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Maintaining bilingualism through technologies: the case of young Russian heritage learners

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Abstract

The multicultural realities of modern society require an effective system to support the development and preservation of the heritage language of children growing and developing outside of their heritage culture. Digital technologies may come at hand to parents and educators who strive to create such a system for their bi- or multilingual children.

This paper reports on the mixed methods research study that documented and analyzed attitude to and the usage of digital technologies by Russian-speaking parents raising bi-/multilingual children outside of Russia. Thirty-four participants from 12 countries completed an online questionnaire. Three native Russian mothers raising young Russian heritage language learners were also engaged into a case study.

The study revealed that parenting efforts could include speech development learning activities with traditional and digital learning tools. Participants expressed their favorable view on the educational value of digital (computer, mobile, online) technologies. In practice, however, parents' usage of these tools was very limited as most of them preferred a printed book and live communication for maintaining Russian. It was obvious that many parents are not well informed about the availability of high-quality digital resources for the development of Russian speech in preschoolers and/or do not see their advantages. The results of the research confirmed studies that indicated the importance of creating the "child-digital resource-teacher" interaction and the need for mediation by an adult in a situation where a child interacts with a computer or tablet. These results are of practical significance for formal and informal bilingual educators, teacher training institutions and parents of bi-/multilingual children.

KEYWORDS: Educational Technology, Digital Learning Objects, Bi/Multilingual Education.

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1. Introduction

The multicultural realities of modern society require an effective system to support the development and preservation of heritage language of children growing and developing outside of their ethnic culture. Given the globalization of the labor market and the migration processes of recent decades, many countries experience the growth of population for which the language spoken in the family circle differs from the dominant (state) language of the nation.

At the same time, the number of mixed marriages is growing. According to the UN, in 2017, 258 million people lived outside the country where they were born (Pison, 2019), with the largest number of immigrants living in such countries (in descending order) as the United States of America, Russia, Saudi Arabia, Germany and the United Kingdom. It is also important to note that the leading sending countries (in descending order) are India, Mexico, Russia, China and Bangladesh. Currently, 10.4 million people born in Russia live outside its borders (Pison, 2019). According to other sources, in the first decade of the 21st century,

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30 million Russians and their descendants lived outside of Russia (Russian diaspora, 2020).

These migration and globalization trends require the development of a multilingual member of society (Brinton et al., 2008). At the same time, existing education systems, especially on the pre-school level, do not always support bi-and multilingualism. Often, it is only the family that provides space for preserving heritage language. Studies show that parents often play a key role in the development of bi-or multilingualism of their young children (Cho, 2008; Kheirkhah & Cekaite, 2015; King et al., 2006), while their disbelief in bi-/multilingualism leads to the loss of the family language, its complete displacement by the language of the country's dominant culture (Mbakop & Ndada, 2019).

Family members who have decided to transfer their mother tongue to a child choose a range of teaching methods and technologies that allow them to create language learning environment. Digital tools, among others, may take an important place in this environment (Morgan & Peter, 2014). Learning technologies, where digital tools link the child and the parent, allow us to create the conditions for the child's speech development, contributing to his/her high engagement with the content and involvement in the learning process (Debski, 2019). Computer and mobile language games, active use of electronic resources in the target language, synchronous and asynchronous online communication can also contribute to the development and preservation of the child's heritage language (Cho, 2008; Morgan & Peter, 2014).

With the gradual introduction of digital technologies into lives of young children, researchers start documenting cases of the use of computer, mobile and other digital tools in the development of (native, non-native) speech of preschool children. Despite the presence of skeptics who emphasize the negative impact of modern IT technologies on children, a significant number of practitioners and researchers acknowledge and confirm that multimodality (that is, the use of several channels (modes) of information transfer) and interactivity (that is, the possibility of active two- or multilateral interaction) of digital technologies offer great opportunities for studying language and literacy in general (Bus, et al., 2015; Cummins, 2008; Kayumova & Sadykova, 2019; Meskill & Mossop, 2000; Plass & Jones, 2005; Sadykova et al., 2018; Smeets & Bus, 2014). Digital tools such as games, wikis, talking avatars, and interactive stories can have a positive effect on developing language skills, increasing learning motivation, creating an engaging learning situation of play (Edwards, 2016; Li & Ni, 2013; Terrell, 2011; Verdugo & Belmonte, 2007). Studies indicate the effectiveness of the use of digital resources for the development of phonological skills of children (Segers & Verhoeven, 2003). Moreover, IT technologies can become a transmitter of culture, an instrument for developing sociocultural skills, which is especially important for children brought up outside their ethnic homeland (Sadykova et al., 2018).

This study aims to partially compensate for the lack of research on the use of digital (computer, mobile, online) technologies for preserving and maintaining the heritage (mother, family) language of children. The research team set the task to study the application of digital technologies by Russian-speaking parents raising bilingual (multilingual) children outside the Russian educational environment.

2. Materials and Methods

2.1 Research questions

This exploratory mixed-methods study was guided by the following research questions:

1. What role may digital technologies play in the development and maintenance of young Russian heritage learners?
2. How do native Russia parents of heritage learners make use of digital resources for speech development of their bi- / multilingual children?

2.2 Theoretical foundation

This study is based on the sociocultural theoretical framework developed by the Russian psychologist Lev Vygotsky (1978) and further expanded by his followers as well as on the construct of *producerly pleasures* described in Meskill (2007).

Vygotskian sociocultural paradigm underscores the importance of social interaction in the learning process and emphasizes the significant role of a *more knowledgeable other* and *mediating tools* for creating learning environment conducive to successful internization of knowledge. In Vygotskian sociocultural paradigm, learning tools play the role of *mediators of knowledge* (Vygotsky, 1978). Digital learning objects may also be described as knowledge mediators as they are able to build learning environment that enables the child to interact with the content and acquire the new knowledge and skills. Moreover, studies show that digital technology may create the situation of play, thus presenting and practicing the content in the form most appropriate for young learners (Roskos & Christie, 2001).

Children's experiences with digital screens could also be characterized by *producerly pleasures* inherent in digital activity (Meskill, 2007). Digital technologies enable the child to seek for information, identify and relate to it, feel satisfied and rewarded when being able to locate, interact and experience the feeling of relatability. Interactions with digital technology are also described as having *screen magic* effect, when the user is captivated by what is happening on the screen and experiences the fear of missing out – FOMO (Turkle, 2016).

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These four digital screens characteristics – *seeking, identification /relatability, rewards and screen magic* – were shown to affect the *child-technology-teacher* interaction. The study conducted in state and private bilingual kindergartens and preschools in the Russian Federation, (Meskill et. al, 2020) demonstrated how these four dimensions were enacted further illustrating this by mediating strategies that participating teachers employed when integrating multimodal digital resources in Russian language activities with bilingual children.

2.3 Data collection and analysis

This study aimed to get a broad understanding of the subject matter and involve Russian parents raising children in different countries. The data collection started with the online survey administered through Google Forms. The survey included 24 questions, both multiple-choice and open-ended (see Appendix), focused on demographic data of participants and the degree of penetration of digital (computer, mobile, online) resources into lives of young bilingual (multilingual) children.

To recruit participants, the invitation to participate in the study was distributed via social networks (groups for Russian-speaking emigrants), as well as by sending emails to public addresses of Russian preschool institutions abroad and to the personal addresses of Russian-speaking repatriates who responded to personal proposals of the members of the research team. The questionnaire was completed by 34 respondents. The responses of 9 participants were excluded from the analysis because the age of their children did not match the target group (children up to 8 years old). The rest of the survey participants were parents and educators of 3-4-year-olds (40%, 10 respondents), 5-6-year-olds (48%, 12 respondents) and 7-8-year-olds (12%, 3 respondents); 60% of the children were boys and 40% were girls. Among the respondents were representatives of Turkey (five respondents), Italy, Great Britain and the USA (three respondents each), Switzerland, Germany and Morocco (two respondents each), Australia, Canada, Lithuania, India, France (one respondent each). Results of 25 questionnaires were analysed qualitatively and quantitatively. Answers to open-ended questions underwent content analysis for recurrent themes by two researchers, while data from close-ended questions enabled the research team to analyze percentiles, create graphs and see the trends.

In the second stage, the research focused on individual cases. Three mothers of young bilingual children agreed to video record their home Russian learning activities that involved a child's interaction with a digital resource. A parent could select her own digital material, however researchers also recommended resources if a parent asked for such help. On completion of a set of lessons, parents were interviewed by means of instant messaging services and email, which enabled the researchers to get better understanding of parents' attitude to the use of technology by their children in general and for speech development in particular. The collected videos of lessons and interviews were analyzed qualitatively for recurrent themes that were then compared and contrasted with survey data and between cases.

For the purposes of this study the case participants were families in which Russian mothers were bringing up children of 8 years old or younger while living outside of the Russian Federation. All children involved into the case study were born and raised outside of Russia.

Case #1 is a family of a 4-year-old boy Erik (*here and later names of all study participants are changed to protect their identity), a 7-year-old boy Denny, their Russian-speaking mother Alia and Turkish-speaking father Marat. Both boys speak Turkish with their father, Russian with their mother and attend Turkish kindergarten and school in Istanbul, Turkey. The mother states that the level of Russian language proficiency of her children is lower than the average level of a child of the same age and gender living in Russia. Oral communication of children is mainly carried out in the language of the environment (i.e. Turkish). The percentage of Russian-language information that children receive from outside (i.e. from people, books, media, etc.) is low and comprises approximately 21-40% of the total amount of information received. In this regard, the mother makes efforts to preserve the Russian language in the family. A Russian language teacher gives lessons to the children once a week. The mother does Russian language exercises with her children in activity-books; she reads books in Russian to them, and makes sure that children regularly watch cartoons in Russian. Other ways to learn the language include communicating with Russian-speaking neighbours and friends, traveling to relatives in Russia, viewing or listening to Russian media.

Case #2 is a family where both parents are native Russians but who moved to the United States after the father took the position in the IT field. They live in Boston area. Mother Alina, who has a degree in language education, takes care of three boys: 3-year-old Faris, 5-year-old Amir and 11-year-old Ilgyz. Russian is the only medium of communication at home, though two older children attend English-speaking schools. Boys also visit their grandparents in Russia each summer (for up to 3 months) and sometimes for winter holidays. These efforts enable the mother to state that the level of Russian language proficiency of her children is higher or the same as the average level of a child of the same age and gender living in Russia.

Case #3 is a family from Morocco. Mother Albina is a native Russian who married to a Pakistan Sindhi when studying in the USA. The family lived in the USA for more than 15 years and then moved to Morocco when the father received a job offer from the university

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located in Ifrane. There are 5 children in the family including an 8-year-old boy Tagir and two girls – 5-year-old Alsu and 2,7-year-old Rushana. The medium of communication at home is English, while mother sometimes speaks to her children in elementary Russian and father in elementary Arabic. Each summer for about one month children visit their grandparents in Russia and usually once in every three years for about three weeks they spend time with grandparents in the United Arab Emirates. The mother notes that the level of Russian language proficiency of her three younger children is much lower than the average level of a child of the same age and gender living in Russia. Oral communication of children with their parents and each other at home is carried out only in English since they do not attend any schools (both English-speaking or Arabic-speaking) being home schooled with their mother and father who are educators.

Due to the small sample size the results of the study are limited in generalizability. Data collection involved the necessity to access participants who were living in different parts of the world and in diverse time zones; therefore all communication was conducted via digital technologies (computers, mobile phones, tablets) and online (email, instant messaging, cloud services). This slowed down the data collection process but enabled the researchers to involve participants from abroad.

3. Results

3.1 Digital technologies in the life of a bilingual child

The survey results demonstrated the level of technology usage by children of 8 years old or younger whose parents and educators responded to the questionnaire. The study shows that most of these children use digital technology for less than 1 hour per day (48%, 12 respondents) or do not use it at all (8%, 2 respondents), which could be due to the early age of the children. Children of five respondents (20%) use computer or mobile technologies 2-3 hours a day, four children (16%) – 1-2 hours a day. Only one child (4%) uses digital technology for more than 3 hours a day (see Fig. 1).

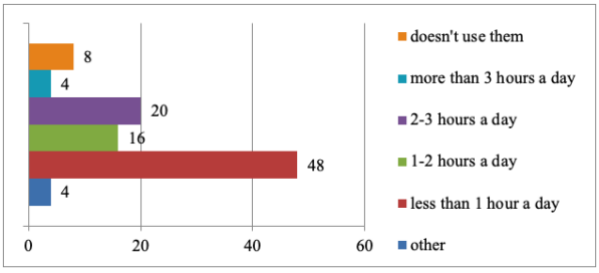

Figure 1 - Answers to the question "How often does a child use computer and mobile technologies?" (%)

The questionnaire also indicated that about half of the children surveyed (52%, 13 respondents) do not use a computer, tablet or mobile phone to develop Russian speech. Twenty percent of children (5 respondents) use computer or mobile technologies to develop children's speech for a maximum of 30 minutes a day; 8% (2 respondents) – 30-60 minutes a day; 12% (3 respondents) – 1-2 hours a day. One respondent (4%) replied that his/her child uses digital technology to develop speech 2-3 hours a day, one (4%) – more than 3 hours a day (see Fig. 2).

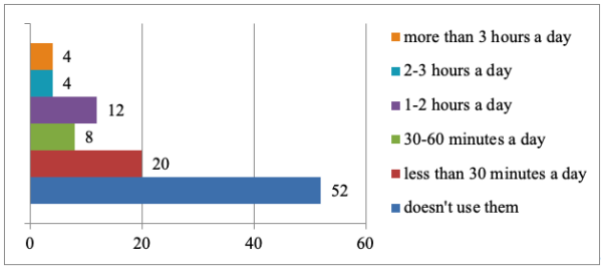

Figure 2 - Answers to the question "How often does a child use computer and mobile technologies to develop Russian speech?" (%)

The study revealed that the vast majority of respondents prefer to use traditional (non-digital) learning tools, namely printed books (80%, 20 respondents), children's games (20%, 5 respondents), cartoons and puzzles (4%, 1 respondent). One respondent (4%) uses digital games and digital resources in joint activities for the development of Russian speech of a child; another respondent (4%) explained that he uses them extremely rarely. One parent noted that his child is listening to Arzamas radio, namely the "Children's room" section (see Fig. 3).

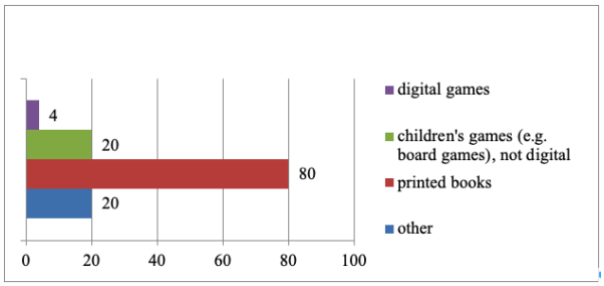

Figure 3 - Answers to the question "What educational materials do you use with your child to develop Russian speech?" (%)

The survey results are supported by the results of the case study.

Alia, mother of the two boys living in Turkey (case #1) explained that she prefers to use traditional (non-digital) teaching tools, namely printed books. However, there are cases of technology usage to study English. In her interview Alia stated: *"We [child 1 and mother] did crossword puzzles on the tablet together; we tried to find correct words. If there was a word unknown to my child, I explained it to him"*. Despite the fact that the children are not active users of digital resources, the mother readily agreed to participate in the case study and to test the online resources she had never used before. It was clear from the interview that Alia

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believes that digital resources can be useful for the development of Russian language and culture of her children; however, to achieve a positive result, the interaction of children and technology, according to the mother, should be accompanied by active participation of the parent. She also expressed her interest to learn about Russian language resources for children.

In December 2019, the mother organized mini-lessons of Russian for her children, 4-year-old Erik (Child 1) and 7-year-old Denny (Child 2), with the use of digital technologies: the children were given tasks on a tablet. The resource chosen was the *Playground* section on an online platform *Education in Russian* developed in Pushkin State Russian Language Institute [http://rus4chld.pushkininstitute.ru/#/playingfield/game]. The lessons were recorded by the mother with a smartphone.

In total, we received five videos but two were excluded from the selection because of uncompleted character. The total duration of the three videos is 7 minutes:

- Video 1 (duration 2:11): Child 1 solves riddles together with his mother [http://rus4chld.pushkininstitute.ru/moduleload?id=Zagadki_po_priznakam];
- Video 2 (duration 03:29): Child 2 performs the task Mothers and babies together with his mother and Child 1 [http://rus4chld.pushkininstitute.ru/moduleload?id=Mamy_detki];
- Video 3 (duration 02:21): Child 2 performs the task Can or can't together with his mother and Child 1 [http://rus4chld.pushkininstitute.ru/moduleload?id=Mozhno_nelzya].

In case #2, Alina also expressed her concern with the use of (computer, mobile, online) technology in the early age. In fact, she was firm about the need to limit their boys' exposure to technology. Having an education in linguistics and language teaching, experience teaching Spanish as a foreign language and a certificate of a Russian language teacher, she makes much effort for creating appropriate environment for maintaining and developing Russian language skills of her children. In her interview, she confessed that she prefers a printed book and live communication for learning Russian (and other skills) rather than using digital resources. Despite the fact that the children can use a computer, tablet or mobile phone, Alina limits the usage of digital technology, as she prefers to use traditional (printed) teaching tools. However, she uses audio devices like an iPod for listening fairy-tales and music. She also practices recording her own voice or her older son's voice while reading most favourite stories and fairy-tales to be able to replay later.

For the purpose of this case study Alina decided to use a digital resource *Live Fairytales*, which is a state-funded online Russian language school for 3-5-year-old children (https://skazki.pushkininstitute.ru). A mother and her two children, Faris who was 5 (Child 1) and 3-year-old Amir (Child 2), had Russian language lessons on a computer (laptop). Three videos were recorded with a total duration of 38:23 minutes.

- Video 1 (duration 19:57): Child 1 and Child 2 complete the tasks of Module 1 *My family* with their mother [https://skazki.pushkininstitute.ru/skazki/#/module/1_1/startPage]. She asks additional questions, draws children's attention to some details and characters and cheers up her children. Children listen to the information about the main character's family and a fairy tale and then answer questions by selecting the right card.
- Video 2 (duration 07:13): Child 1 and Child 2 complete the tasks of the first part of Module 4 *New Year*; mother asks Child 1 to read the titles in the module, asks both boys to describe pictures and helps them by asking supporting questions [https://skazki.pushkininstitute.ru/skazki/#/module/1_4/startPage]. They then decorate the Christmas tree dragging Christmas decorations according to their size, shape and color.
- Video 3 (duration 11:13): Child 1 and Child 2 perform the task of the second part of Module 4 *New Year* [https://skazki.pushkininstitute.ru/skazki/#/module/1_4/lesson/2 / task / 1 / scene / 2]. The resource tells a fairy tale and then children supported by their mother complete comprehension tasks: answer character's questions by selecting the right card and coloring the picture.

Albina from Morocco does not limit technology usage of her children as strongly as Alina. But she still does not feel very positive about the use of technologies for teaching a child something. The main reason for it, as she confessed in an interview, is that introducing a computer into teaching something means introducing the negatives of the computer; moreover, it might be difficult to police a child especially the young one. At the same time, she admits: *"Maybe it's because I haven't found any kind of really engaging programme that I am just blown away by. Maybe if I did find something like this then I would overlook the negatives of the digital means of presenting information in general."* Moreover, she agrees that digital technology can perform as a tool for maintaining bilingualism but has only limited potential. For example, she has used Russian-speaking cartoons that she found useful but only because she did a lot of her own work speaking continually and involving children into active interaction.

In her case Albina used the online platform *Education in Russian*. She and her children, Tagir who was 8 (Child 1), Alsu who was 5 (Child 2), and Rushana who was 2,7 years old (Child 3) at the moment of the study, had Russian mini-lessons in the section *Russian for our Kids* [http://rus4chld.pushkininstitute.ru/#/]. Three videos were recorded with a total duration of 17:49 minutes.

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- Video 1 (duration 03:21): Child 3 performs tasks of the *Summer Day* lesson on painting the landscape together with his mother [http://rus4chld.pushkininstitute.ru/moduleload?id=Raskr_LetniyDen]
- Video 2 (duration 05:14): Child 2 and Child 3 perform the *Mothers and babies* task on matching adult animals and their cubs together with their mother [http://rus4chld.pushkininstitute.ru/moduleload?id=Mamy_detki];
- Video 3 (duration 09:14): Child 1 and Child 2 perform the task of the *Summer Day* lesson on painting the landscape together with their mother [http://rus4chld.pushkininstitute.ru/moduleload?id=Raskr_LetniyDen].

To sum up, the survey and the study of cases demonstrate that parents are not very enthusiastic about the introduction of digital technology in general and for learning Russian in particular. Parents and educators do not encourage children to use these tools, preferring printed books, board games and live communication in family as major means of creating learning environment conducive to heritage language acquisition. Children's early age seem to be the major factor that impacts low usage of technology. On the other hand, parents show little knowledge of educational resources meant for very young Russian language learners.

3.2 Digital screens as mediators of knowledge

In the following sections, the four digital screen characteristics – *seeking*, *rewards*, *identification*, and *screen magic* (Meskill, 2007; Meskill et al., 2020) – are used to analyse *child-technology-mother* interactions video recorded in 3 cases.

Seeking

Seeking for new knowledge through interaction with the digital screen were evident in all three cases examined. The children clearly derived producerly pleasure through guided seeking.

[*Case #3. The screen shows a picture that a child has to paint following the prompts.*]
Resource [*sets the task in Russian*]: First choose the color and then paint. I will prompt you. Goose's beak paint red.
Mother [*repeats in Russian*]: Goose's beak paint red. [*Speaks English*]: So, you will choose the color…
Child 1 [*knows the colors, answers in Russian*]: red. [*Speaks English*]: red color.
Mother [*Speaks English*]: So, you choose the color and then you have to color it. [*Repeats in Russian*]: Goose's beak paint red. Who is goose? Where is goose?
Child 1 [*points at different pictures, asks in English*]: This? This?
Mother [*speaks Russian*]: Yes. Now what is goose's beak? What can be red?
Child 1 [*Speaks English*]: Beak! (Case #3, Video 1).

The next example illustrates activity that a mother performs with two children at the same time.

[*Case #1. A child has to drag the pictures depicting activities (such as reading, cycling, sweeping the floor, etc.) to their matching location – either 'indoors' or 'outdoors'*].
Mother [*speaks Russian*]: Where do we ski? (*pointing to the picture depicting skiing*)
Child 1: Where do we ski? Indoors or outdoors? *(asks the questions in Russian accompanying them with expressive facial and body movements)*
Mother [*repeats in Russian*]: Where do we ski?
Child 2 [*pointing to the picture depicting skiing in the snow answers in Russian*]: Snow.
Mother [*speaks Russian*]: Yes. Is it indoors or outdoors?
Child 2 [*answers in Russian*]: Snow.
Mother [*asks in Russian*]: Where does it snow? Indoors or outdoors?
Child 2 clicks on the picture depicting skiing.
Resource [*in Russian*]: Skiing.
Mother [*speaks Russian*]: Where does it snow? It snows outdoors. Drag the picture. (Case #1, Video 3).

As we can see, the less proficient the child in Russian, the more he depends on the resources and affordances at hand, i.e., on-screen images and audio, his parent and sibling. The younger child seems to be unfamiliar with the word 'skiing' in Russian; however, he knows the word 'snow' and operates with this word to participate in the task. Both the parent and older child outpace the digital resource and provide initial language support by naming the activity and possible variants of its location. The application names the activity only when the child clicks on the picture.

In general, both children derive pleasure through this seeking activity: the older child is delighted by being *the more knowledgeable other* (Vygotsky, 1978) who can assist and guide the less proficient brother; the younger child is happy to be allowed to click the buttons and do this interactive seeking activity on his own.

Identification

This dimension refers to the feeling of relatability, when the user is able to identify oneself with or relate to what happens on the screen. Children usually identify with the digital characters that 'reside' in the resource, the so-called learning buddies (McCloud, 1993). In Case #1 identification was manifested when the older child communicated directly with the digital character – an animated girl Masha who asked him riddles:

[A child has to solve a riddle. There are four flashcards on the screen.]
Masha: *I have some riddles for you. I'll think of an object; you have to guess what it is. It is wooden and brown. It has four legs.*
(The boy clicks on the picture of a table).
Masha: *Yes, that's right. It is a table.*
Child 1[*speaks Russian in a disappointed voice*]: *Oh,*

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that was easy.
Masha: *It is juicy, round and orange.*
Child 1 [*answers in Russian*]: *Of course, it is a ... (clicks on the picture of an orange).*
Masha: *Yes, that's right. It's an orange.* (Case #1, Video 1).
In Case #2, we also see how a child speaks to digital characters as if they were their buddies. The following transcripts provide an example of a child responding to the screen character Masha spontaneously as if she was real:
Masha (*on screen speaks Russian*): What's your name?
Child 2 [*speaks Russian*]: Amir. [*The boy gives an answer without any hesitation*].
Masha [*on screen speaks Russian*]: You have a very beautiful name. *(The child is very pleased. He smiles and looks at his mother).* (Case #2, Video 1).

Rewards

The rewards dimension of producerly pleasures is clearly intertwined with seeking. In our case, digital rewards took many forms, both verbal (e.g. 'Well done!') and non-verbal (e.g. characters start moving or images start flashing, etc.). The children were rewarded when they correctly comprehended and produced Russian and when they successfully identified and manipulated onscreen material. The pleasure of these linguistic/digital successes was immediately observable as there were gasps of thrill and delight, smiles and laughter, and spontaneous applause.
[*A child has to match mother animals and baby animals. When the child clicks the correct buttons, on the screen an animated gosling comes up to its mommy goose.*]
Mother [*speaks English and then translates into Russian*]: Hey, the gosling cames to its mommy!
Child 2 starts smiling and clapping his hands. (Case #1, Video 2).

Some modern digital educational resources designed for children employ rewards to motivate the users to complete the task. In case #2, the digital online activity used for language learning used gems (diamonds) that a child received from a dragon Zmej Gorynych after the completion of an activity. In the next example we can see how both participating children want to get diamonds.
Masha [*on screen speaks Russian*]: Hello, I am Masha. I am four years old. How old are you?
Child 1 [*whispers in Russian*]: Five.
Mother [*addressing the younger child in Russian*]: Who is it on the pic?
Child 2 [*in Russian*]: Six!!
Mother [*speaks Russian, in surprise*]: Oh really? You are six?
Masha [*there are flashing cards on the screen while she is counting in Russian*]: How old are you: one, two, three, four, five?
Child 1 with the help of his mother chooses the card with number 5.
Zmey Gorynych [*speaks Russian*]: Wow! You are five already! Here is a gem for you!
Child1 [*speaks Russian, in excitement*]: It's Zmey Gorynych!
Mother [*in Russian*]: Yes, he gave you a gem.
Child 2 [*in Russian*]: And I get a gem! (Case #2, Video 1).

Screen Magic

The magical effect of the screen was very well illustrated in all three cases. Video recorded activities reveal that there is pleasure in co-viewing or co-experiencing digital worlds. In Case #1 we see how a younger child climbs to his mother's laps when she starts doing language activities on the tablet with her older son. We see that the same happens in Case #2 and Case #3.

In most cases, a mother and children gather around a single screen as a group with the purpose of interacting with the screen and with each other. For example, in Case #1 we observe children stretching across the table to get closer to the screen not to miss something. When they see a new page or a new task they exclaim "Oh!" or "Wow!" in excitement. Moreover, they want to navigate and control what is happening on the screen by themselves.
Mother [*pointing at the screen to the button "enter" speaks Russian*]: Press! We'll enter the fairytale.
Child 1 [*presses the button*].
Mother [*in Russian encourages him while the page is loading*]: Oh! Somebody might appear! It might be Baba Yaga… Or somebody else? Maybe a goblin? [*there is a technical problem and the system asks to register*] Ok, hold on, mom should register here…
Researcher [*offers her help and reaching for the laptop*]: Ok, let me help you.
Mother [*speaks Russian*]: Ok, Lidia will help us.
Child 1 [*in a stubborn voice speaks Russian*]: No, I will! (Case #2, Video 1).

4. Discussion and Conclusions

The survey results show a generally positive attitude of parents who raise Russian heritage speakers outside of the Russian Federation to digital (computer, mobile, online) education technologies. In practice, however, parents are often reluctant to use these tools to develop the speech of their own children preferring a printed book and live communication. Partially this seems to be due to the early age of learners and parents' concern with the negative impact of digital environment to children's health. Moreover, it became obvious that many parents are poorly informed about the availability of high-quality digital resources for the development of Russian speech in pre-school children. Some parents may also not see the need to replace traditional media to digital as they do not see the advantages of such replacement nor do they know much about how to properly do it. Meanwhile modern studies show that children of the digital age, that is, the so-called *digital*

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natives, can effectively interact with multimodal and interactive learning tools, including for the purposes of supporting active bi- and multilingualism (Cummins, 2008; Lohe & Elsner, 2014; Meskill & Mossop, 2000).

The results of the study confirm previous research that indicates the importance of creating the *child-technology-teacher* dialogue and the need for mediation by an adult (teacher, parent) in a situation where a child interacts with a computer or tablet screen (Meskill et al., 2020; Rosen & Jaruszewicz, 2009; Sadykova et al., 2019). The right choice of a digital tool that enables such mediation might be critical for productive interaction to happen. The child reacts well to screen activities that involve her/him into active interaction with it and provides pleasurable experiences through the situations of seeking, identification, and rewards. The magic of screen may engage the child into child-to-screen interaction that simulates real communication and supports language production and engagement with the language content.

The cases demonstrated that digital technologies may play the knowledge mediating role as they enable the teacher (mothers in our cases) to support strong interest of a child to the content, engage young learners with pleasurable language learning activities, and enhance content base with multimodal presentation of the information.

Study results speak for the need to provide additional support to parents of heritage learners who would like to integrate technologies into their homeschooling activities. The survey and case study data revealed that the majority of parents cannot always fully develop the speech of their bi- or multilingual children, as they do not have sufficient competencies in the field of bilingual pedagogy and digital educational resources. The creation of open and accessible resources in this area, as well as (online) consultation of language and early childhood specialists, could partially compensate for this gap.

At the current post-industrial stage of development our society is faced with the need to address issues related to the processes of globalization and migration. Effecting primarily spheres of politics and economics, these processes have an impact on the education and development of children, including those who are educated in the homeschooling format. A multicultural and multilingual society is made up of families where issues of the interaction of cultures and languages are matters that require daily close attention. Families raising children in a bi- and multilingual environment must make considerable efforts to preserve heritage language of their off-springs. Our study shows that parenting efforts can include both speech development classes with traditional and digital learning tools, and activities that indirectly create linguistic and cultural environment that promotes the development of speech skills. Digital tools, however, require more time to penetrate into the everyday learning activities, while parents need additional support to learn what tools are available and how to integrate them into their home educational practices.

These results are of practical significance for formal and informal bilingual educators, teacher training institutions and parents of bi-/multilingual children.

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