USE OF FILMS, PLATFORMS, AND EDUCATIONAL APPLICATIONS IN PRIMARY EDUCATION

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ABSTRACT

The purpose of this study is to investigate primary school teachers' perceptions regarding the frequency of using educational platforms, digital applications, and videos for teaching science and geography. Data collection was carried out through a questionnaire survey in which 107 primary school teachers voluntarily participated. The analysis included: the frequency with which teachers use videos in science lessons, from various sources; the frequency of students using digital games and videos from various sources; the frequency of teachers creating/editing videos; the frequency of teachers using educational platforms and applications in science lessons; and the frequency of students using digital applications. The results show that primary school teachers use videos in science and geography lessons, most frequently using video clips, and that they rarely create, edit, or adapt videos using digital applications. Primary school teachers consider that students frequently use digital games and quite rarely use digital applications.

Keywords: *movies, educational platforms, digital applications, primary education, sciences, geography*.

INTRODUCTION

In the information age, digital technologies represent a real potential for teaching and learning (Juuti et al., 2022), and the demand for technological tools that can support the teaching and learning process is rapidly increasing (Nhan & Thu, 2023). Currently, as a result of the development of information and communication technology, education systems worldwide can benefit from the development of educational platforms, the variety of digital applications, and resources available for free or at a cost.

As a result of the COVID-19 pandemic, learning and video conferencing platforms have been and are frequently used in the Romanian education system, providing facilities for teachers to organize multimedia activities (Vereș et al., 2020a; Dulamă & Ilovan, 2020), for viewing and using films in learning activities (Vereș et al., 2020a), and for other educational resources. The way Google Classroom and video conferencing platforms such as Google Meet and Zoom are used in teaching has been described in studies aimed at supporting teachers in their use (Ilie, 2021a, b, c). By using various platforms, learners can maximize their learning experience (Omar & Hasim, 2021).

The applications available on the internet provide opportunities for creating teaching materials, and video conferencing platforms allow for their use. Through the social media platform Zoom, short educational films have been created by students (Dulamă et al., 2020a) and teachers (Ilie et al., 2020a). The social network Facebook and the YouTube application allow for the viewing, downloading, and sharing of films (Magdaș et al., 2018). Worldwide, many organizations—such as the European Space Agency (ESA), the National Aeronautics and Space Administration (NASA), and the European Southern Observatory (ESO)—produce films and other multimedia materials that they distribute free of charge via the internet (Vereș & Magdaș, 2020b).

Due to the rapid development of communication and information technology and the decreasing costs, teachers, students, and pupils in Romania have access to electronic devices (computers, tablets, smartphones) that they can use to create and edit films (Dulamă et al., 2020b; Dulamă et al., 2019) and to distribute them on the internet, thereby increasing the availability of educational films in Romanian. Electronic devices are used for documentaries by students who will become teachers (Magdaș et al., 2018) and by primary school teachers (Vereș & Magdaș, 2020a). Future teachers use electronic devices in field research (Rus et al., 2019), as well as in the development of certain projects (Ursu et al., 2019). Primary school teachers use electronic devices and various applications in the design and implementation of educational activities (Magdaș et al., 2019a).

 The opportunity to view and use films, as well as to utilize multimedia resources and digital applications in lessons, increases with the equipping of more and more classrooms with smart boards. Many primary school teachers report that they have access to smart boards and possess the necessary skills to use them (Zoltan et al., 2019; Magdaș et al., 2019b). The use of films and other multimedia products is encouraged in Romania through interactive learning activities in digital textbooks (Dulamă et al., 2017a; Magdaș et al., 2017; Ilovan et al., 2018a).

Films are a valuable educational resource as they represent certain aspects of reality that cannot be adequately depicted through other materials (Dulamă, 1996) and because they fulfill important functions for instruction (Dulamă, 2000). While in cinematography a film is considered an audiovisual work (Turković, 2021), in educational literature, films are regarded as teaching tools, categorized into various types: actual audiovisual means (Crețu & Ionescu, 1982), substitute means (Bontaș, 1995), and audiovisual means (Dulamă, 2010; 2011; 2012). As external, artificial representations created by humans, films relatively faithfully represent certain aspects of reality, employing specific means, procedures, and techniques (Vereș, 2024).

In the educational environment, cognitive objectives are achieved through the use of a variety of films as types (Dulamă, 2000) or as formats of films (Ciascai et al., 2007). In literature from the field of educational sciences, the preparation of teaching activities based on films is described (Dulamă & Roșcovan, 2007), as well as the approach to using films in instructional activities (Dulamă, 2001). Other works present instructional models (Dulamă & Ilovan, 2007), situations of learning activities organized around films (Dulamă & Gurscă, 2006; Dulamă, 2008a, 2008b), and a set of rules regarding the integration of films into teaching activities (Dulamă, 2006).

Films are used by teachers in activities with students to achieve: environmental education and education for sustainable development (Ilovan et al., 2018b; 2019), observation of spectacular landscapes (Dulamă, 2014), and forestry education (Dulamă et al., 2016; Dulamă, 2017b). In primary

education, the viewing of films by students during learning activities aimed at: forming representations (Pahome, 2023a,b), environmental education, observing rural settlements in Romania (Ilie et al., 2020b), understanding plant development (Ilie & Cristea, 2020a), and the relationship between organisms and their environment (Ilie et al., 2020c). Animated films were viewed by students to acquire knowledge about the environment (Iurean, 2018; 2019), the solar system (Vereș & Magdaș, 2020a), the formation of seasons (Vereș et al., 2020b), the water cycle in nature (Vereș et al., 2021), to understand various geographical processes and phenomena (Dulamă & Ilovan, 2007), and to achieve other purposes (Vereș & Magdaș, 2020b).

Based on the literature review, it is found that, in the Romanian education system, including primary education, there is interest in using training platforms, electronic devices, and digital applications, and that teachers and students generally possess the necessary skills to use them. In the context where the development of technologies and applications is occurring at an accelerated pace globally, and electronic means (smart boards, tablets, computers, and other electronic devices) are being introduced and utilized in the Romanian pre-university education system, the question arises as to what extent primary school teachers and students utilize these means in the educational process to improve teaching, learning, and assessment. The aim of our study is to investigate the perceptions of primary school teachers regarding the frequency of using educational platforms, digital applications, and films for learning in science and geography.

The research questions are as follows:
1. What categories of films are used by primary school teachers for learning in science?
2. What sources do primary school teachers use to obtain films for science?
3. What categories of science-themed films are watched by students?
4. How frequently do teachers create or edit films?
5. What educational platforms and digital applications are used by primary school teachers?
6. What digital applications are used by students?

METHODOLOGY

Participants. In this study, 107 primary school teachers participated, comprising both genders (103 female and 4 male). The majority of participating teachers belong to the age groups of 40-49 years (N = 48; 44.9%) and 50-59 years (N = 39; 36.1%). In the 30-39 year age group, there are 13 teachers (12.1%), in the over 60 year age group, there are five teachers (4.7%), and in the 20-29 year age group, there are two teachers (1.9%). Of the participating teachers, 71 (66.4%) have completed master's studies, 29 (27.1%) have completed undergraduate studies, two (1.9%) hold a doctoral degree, and five (4.7%) have secondary education qualifications.

The majority of participating primary school teachers who answered the questionnaire have over 20 years of teaching experience with students: 56 teachers (52.3%) have between 21-30 years of experience, 28 teachers (26.2%) have over 30 years of experience, three teachers (2.8%) have between 6-10 years of experience, and seven teachers (6.5%) have less than 5 years. Among them, 87 (81.3%) have obtained Grade I, 7 (6.5%) have obtained Grade II, 11 (10.3%) have a permanent teaching degree, and two (1.9%) indicated that they have not yet obtained a teaching degree. Most of the participating teachers (N = 58; 54.2%) reported teaching in an urban environment, 43.9% (N = 47) in a rural environment, and 1.9% (N = 2) in both types of environments.

Procedure. Data were collected through a survey conducted in August 2024. We used an online questionnaire designed in Google Forms. The invitation to complete the questionnaire was sent by the author to primary school teachers from Neamț and Sălaj counties via email or WhatsApp. Participation in completing the questionnaire was voluntary. The estimated time to complete the questionnaire is approximately 5-7 minutes. Throughout the research and study process, the confidentiality of the participants' personal data was respected, as well as legal and ethical

requirements, in accordance with the General Data Protection Regulation (GDPR) (2018). No personal data was collected through the questionnaire.

Instrument. The tool used for data collection from primary school teachers ("Questionnaire for Primary School Teachers Regarding the Use of Films, Educational Platforms, and Digital Applications") (Appendix no. 1) was designed by researchers based on their observations and experiences with students, as well as information regarding the use of films, educational platforms, and digital applications in primary education. The items in the questionnaire were analyzed and verified by experts in the field of education sciences. Considering the purpose and research questions, the questionnaire consists of two parts: the first part contains the items, while the second part includes "Participant Information" (gender, age, education, teaching experience, teaching degree, and the environment in which the school is located). The first part of the questionnaire has six sections: I. "Categories of Films Used by Teachers in Sciences" (6 items); II. "Sources from Which Teachers Obtain Films for Sciences" (7 items); III. "Categories of Films with Science Themes Viewed by Students" (7 items); IV. "Film Preparation/Processing by Teachers" (6 items); V. "Use of Educational Platforms and Digital Applications by Teachers" (18 items); VI. "Use of Digital Applications by Students" (17 items). Responses were rated on a Likert scale from 1 to 5, where each value has the following significance: 1 - not at all, 2 - very rarely, 3 - rarely, 4 - often/frequently, 5 - very often. If primary school teachers did not know the answer, they selected "I don't know."

RESULTS AND DISCUSSIONS

Frequency of Film Use by Primary School Teachers in Science Lessons

The results show that the frequency of film use by primary school teachers in science lessons is high across all categories of films, with values ranging from 3.78 (the highest average) to 3.42 (the lowest average) (Table 1). Videos are used most frequently (M = 3.78) in science lessons. This result suggests that teachers prefer to use videos, likely due to their accessibility, the short duration of information presentation in videos, and the visually appealing format.

Documentary films occupy second place (M = 3.76), being used almost as frequently as videos. This result may indicate a preference for professionally structured content, with detailed and contextualized information. Films from school textbooks and animated films have similar averages (M = 3.64 and M = 3.60). This result suggests that, although they are frequently used in science lessons, they are not as highly valued as videos and documentary films. Films from curricular supplements (M = 3.57) and other categories of films (M = 3.42) are used less frequently compared to the other categories, indicating a lower occurrence in daily educational practice.

The results suggest that films are a frequently used educational resource by primary school teachers in science lessons, with a greater emphasis on videos and documentary films, confirming the conclusions of other studies (Ilie & Cristea, 2020; Ilie & Magdaș, 2021). The frequency of using animated films, those from school textbooks, and those from curricular supplements suggests that teachers see these resources as useful, but not as effective for science learning as videos and documentary films. Other categories of films (e.g., feature films) are used the least, which may indicate a lack of appropriate content or a preference for standardized and verified resources. We deduce that films are valued by primary school teachers for their ability to represent complex information in an accessible and engaging way for students.

The standard deviations are quite similar for all categories, ranging from 0.99 to 1.12. These values suggest that some teachers use films from these categories much more frequently than others, due to several factors (accessibility to the internet and computers, available time resources, personal preferences, and students' needs).

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Table 1

The frequency of film usage by primary school teachers in science lessons

Categories of Films	M	SD
Videos	3,78	1,10
Documentary Films	3,76	0,99
Films from Textbooks	3,64	1,10
Animated Films	3,60	1,08
Films from Curriculum Supplements	3,57	1,11
Other Films	3,42	1,12

Frequencies of Film Use from Various Sources by Primary School Teachers

The results show that the frequency of use of films from various sources by primary school teachers varies between 3.82 (the highest average) and 1.31 (the lowest average) (Table 2). Regarding the sources of the films, it is observed that primary school teachers frequently utilize films from the internet (YouTube and other online sources), from CDs/DVDs produced by various companies, as well as from the free website Pinterest, the social media platform Facebook, and the TikTok application.

The results indicate that primary school teachers most frequently obtain films from the website YouTube.com and other online sources, likely due to the ease of finding films on the internet, the lack of a need to create a user account, and the fact that most resources are free. The website YouTube is the most commonly used source (M = 3.82) by primary school teachers for obtaining films that can be viewed in science lessons. This result suggests that YouTube is regarded as a reliable and accessible source that offers a wide range of accessible and varied videos tailored to the diverse needs of students and educational goals.

Other online sources (M = 3.34) are used moderately, indicating that there are additional film sources on the internet, aside from those mentioned in the questionnaire, that primary school teachers have the necessary skills to search for and discover. Furthermore, they show a preference for diversifying their online sources, although their usage is not as frequent as that of films obtained from the YouTube website. It is possible that primary school teachers also use films from digital textbooks available for free on the Ministry of Education's website (Ministry of Education, n.d.). Buzilă et al. (2017) note a trend among primary school teachers in Romania to use animated films from digital textbooks. Regarding future geography teachers, it has been observed that they consume significant amounts of time to engage in activities using internet sources (Dulamă et al., 2015).

The mean of 3.00 attributed to the frequency of using films from CDs/DVDs produced by various companies indicates occasional to rare usage. Although CDs/DVDs are not as relevant in the digital age, they continue to be used, likely due to the verified and high-quality content produced by specialized companies. The very high standard deviation (SD = 2.00) indicates significant variability in the use of films from CDs and DVDs by primary school teachers; thus, some use them frequently, while others use them rarely or not at all.

Although Pinterest and Facebook are well-known platforms, the results show that primary school teachers use them less frequently for educational purposes. The Pinterest website (M = 2.43) and the social media network Facebook (M = 2.42) are rarely used to identify films for science lessons. Future geography teachers allocate significant time resources to conduct various activities on Facebook (Dulamă et al., 2016). Pinterest is an online platform known to teachers as it provides resources for classroom instruction (Navy & Nixon, 2023), functioning as a digital album where users can easily create boards to post, save, or "pin" educational resources online, organized by categories (Brannon et al., 2019; Mull & Lee, 2014), and share information with others (Mull & Lee, 2014).

TikTok, which is the most requested application by children, teenagers, and students worldwide (Putri et al., 2023), is the least used (M = 1.31) by primary school teachers in Romania to retrieve films intended for learning in primary education. This was anticipated in the study since the platform is perceived by them more as an entertainment medium than as an educational one.

Table 2

Frequencies of Film Use from Various Sources by Primary School Teachers

Sources	M	SD
YouTube	3,82	1, 11
Other online sources	3,34	1,15
CD-uri/DVD-uri produced by various companies	3,00	2,0
Pinterest	2,43	1,21
Facebook	2,42	1,13
TikTok	1,31	0,63

Frequency of Use of Digital Games and Movies from Various Sources by Students

Due to students' interest in digital games, we aimed to compare the frequency of their use with that of various categories of films. The perception of teachers is that students most frequently play computer and phone games, spending a significant amount of time on this activity. This result suggests that, in the opinion of teachers, this form of interaction with multimedia content far exceeds the viewing of educational films, with a standard deviation of 1.27, indicating a relatively large variability in teachers' perceptions regarding the frequency of this activity. This result suggests that teachers believe that while many students frequently engage in digital games, there are also some who do so less often. The findings show a greater attraction and preference of students for digital games compared to educational films, likely due to the interactivity, entertainment value of games, and immediate feedback they provide. Digital games, which are preferred activities by students and intrinsically motivate them the most, could be utilized by teachers to facilitate knowledge acquisition and enhance the effectiveness of instruction.

Teachers in pre-university education perceive that their students allocate daily time for digital games, using computers or phones (61.42%) for enjoyment (70.08%) (Dumitru & Ciascai, 2020). A total of 72.44% of surveyed teachers believe that entertaining games result in time loss but agree (66.93%) to use entertaining educational games in the classroom as a tool or method for learning (67.72%) and, to a lesser extent, as a learning framework (55.91%) (Dumitru & Ciascai, 2020). In Romania, game-based learning is practiced in preschool and primary education (Magdaş et al., 2019), with play being associated with intrinsic motivation, as well as with failure and success (Magdaş & Răduţ-Taciu, 2016). The literature highlights some beneficial aspects of online games for children: the development of perseverance in achieving goals, resilience, including in the context of loss, improvement of communication skills, and respect for others' opinions (Magdaş, 2014).

The results show that all films with science themes (animated films, videos, other films, documentaries, films from textbooks, and supplementary materials) are rarely watched by students. primary school teachers perceive that students watch animated films with science themes the most, but still rarely (M=2.72), indicating that they are more appealing to students than other categories of films. Regarding educational content, animated films seem to be the most attractive to students, likely due to the combination of educational content with engaging visual and narrative elements, including characters that children can interact with (Vereş & Magdaş, 2020a; Vereş & Magdaş, 2020b; Vereş et al., 2020a), as well as sound and visual backgrounds that create a pleasant atmosphere.

Science-themed videos (M = 2.60) and other categories of science-themed films (M = 2.54) are rarely watched, indicating a moderate interest among students. In fact, students may watch

science-themed videos on YouTube (for example, about animals and plants, cosmic bodies, or dinosaurs) but might not associate them spontaneously with science or consider them as films rather than videos.

Respondent teachers perceive that students rarely watch science-themed documentaries (M = 2.47). Students might watch documentaries on various television channels, using a "film library," or through streaming services like Netflix (Taishoff & Sargenti, 2019), as well as on YouTube. This result suggests that teachers believe students are not interested in the content of such films and lack the curiosity and motivation to watch them.

Respondent teachers perceive that students rarely watch science films from school textbooks (M = 2.42) and films from curricular supplements (M = 2.39). These results suggest that films from textbooks and curricular supplements are rarely used by students, even though they are permanently available for users. Primary school students can watch films from digital school textbooks available on the Ministry of Education's website, but identifying and using them is difficult and requires navigating many steps, compared to using other online sources. To access films from school textbooks, students need to know the steps to follow to access the section dedicated to school textbooks on the MEN website, and the procedures vary from one textbook to another. Accessing films offered by curricular supplements requires an access code and the installation of the supplement on the computer's memory.

The results show that, in general, students exhibit fairly homogeneous behaviors regarding film viewing. All categories of films have averages below 3, indicating relatively low usage compared to games. This suggests a challenge for teachers and educational content creators: how to make educational video materials more appealing to students. Integrating more interactive elements and visually engaging features, similar to those found in games, could increase students' interest in these films.

Table 3
Frequency of Using Digital Games
and Watching Science-Themed Films from Various Sources by Students

Categories of Films and Games	M	SD
Digital Games	4,04	1,27
Animated Films	2,72	1,15
Videos	2,60	1,08
Other films	2,54	1,15
Documentary Films	2,47	1,12
Films from Textbooks	2,42	1,17
Films from Curriculum Supplements	2,39	1,13

The frequency of film development and processing by primary school teachers

The results indicate that primary school teachers generally develop, process, and adapt film content (M = 2.76) and specifically for science-related films (M = 2.74) using digital applications (Table 4). The mean values suggest this activity is carried out rarely to moderately, indicating that, while there is interest in this activity, it is not frequent. The small difference between the two means suggests a uniform approach to processing general-themed films and those specific to science. This could point to a lack of specific adaptation of content by subject or a homogeneous use of digital applications across different types of films. In both cases, the standard deviation (SD = 1.24; SD = 1.23) indicates that while most primary school teachers rarely use these techniques, there are some who use them more frequently or not at all. The use of digital applications for developing, processing, and adapting film content, including science films, is not yet a consistent practice among primary education teachers.

Regarding the use of their own films, the results show that primary school teachers very rarely use their own films (between "rarely" and "very rarely") in teaching activities in general (M = 2.34) and specifically for science (M = 2.32). This result suggests that, while there is interest in creating and using their own content, this practice is not common, regardless of the subject. The standard deviation (SD = 1.25; SD = 1.21) in both cases indicates that although most teachers rarely use their own films, there are primary school teachers who use them more frequently or not at all.

Primary school teachers perceive that students very rarely make films on various topics (M = 1.94) and science-related topics (M = 1.65), suggesting that film creation is not a common activity among students, despite their access to mobile phones that could easily facilitate film production. The difference in means suggests that science-themed films are perceived as even less frequent than general-themed films, possibly reflecting a perceived additional difficulty for students in integrating scientific content into video projects or a lack of interest in creating science-themed films. The standard deviation (SD = 1.07; SD = 0.83) indicates that, although most students are seen as rarely or never making films, there are isolated cases where teachers believe that some students do create films.

Table 4

The frequency of film development/processing by primary school teachers and students

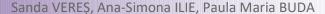| Film Development, Processing, and Usage	M	SD
Development/processing/adaptation of film content using digital applications	2,76	1,24
Development/processing/adaptation of science film content using digital applications	2,74	1,23
Use of personal films	2,34	1,25
Use of personal science-themed films	2,32	1,21
Film creation by students	1,94	1,07
Creation of science-themed films by students	1,65	0,83

The frequency of educational platform and application usage in science lessons by primary school teachers

The results indicate that across all items, the values range from 3.73 (the highest mean) to 1.89 (the lowest mean) (Table 5). Wordwall is the most used educational platform (M = 3.73), suggesting that primary education teachers (primary school teachers) frequently use this platform to create educational games and have an interest in utilizing games as an interactive learning method in science lessons.

Primary school teachers report that they rarely use the Google Maps application (M = 3.07) in science lessons, as it is more suitable for studying locations and understanding geographical concepts. The results also suggest that primary school teachers are less familiar with this application and have limited time resources to utilize it in geography lessons.

The educational platform "Şcoala Intuitext" is rarely used by primary school teachers in science lessons (M = 3.00), indicating that online resources are considered useful in science education. However, it is possible that not all primary school teachers have easy access to the platform, either due to associated costs (a subscription is required for both teachers and students) or due to technical limitations.

Virtual tours in museums (such as the Antipa Museum) are rarely used by primary school teachers in science lessons (M = 2.82), while virtual tours, in general, have a usage slightly below the "rare" level (M = 2.77). This indicates a low interest in utilizing these resources, which can be

explained by the limited duration of science lessons and the time-consuming nature of virtual tours, as well as their inadequacy with educational objectives or the specific themes of science lessons.

Kahoot! is rarely used for creating games (M = 2.71) and for using games created by other users (M = 2.71) in science lessons. It is possible that not all primary school teachers have easy access to the platform, either due to associated costs (a subscription is required for teachers) or due to technical limitations. The results suggest that primary school teachers may not be fully familiar with how to use games created by other users on Kahoot!, or they might consider that many of the available games do not align exactly with their educational objectives or the specific needs of their students. However, the literature presents how to use the Kahoot! platform (Vereş, 2020) and provides a range of examples related to deciduous forests that can be used in forming representations for primary education students (Pahome, 2023c).

The Padlet application is rarely used (M = 2.71) by primary school teachers in science lessons. The rare use of Padlet by primary school teachers can be explained by their limited knowledge of the features it offers, a lack of time for lesson preparation, access to digital resources, and a preference for other digital platforms or traditional methods.

The Google Earth application is rarely used (M = 2.54) by primary school teachers in science lessons, likely because they perceive this application as more relevant for geography lessons. Although the application provides functionalities for geographical exploration and visualizing different locations (Osaci-Costache et al., 2015), it may not always be considered essential for achieving the objectives set at the primary education level.

The educational platform LIVRESQ is rarely used (M = 2.48) by primary school teachers in science lessons. The results may indicate a potential need for additional professional training to fully exploit this resource, as primary school teachers must possess a certain level of digital competence to create or adapt lessons and activities. It is possible that primary school teachers who are not familiar with using complex digital platforms prefer simpler or more intuitive solutions.

The Edpuzzle educational platform is rarely used (M = 2.29) by primary school teachers in science lessons. This result suggests that, for most primary school teachers, processing films with Edpuzzle is not a common practice. Although Edpuzzle allows for the integration of questions and interactions in educational videos (Vereş, 2021a), its use requires knowledge of the platform and how to create and customize content. The platform and its usage may be perceived as complex by primary school teachers, potentially discouraging those who do not possess intermediate or advanced digital skills.

The "Chatter Pix" application is used quite rarely (M = 2.25) by primary school teachers in science lessons. This result may suggest that, although "Chatter Pix" allows for the addition of animations and comments on images, its use may require some familiarity and understanding of the application's functionalities, as it can only be used on mobile phones.

The Google Street application is rarely used (M = 2.24) in geography lessons at the primary education level. This result may suggest that, although Google Street View is designed for exploring locations, it may not have a direct and evident applicability in an educational context.

"Mentimeter" is used very rarely (M = 2.21) by primary school teachers in science lessons. Most primary school teachers use it very rarely or not at all. Although "Mentimeter" is designed for creating questionnaires, tests, interactive questions, and presentations (Ilie, 2020), the application may be perceived as complex or difficult to integrate into lessons, especially for primary school teachers who are not familiar with such tools.

The educational platform "mozaWeb" is used very rarely (M = 2.19) by primary school teachers in science lessons. This result suggests that primary school teachers may not be familiar with the "mozaWeb" platform, likely because they have not had the opportunity to participate in training sessions to acquire the necessary knowledge for its effective use. The rare usage of this

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platform may also be influenced by the need for a license to use it and the limitation of providing free access to only five educational resources per week.

QR codes are used very rarely (M = 2.11) by primary school teachers in science lessons, likely because they are not familiar with how to create and use them. Quick Response (QR) codes are two-dimensional barcodes used for encoding and decoding information. They contain various data or information (text, URLs, SMS messages) that is encoded. The data can be decoded by scanning the barcode with a mobile device that has internet access and is equipped with a camera and QR reading software (Rikala & Kankaanranta, 2012). QR codes can be utilized in various ways in science and geography lessons: in laboratory activities (Karahan & Bilici, 2017), in game-based learning activities (such as treasure hunts) (Karahan & Bilici, 2017; Law & So, 2010), and in outdoor or field activities (Lee et al., 2011).

The "Storybird" application is used very rarely (M = 1.96) by primary school teachers in science lessons, likely because they may find it difficult to integrate the use of digital books for creating illustrated stories into science lessons. The educational platform "Wand Education" is also used very rarely (M = 1.89) by primary school teachers for creating or adapting science lessons, likely because this platform has been minimally promoted in the educational environment, despite offering multiple functionalities (Vereş, 2021b).

Table 5
The frequency of using educational platforms
and applications in science lessons by primary school teachers

Educational platforms and applications	M	SD
Collaborative platform "Wordwall"	3,73	1,45
Google Maps application	3,00	1,22
Educational platform "Şcoala Intuitext"	3,00	1,23
Virtual tours in museums	2,82	1,23
Virtual tours	2,77	1,11
Collaborative platform "Kahoot!" (game creation)	2,71	1,33
Collaborative platform "Kahoot!" (usage)	2,71	1,32
Collaborative platform "Padlet"	2,71	1,44
Google Earth application	2,54	1,19
Educational platform "LIVRESQ"	2,48	1,23
Educational platform "Edpuzzle"	2,29	1,19
"Chatter Pix" application	2,25	1,36
Google Street application	2,24	1,23
"Mentimeter" application	2,21	1,19
Educational platform "mozaWeb"	2,19	1,18
QR Code	2,11	1,11
Digital book "Storybird"	1,96	1,08
Educational platform "Wand Education"	1,89	1,08

The frequency of using digital applications by students

The results show that the frequency of using digital applications by students across all items varies between 2.38 (the highest mean) and 1.58 (the lowest mean) (Table 6). Primary school teachers perceive Google Maps as the most frequently used digital application (M = 2.38) by students among those mentioned. Although this application has educational potential for geography, its usage by students is perceived by primary school teachers as occasional, likely because students are not familiar with using Google Maps in their activities, and teachers do not frequently utilize this application in their teaching activities. The use of the application requires access to mobile phones or tablets, which can be a limitation at home for some students.

Primary school teachers perceive that virtual tours in museums (for example, the Antipa Museum) are rarely used (M = 2.27) by students, a perception similar to that of the frequency of using virtual tours (M = 2.16) in general by students. Although virtual tours provide students with the opportunity to explore various virtual environments, primary school teachers believe that students tend to avoid using them, as they may not be sufficiently attracted to these applications, likely preferring other forms of digital learning or those that provide immediate satisfaction.

Primary school teachers perceive that the GPS application for walking is rarely used by students (M = 2.22). Although this application provides students with the opportunity to explore various places, activities (such as trips or outdoor activities) in primary education that would require the use of GPS applications are relatively rare. Primary school students do not typically have constant access to smartphones or devices that have GPS applications, and current legislation in Romania is strict regarding the use of mobile phones by students, especially during class hours (Parliament of Romania, 2023).

Primary school teachers perceive that Google Earth is rarely used by students (M = 2.16). This result suggests that, although this application is appreciated for its features that facilitate exploration of the planet, its effective use requires certain technical skills from users. Primary school students may thus have some difficulties navigating and using all the functions of this application, which can discourage them from using it frequently.

Primary school teachers perceive that the use of the Google Street application by students is quite rare (M = 2.10). The application allows for the exploration of streets and locations in the neighborhood and around the world through panoramic images. It is possible that Google Street is not viewed by primary school teachers as an essential resource for knowledge in geography for primary school students, as they are less involved in lessons or activities that require environmental exploration.

Primary school teachers perceive that the "Chatter Pix" application is used very rarely by students (M = 2.01). Although the application allows students to take photos and add audio effects, transforming static images into short, entertaining videos, it is likely perceived by primary school teachers as being more oriented towards fun and creativity rather than being a valuable tool for learning geography or sciences. While it is an application that encourages creativity, students may not be familiar with it or may lack sufficient motivation to use it, especially if it is not integrated by primary school teachers into activities in an engaging way. "Chatter Pix" may not be widely used due to the lack of educational content tailored for primary education.

Primary school teachers perceive that the CapCut application is used very rarely by students (M = 1.96). CapCut is a video editing application that allows the creation of videos with multiple effects and transitions. Although it is a video editing app, primary school students may not have the digital skills necessary to use CapCut. Creating videos is not a frequent activity in primary classes, which reduces the need to use such an application.

Primary school teachers perceive that applications for identifying plants and animals (e.g., Animal Identifier, BirdNET, Picture Bird, Bird Identifier, iNaturalist) are used very rarely by students (M = 1.96; M = 1.94; M = 1.92; M = 1.91). To use plant and animal identification applications effectively, students would need access to mobile devices (smartphones or tablets) with a good quality internet connection. In many cases, the lack of access to such equipment at home limits the use of these applications, and the fact that these applications are not utilized in lessons may reduce the chances for students to become familiar with and use them.

Primary school teachers perceive that Padlet is used very rarely by students (M = 1.88). Although Padlet is a collaborative platform that allows the creation of virtual boards where students can post ideas, images, files, and other types of content, if teachers do not use this platform frequently in their educational activities, the chances for students to use it are reduced.

Primary school teachers have the perception that the Storybird application is used very rarely by students (M = 1.60). This platform enables the creation of digital stories, encouraging creative writing and the use of images to illustrate stories. On the one hand, students' interest in using this application can be explained by the fact that, in general, creative writing activities are not often included in science or geography lessons in primary education. On the other hand, Storybird, being a more complex creation platform, requires a higher level of digital competence and creativity.

Primary school teachers perceive that the Loom application is used very rarely by students (M = 1.58). The Loom application is a video capture tool that allows screen recording and the addition of audio comments, used to create presentations or video tutorials. The Loom application requires a certain level of digital and technical competence to record and edit videos. Primary school students may not yet be prepared to use such applications, especially if they are not guided. In primary education, activities involving video recording or screen capturing are rare.

Primary school teachers perceive that Screencast-O-Matic is another application used very rarely by students (M = 1.58). Similar to the Loom application, this is a video and screen capture application often used for tutorials or presentations. Like Loom, Screencast-O-Matic may be perceived by primary school teachers as being too technical for primary school students to use. They might not fully understand its utility or may not yet be trained to effectively use such a tool.

Table 6
Frequency of Digital Application Use by Students

Digital Applications	M	SD
Google Maps	2,38	1,24
Virtual Tours in Museums	2,27	1,18
GPS Application for Walking	2,22	1,26
Google Earth	2,16	1,16
Virtual Tours	2,14	1,13
Google Street	2,1	1,13
Chatter Pix	2,01	1,33
CapCut	1,96	1,32
Applications for Identifying Animals	1,94	1,14
Explore.org (Animals in Their Habitat)	1,92	1,17
Applications for Identifying Birds	1,91	1,11
Collaborative Platform "Padlet"	1,88	1,01
Applications for Identifying Plants and Animals	1,88	1,07
Digital Storybook	1,60	0,85
Loom	1,58	1,08
Screencast-O-Matic	1,58	1,01

CONCLUSIONS

Regarding the use of learning platforms, digital applications, and multimedia sources by primary school teachers and students in learning sciences and geography, several conclusions can be drawn. In science lessons, primary school teachers most frequently use videos (M = 3.78), followed by documentaries, films from textbooks, animated films, films from curricular aids, and other films. Primary school teachers primarily utilize films sourced from the YouTube website in science lessons, while films obtained from CDs and DVDs produced by various companies or from other internet sources (such as Pinterest, Facebook, and TikTok) are used rarely.

Primary school teachers rarely create, edit, and adapt content from the films they use across various subjects, including those for science lessons (M = 2.74). They also very rarely use their own

films in teaching activities, including in science (M = 2.32). Regarding training platforms, the most utilized by primary school teachers is Wordwall (M = 3.73). Primary school teachers rarely use applications such as Google Maps, the educational platform "Școala Intuitext," virtual tours, "Kahoot!," "Padlet," "LIVRESQ," "Edpuzzle," "Chatter Pix," and Google Street. They use applications like "Mentimeter," "MozaWeb," "Storybird," and "Wand Education" very rarely.

Regarding primary education students, primary school teachers perceive that they most frequently play digital games (M = 4.04) and rarely watch films with science themes (animated films, videos, other films, documentaries, and films from textbooks and supplementary materials). Concerning film production by students, primary school teachers believe that they very rarely create films on various themes (M = 1.94) and films with science themes (M = 1.65), despite having the necessary electronic devices. Primary school teachers perceive that students rarely use certain digital applications (Google Maps, virtual tours, GPS, Google Earth, Google Street) and very rarely use other applications ("Chatter Pix," CapCut, applications for identifying plants and animals, "Padlet," Storybird, Loom).

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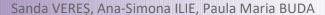
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APPENDIX

Questionnaire addressed to PRIMARY SCHOOL TEACHERS in primary education regarding the use of films, educational platforms, and digital applications

We kindly ask for your support in conducting a study that will be published in the Romanian Review of Geographical Education (https://rrge.reviste.ubbcluj.ro/). Your involvement is very important for the realization of this study. The data obtained will be statistically processed, ensuring full confidentiality of the responses. The questions below primarily refer to the use of films, educational platforms, and digital applications in science and geography. Please reflect on and complete the numerical scale for all items in this questionnaire, as well as provide information about yourself as a teacher. There are no correct or incorrect answers. What matters is that you consider your own teaching activity and experience and respond honestly. Please read each item in the questionnaire carefully and, for items accompanied by a 1-5 scale, choose one of the values from 1 to 5, each having the following meanings: 1 – not at all, 2 - very rarely, 3 – rarely, 4 - often/frequently, 5 - very often. If you do not know the answer, please indicate "I don't know."

Factor	Items	I don't know.	1	2	3	4	5
Categories of films used by primary school teachers in science	How often have you used films from school textbooks in science lessons?						
	How often have you used films from curriculum supplements in science lessons?						
	How often have you used animated films in science lessons?						
	How often have you used documentary films in science lessons?						
	How often have you used videos in science lessons?						
	How often have you used other films in science lessons?						
Sources from which teachers sourced films for science	How often have you used science-themed films sourced from YouTube?						
	How often have you used science-themed films sourced from Facebook?						
	How often have you used science-themed films sourced from TikTok?						
	How often have you used science-themed films sourced from Pinterest?						
	How often have you used science-themed films sourced from CDs/DVDs produced by various companies?						
	How often have you used science-themed films sourced from other online sources?						
Categories of science-themed films watched by students	How often do you think your students watch films from science textbooks?						
	How often do you think your students watch films from curriculum supplements in science?						
	How often do you think your students watch animated films with science themes?						
	How often do you think your students watch documentary films with science themes?						
	How often do you think your students watch videos with science themes?						
	How often do you think your students watch other films with science themes?						
	How often do you think your students play computer/phone games?						
	How often have you used films that you created yourself?						

	Question						
	How often have you used science-themed films that you created yourself?						
	How often have you processed/adapted the content of a film using digital applications?						
	How often have you processed/adapted the content of a film for science using digital applications?						
	How often do you think your students create films?						
	How often do you think your students create films with science themes?						
Use of educational platforms And digital applications by primary school teachers with students	How often have you used the animations offered by the educational platform "Şcoala Intuitext" in science lessons?						
	How often have you used the animations offered by the educational platform "mozaWeb" in science lessons?						
	How often have you used the educational platform "Wand Education" in science lessons? (creating or adapting lessons/activities)?						
	How often have you used the educational platform "LIVRESQ" in for science lessons? (creating or adapting lessons/activities)?						
	How often have you used the educational platform "Edpuzzle" in for science lessons (processing films + themes for students)?						
	How often have you used the collaborative platform "Kahoot!" for (creating games) in science lessons?						
	How often have you used games from the collaborative platform "Kahoot!" in science lessons?						
	How often have you used the "Mentimeter" application for (creating games) in science lessons?						
	How often have you used the collaborative platform "Wordwall" (creating games) in science lessons?						
	How often have you used the collaborative platform "Padlet" in science lessons?						
	How often have you used the digital book "storybird" in science lessons?						
	How often have you used the "Chatter Pix" application in science lessons?						
Use of digital applications by primary school teachers	How often have you used QR Codes with your students?						
	How often have you used the Google Maps application with your students?						
	How often have you used the Google Street application with your students?						
	How often have you used the Google Earth application with your students?						
	How often have you used virtual tours with your students?						
	How often have you used virtual tours in museums with your students (e.g., Antipa Museum)?						
Use of digital applications by students	How often do you think your students use the collaborative platform "Padlet"?						
	How often do you think your students use the digital book "storybird"?						
	How often do you think your students use the "Chatter Pix" application?						

How often do you think your students use the Loom application?						
How often do you think your students use the Screencast-O-Matic application?						
How often do you think your students use the CapCut application?						
How often do you think your students use Explore.org (Animals in their natural habitats)?						
How often do you think your students use plant identification applications (e.g., PlantSnap, PictureThis, Plantnet)?						
How often do you think your students use applications for identifying plants and animals (e.g., iNaturalist)?						
How often do you think your students use applications for identifying animals (e.g., Animal Identifier)?						
How often do you think your students use applications for identifying birds (e.g., BirdNET, Picture Bird - Bird Identifier)?						
How often do you think your students use the Google Maps application?						
How often do you think your students use the Google Street application?						
How often do you think your students use the Google Earth application?						
How often do you think your students use GPS applications for walking?						
How often do you think your students use virtual tours?						
How often do you think your students use virtual tours in museums (e.g., Antipa Museum)						

Participant Information

1. Gender
o   Female
o   Male

2. Age:
o   20-29 years
o   30-39 years
o   40-49 years
o   50-59 years
o   60 și peste 60 years

3. Education:
o   High school
o   Bachelor's
o   Master's
o   Doctorate

4. Teaching experience
o   Less than 5 years
o   Between 6 and 10 years
o   Between 11 and 20 years
o   Between 21 and 30 years
o   Over 31 years

5. Teaching degree:
o   No teaching degree
o   Definitive

o   Teaching degree II
o   Teaching degree I

6. The school/schools where you teach are located in:

o   Rural area
o   Urban area
o   Both rural and urban