

The Effectiveness of Using Interactive Video on Teaching Social and National Education in Developing Students Visual Thinking

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Abstract

The study aimed to reveal the effectiveness of using interactive video on teaching social and patriotic education in developing visual thinking among students, the study sample consisted of (48) fifth-grade students from Mada International Academy affiliated to Wadi Al-Seer Brigade in the Jordanian capital, Amman. The study used a semi-experimental design, and the study sample was distributed to Two groups: an experimental group (25) students and a control group (23) students, and the results showed a statistically significant difference in visual thinking, and that the difference was in favor of the experimental group who were exposed to the interactive digital video teaching method compared to the members of the control group, and in light of this the study presented a group Among the recommendations, the most prominent of which is the need to use interactive digital video while teaching social and national education, because of its effectiveness in developing students' visual thinking skills, such as: What the researcher recommends is that school administrations should pay attention to providing the material requirements for teaching using interactive digital video for various study subjects such as computer labs, the Internet, projectors and others.

Keywords: interactive video, visual thinking.

Introduction

The concept of e-learning has spread since the use of electronic means to process lessons in traditional classrooms and the use of multimedia in the processes of teaching and self-education, building smart schools and virtual classrooms that allow students to attend and interact with lectures and seminars held in other countries through the Internet and interactive technology where The technology revolution has made rapid progress and it has become necessary to know that it will benefit from this modern technology and has entered all areas of daily life and has already become one of the greatest fields, and in the early nineties the term e-learning appeared as one of the uses of technology in learning (Abed, 2019).

E-learning includes many types of media that transmit text, audio, images, animation, and video streaming. It includes applications and technical processes such as audio or video tape, satellite television, CD-ROMs, computer-based learning, in addition to intranet and web-based platforms. In addition to information and communication systems, whether stand-alone or based on local networks or the Internet in networked learning (Dvoryanchikov, Kalashnikova, Pechnikova & Frolova, 2016).

Interactive video is one of the innovations in educational technology, as it provides audio-visual information based on the learner's responses, in which sound and images are displayed through a display screen, which is part of an integrated unit consisting of a computer and a data entry device, a program divided into subsections consisting From dynamic sequences, static frames, questions

and lists, the learner's responses through the computer are the determinant of the number of sequences of clips or video scenes (Shalaby, Al-Masry, Asaad and El-Desouky, 2018).

McLendon (McLendon, 2017, P16) defined interactive video as "a digital multimedia presentation that is coordinated and arranged within a specific framework chosen by the teacher to suit specific lessons, and has many possible applications, and can provide distance education services, and is By increasing interaction and participation in the classroom.

Jett, Sacchi, Lee & Clarke, 2016, p23, add to the above that the interactive video is "a pedagogical academic method that is used by the teacher in the classroom, through which he supports the curriculum In the video, to be better explained and easier to understand and explain to students of all age groups.

In addition to the above, Anderson & Davidson (2019 p16) define interactive video as "a form of media that allows users to interact with content. Interaction in videos can come from many different types of functions. Through it, activating modern teaching methods and raising the level of advanced education, which conveys the explanation and ideas in a much clearer way to the student than the traditional method."

The interactive video has many characteristics as it provides the ability to control the presentation of the learner, interact with the links and options that appear during the video playback, and also provides more explanation and additional information that can be provided according to the preferences of each student, and is characterized by flexibility and ease of dealing in terms of The possibility of submitting and returning with the video when explaining, the ability to close it and turn it on at any time, and the possibility of modifying it according to the requirements of the lessons to be explained. Thus, the interactive video provides learners with a customized learning environment, motivating students and increasing their motivation to learn (Cobârzan, Schoeffmann, Bailer, Hürst, Blažek, A. , Lokoč & Rossetto, 2017).

Interactive videos transform the learning experience from one-way communication to exchanging information with the learner taking an active role Interactive video can include a wide range of active elements, including click-

to-discover interactions, questions, polls, and more, resulting in interactive video The interactive videos also provide students and teachers with control over it in a way that allows them to design and organize the virtual learning environment, where they can watch and learn from the videos at their own pace without pressure from teachers or classmates, in addition, they always have the choice of either moving to the contents of Subject in advance or stick to set basics, interactive video can help with self-learning (Palaigeorgiou & Papadopoulou, 2019).

Al-Hinnawi (2012) indicated that there are many stages of interactive digital video design, which are:

First: the analysis stage, which includes: analyzing the characteristics of learners, defining general and specific goals, defining, analyzing, segmenting and organizing educational content, and deriving and formulating educational goals.

Second: the planning stage, which includes: defining the parts and elements of the interactive digital video (the introduction, the content of the interactive digital video, the pre-, post- and post-test, and the conclusion), defining detailed self-learning, and mapping workflows, the pillars of diagrams and programming.

Third: The stage of implementation and production (design and programming), which includes: designing interactive interfaces, writing and formatting text, producing and modifying sound materials and sound effects, producing graphics and still images, producing animations and moving effects and modifying them, video production, adjusting and integrating multimedia production and programming.

Fourth: The evaluation stage, which includes: arbitration of interactive digital videos from a scientific point of view, arbitration of interactive digital videos according to design standards, conducting experiments in exploratory groups, and providing observations and reviews according to the evaluation process.

Visual thinking is considered one of the most important mental operations carried out by individuals, and one of its most important

characteristics is that it depends on images, colors, and hints, and links visual stimuli with mental structures, to reach new concepts, meanings, or relationships, and helps to organize and reshape mental images with purposeful visual models (Al-Harbi, 2021).

Al-Abadi (2020, p. 48) defines it as “the ability to analyze what surrounds an individual in his environment by processing ideas in visible light.” The resulting perception refers to the name of sight or vision, and refers to the way we see and interpret all the visual information around us.

Al-Hamid (2020, p. 255) defines it as “the individual’s mental ability to translate the visual stimuli he sees into the linguistic instructions he represents in describing visual tools, realizing their relationships, analyzing and interpreting ambiguities in them, and extracting meaning and concepts.”

Visual thinking skills are one of the skills that encourage the learner to visually distinguish information by integrating his visual perception and cognitive experience for language acquisition, a visual image formed by the mind after processing it through memory, thanks to the brain’s search for meaning and relationships (Al-Najjar, Al-Najjar, Suleiman, 2022).

By reviewing previous literature, the researcher found agreement between Amer and Al-Masry (2016), and Dake's study (Dake, 1993) dividing visual thinking skills into:

First: Visual reading skill: It refers to the ability to determine the dimensions, size and nature of the displayed image.

Second: The skill of analyzing shapes and images: It means the ability to display relationships in shape and image, and to identify and classify the characteristics of those relationships.

Third: The skill of interpreting information: It means the ability to link relational elements in images and shapes, identify gaps, and find interconnectedness and differences between them.

Fourth: The skill of inferring meaning: the ability to derive new meanings and ideas and to derive concepts and principles from shapes and images.

Al-Harbi (2021) adds that visual thinking is important in the educational process, which is through the ability to deal with modern technological developments required to meet the challenges of the times, as well as when displaying shapes and images, it helps to strengthen the relationship between learners and their surroundings inside and outside the school, and provides great image visualization. A mentality that may be relevant to the learner's life, and in terms of development and innovation, it also helps to encourage cooperation and exchange of experience with others, as well as an interest in the dynamic production, activities, drawing and creative work that learners need.

Previous Studies

Mustadi (2019) conducted a study aimed at increasing students’ critical thinking ability using the visual thinking technique. Students’ critical thinking ability was measured through 6 indicators, five of these indicators measured students’ cognitive ability through analysis, description and interpretation and assessment and conclusion of the activity, while the other indicator measured the students' emotional ability to self. The list, 40 university students in Indonesia participated, and the methodology used in the research was descriptive-analytical, and the tools used were a written test in the form of an essay and an interview, and the result of the research showed that the use of visual thinking technique made students’ critical things increase for all indicators, which is the ability to On the analysis, description, interpretation, evaluation, conclusion, and evaluation of self-regulation on their own.

Al-Sunaid (2020) conducted a study aimed at identifying the effectiveness of an interactive educational video in the academic achievement in geography of sixth grade students in Madaba Governorate. The sixth grade students at Ibn Tamimah Comprehensive School in Madaba Governorate, were divided into two groups: the experimental group consisted of (30) students who were taught geography using interactive video, and the control group consisted of (30) students who were taught geography in the usual way, and the results showed The study found that there were statistically significant differences between the mean scores of the

control group and the experimental group in favor of the experimental group in the post test, which was studied using the interactive video.

Laila & Raharja (2021) conducted a study aimed at determining the effect of interactive video media on stimulating student learning in fifth grade social studies in Singapore. The research was conducted using interactive video media in learning social studies in the equal semester of the academic year 2020/2021. The research used the experimental method and applied it to the same group by making it experimental and control. The sample of this study included all fifth-grade students in a school and their number was 20 students (11 female students and 9 male students), and the results were reached that there is an impact on the use of interactive video media on stimulating learning Social studies for fifth graders.

Al-Khafaji (2021) conducted a study aimed at knowing the effect of teaching physical geography on visual thinking skills in the achievement of fifth-grade literary female students. The study was conducted in Iraq, and used the experimental method. The research sample consisted of (64) students. The fifth literary grade in the preparatory and secondary day schools for girls affiliated with the General Directorate of Education in Baghdad / Al-Rusafa with (32) students in the experimental group and (32) in the control group. There are no statistically significant differences between the average scores of the experimental group students who study physical geography in visual thinking skills and the average scores of the control group students who study the same subject in the usual way in achievement), and the results in the achievement test showed the superiority of the experimental group students who studied physical geography The students of the control group who studied the same subject in the usual way.

Al-Surour and Al-Ajmi (2022) conducted a study aimed at identifying the effect of using the thinking maps strategy in teaching physics concepts to develop visual thinking skills for second-grade female students. The study was conducted in the Kingdom of Saudi Arabia, and the experimental method was used, and the

study sample consisted of female students The second secondary school at Al-Khazara Secondary School for Girls, consisting of (60) female students, was divided into two experimental and control groups. The study tools used a test of visual thinking skills in the “Waves and Vibrations” chapter. The results showed that the experimental group outperformed the control group in developing visual thinking skills, and also showed the greater The size of the effect in teaching physics concepts using the thinking maps strategy to develop the visual thinking skills of the experimental group students.

methodology

The quasi-experimental approach was used in order to answer the study question, and according to the design of the experimental and control groups, where the experimental group was subjected to a unit study using digital interactive video, and the control group was taught the educational unit in the traditional way.

study

population consisted of all fifth grade students in schools affiliated with the Directorate of Education, Capital Governorate / Wadi Al-Seer District in Jordan, whose number is (3068), according to its statistics for the academic year 2021/2022.

Study sample The study

sample consisted of Mada International Academy, which is one of the schools located in the capital Amman Governorate / Wadi Al-Seer District. Two divisions of fifth-grade students were chosen from this academy in a random way from among the 3 available divisions in the Academy. The number of students in these two divisions is (48) male and female, and one of them was appointed as an experimental group, numbering (25) students, and the other as a control group, numbering (23) students. Table (1) shows the distribution of the sample members according to the variable of the teaching method (interactive digital video, traditional).

Table (1): Frequencies and Percentages by Study Variables

	Categories	Educational Unit	Frequency	Percentage
Group	experimental	Interactive Digital Video	25	%52.08
	control	Traditional	23	%47.92
	Total		48	%100

Study tools

To answer the study question and verify its hypotheses, the following tool was used:

Visual Thinking Test

The visual thinking test was prepared to measure the acquisition of visual thinking skills by fifth grade students in the unit (Living Together) of the Social and National Education book using the digital interactive video, according to the following steps:

- The educational literature related to visual thinking was referred to.
- Previous studies related to visual thinking were referenced.
- The visual thinking skills were reached (reading shapes, analyzing shapes, deriving meanings, interpreting information).
- The unit (Living Together) was referred to, analyzed and questions were formulated according to visual thinking skills. The number of test items in its initial form was (20) questions, with (5) questions for each of the skills.

Validity of the Visual Thinking Test

The validity of the test content was confirmed by presenting it to a group of arbitrators from the Department of Curriculum and Teaching with experience from PhD holders in social studies curricula and methods of teaching them, and a number of educational supervisors in the Ministry of Education, whose number was (12)

arbitrators. They were asked to express their opinion on the inclusion of the test items and their suitability for each skill, the extent to which the test achieved the purpose of the study, the extent to which the test questions were clear and covered skills, and the extent to which the alternatives were related to the questions, as it was presented to a specialist in the Arabic language to ensure the linguistic and grammatical integrity of the paragraphs. In light of the arbitrators' observations, some paragraphs were modified.

The stability of the visual thinking test The stability of the test

was verified by applying the test to an exploratory sample from outside the study sample consisting of (20) students from Mada International Academy. The test-retest method was used, where the test was re-applied with an interval of two weeks. From the first application of the test, then the Pearson correlation coefficient was calculated between the two applications, which amounted to (0.936), and this value indicates that the test has a high degree of stability, and this enhances the accuracy of the study tool and the possibility of applying it to the study sample to achieve its purposes.

Coefficients of difficulty and discrimination

The coefficients of difficulty and discrimination were calculated for the paragraphs of the visual thinking test for an exploratory sample of (20) students from outside the study sample. As Table (2) shows.

Table 2: Difficulty and discrimination coefficients for the paragraphs of the visual thinking test Item

Paragraph number	Difficulty	coefficient Discrimination coefficient	Paragraph number	Difficulty	coefficient Discrimination coefficient
1	0.70	0.8	11	0.50	0.4
2	0.55	0.7	12	0.65	0.5
3	0.25	0.5	13	0.35	0.5
4	0.85	0.5	14	0.55	0.7
5	0.40	0.4	15	0.50	0.6
6	0.70	0.4	16	0.70	0.4
7	0.80	0.4	17	0.50	0.6
8	0.70	0.6	18	0.85	0.5
9	0.40	0.4	19	0.40	0.8
10	0.50	0.4	20	0.40	0.4

It is clear from Table (2) that the values of the difficulty coefficients for the visual thinking test items ranged Between (0.25-0.85), the discrimination coefficients for the test items ranged between (0.4-0.8), and these values are within the acceptable range for keeping the test items, according to the criterion referred to by Odeh study (2010), which is summarized as follows:

1. Items that Its coefficients of difficulty range between (0.8-0.24) which are acceptable and sustainable.
2. Paragraphs with a negative discrimination coefficient are deleted without being preserved.
3. Items with values of discrimination coefficients between (0.0 -0.19) are considered weak and should be removed.
4. Clauses whose values of discrimination coefficient range between (0.19-

0.39) are acceptable and it is recommended to improve them.

5. Paragraphs with a coefficient of discrimination higher than (0.39) are considered to have a good coefficient of discrimination and are retained.

In light of the previous criteria, all (20) questions of the visual thinking test were retained.

The equivalence of the experimental and control groups in the tribal test

To verify the equivalence of the students of the experimental and control groups in the tribal visual thinking test, the arithmetic averages and standard deviations of the grades of the fifth grade students in the tribal test were calculated according to the group variable (experimental, control), where the (t-test) was used to show the significance of the statistical differences between the arithmetic averages in the two groups, and Table (3) shows this.

Table (3): Arithmetic averages and standard deviations of the grades of the fifth grade students on the tribal test using (t-test) according to the group variable (experimental, control)

Group	Number	Standard Arithmetic mean	deviation	value (t)	Degrees of freedom (F)	Statistical significance (sig)
experimental	23	10.09	2.61	0.098	46	0.875
control	25	10.16	2.58			

* Statistically significant at the significance level (0.05)

It appears from Table (3) that there are no statistically significant differences at the significance level ($\alpha \leq 0.05$) Between the arithmetic averages of the scores of the experimental and control groups on the tribal visual thinking test, which indicates the equivalence of the two groups in the tribal application.

Statistical processing

To answer the study question and achieve its objectives, the following statistical methods were used:

- Arithmetic means, standard deviations, and t-test to verify the equivalence of the two study groups on the pre-test.

- Arithmetic averages were calculated using an associated analysis of variance (ANCOVA).

Study results

Presentation of the results of the study question: Are there statistically significant differences at the significance level ($\alpha=0.05$) between the arithmetic averages of the experimental group and the control group on the visual thinking test due to the teaching method (interactive digital video, traditional)?

To answer this question, the arithmetic means and standard deviations of the achievement of fifth grade students in the visual thinking test, before and after, were calculated according to the teaching method (interactive digital video, traditional), as shown in Table (4).

Table (4): Arithmetic averages and standard deviations of the achievement of fifth-grade students in the visual thinking test, before and after, according to the teaching method (interactive digital video, traditional)

Skill	Teaching Method	Number	Pretest		Post test	
			Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation
read shapes	Conventional	23	2.96	1.26	3.52	1.75
	Interactive Digital Video	25	2.92	0.95	4.56	0.65
Analyzing	traditional	23	2.70	1.10	3.09	1.86

	Interactive Digital Video	25	2.52	0.92	4.28	0.84
meanings	traditional	23	2.13	1.51	3.26	1.57
	Interactive Digital Video	25	2.12	1.01	4.44	0.96
Interpreting	traditional	23	2.30	1.40	3.52	0.99
	Interactive Digital Video	25	2.60	1.04	4.64	0.64
Visual thinking as a whole	Traditional	23	10.09	2.61	13.39	4.41
	Interactive Digital Video	25	10.16	2.58	17.92	1.41

Statistically significant at significance level ($\alpha \leq 0.05$).

It is evident from Table (4) that there are apparent differences between the arithmetic averages of the pre and post tests for the performance of the study sample members on the visual thinking test as a whole according to the teaching method (interactive digital video,

traditional) in favor of the interactive digital video teaching method and for all test skills (reading shapes, analyzing shapes, infer meanings, interpret information). In order to verify the significance of these differences, and to find out whether these apparent differences are statistically significant, one-way ANCOVA was used, as shown in Table (5).

Table (5): The results of the accompanying way ANCOVA analysis of the effect of the teaching method on the achievement of the fifth grade students in the visual thinking test

Source of variation	Source of variation	Total squares	degrees of freedom	average total squares	value F	statistical significance	size (η^2)
Reading figures	Pretest	.016	1	.016	.013	.910	.000
	Method Teaching	12.913	1	12.913	70625	.008	.142
	Error	77.899	46	1.693			
Analysis of shapes	Pretest	.370	1	.370	.361	.551	.008
	Method Teaching	17.051	1	17.051	8.446	.006	.155
	Error	92.866	46	2.019			

meanings	Pretest	.001	1	.001	.001	.978	.000
	Method Teaching	16.655	1	16.655	10.003	.003	.179
	Error	76.595	46	1.665			
Interpretation of information	Pretest	1.047	1	1.047	.699	.407	.015
	Method Teaching	14.980	1	14.980	21.876	.000	.322
	Error	31.499	46	.685			
Visual thinking as a whole		.064	1	.064	.010	.923	.000
		245.682	1	245.682	23.776	.000	.341
		245.682	1	245.82			

Statistically significant at the level of significance ($\alpha \leq 0.05$).

The results of Table (5) indicate that there are statistically significant differences between the averages of the experimental and control groups in the post test of the achievement of the fifth grade students in the visual thinking test, where the value of (P) with regard to the teaching method was (23.776), with a significance level equal to (0.000), These differences came in favor of the experimental group, which got a higher mean.

Table (5) also shows that the value of the effect size resulting from the use of interactive digital video in developing visual thinking among fifth grade students reached (0.341), and this value is considered high, depending on Cohen's classification of the effect size (Cohen, 1977).

The results of Table (5) indicated that there were statistically significant differences between the averages of the experimental and control groups in the post test of the

achievement of fifth grade students in all visual thinking skills (reading shapes, analyzing shapes, deriving meanings, interpreting information), where the value of (P) for the skill of reading shapes in relation to the teaching method (7.625), and at the level of significance (0.008), while the value of (P) for the skill of analyzing shapes with regard to the teaching method reached (8.446), and at the level of significance (0.006), and the skill of deriving meanings reached a value of (Q) with regard to the teaching method (10.003), with a level of significance (0.003), and the value of (P) for the skill of interpreting information with regard to the teaching method was (21.876), and at a level of significance (0.000).

In order to find out in favor of which group the differences came, the modified arithmetic averages of the marks of the fifth grade students in the dimensional visual thinking test were calculated as shown in Table (6).

Table (6): The adjusted arithmetic averages and standard errors of the marks of the fifth grade students in the dimensional visual thinking test.

Group	arithmetic mean average	standard error
Experimental	17.920	0.643
Control	13.391	0.670

from Table (6) that the adjusted arithmetic mean of the marks of the fifth grade students in The dimensional visual thinking test for the experimental group amounted to (17,920), while the control group averaged (13.391), and this indicates that the differences came in favor of the experimental group.

Discussing the results of the study question: Are there statistically significant differences at the significance level ($\alpha=0.05$) between the arithmetic averages of the experimental group and the control group on the visual thinking test due to the teaching method (interactive digital video, traditional)?

The results related to this question showed that there were statistically significant differences between the averages of the experimental and control groups in the post test of the achievement of the fifth grade students in the visual thinking test, where the value of (P) with regard to the teaching method was (23.776), and with a significance level equal to (0.000), as it came These differences are in favor of the experimental group that got a higher mean.

The results also showed that the value of the effect size resulting from the use of interactive digital video in developing the visual thinking of the fifth grade students amounted to (0.341).

The results also indicated that there were statistically significant differences between the averages of the experimental and control groups in the post test of the achievement of fifth grade students in all visual thinking skills (reading shapes, analyzing shapes, deriving meanings, interpreting information), where the value of (P) for the skill of reading shapes reached With regard to the teaching method (7.625), and at the level of significance (0.008),

while the value of (P) for the skill of analyzing shapes with regard to the teaching method was (8.446), and at the level of significance (0.006), as for the skill of deriving meanings, it reached a value of (P) with regard to The teaching method (10.003), and the level of significance (0.003), and the value of (P) for the skill of interpreting information with regard to the teaching method was (21.876), and at the level of significance (0.000), as all these differences came in favor of the experimental group that got a higher arithmetic mean.

This indicates that there is an effect of the interactive digital video in developing the visual thinking of the students of the experimental group compared to the students of the control group who were taught in the traditional way.

This result may be attributed to the fact that interactive digital video is based on the use of visual and auditory stimuli such as texts, graphics, static and animated images, hints, interaction buttons, links of educational activities and interactive games that move students from the level of receiving and listening to the level of interaction and mental and mental activity that makes students feel that they are in A real world compared to the traditional teaching method, which is characterized by rigidity and information-filled.

This may also be due to the fact that the interactive digital video generates motivation and motivation for students to learn the topics of the subject, and increases their enthusiasm for positive interaction with the presented information and concepts.

The superiority of the students of the experimental group over the students of the control group in visual thinking skills may be attributed to the fact that the visual effects used by the interactive digital video develop the mental abilities associated with these stimuli, so new information and concepts are easily acquired and quickly remembered when students are exposed to visual stimuli related to this information.

The color pattern in the interactive digital video is one of the cognitive factors that contribute to remembering and retrieval of information, in a way that develops students' ability to notice visual forms, read them, analyze them into their elements, and the ability to deduce

relationships between images or multiple shapes, describe shapes and distinguish them and realize their contents.

The superiority of the students of the experimental group over the students of the control group in the visual thinking skill represented by reading shapes may be attributed to the fact that the interactive digital video develops the students' ability to identify the displayed shapes, images and symbols, understand their contents, and determine their dimensions and nature.

The superiority of the students of the experimental group over the students of the control group in the visual thinking skill represented by analyzing shapes may be attributed to the fact that the interactive digital video, with its use of visual stimuli, increases the students' ability to focus on the minute details in the form or image and pay attention to its partial and total data.

As for the superiority of the students of the experimental group over the students of the control group in the visual thinking skill represented in interpreting information, it may be due to the fact that the use of interactive digital video in teaching the subjects of the subject enables the student to understand and clarify the implications of shapes and images, and to bring them closer and perceive the relationships that link them.

The superiority of the students of the experimental group over the students of the control group in the visual thinking skill represented in deriving meanings can be explained by the fact that the interactive digital video develops the students' ability to extract new principles, concepts and meanings, through the displayed images and shapes.

Recommendations

In light of the results that were reached, the following recommendations were made:

1. The researcher recommends the necessity of using interactive digital video while teaching social and patriotic education, because of its effectiveness in developing students' visual thinking skills.

2. The researcher recommends that school administrations should pay attention to providing the material requirements for teaching using interactive digital video for various study subjects such as computer labs, the Internet, projectors and others.

3. The researcher recommends conducting more studies and research that demonstrate the impact of using different teaching methods such as (electronic educational games, smart interactive boards, and educational applications) in developing visual thinking.

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