While journal articles aim to present comprehensive, detailed and theoretical information, conference proceedings aim to present innovative ideas, application examples and practical solutions (Daugavet et al., 2019; Fill & Ward, 2020). Examining the studies in different publication platforms such as journal articles and conference proceedings can identify the gap in the literature on the subject in a healthier way and provides an opportunity to advance the field (Huang et al., 2023; Jayanthiladevi et al., 2020).

The studies examined were mostly on "digital video production with artificial intelligence" and "human-computer interaction". These topics can be interpreted as an interesting and important field as well as being related to the purpose of the research. The advanced algorithms of artificial intelligence, the increasing demand for digital content and the exploration of new research areas are effective in the realization of research on digital video production with artificial intelligence. Within the scope of human-computer interaction, interface systems that can interact with users using artificial intelligence features are being developed. These systems have a user-friendly structure and are the result of the ease of use of language processing techniques and AI-supported digital video production tools (Er et al., 2023; Lauriola et al., 2021; Schmidt et al., 2021). The literature can be saturated by realizing innovative and user-centered systems within the scope of these topics.

"Natural language processing", 'speech recognition' and 'deep learning' technologies were frequently used in the studies analyzed. These technologies demonstrate the function of artificial intelligence in

digital video production. In addition, digital video creation processes become more efficient, faster and easier by using these technologies. When the studies in the literature on natural language processing technology are examined, it is seen that digital videos are created in response to text input, analyzed automatically and new scenarios are written from the beginning (Akhila, 2018; Yu et al., 2021). Speech recognition technology can organize digital video with voice utterances, convert voice utterances in digital video into textual expressions, and classify the content it finds by searching for content to find the location of conversations in digital video (Pluzhnikova, 2020). Similar to other AI technologies, deep learning technology also plays an important role in digital video production. Deep learning technology is used to improve the quality of low-resolution digital videos, edit and edit digital video content, and add impressive effects to digital videos (Malik et al., 2022; Yavuzkilic et al., 2021). Therefore, it is predicted that the development and use of these technologies in future studies will provide perspectives in the production of digital videos.

It has been observed that the variables of "digital video creation", "synthetic media", "speech recognition", "human-computer interaction" and "image recognition" have been examined in the researches. Investigation of these variables shows that studies on digital video creation with artificial intelligence are limited. In addition, the frequent use of these variables is due to the increasing demand of users for digital video content (Mikos, 2016). This finding shows that the use of artificial intelligence in digital video production has been adopted by many researchers. Therefore, it can be said that it will be important to conduct new studies using these variables.

Among the most commonly used keywords in the studies examined within the scope of the research are "artificial intelligence", "digital video creation", "video-based learning" and "synthetic media". These keywords show that the use of artificial intelligence in digital video production has wide effects and various application tools. In addition, further research to understand the use of AI in digital video production in a broader framework contributes to the literature.

Among the benefits provided by the use of artificial intelligence in digital video production, "visual effects and animation creation" and "creative support and innovation" ranked high in the studies analyzed. These benefits can be attributed to users' increasing demand for digital content, their desire to communicate more with digital content, and their desire to create digital content faster and more effectively. In addition, in terms of digital videos being a visual design field, the use of impressive and creative effects can be provided by artificial intelligence design technologies. This finding is supported by many studies in the literature (Li, 2023; Liu & Peng, 2021; Xian & Sahagun, 2023). In addition, when other studies in the literature are examined, it is seen that by using artificial intelligence in the process of creating visual effects and animations, human intervention is minimized and creativity time is accelerated (Santos et al., 2021; Wang, 2019). It is possible to see these benefits especially in the movie and digital game industries (Epstein et al., 2023). Digital videos used in the movie and gaming industries can be created in a high quality way at low cost.

In conclusion, this study has revealed important findings about the scientific studies on the use of artificial intelligence in digital video production. There are many artificial intelligence technologies in digital video production and researchers can use these technologies to create digital videos faster and more efficiently and reduce the cost of digital video production. They can also develop technically and economically richer materials. Practitioners can introduce new ideas and approaches by using AI in education.

In future studies on the use of artificial intelligence in digital video production, it will contribute to the originality of the research if researchers plan their studies by considering these points. This study is limited to the keywords used and the studies accessed until November 2023 in the databases kept within the scope. Studies that could not be accessed through the database were excluded.

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