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Preschooolers' Media and Technology Skills : Can Elephants use Technology

Rumeysa Yıldırım[1] Esra Macaroğlu Akgül[2]

21st-century technologies have brought developments and led to changes, making some skills more important. These skills include media literacy, life and career skills, learning and innovation (4Cs), and information, media, and technology skills. The aim of this study is to examine the information, media, and technology skills, as well as the media literacy levels, of preschool children. The study used the practitioner action research method. The research group consisted of 22 children aged 5-6 who attended a preschool institution in Istanbul. To collect data, the "Media Literacy Scale for Children" (ÇİMO 36-72 Months) and the "Techno Kids Television Dictionary," developed by the researcher, were used. Additionally, the "Demographic Information Form" and the "21st Century Skills Scale for 5-6 Year-Old Children (DAY-2)" were adapted to create the "Techno Kids Information, Media, and Technology Skills Child Interview Form." The data were analyzed using the MaxQDA 2023 software. The findings showed that while children's information, media, and technology skills were high, their media literacy levels were low. An action plan was implemented to improve their knowledge and skills regarding smart symbols, and as a result, their media literacy levels increased.

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INTRODUCTION

Media technologies, which have become part of human life, are divided into two categories: traditional and new media technologies. Radio, television, newspapers, etc. are traditional media tools, while computers and the internet are grouped as new media tools. With the increase in information and its rapid dissemination, there is a need for individuals who can effectively use, analyse, and critique information and use technology correctly (Polat & Odabaş, 2008, cited in Karaman & Karataş, 2009). The 21st-century skills present at all levels of education are also important in the pre-school period, a time of rapid development in human life, in terms of imparting 21st-century skills. The 21st-century skills that need to be acquired in the pre-school period are classified as Learning and Innovation Skills, Information, Media and Technology Skills, and Life and Career Skills (Mercan, 2022). Learning and innovation skills consist of early creativity and innovation skills, critical thinking and problem solving, communication and collaboration. Information, media and technology skills cover early learning information and media literacy. The media has a significant impact on the lives of pre-school children, which is why it is important for them to be media literate (Kadan & Aral, 2018). Life and career skills consist of flexibility and adaptability, initiative and self-management (self-regulation), social and intercultural skills, productivity and accountability, leadership and responsibility skills. Although the media has provided many opportunities, the increase in diversity in this field and its power to influence all individuals of different age groups in society has led to the emergence of the concept of media literacy (Kurt & Kürüm, 2010). The emergence of this concept has also brought certain objectives. The aim of media literacy is to raise individuals who are equipped with sufficient knowledge and awareness to correctly read messages in the media, consciously analyse them, and evaluate them taking the consequences into account (Kurt & Kürüm, 2010). Better selection of media content by parents and children enables children to use media in a manner appropriate to their developmental stages. This ensures that parents and children become more informed consumers of media (Levin et al., 2004). Furthermore, media literacy, which is among the 21st-century skills, is important for preschool children to learn and understand the media they are directly or indirectly exposed to and for them to become aware at an early age. Preschool children, who will be the adults of the future, should develop in the areas of information, media, technology skills, and media literacy. A review of the literature reveals that while studies have been conducted on the 21st-century skills of preschool children (Arslan Nizam & Akşin Yavuz, 2024; Kıshalı & Gültekin, 2022), the information about the children was obtained from their parents or teachers. Furthermore, it is observed that there are no studies aimed solely at identifying information, media, and technology skills. Not knowing the place of technological devices and media in children's lives may prevent understanding the effects of media content prepared for preschool children on their psychological world and their readiness according to their age and developmental levels, thus hindering the preparation of appropriate content. This can be considered a problem. From this perspective, the pre-school period is the second fastest period of development in human life, and children

[1]MEB, rumeysa_yildirim@hotmail.com, orcid.org/ 0000-0002-7555-8477
[2]FSMV University, emakgul@fsm.edu.tr, orcid.org/ 0000-0001-6897-538X

achieve more lasting learning with less effort. In this age of speed, social media is increasingly becoming part of our lives and managing our perceptions. Not obtaining information from children is a problem because, even though they are young, the best way to obtain information about children is by working with them. Pre-school children learn by doing and experiencing.

In this context, the questions addressed in the study were prepared under two main headings by examining the 21st Century Skills Scale for 5-6 Year Old Children (DAY-2) and the Media Literacy Scale Children's Form (36-72 months) and are listed below:

1. What are the information, media, and technology skill levels of preschool-aged children?
    a. What is their level of identifying technological devices and providing information about them?
    b. What is their level of ability to compare the perspective of the main character with that of other characters in a story or fairy tale?
    c. What is their ability to utilise their previous experiences to access new information?
    d. What is their level of ability to use technological devices (phones, tablets, computers)?
2. What is the level of media literacy among pre-school children?
    a. What is their level of knowledge about smart signs on screens?
    b. What is their level of recognition of traditional and new media tools? Data was collected using a form developed to examine the information, media and technology skills and media literacy levels of pre-school children.

METHOD

This study, which aims to examine the knowledge, media, technology skills, and media literacy levels of pre-school children, utilised practitioner action research, one of the action research methods. Different discourses are encountered in the literature regarding the definition of action research. For example, action research is defined in some sources (Yıldırım, Şimşek; 2021) as one of the designs of qualitative research methods, while in other sources (Saracaloğlu & Eranıl, 2019; Toraman Türk, 2023) it is defined as a different research approach. Toraman Türk (2023) states that action research is considered a sub-dimension of qualitative research in Turkish sources, but that this assessment is incorrect. Supporting this statement, Toraman Türk and Dudu (2022) also argue that action research is a fourth methodological approach, distinct from qualitative, quantitative, and mixed methods. Action research has been accepted as a fourth method within the scope of this study.

Action research has three types: technical, practitioner, and liberatory action research (Yıldırım & Şimşek, 2021). In this research, the researcher identified the problem situation/situation to be improved in their own class and took action, therefore the practitioner action research method was used in the scope of the research. Practitioner action research is a combination of practitioner research and action research. According to Fox et al. (2007), the research model in which a practitioner working in any professional field is also a researcher is called practitioner research. Burton & Bartlett (2005) also mention that action research often benefits from practitioner research because action research emphasises professional development (Dudu, 2023).

Practitioner action research is also referred to in the literature as applied/reciprocal, collaborative/discussion-focused action research (Saracaloğlu & Eranıl, 2019; Yıldırım & Şimşek, 2021). Somekh (1995) rejects the two-stage form of action research, which is the conventional form of research where researchers first conduct research and then practitioners implement it, combining practitioner research and action research (Dudu, 2023). According to Berg (2001), in practitioner action research, practitioners interpret their own practices and make changes to them with the aim of improving the practice (Başarır, 2019). The researcher attempts to identify the problem or the situation that needs improvement by making observations before starting the practice. They also continuously evaluate and research during the implementation phase. In practitioner action research, researchers are their own research subjects or sources of information, and since it is based on the practitioners' own experiences, each practitioner action research study is unique and subjective (Dudu, 2023). Since the person conducting the research and the person implementing it are the same, even if the research topic or study group is the same, the dynamics of each practitioner action research study will differ due to variations in time, place, and people.

Dudu (2023) classifies the stages of practitioner action research as: focusing, planning, taking action, observing, reflecting, revising, and refocusing. These seven steps were considered in this research, and their definitions and how they were incorporated into the research are described below.

The focusing stage is the starting point of practitioner action research, where the situation to be changed or improved is identified. In the focusing stage of this study, the researcher observed the children and obtained information about their use of technological devices by sending personal information forms to their parents. Planning phase: This is the stage where purposeful planning takes place to determine the problem, the people who will participate in the research, the data to be collected, and the method of data analysis. In the planning phase, the researcher took on both the implementation and research roles alone. How the data to be collected to answer the question would be analysed was designed in this section. The action phase is when the researcher analyses the data obtained in the planning phase and makes changes to some of their behaviour. In the action phase, the researcher conducted individual interviews with the children and applied the media literacy interview form and the Teknofiller story form, which includes the assessment of the level of knowledge, media and technology skills. The observation phase is the stage where the researcher collects evidence through observation and notes the reactions of the study group. In the observation phase, the researcher observed the children's media literacy and information, media, and technology skills. The reflection phase is the stage where the researcher evaluates whether the action had the expected effect on the study group. Reflection phase: As a result of the interviews and observations, it was found that while the children's knowledge, media and technology skills were high, the majority of them had a low level of media literacy. Revision phase: The researcher eliminated actions that did not improve the situation or solve the problem. In the revision stage, the researcher prepared a television dictionary and applied it through individual interviews with the children. In the refocusing stage, the researcher refocused on implementing the action they had revised and undertook new actions (Dudu, 2023). In the refocusing phase, the 'Television Dictionary' was reapplied to the children individually after two months to enable them to remember smart signs and match them with the series, documentaries, and cartoons discussed. The children's recall levels were also determined. It was concluded that the television dictionary application enabled effective learning and that their learning was permanent.

Participants

Twenty-two 5-year-old children and their parents, who were studying at an independent state nursery school affiliated with the Ministry of National Education in the 2023-2024 academic year, participated in the research. The working group of this action research, in which the researcher was also the implementer, consisted of children in the researcher's own class.

Data Collection Tool

Permission has been obtained to use the "Media Literacy Scale for Children (36-72 months)" developed by Kadan and Aral (2020) and the "21st Century Skills Scale for 5-6 Year Old Children (DAY- 2)" developed by Yalçın, Simsar and Dinler (2020) in this study. The Media Literacy Child Interview Form was prepared based on the "Media Literacy Scale for Children (36-72 months)" developed by Kadan and Aral (2020) to determine children's media literacy levels, and the 21st Century Skills Scale for 5-6 Year Old Children (DAY-2) developed by Yalçın, Simsar and Dinler (2020). The items are as follows: 'Describes technological tools using simple words and provides information about them. Compares the main character's point of view with that of other characters in a story or fairy tale. Uses previous experiences to access new information. Asks how to use technological devices and uses them independently.' The story 'Teknofiller' (Technofilers), prepared by the researcher for the identification of these items, was used. Information about the Teknofiller story is presented in detail below. The Teknofiller Television Dictionary Children's Interview Form was prepared to develop media literacy levels. The relevant information is presented in detail below.

Personal Information Form

The Personal Information Form consists of 10 questions regarding the gender of preschool children participating in the research, the age and educational status of their parents, whether the child owns a technological device, and how much time they spend with the device and how they use it.

Teknofiller Story-Knowledge, Media, Technology Skills Child Interview Form

The 21st Century Skills Scale for 5-6 Year Old Children, developed by Yalçın, Simsar and Dinler (2020), was used in the study. The scale is designed to measure the 21st-century skills of 5-6-year-old children. It is a 4-point Likert-type scale with 3 sub-dimensions. It consists of the sub-dimensions of Learning and Innovation Skills, Life and Career Skills, and Information, Media and Technology Skills from the 21st-century skills. The questions in the Teknofiller story prepared as part of the research were developed taking into account the items included in the scale.

The Cronbach's alpha values for each sub-dimension of the 33-item scale were calculated as follows: .96 for the Learning and Innovation Skills (4Cs) dimension, .94 for the Life and Career Skills dimension, and .92 for the Information, Media, and Technology Skills dimension. The Cronbach's alpha value for the unidimensional form of the scale was determined to be .97. According to Kayış (2014), a reliability coefficient of .97 and above indicates that the scale has a high degree of reliability. When examined individually according to its sub-dimensions, the scale as a whole also has a high degree of internal consistency. For this reason, items 29-33 from the Information, Media and Technology Skills sub-dimension of the 21st Century Skills Scale were used in the study. Each item on the scale is worth 4 points, and the maximum possible score for the Information, Media and Technology sub-dimension is 20.

In order to examine the Knowledge, Media and Technology Skills of pre-school children, a story called Teknofiller was written and illustrated by the researcher, with expert opinion. Before creating the story, the researcher conducted research on animals to find a character that would attract children's interest and discovered that elephant brains share similar characteristics with human brains, possessing high intelligence, strong family bonds, and social relationships. Based on this information, the researcher decided to write a story about elephants encountering technological devices and learning how to use them. The researcher wrote the story in 15 days (4-19 October 2023) with the corrections provided by their advisor and illustrated it in 7 days (20-27 October 2023) using Canva and Web2 tools. When selecting elephant images, care was taken to ensure they had colours and features that would appeal to children and that their sizes were consistent with the story. The title 'Teknofiller' was deemed appropriate as it combines both technology and elephants. After adding the front and back cover pages and page numbers, the story was sent to five experts (30 October 2023), and revisions were made based on the suggestions provided by two of them. Expert opinions forms. Based on the expert opinions received on 3 and 6 November 2023, adjustments were made using the Canva programme, and the story, totalling 82 pages, was prepared for printing.

Pages 1-25 of the story are aimed at identifying the skills 'Defines technological tools using simple words and provides information about them' and 'Can compare the main character's point of view with that of other characters in a story or fairy tale'. Pages 26-79 of the story focus on Information, Media and Technology Skills: 'Uses previous experiences to access new information'. 'Asks how to use technological devices (phone, tablet, computer, television) and uses them independently' and 'Finds the game/application they want to use on technological devices (phone, tablet, computer, television) with adult assistance'.

Although tablets, phones, and computers are included under the heading of technological devices in the scope of information, media, and technology skills, television is also included in the interview form used to determine children's media literacy levels. Therefore, television has been added to these devices to determine children's skills regarding television use.

A checklist was created by the researcher to be used in the pilot study and subsequent studies to systematically record the children's responses. Subsequently, a pilot study (20 November 2023) was conducted with one boy and one girl aged 5-6, and these individual interviews lasted 30-35 minutes. Individual interviews with the study group (22 children) were completed within 5 days (27 November- 1 December 2023).

Media Literacy Preschool Child Interview Form

Based on the items developed by Kadan & Aral (2020) in the 'Media Literacy Scale for Children (36-72 months)', the researcher created the 'Media Literacy Pre-school Children Interview Form'. The form contains 10 questions regarding children's recognition of traditional and new media tools and smart signs. Each correct answer on the form is worth 1 point, while incorrect answers or no response are worth 0 points. A score of 0-5 indicates that media literacy levels need to be developed, while a score of 6-10 indicates advanced media literacy levels. Individual interviews with children lasted 10-20 minutes and were completed within 5 days.

Items 1, 2, 3, 4, 5, 8, 9, and 10 have high discriminating power; item 7 has medium discriminating power, and item 6 has low discriminating power. This indicates that the scale has construct validity. It is emphasised that for a measurement tool to be considered reliable, its reliability coefficient must be 0.50 or above (Büyüköztürk, 2018). The reliability coefficient of the Media Literacy Scale for Children is above 50%.

Technophiles Television Dictionary Children's Interview Form

The 'Television Dictionary' was created by the researcher to increase children's knowledge of smart signs (general audience, 7 years and older, violence/fear, behaviours that could set a negative example) and to enable them to identify the smart sign of the cartoon/series/documentary (1 each) discussed. The reason for selecting these four smart signs is that the Media Literacy Child Interview Form, which had previously been administered to children through individual interviews, included signs for general audience, ages 7 and up, violence/fear, and behaviour that could set a negative example, and children's knowledge of these signs was insufficient.

Smart symbol images were added to the cards prepared in the Canva programme, and documentary/cartoon/series images, titles, and content were added to the other cards. The dictionary was completed within one week. The pilot application of the dictionary was carried out with individual interviews lasting 10-18 minutes with one girl and one boy aged 5-6. In the pilot application, having only one card each for series, cartoons, and documentaries caused the children to match the last remaining card with the last remaining symbol. Upon the children expressing their desire for more series, cartoons, and documentaries, the number of cards was increased to two.

The dictionary, which was implemented in a single session, consists of two stages. In the first stage of the individual interviews with the children, smart signs for the general audience aged 7 and above, violence/fear, and behaviours that could set a negative example were introduced to the children. After the introduction, the cards were shown again, and the children were expected to say what they saw. For the second stage, the researcher prepared cards (two copies each) for each smart sign, featuring series, cartoons, and documentaries. One card displays the visual, name, and channel of the series, cartoon, or documentary, while the other card displays the name of the channel it aired on and its subject matter. The visual of the programme is shown to the child, and the researcher reads the subject matter and asks which smart sign it corresponds to.

Data Collection and Analysis

The Teknofiller Story - Knowledge, Media and Technology Skills Child Interview Form was completed within five days through individual interviews with children. Subsequently, the 'Media Literacy Child Interview Form' was completed within five days through individual interviews with children. Finally, data was collected through individual interviews with children using the 'Technofilers Television Dictionary Interview Form' prepared by the researcher.

Data Analysis For data analysis, inductive analysis was preferred, which helps to discover patterns, themes, and categories in the collected data. Inductive analysis is flexible and allows the data collected throughout the action research process to shape the themes (Bolat, 2019).

As a first step, the transcribed data was uploaded to the MaxQda programme in files. The researcher began reading the section of each child's file related to Information, Media and Technology Skills, marking responses that addressed the skill in order to find recurring elements. To enable the responses to be coded and grouped, a colour was assigned to each word or group of words. In the panel containing all the codes, the researcher grouped those that were related to each other and summarised them under a main theme. Creative coding, code clouds and graphs were created and exported. The children were coded as C1, C2 and C3.

The information obtained through the applied media literacy child interview form was examined by the researcher, and words related to the topic were selected and coded to determine their frequency. Each word was assigned a different colour. The media literacy child interview form aims to identify children's knowledge of traditional and new media and their knowledge of smart signs. Relevant data obtained were grouped, and themes of traditional media, new media, and smart signs were created. The analysis resulting from coding and categorisation was exported using MaxQda visual tools, such as creative coding, code clouds, and graphs. Children were coded as C1, C2, and C3.

FINDINGS

In this section, the findings obtained through data collection tools appropriate to the purpose of the study are presented under two main themes in line with the sub-objectives of the study: findings regarding the information, media and technology skill levels of preschool children and findings regarding their media literacy levels.

Information, Media, and Technology Skills of Preschool Children

The Findings regarding the information, media, and technology skill levels of preschool children, obtained through individual interviews using the Technofil Story-Information, Media, and Technology Skill Interview Form, are presented below under the three sub-themes listed above.

Findings Regarding Levels of Recognising and Providing Information About Technological Devices;

The technological device recognition levels of all children included in the study are presented in Table 1.

Table 1.Graph of Levels of Recognition of Technological Devices

	f	%
can define	22	100

The children recognised technological devices (tablets, phones, computers, televisions) and provided information about them. The fact that the children could recognise the devices when they saw pictures of them allows us to conclude that technological devices have a place in their lives.

When identifying the devices, the children stated:

"The tablet has buttons, a screen, corners, and a cover." (C5)

“The tablet has a volume control button, a screen, a charging port, and a headphone jack.” (C6)

“You can play games. You can watch videos. You can play games with or without the internet. We ask our mum for time.” (C6)

“You can watch cartoons. You can play music. You can connect it to the car and listen to songs. You can play games. You can take photos. You can call someone. You can look at things on Instagram.” (C3). “The computer has letters, buttons, and a screen.” (C11)

“Things are written. Games are played. Pictures are taken. We go to school. Things are watched. Writing is done.” (C10)

“It has a remote control. Some televisions may be small. Some may not need a television stand; they can be hung on the wall. Some may not have an antenna.” (C21)

They have used these expressions.

Findings Regarding the Level of Ability to Compare the Main Character's Perspective with the Perspectives of Other Characters in a Story or Fairy Tale;

All children in the study group answered the questions on pages 23, 26, and 60 of the 'Teknofiller' story, interpreting the perspectives of other characters and expressing their own perspectives. The children's answers were examined under subheadings.

Findings Regarding Children's Opinions on the Use of Technological Devices (Page 23)

Children who answered that they could use technological devices were asked how they could do so, and children who answered that they could not use them were asked why they could not. The children's responses are presented in Table 2 below.

Table 2. Graphic on Why Elephants Cannot Use Technological Devices (Page 23)

	f	%
I don't know	2	11
They can't think, they break	1	5
They have no hands	12	63
The hoses are too soft; they can't be pressed	2	11
They are not human beings	1	5
They don't know the password	1	5

As seen in Table 2, children who stated that elephants cannot use technological devices provided reasons for their statements. While only a small proportion of children did not specify a reason, the vast majority stated that elephants cannot use technological devices because they do not have hands. Other reasons mentioned by the children include elephants' trunks being too soft, not knowing the password, not being able to think, and not being human.

Findings Regarding Children's Views on Being Good Friends (Page 26)

On page 26 of the Teknofiller story, the children were shown Shushu and Mumu, two elephants walking side by side and chatting, and asked, 'Do you think they are good friends? All of the children stated that Mumu and Şuşu, the main characters, were good friends. The graph below (Table 3) shows the children's views on 'being good friends'.

Table 3. Graph of Children's Opinions on Being Good Friends (Page 26)

	f	%
reading stories	1	4
not to fight	1	4
not being best friends	1	4
I don't know	2	8
to say "I love you"	1	4
Share	2	8
to go out together	4	15
to chat	10	38
play games	4	15

As seen in Table 3, the children most often described chatting, followed by playing games and going out together as indicators of good friendship. The children also mentioned reading stories, not fighting, being best friends, saying "I love you very much" and sharing as indicators of good friendship. The findings described above are illustrated below with examples from the participants' statements: "They are good friends because chatting is a nice thing." (C10)

"They have become good friends. I play cooperatively with my good friends; I wait while they change their shoes." (C11)

The children expressed their own ways of forming friendships and the behaviours they see as signs of good friendship through stories. This can be seen as an indication that children have reasoning skills. Findings Regarding Children's Opinions on the Use of Technological Devices (Frequency) (Page 60)

On page 60 of the Teknofiller story, Heybelifil warns children not to spend too much time with technological devices and not to neglect having fun with their friends. Children are then asked what they think and whether they agree with Heybelifil. All the children agreed with Heybelifil's statements and explained their reasons. The graph showing the children's opinions is presented in Table 4 below.

Table 4. Graph of Children's Opinions Regarding the Use of Technological Devices (Frequency) (Page 60)

	f	%
they cannot dream	1	4
they get upset	1	4
causes mental retardation	3	11
their eyesight deteriorates	11	39
playing with friends is fun	12	43

As seen in Table 4, the children understood the perspective of Heybelifil, one of the main characters, and presented their own perspectives. The children stated that the main reason not to use technological devices constantly was that playing with friends was more fun, followed by the fact that their eyesight would deteriorate. The least frequently used statements were that they would not be able to dream and that they would become sulky. They also put forward the view that constant use of technological devices causes intellectual disability. The fact that children are able to use the term intellectual disability suggests that they have previously been informed by their parents or an adult about the effects of excessive use of technological devices on humans.

Findings Regarding the Ability to Use Previous Experiences to Acquire New Information and the Level of Proficiency in Using Technological Devices (Telephone, Tablet, Computer, Television)

Pages 56 and 66 of the Teknofiller story contain questions about children's television usage skills, page 64 about tablet usage, page 70 about computer usage, and pages 72, 76, and 78 about telephone usage skills. The findings regarding children's use of technological devices are presented in Table 5 below.

Table 5. Ability to access new information based on previous experiences and ability to use technological devices (telephone, tablet, computer, television)

	f	%
Tablet	22	100
Phone	22	100
Computer	2	10
Television	17	77,27

As seen in Table 5, all children were able to use tablets and phones independently. In tablet use, they were asked to perform an application related to the ability to open games, and all children were able to do so.

Findings Regarding the Media Literacy Levels of Pre-school Children

The media literacy levels of preschool children were assessed through individual interviews using the Media Literacy Preschool Children Interview Form, consisting of ten questions, with each correct answer scoring one point. The scores obtained by the children are presented in Table 6.

Table 6.Graph of Media Literacy Scores of Preschool Children

	f	%
4 score	2	9
5 score	1	5
3 score	3	14
6 score	3	14
2 score	13	59

According to Table 6, the Media Literacy Preschool Interview Form scores of the children in the study group range from 0 to 10 points. In the interview form consisting of 10 questions and a maximum score of 10 points, scores of 5 and below are considered to need improvement, while scores of 6 and above are considered advanced. Therefore, it is evident that the media literacy level of the vast majority of children needs to be developed.

Findings Regarding the Level of Recognition of Traditional and New Media Tools

All children recognised and named the technological devices (phone, tablet, headphones, television, camera) included in the interview form. Children's recognition of traditional and new media tools is presented in creative coding format in Table 7 below.

Table 7. Graph of Findings Regarding Levels of Recognition of Traditional and New Media Tools

	f	%
new media tools	22	100
traditional media tools	8	36,6

As shown in Table 7, while all children are familiar with new media tools, few children are familiar with traditional media tools (television, radio, newspapers). Children who were unfamiliar with newspapers were asked to comment on what they thought a newspaper looked like, and their responses are presented in graph form in Table 8 below.

Table 8. Graph of Comments Related to Newspapers

	f	%
Atatürk	4	50
Flag	1	13
Map	1	13
Paper	1	13
Children	1	13

As seen in Table 8, when asked about newspapers, children who were unfamiliar with them most often said that newspapers resembled Atatürk. Children also gave answers such as flag, map, children, and paper. It is assumed that children gave the answers Atatürk and flag because these were shown on the newspaper presented to them.

Findings Regarding Knowledge of Smart Signs on the Screen

The children answered questions about smart signs in the media literacy child interview form. It was observed that the majority of children did not recognise smart signs and therefore did not know what to do when they saw them. The findings are presented in graph form in Table 9.

Table 9.Word Cloud of Smart Sign Recognition Status

	f	%
for ages 7 and up	3	38
general audience	5	63

As seen in Table 9, 14 children stated that they did not recognise any of the smart symbols (general audience, suitable for ages 7 and above, violence/fear, behaviours that could set a negative example) found in the child interview form. A small proportion of children recognised the general audience and suitable for ages 7 and above signs.

Due to the fact that the majority of children (n:14) did not recognise the smart symbols, the researcher created the Technofilers Television Dictionary. The dictionary was completed through 12- 25 minute individual interviews with each child. The data obtained through the interviews is presented below under the following headings.

Findings Regarding Children's Broadcast-Smart Symbol Matching

The findings obtained from the children are presented below in Table 10.

Table 10. Broadcast-Sign Matching Creative Coding

	f	%
for ages 7 and up	22	100
general audience	22	100
signs of behavior that could set a bad example	15	68.18
sign of violence and fear	14	63.63

As seen in Table 10, all children were able to easily match the signs for ages 7 and above and the general audience signs with the broadcast. It was also observed that the vast majority of children were able to match the signs for potentially negative behaviour and violence/fear with the broadcast. Nevertheless, the 7 years and older and general audience ratings can be said to be the ratings that children understood better. Some of the participants' statements are provided below:

"It was easy. The stories were very entertaining and easy. I liked the family camp the most because there was no fighting. We don't go camping with my family, but I would like to. With what I've learned, I'll change the channel when I see the violence/fear and negative example symbols." (C6)

"The stories on the cards were very easy. I understood the signs, I liked the stories. I liked the family camp the most because they do nice things, everyone can watch it." (C10)

Following this application, in the adaptation phase, which is the final stage of the practitioner action research, the Teknofiller Television Dictionary Children's Interview Form was reapplied with the number of broadcasts

reduced to 1 in order to collect data on the children's retention of their learning about smart signs. The data obtained is presented below in Table 11.

Table 11. Broadcast-Sign Matching

	f	%
for ages 7 and up	22	100
general audience	22	100
signs of behavior that could set a bad example	16	72.73
sign of violence and fear	22	100

As seen in Table 11, all children recognised the signs for violence/fear, general audience, and ages 7 and above and were able to match them with the broadcast. The behaviour that could constitute a negative example is again a label that children found difficult to learn in the initial introduction to the Technofil TV Dictionary application. Five weeks after the application, the Technofil TV Dictionary was reapplied to determine the children's level of recall, and the results were found to be better than in the first application.

Other Findings Related to the Teknofiller Story

After the story was completed, the children were asked for their opinions on the story. The children's thoughts on the Teknofiller story are presented in table form in Table 12 below.

Table 12. Graph of Comments on the Story

	f	%
I like it	22	50
It was easy	16	36
It was difficult	4	9
Some parts were difficult, some were easy.	2	5

As seen in Table 12, all children (n:22) stated that they liked the story. While the vast majority of children found the questions in the story easy (n:16), some children found them difficult (n:4) and somewhat difficult (n:2). Some participant views regarding the findings obtained are given below:

"I liked the story. I liked Aunt Şilu and Heybelifili the most. The things she wanted were very beautiful. It was easy" (C1).

"I liked the story. I liked how the elephant explained the tablets and other things. I liked Aunt Shilu the most because she was the leader of the herd. I also really like being a star child. It was easy" (C2).

"I liked the story. I liked the elephant the most because he told the elephants. The questions were easy" (C3).

Children's favorite elephants are presented in Table 13.

Table 13. The most beloved elephants

	f	%
Heybelifil	7	24
Mumu	7	24
all elephants	2	7
aunt şilu	8	28
Şuşu	5	17

As shown in Table 13, the majority of children stated that they loved Aunt Şilu, Mumu and Heybelifil. This can be seen as an indication that the children formed bonds with the elephants.

RESULT and DISCUSSION

In this study, the "Information, Media and Technology Skills," one of the 21st-century skills, of the children in the study group were examined through the story titled "Teknofiller" created by the researcher, and data were obtained through individual interviews with the children. As a result of these interviews, it was concluded that the children's information, media and technology skills were well developed. To determine their media literacy level, the "media literacy child interview form" was administered through individual interviews with the children. The media literacy child interview form included questions about smart signs and traditional-new media. It was concluded that the media literacy levels of the children in the study group needed to be developed. Based on this result, the researcher prepared and implemented an action plan entitled "techno-philes-television dictionary".

The "techno-philes television dictionary" applications, which aim to enable children to learn smart cues (general audience, ages 7 and up, violence/fear, behaviours that could set a negative example) and match them with a broadcast on the subject, have been shown to result in learning. Five weeks after the application, the techno-philes-television dictionary was reapplied to determine children's recall levels, and the results were found to be even better than the first application.

The knowledge, media, and technology skills of preschool children were examined under the subheadings of comparing the main character's perspective with that of other characters, recognising and describing technological devices, utilising previous experiences to access new information, and being able to use technological devices.

The children were able to compare the perspectives of the main character and other characters and express their own ideas in a logical manner. Supporting this result, the Updated MEB Pre-school Education Programme (2024) states that it is stated that children can establish cause-and- effect relationships (cognitive development, achievement 5), recognise symbols used in daily life (cognitive development, achievement 6), demonstrate critical thinking skills (cognitive development, achievement 21), and make decisions between options (cognitive development, achievement 23). The achievements included in the programme demonstrate that pre-school children can acquire this skill. All children have recognised and identified technological devices such as tablets, phones, computers, and televisions. The fact that children easily recognise technological devices is an indication that these devices have a place in their lives. In their study "Examining the Views of Parents with Preschool Children on Technology Use" (2020), Oğuz and Kutlaca also found that parents stated that their children easily used the devices.

When describing the devices, children mentioned both their external structural features and their functional characteristics. This may indicate that technological devices attract children's attention and that children examine them in depth. As part of the study, a "personal information form" was sent to parents, and information was obtained about how much time children spent with technological devices and how they spent their time with the devices. The information obtained from this indicates that the majority of children own a technological device, mostly spend time with their parents or older siblings, and spend less than 1 hour per day with the device.

Studies have found that preschool children began to use technological devices uncontrollably, especially after the pandemic (Batmaz & Güler, 2022; Baysan, 2022; Gökler & Turan, 2020; Yüksel &Albaş, 2023; Pınar, 2021; Okatan & Tagay, 2023). Although the information obtained in the study indicates that children spend time with technological devices under supervision, there are also children who spend time alone with the device. Children who know how to use technological devices but lack knowledge about how to use them appropriately may be exposed to harmful content when left alone. Information about children's ability to use technological devices and benefit from their previous experiences to access new information was conveyed through the story, in which the elephants needed help. All children can easily use tablets and phones. Arslan (2022), in his study titled 'Examining the relationship between digital parenting awareness and problematic media use in children', supports this result, concluding that tablets are the most commonly used technological devices among preschool children, followed by smartphones. Furthermore, it has been observed that preschool children's use of technological devices increased during the pandemic (Demir Öztürk et al., 2020) and that they used tablets and phones the most (Döğer &Kılınç, 2021). The fact that the children in the study group could easily use tablets and phones may indicate that these devices have a place in their lives. At the same time, the expressions used by children when describing tablets and phones (I play games, I watch videos, I take photos, I do research...) are consistent with this result.

Some children had difficulty using the television. This may be due to tablets and phones being used more frequently in homes, while the television is not preferred. Very few children can use a computer. When describing technological devices, children also characterised the computer as an adult device, stating that it is used for 'working, doing homework, and holding meetings'. The reason for not being able to use computers may be that they do not spend much time with this device. Indeed, children are aware that a mouse is needed to use a computer; they move the mouse over the file they want to open and wait for it to open.

Supporting this result, Yıldız (2024) concluded in their study titled 'Examination of Technology Usage Levels of Pre-school Children and Primary School Students' that the device children spend the least time with is the computer. Furthermore, Oral Paksoy and Arslan (2021) stated in their study titled "Examination of Preschool Children's Television Viewing and Computer Playing Times in Terms of Visual-Motor Integration" that computers are harmful to children's cognitive and physical development and should not be used until the age of 6. In light of this information in the field, the fact that the children in the study group did not know how to use computers may be an indication that they did not spend time on computers.

The level of media literacy among pre-school children in this study examines their recognition of traditional and new media, as well as their recognition of smart signs. In light of the information presented in the findings of the media literacy interview form, the majority of children low level of media literacy; therefore, the technophiles television dictionary action plan was implemented to enable children to learn smart signs and match smart signs with broadcasts. Five weeks after the implementation, when the action plan was reapplied, it was observed that the children's recall levels were high and their learning had become permanent.

The fact that children recognise smart signs and can determine whether they are appropriate for them will contribute to their development by enabling them to gain awareness about media content and take steps towards becoming media literate at an early age. Özonur (2016), in their study titled 'Classification Systems for Television Programmes: What Are Smart Labels Used For?', states that viewers are active in front of the screen and can choose the most suitable programme for themselves and their children while being protected from the negative effects of the screen. Özbay and Akyıldız (2021), in their study titled "The Role of Regulatory and Supervisory Institutions in Combating Externalities: The Example of RTÜK," state that smart labels, which provide information about the content before the broadcast begins, increase parents' awareness and prevent children and young people from being exposed to harmful content. The findings of this research are supported by studies in the literature, which indicate that smart labels have positive effects on children's development.

In his research on parents' media literacy awareness, Gündüz Kalan (2010) states that, contrary to this result, the activities that can be carried out for the media literacy of pre-school children are limited. However, a large amount of data can be collected from pre-school children using measurement tools appropriate to their age and developmental level.

Another striking result is that children have developed information, media, and technology skills, which are sub-dimensions of 21st-century skills. In a study conducted with preschool teachers (Güney Manavoğlu, 2022), it is stated that they consider it important for children to have only information literacy skills among

information, media, and technology skills; however, this study concluded that children have advanced levels of information, media, and technology skills. This may be due to children being born in years when technological devices are used intensively and learning by observing their surroundings.

In order to develop information, media, technology skills and media literacy, which are among the 21st century skills, in pre-school children, it is first necessary to determine the children's levels. Within the scope of the thesis study, the researcher reached these results through measurement tools prepared in a manner suitable for pre-school children, and the measurement tools were made available for use by all preschool teachers. Recommendations Cooperation between children, families and teachers is crucial to ensuring the holistic development of children in pre-school education. Therefore, by providing training to families and teachers to become good media literate individuals, children's media literacy skills can also be developed. Even though children are young, they can be encouraged to take on responsibilities appropriate to their age and developmental level in their own lives, drawing their attention to approach the media critically with the support of families and teachers.

Children can be encouraged not to be passive in the face of media content, to gain awareness and to develop critical thinking skills. In this field, data on 21st-century skills for pre-school children is obtained through parents and teachers. However, when age- and developmentally-appropriate measurement tools are used, children are able to express their own thoughts. In this way, information is obtained from the primary source. Therefore, in studies conducted with pre-school children, data can be collected from them by developing measurement tools suitable for children.

Declarations

Conflict of Interest

There are no circumstances that could constitute a conflict of interest. (Mandatory disclosure)

Ethics Approval

Name of the ethics committee conducting the review: FSMVÜ

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Research and Publication Ethics Statement

- This material is the authors' own original work, which has not been previously published elsewhere.
- The paper reflects the authors' own research and analysis in a truthful and complete manner.
- The results are appropriately placed in the context of prior and existing research.
- All sources used are properly disclosed.

Contribution Rates of Authors to the Article

1st author (50%), 2nd author (50%). The study is derived from a thesis.

(Mandatory declaration)

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Appendices

Appendix 1. The Technofillies Story

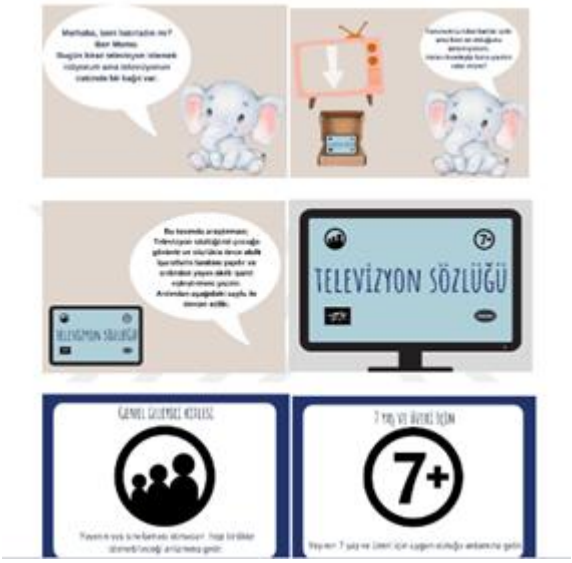

-35-
Fil 'Merhaba sevgili filler, sizleri buralarda ilk defa görüyorum. Meraklanmayın artık bu teknolojisiz hayattan siz de kurtulacaksınız. Siz de birer teknofil olmak istemez misiniz?' Dedi.
Tüm filler: 'İsteriz isteriz isteriz.'
Şilu teyze 'Son bir anlat bakalım heybeli fil, nedir heybendeki, teknofil olmak da ne demekmiş?'
-36-


-61-
Artık sürüdeki herkesin bir teknolojik cihazı olmuştu. Birer teknofil olduğu için herkes çok mutluydu fakat Heybeli filin söylediklerini de unutmayacaklardı. Şimdi Mumu tabletiyle oyun oynamak istiyor.
-62-


SEN ONUN NE OLDUĞUNU BİLİYOR MUSUN?
-19-
Şilu teyze devam etti: 'Onun adı tablet, insanlar onunla oyun oynuyor, müzik dinliyor, yazı yazıyor ve hikaye dinliyorlar.' Dedi.
-20-


-29-
Sürüdeki tüm filler şaşkın şaşkın birbirine bakıyor ve aynı soruları soruyorlardı.
'bu fillerin ellerindekiler de nedir? Daha önce hiç böyle bir fil sürüsü görmemiştim.'
'Ben de görmedim.'
'Ben de.'
Şilu teyze 'ileride filler de insanlar gibi olacak diyorlardı ama hiç ihtimal vermemiştim. Ben de şaşkınım sevgili filler.'
Mumu 'Nereden bulmuşlar ki, acaba nasıl kullanıyorlar, kim öğretmiş...' diye sorularını sıraladı.
-30-

Appendix 2. Technofillies Television Glossary



Appendix 3. Media Literacy Child Interview Form