The European Proceedings of
Social and Behavioural Sciences
EpSBS

www.europeanproceedings.com
e-ISSN: 2357-1330

DOI: 10.15405/epsbs.2021.03.02.27

ERD 2020
Education, Reflection, Development, Eighth Edition

VISUAL IMAGERY IN NATURAL SCIENCES ACTIVITIES

Florentina Drăghici (a), Maria Eliza Dulamă (b), Oana-Ramona Ilovan (c)*,
Ioana Alexandra Ciupe (d), Dorin Opriş (e), Alina Toderaş (f)
*Corresponding author

(a) Faculty of Psychology and Sciences of Education, Babeş-Bolyai University, 7 Sindicatelor St., Cluj-Napoca; "Reconstrucţia" Kindergarten of "Petru Rareş" High School, Feldioara, Braşov County, Romania, floriinbuchete@yahoo.com
(b) Faculty of Psychology and Sciences of Education, Babeş-Bolyai University, 7 Sindicatelor St., Cluj-Napoca, Romania, dulama@upcmail.ro
(c) Faculty of Geography, Babeş-Bolyai University, 5-7 Clinicilor St., Cluj-Napoca, Romania, ilovanoana@yahoo.com
(d) Faculty of Geography, Babeş-Bolyai University, 5-7 Clinicilor St., Cluj-Napoca, Romania, alexandra.ciupe@yahoo.com
(e) "1 Decembrie 1918" University, 5 Gabriel Bethlen St., Alba Iulia, Romania, dorin_monica@yahoo.com
(f) "Ferdinand I" Military Technical Academy, Bucharest; "Elie Carafoli" National Institute for Aerospace Research, 220 Iuliu Maniu St., Bucharest, Romania, toderas.alina@incas.ro

Abstract

Photographs and drawings are used to help kindergarten children to represent visually the contents discussed during Natural Sciences activities. The aim of this qualitative study is to analyse the strategies that teachers develop in order to identify the appropriate texts they could use during learning activities on a certain topic and their strategies for choosing the appropriate images (matching the respective texts). During the documentation process on the topic The Oak Forest, the teacher looked for images (photographs and drawings), literary texts and scientific ones, in the Internet network and in books for children and adults. In this case, the teacher used photographs from the Internet with the oak forest and created a children's story. The PowerPoint presentation that contained collages of thematically organized photos and the text of the narrative was presented on the Zoom platform. During the learning activity, we paid attention to the following: achievement of the concept of forest, listing and description of some tree species, enumeration of plant and animal species characteristic of the forest and the presentation on aspects of their lives. We analysed how the learning unfolded, parents' and children's opinions about the activity, and the knowledge that children achieved. In the end, we drew conclusions on the strengths of activities which combined text with visual imagery.

Keywords: Oak forest, PowerPoint presentation, Zoom platform, online activity, preschool, COVID-19 pandemic

https://doi.org/10.15405/epsbs.2021.03.02.27
Corresponding Author: Oana-Ramona Ilovan
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

1. Introduction

This paper focuses on the analysis of visual materials use in the pre-schoolers' knowledge acquisition process about the forest, as a basis for their forestry education. Photographs, films, and drawings constitute frequently used materials in learning activities in Natural Sciences (Dulamă, 2012). These visual materials represent a necessary and useful visual support in the formation of representations of the environment and its components (Dulamă & Magdaș, 2014; Dulamă et al., 2017; Ilovan et al., 2018, 2019; Magdaș et al., 2017; 2018). In light of this, since visual literacy underlies understanding processes (Sinatra, 1986, p. 4), it is essential that in preschool education, organising experiences takes place in visual environments, and thus contributing to pupils' improvement of their cognitive skills (Messaris, 1994, p. 3). Therefore, knowing that "photographs have a swifter and more succinct impact than words" (Goldberg, 1991, p. 7), they are usually used to facilitate the pre-schoolers' perceptions of nature (Deac et al., 2019).

Such a visual pedagogical tool is applied to deepen the lived experiences in nature (Socha et al., 2016). Moreover, by means of photographs, the interest, curiosity and involvement in environmental education activities are stimulated (Ardoin et al., 2014), ties to the information previously taught are established, critical thinking develops (Hindal, 2014), and pupils' responses are improved (Ewald & Lightfoot, 2001, p. 119).

In order to achieve forestry education, in several European countries, there is a tendency to organize various activities in the forest environment: guided trips in the forest and other "forest pedagogical activities" (Austria); bird watching and wild fauna knowledge trips (Finland); hiking and certain outdoor adventure activities (Norway); wildlife watching and various recreational activities (Romania); rides on mountain bike trails and other related services (Great Britain) (cf. Niskanen, 2006); woods experiences (Great Britain) (cf. O'Brien & Murray, 2007); watching plant and animal collections, shows with birds of prey, exposés, hiking on thematic trails, carved in wooden trunks (France) (cf. Cadar, 2014).

In Romania, geography teachers claim that the most efficient activities for pupils' forestry education are those carried out in the forest environment (e.g., walks, hiking, camps, systematic observations, picking of berries, medicinal plants and mushrooms, adventure park activities) (Dulamă et al., 2016, p. 37). However, activities outside the forest environment that are perceived as more effective for forest education are the following: involvement in projects, the teachers' actions, meetings with foresters and NGO representatives, documentary films, designing posters, being part of social networks (Dulamă et al., 2016, p. 37). In light of this, noting that school and family have the greatest impact on forestry education and forest protection in Romania, surpassing television, social media, and online publications (Dulamă et al., 2016, p. 33), we consider that the organization of forest knowledge activities for pre-schoolers is particularly useful.

This view should be supported despite the current social and educational context marked by the spread of COVID-19, which have forced the school institutions to design teaching activities for the virtual environment. In addition, teachers' teaching style is significant for pupils' emotional resilience at an early age and for learning (Crișan et al., 2014; Fetti & Albulescu, 2020), and teachers should be supported to find improvements concerning this within the online environment.

https://doi.org/10.15405/epsbs.2021.03.02.27
Corresponding Author: Oana-Ramona Ilovan
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

2. Problem Statement

In the instances when teachers intend to study a particular topic with children, they seek for texts and illustrative materials that are appropriate for that issue. In some situations, teachers identify both texts and visual materials that correspond to the criteria by which they performed the search. However, there are problem-situations in which teachers find either the text or the targeted images or, rarely, they find neither text nor visual materials. Consequently, two problems may occur: the absence of texts and materials required for the optimal or efficient study of a topic; and the mismatch between the written and visual materials.

3. Research Questions

This exploratory research will examine four main research questions: In what manner and where does the teacher look for the texts and illustrative materials required for the *Oak Forest* topic? By what means does the teacher create and process the texts and visual materials to make them understandable to pre-schoolers? How does the teacher use written and visual materials in the learning activities about the *Oak Forest* performed online together with pre-schoolers? What is the efficiency of using these materials (conceived and taken from other sources)?

4. Purpose of the Study

Starting from the research problem, the study aims to investigate three major issues. Therefore, we propose to discover what a teacher does in the situations where: he or she does not find the required texts and materials for the optimal/efficient study of the topic; the written materials do not match the visual ones; and the way in which he or she created/carried out the didactic activity in those circumstances.

5. Research Methods

Procedure. In this exploratory research, several steps were completed. First, texts and visual materials suitable for the *Oak Forest* topic were searched for, analysed and selected. After collection, the processing of visual materials and the designing of the text for the topic in question were realised. Following this, on the Zoom platform, the visual material was used in the learning activity performed online with the pre-schoolers. Finally, the analysis of the children's activity and results was achieved.

Participants. For this assessment, eight of the 21 pre-schoolers from "Reconstrucţia" Kindergarten of "Petru Rareş" High School, Feldioara, Braşov County, Romania, got involved voluntarily. All the participants were aged between four and six, of which three were 4 years old, four were 5 years old, and one was 6 years old. Also, the group consisted of three girls and five boys. To participate in the online activity, six of them used a smart phone, one a tablet and one a personal computer. During that time, the children were supervised by their mothers, four of whom were housewives. One mother had an academic degree, six graduated from high school and one had elementary school education. The first author, a teacher for pre-primary education, performed the activity online and was perceived by pre-schoolers as their teacher, not as a researcher. The teacher participated in the design of the visual material, analysed personal

https://doi.org/10.15405/epsbs.2021.03.02.27
Corresponding Author: Oana-Ramona Ilovan
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

and pre-schoolers' activity, and answered the interview questions. The other authors were involved into research design, as well as in processing, analysis, and interpretation of the collected data.

Data collecting and processing. The data related to the identification of the written and visual sources, creation of the visual material, and learning activity were collected through the semi-structured interview method and the participant observation method. Moreover, the data obtained in the interview, together with the text written by the teacher, underwent a text analysis. In addition, the didactic visual material created was analysed by visual methods. Overall, the exploratory research had the features of a case study design (Magdaș, 2018). Moreover, the amount of children's knowledge proven through the game was processed by statistical methods.

The *research material* included the following sources of data: written and visual material created by the teacher; observations, answers and opinions of the interviewed teacher; the children's answers to the questions in the game and those formulated during the learning activity; and the online activity.

6. Findings

6.1. Searching for texts and visual materials

In the first instance, printed sources were sought. However, neither the information we needed to provide the children with, nor the illustrations in the desired form were found in the children's books. Still, the required scientific information regarding the forest was identified in the geography textbooks for grades VIII and XII, intended for the study of Romania and, also in certain university course materials. Following this, to provide children with the formation of the clearest representations of reality, films were searched for on the internet by Romanian keywords (i.e. pădure de stejar - "Oak forest"). As a result, a documentary film provided by the Netflix channel, lasting for about 90 minutes was found, from which an 8-minute excerpt was selected. In the same vein, many short films were discovered on the official Facebook page of the National Forests Authority - ROMSILVA. Therefore, the selected fragments were appropriate for the children's age and level of understanding, as they included several sequences about animals (wild boars, deer, woodpeckers, foxes, wildcats, etc.). Moreover, several excerpts of the film were mixed and, finally, a short story was conceived.

On the other hand, searching for keywords in English ("deciduous forest", "forest for children") has generated a list of interesting films, but different in concept and type of forest filmed or represented. However, although there are plenty of texts on the Internet (e.g. many different types of films and other illustrative materials about the forest), no material was found to meet all our requirements regarding the following aspects: content, its illustration through visual materials, the suitability to the children's level of understanding, and duration of the presentation. To provide children with systematized information, it was decided to deliver a PowerPoint presentation and create an appropriate story.

6.2. Creating and processing texts and visual materials

In the first phase, the scientific content related to the oak forest was selected. Then, a frequently used list of concepts in learning activities (i.e., forest, tree, bushes) was established. In addition, several sets of information have been compiled regarding the trees and bushes that make up this forest, as well as the

https://doi.org/10.15405/epsbs.2021.03.02.27
Corresponding Author: Oana-Ramona Ilovan
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

most known mammals and birds by children. In the second phase, we started to group certain components of the forest on each PowerPoint slide or to provide information in the text. Moreover, some representative photographs intended to be presented were sought for the oak forest and for the plant species (trees: oak; bushes: hazelnut, hawthorn, blackberry tree, blackthorn; flowering plants: lily of the valley, nettle, dead nettle), mammals (wolf, fox, rabbit, deer, wild boar) and birds (woodpecker, blackbird, titmouse, and jay). In the third phase, the images were assembled into categories on PowerPoint slides (mammals, birds, bushes, flowering plants, etc.) and, simultaneously, the story was created.

Since the children love characters, a drawing with a little girl was selected. Next, a name was chosen for the little girl (Maria), and, around her, a story with an educational purpose was created (Table 1). Because the forest should be perceived by children as a dangerous place for them, a "mute" adult character was added, namely the father who accompanies the girl on a walk. The character Maria was conceived as a prototype – "an exemplary that represents an illustrative model" (Academia Română, Institutul de Lingvistică, 2010). Maria was curious, carefully noticed what she saw around her, followed the details, remembered what she had seen before in that place, enjoyed what she saw, and lived moments of happiness during her discoveries of nature.

In fact, Maria's walk was an activity of exploring the nowadays' world of the forest, it was a journey into the past ("… last summer's walk in the woods. At that time, the blackberries were ripe, and the hazel tree was full of hazelnuts. The blackthorn was laden with drupes, and the branches of the hawthorn and of the rosehip bent under the burden of the red fruit") and in the future ("she planted it in the ground with the hope that a huge and beautiful oak would grow from that small acorn"). Although, on the whole, the text was a narrative one, small fragments of informative texts were assembled within it ("the forest was made up of many trees"), as well as explanatory texts ("the thick trunk of an old oak tree" ... that "had been there for several centuries"), and descriptive texts ("the leaf had winding edges"). Therefore, without using scientific language, in the text was included all the referred information that was obtained from scientific sources and that we intended for the children to acquire.

Table 1. Educational story created for the activity

Walking through the oak forest (1)
Accompanied by her father, Maria went to visit her grandmother. The way up there passed through a dense oak forest. In an instant, she remembered that at kindergarten she learned that the forest was made up of many trees. Hence, in the forest, she saw many young trees, but also some old trees. Then, the little girl curiously remarked the thick trunk of an old oak tree on the side of the path. In fact, the oak tree had been there for several centuries (2).
In a little while, Maria caught a leaf. Hmmm, what might it be? At that instant, the little girl closely looked at the leaf. She noticed right away that the edges of the leaf looked like winding mountain paths. Afterwards, on her way to her grandmother's, Maria found an acorn under an old oak tree. Therefore, in order to show it to her grandmother, she quickly put the acorn in her pocket (3).
Up next, on the side of the path, the little girl recognized several bushes. For instance, Maria noticed the rosehip shrub was full of pink flowers. Then, she also saw an elderflower with blossoms that looked like white umbrellas. Moreover, she found in a glade a hawthorn bloomed and looked like a bouquet of flowers in a vase. Meanwhile, a hazelnut bush pampered itself in the soft light of the sun rays (4).
Between the path and the bushes, several flowering plants were seeking for sunlight. Through their broad leaves, the little girl saw the delicate corollas of lily of the valley. She also noticed that the white flowers of the dead nettle looked like a multi-tiered cake. The nettle bushes dominated in height (5).

https://doi.org/10.15405/epsbs.2021.03.02.27
Corresponding Author: Oana-Ramona Ilovan
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

Suddenly, a herd of wild boars scurried through the leaf layer in search of food. And that was because acorns were their favourite food. In a little while, a wild boar watched intently and was ready to attack. A red fox was also preparing to hunt a frightened rabbit, but because the rabbit was pretty quick on his feet, it ran away and never came back. Meanwhile, a deer scared by a fierce wolf began to jump like a rabbit. But as soon as the danger disappeared, the deer and the rabbit began to look for grass to feed on. Also, the wolf returned to its pack, the fox wandered through the forest and the wild boar, along with its flock, enjoyed the most delicious acorns (6).

Maria heard a woodpecker ... She looked after it. Just then, a blackbird with feathers like coal held victorious a worm in its yellow beak. It was happy because it could take it to her little ones. A titmouse watched from a dry branch. At the same time, a jay was resting on another branch (7).

Right after, Maria remembered the last summer's walk in the forest. At that time, the blackberries were ripe, and the hazel tree was full of hazelnuts. The blackthorn was laden with drupes, and the branches of the hawthorn and of the rosehip bent under the burden of the red fruit. At the end, tired of walking through the forest, glad about what she had seen so far and with a mind full of thoughts on berries, Maria finally arrived at her grandmother's house. There, she remembered about the acorn in her pocket. At that moment, Maria took the acorn out and, together with her grandmother and father, she planted it in the ground hoping that a huge and beautiful oak would grow from that small acorn (8).

Regarding the PowerPoint slides, for the pre-schoolers to make associations at a subliminal and permanent level among the plant and animal species and the forest, on each PowerPoint slide was placed a photograph with the oak forest. Although there are several species in each category in the forest, it was decided that four species are sufficient for children, to memorize them easily, especially if they had seen them before in reality (in photographs or drawings). Moreover, to avoid visual monotony, on each PowerPoint slide, the photos were visually assembled in a different way.

6.3. The use of visual material in the online learning activity

Aiming at becoming familiar with the way of carrying out the designed online activity, about ten days before, the teacher and the children held a video conference on the Zoom platform. Unfortunately, several difficulties were identified: not all pre-schoolers in the class had access to the internet and high-performance devices; poor sound quality was noticed regarding the audience/recipients. Therefore, to solve the problem, the laptop was used as a device for transmitting visual information and the mobile phone to transmit written text or sound to children.

In the preparatory stage of the activity, an access link was created on the Zoom platform, the invitation to the parents was launched and then they were asked to confirm their children's participation at the activity. As such, of the 25 children in the group, the parents of seven children confirmed participation (six via WhatsApp application and one by phone). For the parents to be able to assist their children aged 4-6 to use the devices, the activity was scheduled for June 2 at three o'clock. The connection of mothers and children to the videoconference was made in a 12-13 minutes interval. After connecting everyone, it was requested to turn off the microphones to avoid disturbing the hearing. Also, after the PowerPoint file was inserted into the Zoom platform, to verify the children's access to image and sound, they were asked to raise their thumb if they saw the title on the screen and if they were ready to listen to the story, respectively.

Making them pay attention was achieved by introducing the character Maria. During the PowerPoint slideshow, the written text was presented on each slide. In order to have the children's attention for each photograph, as well as to note the details and to determine the formation of certain representations as

https://doi.org/10.15405/epsbs.2021.03.02.27
Corresponding Author: Oana-Ramona Ilovan
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

consistent as possible with reality, an appropriate strategy for both children and adults was used. After that, the photos were inserted one by one into a PowerPoint slide. Therefore, to ensure the correspondence between the image and its verbally expressed content, while a certain aspect was presented (e.g., the plants, animals, birds, and other aspects), they were indicated with the mouse cursor. By analysing the PowerPoint product before the activity was carried out, it was found that the story created did not provide the entire necessary information for children. Consequently, to deepen the contents, each photo in PowerPoint was described and more information and explanations were supplied to the initial text of the story. Thus, the story was transformed into a "collage"/collection of stories about plants and animals, and they became new characters. However, although the story lasted about 17 minutes, two children disrupted the activity by asking permission to go to the bathroom and announcing their return.

6.4. Efficiency of using materials which were created and taken from other sources

After the story ended, to check the children's acquired or improved knowledge in the learning activity, the *True-False* game was proposed to them. Thus, the children were reminded of the rules known from previous meetings. Through an exercise, it was verified if they understood the rules of the game: they were asked to show how many hands they should raise for the False answer (they raised two hands) and how many hands they should raise for the True answer (they raised one hand). The game contained 42 statements and lasted for approximately 30 minutes. Because the activity on the ZOOM platform is automatically interrupted after 40 minutes, following question no. 24, it was necessary to generate another link and log in details for children. In that case, the connection was much faster (maximum 2-3 minutes), but a child was no longer involved in the activity, and because of a technical problem, the video that recorded this part of the activity was lost. From the analysis of the children's involvement in the game, we found that one child voluntarily answered all questions without the mother's help, one child refused to participate at the game, and the others were encouraged and helped by parents/mothers to answer. Moreover, even if the microphones on the children's devices were muted and they could communicate with their teacher only through the visual channel, still a child did not comply with the requirement. Therefore, she turned on the microphone countless times and verbally provided answers to addressed questions.

In Table 2, are presented the assertions proposed to the children about the oak forest, their grouping by categories and the children's options for these assertions. However, we noticed that there were situations in which the children did not provide any answer. Consequently, as the number of children involved was low and, in many moments, they were influenced by their mothers, these results give us some benchmarks on the information that should be clarified and fixed in future activities.

The results presented in Figure 1, which suggest that the pre-schoolers fixed their long-term memory and were able to remember the information about the characters and their actions can be explained by their training in summarizing the events of the characters in the stories. The fact that the knowledge of flowering plants is on the second place in the hierarchy is due to their confrontation with only two questions in this category. However, the children gained a good score on the items that indicated the knowledge of some aspects related to mammals, bushes, and trees.

https://doi.org/10.15405/epsbs.2021.03.02.27
Corresponding Author: Oana-Ramona Ilovan
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

Table 2. The children's options during the True/False game

Content category	Assertions	True	False	No answer
Characters and their actions	The girl's name in the story was Maria	6	0	1
	Accompanied by her father, Maria went to visit her grandmother	3	3	1
	Maria caught a leaf	7	0	1
	Under an old oak tree, Maria found an acorn	6	1	1
	When she got to her grandmother, Maria planted the acorn	6	1	1
	Maria was helped to plant the acorn by her grandmother and father	7	0	1
	From the small acorn, Maria hoped a huge and beautiful oak would grow	7	0	1
	In the forest, she noticed many trees	7	0	1
Forest	The way to her grandmother passed through a dense oak forest	7	0	1
	The forest was an association of trees or a place where there were a lot of trees	6	1	1
	In the forest, there were trees, shrubs, and an herbaceous layer	5	2	1
	In the forest, there were young trees and older trees	4	2	1
Trees	The trees had a single trunk that started at the root	4	3	1
	The old oak had a thin trunk	3	4	1
	The edges of the leaf caught by Maria looked like winding mountain paths	3	4	1
	The acorn was the fruit of the oak	5	2	1
	The acorn was brown and was the wild boar's favourite food	7	0	1
Bushes	Bushes had several trunks that started at the root	3	3	1
	The rosehip was a shrub	3	4	1
	The rosehip had yellow flowers	3	4	1
	The elderflower was a tree	2	2	4
	The elderflower had blossoms that looked like white umbrellas	4	1	3
	The blackthorn was an herbaceous plant	2	3	3
	The blackthorn was in the shape of a bouquet of flowers	5	1	2
	The hazelnut leaves were very wide	4	2	2
	The hazelnut had a woody shell on the outside	5	0	3
	The blackthorn's fruit were black	6	1	1
	The fruit of the rosehip and of the hawthorn were red	7	0	1
	The blackberries were white fruit	0	7	1
	The fruit of the hazelnut tree were called acorns	1	6	1
Flowering plant	The lily of the valley had broad leaves and pink flowers	3	4	1
	The dead nettle had white flowers	4	3	1
Mammals	The wild boar fed on leaves	0	7	1
	The wild boar fed on acorns	7	0	1
	The wild boar lived in a herd	4	2	1
	The fox hunted rabbits	4	3	1
	The wolf hunted deer	4	3	1
	The deer and the rabbit ate grass	5	2	1
Birds	The woodpecker knocked on the tree to find organisms, larvae	2	5	1
	The blackbird had a yellow beak and white feathers on its body	2	5	1
	The titmouse lives in our country during winter, too	2	0	6
	The jay had blue and black stripes on the wings	3	4	1

https://doi.org/10.15405/epsbs.2021.03.02.27
Corresponding Author: Oana-Ramona Ilovan
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

On the other hand, the lower scores obtained by pre-schoolers on items related to the forest are explained by the degree of their abstraction and by the fact that the forest, being a set of elements, was more difficult to disassemble and mentally configure. Although some pre-schoolers mentioned that they liked birds, the scores on birds' items were the lowest. From the analysis of these elements, it is observed the high degree of detail of the visual information about birds that the pre-schoolers failed to perceive.

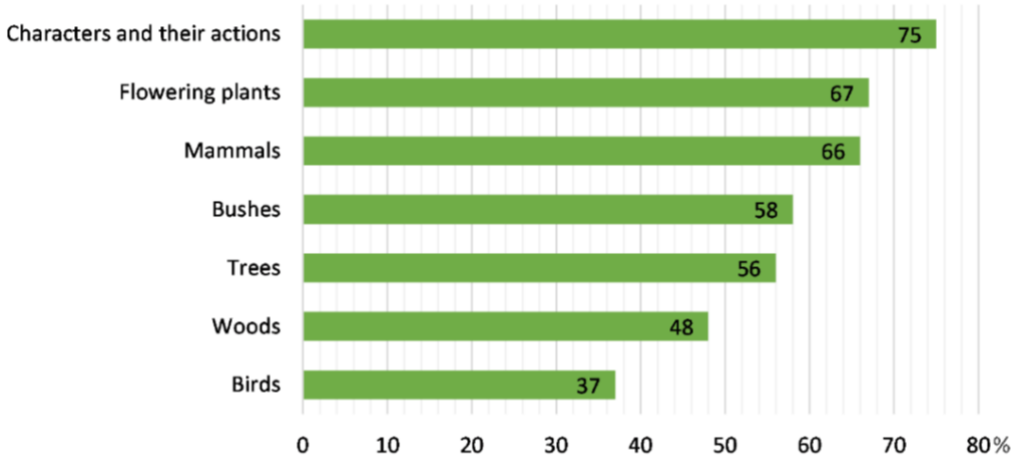

Figure 1. The share of children's correct options by thematic categories

The online activity was completed with a final discussion, lasting about 10 minutes, in which children were given permission to use the microphone. To the question "What did you like most about the activity?", the children's answers ("birds", "the girl and animals", "the girl", "wild boar and deer", "flowers") confirmed our assumptions. Also, one child claimed that he loved "berries and hazelnuts" because he had such fruits in the garden. In addition, to verify if the children made the connection between the film and reality, they were asked to answer which birds or other animals of those presented they noticed in real life. In this regard, only one child stated that the only bird seen in real life was the woodpecker.

We note, therefore, that each child provided answers based on their own life experiences. The whole activity lasted about 70 minutes.

7. Conclusion

Regarding the process of searching for texts and visual materials suitable for a certain topic intended for studying it with pre-schoolers in Natural Sciences, we found that the preschool teacher spent great time resources for both this purpose and for analysing the multitude of web sources (films, photographs, drawings, PowerPoint presentations, texts), as well as printed sources for children and adults. Although there are a lot of sources about the studied subject, they did not meet all the criteria by which the teacher chose the best visual material to be used in the designed activity. Under these conditions, the teacher was forced to spend other great time resources in order to: identify the support materials required to achieve the new visual product; prepare the activity to be carried out online; solve the problems they face when using visual imagery and when communicating with pre-schoolers on the Zoom platform.

https://doi.org/10.15405/epsbs.2021.03.02.27
Corresponding Author: Oana-Ramona Ilovan
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

Concerning the online activity, only one third of children and their families have access to the Internet, have the necessary devices for online communication and show interest for virtual environment activities. In light of this, it was revealed that to perform online activities the following were required: previous preparation; verification and testing of equipment, applications, and connections between teacher and children's devices; supervision and assistance of children by a parent – mothers being those involved in this case; and timely resolution of unforeseen technical problems.

Pre-schoolers showed curiosity and interest in listening to and watching the story supported visually by a PowerPoint presentation, and auditory through the narrative-informative-descriptive comment of the teacher. Moreover, through the game performed after the learning activity (adapted to the conditions of the videoconference and to the lack of pre-schoolers' reading competence) and through the encouragement and support provided by their mothers, the children identified the correct solutions to over half of the items. At the end of the online activity, they confessed that they loved the character they found similarities with, and certain animals and plants specific to the oak forest environment.

Although the preparation and support of the online activity required a very high consumption of the teacher's time and material resources, creativity, digital skills and competence to solve technical problems, the online activity was evaluated as a successful experience for both teacher and children. The strengths of this activity that combines the text with visual images are: the progressive input of images, the text and image synchronization, the exploitation of the opportunity to indicate with the computer mouse the items or the aspect to which reference is made.

Acknowledgments

The research for this article was supported by a STAR-UBB Institute fellowship (The Institute of Advanced Studies in Science and Technology, belonging to Babeș-Bolyai University of Cluj-Napoca, Romania), won by Professor Maria Eliza Dulamă, Ph.D., during the 2019-2020 academic year (for the April-May 2020 period) and titled Valorificarea unor tehnologii avansate pentru realizarea unor filme didactice destinate predării-învățării în învățământul universitar [Valorising Certain Advanced Technologies to Realise Didactic Films for Teaching-Learning in the University System]. The fellowship was funded through the project 33PFE/2018 (Strategic infrastructure at Babeș-Bolyai University in the context of developing new and smart technology – 2018-2020), which was won through a competition organised in 2018 by the Ministry of Research and Innovation, of Romania.

References

Academia Română, Institutul de Lingvistică. (2010). *Micul dicționar academic* [Little academic dictionary] (2nd edition). Editura Univers Enciclopedic.

Ardoin, N. M., DiGiano, M., Bundy, J., Chang, S., Holthuis, N., & O'Connor, K. (2014). Using digital photography and journaling in evaluation of field-based environmental education programs. *Studies in Educational Evaluation, 41*, 68-76.

Cadar, N. (2014). National Forest Office of France and his involvement in environmental education. *Journal of Horticulture, Forestry and Biotechnology, 18*(1), 151-155.

Crișan, C., Albulescu, I., & Copaci, I. (2014). The relationship between test anxiety and perceived teaching style. Implications and consequences on performance self-evaluation. In C. Vasile (Ed.), *Adult*

Education in Universities: Local and Regional Perspectives. Book Series: Procedia Social and Behavioral Sciences, 142, 668-672.

Deac, A. S., Ilovan, O.-R., Chiş, O., & Dulamă, M. E. (2019). Primary grades teachers' perceptions of learning activities in nature. In V. Chiş, & I. Albulescu (Eds.), *6th ERD Conference, European Proceedings of Social & Behavioural Sciences, LXIII*, 358-364. https://doi.org/10.15405/epsbs.2019.06.44

Dulamă, M. E. (2012). *Ştiinţe şi didactica ştiinţelor pentru învăţământul primar şi preşcolar* [Sciences and the didactics of sciences for the primary grades and the kindergarten]. Presa Universitară Clujeană.

Dulamă, M. E., & Magdaş, I. (2014). Analysis of the competences and contents of "Mathematics and Environmental Exploration" subject syllabus for preparatory grade. *Acta Didactica Napocensia*, *7*(2), 11-247.

Dulamă, M. E., Ilovan, O.-R., & Magdaş, I. (2017). The forests of Romania in scientific literature and in geography. Teachers' perceptions and actions. *Environmental Engineering and Management Journal, 16*(1), 169-186.

Dulamă, M. E., Ilovan, O.-R., Magdaş, I., & Răcăşan, B. (2016). Is there any forestry education in Romania? Geography teachers' perceptions, attitudes, and recommendations. *Studia Universitas Babeş-Bolyai, Psychologia-Paedagogia, LXI*(1), 27-52.

Ewald, W., & Lightfoot, A. (2001). *I Wanna Take Me a Picture: Teaching Photography and Writing to Children.* Beacon Press.

Fetti (Mora), D. F., & Albulescu, I. (2020). Developing emotional resilience in the primary education through the teaching style. In V. Chiș (Ed.), 7th ERD Conference, *European Proceedings of Social and Behavioural Sciences, 85*, 669-676. https://doi.org/10.15405/epsbs.2020.06.69

Goldberg, V. (1991). T*he Power of Photography: How Photographs Changed Our Lives*. Abbeville Press.

Hindal, H. S. (2014). Visual-spatial learning: A characteristic of gifted students. *European Scientific Journal, 10*, 13.

Ilovan, O.-R., Dulamă, M. E., Boţan, C. N., Havadi-Nagy, K. X., Horváth, C., Niţoaia, A., Nicula, S.-F., & Rus, G. M. (2018). Environmental education and education for sustainable development in Romania. Teachers' perceptions and recommendations. *Journal of Environmental Protection and Ecology, 19*(1), 350-356.

Ilovan, O.-R., Dulamă, M. E., Boţan, C. N., Havadi-Nagy, K. X., Horváth, C., Niţoaia, A., Nicula, S.-F., & Rus, G. M. (2019). Environmental education and education for sustainable development in Romania. Teachers' perceptions and recommendations (II). *Romanian Review of Geographical Education*, *8*(2), 21-37.

Magdaș, I. (2018). *Prezentarea și prelucrarea datelor cercetării în științele educației. Ghid pentru studenți* [Presenting and processing research data in the Sciences of Education. A students' guide]. Presa Universitară Clujeană. http://www.editura.ubbcluj.ro/bd/ebooks/pdf/2276.pdf

Magdaș, I., Buzilă, S. R., Dulamă, M. E., & Ilovan, O.-R. (2017). Primary grades teachers' perceptions on a Mathematics and Environmental Exploration digital textbook. In M. Vlada (Ed.), *Proceedings of the 12th International Conference on Virtual Learning*, 218-223.

Magdaș, I., Dulamă, M.-E., Ilovan, O.-R., & Crișan, I. C. (2018). Training primary school teachers for teaching the Mathematics and Environmental Exploration subject. In V. Chiș, V., I. Albulescu (Eds.), *5th ERD Conference, European Proceedings of Social & Behavioural Sciences, XLI*, 143-151. https://doi.org/10.15405/epsbs.2018.06.17

Messaris, P. (1994). *Visual "Literacy:" Image, Mind, and Reality*. Westview Press.

Niskanen, A. (Ed.) (2006). Issues affecting enterprise development in the forest sector in Europe, University of Joensuu, Faculty of Forestry. *Research Notes, 169*, 406.

O'Brien, M. L., & Murray, R. (2007). Forest School and its impacts on young children: case studies in Britain. *Urban Forestry & Urban Greening, 6*(4), 249-265.

Sinatra, R. (1986). *Visual Literacy Connections to Thinking, Reading and Writing*. Charles C. Thomas.

Socha, T., Potter, T., Potter, S., & Jickling, B. (2016). Reflections on using pinhole photography as a pedagogical and methodological tool with adolescents in wild nature. *Journal of Outdoor and Environmental Education, 19*(1), 10-21.