



THE RANGE OF COMMUNICATION TOPICS OF THE VISUALLY IMPAIRED IN THE INTERNET COMMUNITIES

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Abstract

Purpose of the study: This study discusses questions associated with the analysis of the most relevant communication topics of sight-disabled people in the Internet communities. According to the World Health Organization, there are about 1.3 billion people worldwide who live with a form of vision disorder. For solving a broad range of social problems of the sight-disabled, interest-based virtual social communities are created in the global internet network. By analyzing the content of these communities, one can judge about the most relevant topics of interest for sight-disabled people.

Methodology: In this work, search and study of the Internet communities of sight-disabled people have been conducted in the VK (Russia) social network. Using the Popsters service of analytics of social network posts and pages, the authors have analyzed the content of the said communities and identified the most relevant topics for this category of citizens. In the research, the hypothesis was used about a stable and significant statistical relation existing between the activity of users in the Internet communities associated with a particular topic and the level of significance of the selected topic for them.

Main Findings: The development of information and communication technologies promotes socialization and integration of sight-disabled people into the civic society. The Internet communities of sight-disabled people focused on various topics are registered in the VK social network. The state has to more extensively support and develop technologies contributing to socialization and integration of sight-disabled people into the civic society.

Applications of this study: The research findings can be of interest for specialists dealing with problems of socialization and social adaptation of people having vision limitations.

Novelty/Originality of this study: It has been found that the Internet communities with the user-supplemented content have the highest quantity of users registered. The topics range of posts in these Internet communities is quite diverse. Posts asserting the traditional life principles: compassion, assistance, overcoming difficulties – win the highest users' response.

Keywords: *Vision Impairment, Sight-disabled People, World Health Organization, Internet, Internet Communities, Social Networks, Information and Communication Technologies, Popsters.*

INTRODUCTION

According to the World Health Organization, there are about 1.3 billion people worldwide living with a form of vision disorder (World Health Organization, 2019). Minor distant vision disorders are registered in 188.5 million people, while moderate and severe far sight disorders – in 217 million people (Bourne et al., 2017). Near sight, disorders have been found in 826 million people (Fricke et al., 2018). About 36 million people are entirely blind (Bourne et al., 2017).

Apparently, alongside the currently observed aging of the population, the risk of increasingly more people developing sight disorders is going to grow. This is especially relevant for Russia. According to the research conducted (Chang et al., 2019), this country's population ages quicker than that of the world's other countries. Usually, citizens of Russia have the package of characteristic senior-age illnesses developed so early as by 59 years old. According to the beginning of population aging, Russia ranks 160th among 192 studied countries.

The contemporary development level of information and communication technologies allows creating virtual social environments with preset features (Pronchev, 2013) that help the sight-disabled integrate into the civic society (Goncharova & Pronchev, 2015; Goncharova et al., 2017; Pronchev et al., 2018). Meanwhile, the virtual environments can be considered as a tool for expanding the closed social and cultural context (Barker, 1963; Vinnikova, 2018) of this category of citizens (Goncharova et al., 2018; Goncharova et al., 2020b).

For solving a broad range of social issues of sight-disabled people, virtual social networks are created, according to their interests (the Internet communities) (Pronchev et al., 2016). The problem range of physical accessibility of such Internet communities is covered in scientific works sufficiently. The works deal with solving the problems of technical equipment of personal computers: Braille font keyboards (Waterhouse, 1958; Waterhouse, 1975), software, speech synthesizers, etc. (Goncharova & Pronchev, 2015), the questions of preparing the personnel for training the disabled (Pronchev & Goncharova, 2016), and with the regulatory framework of the existing issues (Goncharova et al., 2016).

This paper focuses on searching and exploring the operating Internet communities of sight-disabled people, analyzing the content of posts in these communities for identifying the most relevant topics for this category of citizens.

LITERATURE REVIEW

The crucial problem of people having sight impairment is that perceiving visual information ([Amit et al., 2017](#); [Adaval et al., 2019](#)) is either difficult or entirely impossible for them.

Previous studies have shown that in Russia, they are extensively institutionalizing the mechanism of forming accessible environment for people having health limitations, the sight-disabled ones included ([Pronchev et al., 2017](#); [Goncharova et al., 2017](#); [Firsov et al., 2019](#); [Zamiralova et al., 2019](#)). The real breakthrough in the accessibility policy was the adoption of the [State Program of the Russian Federation "Accessible environment" \(2011\)](#) in 2011. The set of measures taken was aimed at making the environment comfortable and convenient for everyone. There was consistent work targeted at the social protection of sight-disabled people, including them into interaction with a variety of social institutions extensively. It was also aimed at granting those opportunities for working, getting an education, and rendering consumer services ([Agapov & Pronchev, 2018](#)) so that their income could be increased, and the quality of life would improve ([Sushko et al., 2016](#)). Concerning the questions of studying and creating a barrier-free environment ([Monakhov & Pronchev, 2020b](#)), it is forming an accessible environment for the sight-disabled as the program approach that has sparked off a growing interest in the scientific community, as well as in various public and commercial organizations.

Recent years have seen some sociological surveys dealing with social problems of sight-disabled people in Russia.

So, for example, a sociological survey was conducted among the blind of the Kursk and Kursk Region for identifying the change of blind people's value references. It has been found ([Lotoreva, 2011](#)) that in conditions of impairment or loss of sight, such a category of values as "health" not only keeps its significance but, conversely, becomes even more critical, too, as compared to the seeing people's rating in this value category. It is for the family that the blind people have high hopes because family value references turn out to be especially important in conditions of impairment or loss of sight, just like in conditions of the lack of employment. In the blind, work occupies the third place, which is explained by the "low" pension and, consequently, having to obtain additional material income ([Lotoreva, 2011](#)).

The center of legal information of Kemerovo regional special library for the blind and visually impaired people studied factors hindering the integration of the disabled into society. The survey results analysis ([Legal information center for the disabled, 1998](#)) has shown that the process of integration of the disabled into the society is tremendously affected by their ignorance of the current legislation which keeps changing. As a result, the majority of people having sight disabilities cannot defend their civil rights (the right for work, education, rest, and access to information, and others) ([Zhavoronkov, 2019](#)).

In 2012, the personality features of visually impaired adolescents depending on their gender were studied. It has been found ([Yakovleva, 2012](#)) that largely, previously existing traditional patterns of masculinity and femininity have changed in today's conditions, and they keep changing. This creates considerable difficulties for adolescents trying to integrate various social roles in their personalities. Visually impaired adolescents do not limit themselves with passive learning gender norms and roles. Still, they strive to independently and dynamically comprehend and form their own gender identity on equal terms with their healthy peers.

For overcoming the existing barriers and for social integration and adaptation of people having health limitations, the following problems have to be solved ([Dobrovolskaya & Shabalina, 1991](#)): 1) the current information and communication technologies have to be adapted, and fundamentally new ones have to be created to ensure the access of people with sight impairment to the entire scope and all types of information; 2) the disabled have to be trained in the independent use of these technologies; 3) the unending need of gaining new knowledge has to be formed in people with disabilities; 4) information about the development of typhlotechnic means for people having health limitations has to be provided.

The authors believe that the crucial tool for creating a barrier-free environment for sight-disabled people is the creation of virtual social environments on the Internet ([Schönbrodt & Asendorpf, 2011](#); [Pronchev et al., 2019b](#)).

As the principal communication channels for the sight-disabled are the sense of touch and hearing, the use of traditional means ([Culham & Nind, 2003](#)) of social integration and adaptation on the Internet (social networks, news feeds, etc.) is impossible without additional special means. As a rule, the information systems available use speech synthesizer software, and the device called the Braille display; these tools allow working with a standard PC ([Goncharova & Pronchev, 2015](#)).

Notably, at present, the Internet's most popular information search services already meet the standards required for presenting information to sight-disabled people.

For example, back in May 2015, they made the home page of the Yandex search engine accessible both to the blind and the visually impaired Internet users who worked via the screen access software (JAWS, NVDA, and VoiceOver). As screen access software reads out just everything fed into it, the portal's main task is to pick the most relevant information. Blind Windows OS users can utilize the Mail and Yandex. Browser, too. Yandex timed the launch of its

services to coincide with the Global Accessibility Awareness Day which is dedicated to popularizing accessibility within the IT-branch – i.e., the ideas of designing interfaces to be accessible to people having health limitations ([Yandex, 2014](#)).

Google search engine launched its new free speech synthesizer to voice over any text shown on the screen ([Google, 2014](#)) at the end of May 2014. It enables the functions of "Reading aloud" in Google Play Books, listening to words pronounced by Google Translator, working with TalkBack, and using other accessibility features (with all the actions voiced over simultaneously). The speech synthesizer supports quite a lot of languages: English (in the variants of Great Britain, India, and the USA), Spanish (the variants of Spain and the USA), Portuguese (as spoken in Brazil), Italian, French, Dutch, German, Polish, Russian, Turkish, Hindi, Thai, Indonesian, Cantonese, Mandarin, Korean, and Japanese ([Google, 2014](#)).

Comparing the authors' 2015 research ([Goncharova & Pronchev, 2015](#)) with the one presented in 2020, one can note the increase in the number of sight-disabled people in social networks of the Internet.

In 2015, the authors noted in their work that "in spite of certain success in the area of social integration and adaptation of people with sight impairments by means of virtual environments (the use of speech synthesizer software, Braille displays), the activity of this category of citizens is not high in virtual environments. So few as several hundreds of people extensively use the most popular social networks, both specialized and conventional ones... The State Program of the Russian Federation "Accessible environment" promotes the creation of new virtual social environments considering in their operation the "mechanisms" for the people with vision disorders to access them. In the future, all the state and municipal websites have to ensure this category of citizens the "free" access to their resources" ([Goncharova & Pronchev, 2015](#)).

In the last five years, they have discovered new technological opportunities for the sight-disabled, which contributed to their more successful socialization in virtual environments. At the same time, new tool options for users have been created, for example, Popsters analytical service (Online: <https://popsters.ru>. Available 28/01/2020). In this work, based on new analytical opportunities, the authors make an attempt to find out what communication topics are the most relevant for people with sight disabilities.

The objective of the study

The objective of this research is the study of the most relevant for sight-disabled people topics of communications in the Internet social networks. The most discussed subjects allow identifying the key lines of social work with this category of citizens, creating and granting conditions that help people with sight disabilities become full-fledged members of the civic society.

The studies were conducted in the popular Russian social network – VK (Online: <https://vk.com>, available 28/01/2020). VK is the largest social network in Russia and the CIS: 97 million users per month, 10 billion of messages daily, and 1 billion "likes" marks per day (Online: <https://vk.com>, available 28/01/2020).

The main tasks of the research are the following:

1. Searching for the Internet communities of sight-disabled people in the VK social network;
2. Analyzing the relevance for the sight-disabled communication topics.

RESEARCH METHODOLOGICAL FRAMEWORK

In this work, the Internet study conducted by the authors in January 2020 was used as the source of empirical data.

In the Internet study, the hypothesis about there being a stable and significant statistical relation between the activity of users in the Internet communities associated with a particular topic (descriptors) and the level of significance of the selected topic for them (indicators) ([Petrov & Pronchev, 2017](#); [Pronchev et al., 2019a](#)).

The Popsters analytical service (Online: <https://popsters.ru>. Available 28/01/2020) was used as a toolkit. On January 28, 2020, the search and study of communication topics that are the most relevant for sight-disabled people in the Internet communities of the VK social network were conducted.

Various metrics of the Popsters resource were employed (see Table 1).

Table 1: The Popsters Resource Metrics

Name of the metric	Description
ER (abbr. Engagement Rate)	users' engagement rate of the content published (posts);
ERpost	users' engagement rate of a particular posts ERpost = (likes + reposts + comments [+ dislikes for YouTube]) / quantity of followers
ERday	total users' engagement rate for all posts published within a day

ERview	engagement rate of a particular post calculated as the number of views (for VKontakte, YouTube, Coub, and Flickr) $ERview = (\text{likes} + \text{reposts} + \text{comments} [+ \text{dislikes for YouTube}]) / \text{quantity of views of the published item}$
average ERpost	the arithmetic average of ERpost for all published items for the period under analysis
average RERview	the arithmetic average of ERview of all the posts
average ERday	the arithmetic average of ERday for the entire period under analysis
LR (abbr. Love Rate)	love rate ("likes" only) $LR = (\text{The total of likes}) / \text{quantity of followers/quantity of published items for the period under analysis}$
TR (abbr. Talk Rate)	talk rate (comments only) $TR = (\text{The total of comments}) / \text{quantity of followers/quantity of published items for the period under analysis}$

Source: According to the online resource <https://popsters.ru>. Available 28/01/2020

RESULTS AND DISCUSSION

Searching for the Internet communities of sight-disabled people

At the first stage of the research, the search for the Internet communities of sight-disabled people was conducted in the VKontakte social network (<https://vk.com>, available 28/01/2020). The search results for the most popular queries are presented in Table 2.

Table 2: The Most Popular Queries in the VK Social Network

Search line queries	The quantity of communities, pcs (as of 28/01/2020)	Notes
"the visually impaired"	80	
"the disabled vision"	12	
"the blind"	1032	84 communities satisfy the problems range of people having vision limitations
"typhlocenter"	1	
"the blind people"	137	
"people having vision limitations"	-	

Source: According to the authors' data

The total quantity of communities registered in the VKontakte social network as of 28/01/2020 equals 517119. The obtained data indicate that the share of communities for sight-disabled people makes less than one percent (more precisely, it is 0.06%) Meanwhile, notably, members of these communities include both the sight-disabled and healthy people.

Our findings correlate with the research by [Dorota Żuchowska-Skiba \(2018\)](#), who notes that «social networks of people with disabilities are smaller than those of able-bodied people. In addition, regardless of their degree of disability, they are largely based on relationships with their closest relatives. These points to the importance of family for this category, which, given that it is a network with the greatest number of social interactions of people with disabilities, can also play an important supporting role in difficult situations» ([Żuchowska-Skiba, 2018, p. 151](#)).

These findings reveal that the said Internet communities represent public organizations (17.5%), state services (9.8%), commercial structures (7.2%), but mainly they are users content ones (65.5%). Public and state organizations feature public libraries, foundations for the blind and visually impaired, boarding schools, and other educational structures.

As it is known, education also affected the number of social interactions of people with disabilities ([Stojkow & Żuchowska-Skiba, 2018](#)). The higher the level of education, the larger the number of social interactions. Here, the differences were definitely higher: people with primary and lower education had on average 0.73 fewer social interactions than people with lower secondary or vocational education. People with secondary education had an average of 1.06 contacts with the family. Those with the highest average number of contacts with the family where people with higher education (1.33) ([Stojkow & Żuchowska-Skiba, 2018](#)).

Commercial structures post information about computer equipment and software for the visually impaired in the pages of their communities.

The range of topics of users' content includes news, leisure, education, culture, health ([Goncharova et al., 2020a](#)).

Next, open communities having the highest number of followers (500 people and more) were analyzed. The results obtained are presented in Table 3.

Table 3: The Open Internet Communities

No.	Names of the Internet communities	The number of members	Content submitted by	The range of topics
1.	Library for the blind and visually impaired, SPb https://vk.com/gbssspb	3394	A state structure	The state library
2.	Tactile books (for blind children) https://vk.com/living_books	2438	Users	Education, culture, upbringing
3.	au-books.com – Audio library for the blind people https://vk.com/au_books	2405	Users	Education, culture
4.	Massage and manual therapy – a blind specialist SPb https://vk.com/manualterapia	2351	Users	Health
5.	Tours with a blind guide "Tangible Petersburg" https://vk.com/2feelspb	1818	Users	Culture
6.	The typical blind https://vk.com/typicalblind	1622	Users	Education
7.	Camerata https://vk.com/tiflocentr	1565	A public organization	Various topics
8.	All-Russian Society of the blind – Saint-Petersburg https://vk.com/spbvos	1374	A public organization	Various topics
9.	The youth movement of sight-disabled people https://vk.com/ya.ksrk	1284	A public organization	Various topics
10.	The blind massage therapist. Sevastopol https://vk.com/club169449753	1197	Users	Health
11.	Jumble sale for the blind and visually impaired https://vk.com/blindmarket	1451	Users	Social and economic sphere (market)
12.	Problems of blind users of the vk.com website https://vk.com/vkblind	1025	Users	Technology, education, ICT
13.	Guide – device for the blind and visually impaired https://vk.com/public141616009	1017	Users	Innovation technologies
14.	Jobs for blind people https://vk.com/trudvos	991	A public organization	Employment
15.	All about electronics for the blind https://vk.com/elektronika_nuse_help	999	Users	Science and technology
16.	Nezrya (lit. Not in vain) – assistance to the blind people https://vk.com/nezryaproject	871	A commercial organization	Education
17.	BlindDroid "The Android world through the eyes of the blind" https://vk.com/blinddroid	796	Users	ICT
18.	Memes for the visually impaired https://vk.com/memes15678	760	Users	Entertainment
19.	Manual medicine – blind massage therapists https://vk.com/club21772478	651	Users	Health and medicine
20.	Group for the blind and visually impaired. I can do everything	581	Users	ICT, education

Source: According to the authors' data

For further analysis, the authors used the Popsters analytics service for posts and pages in social networks (<https://popsters.ru>, available 28/01/2020). The Internet communities were analyzed in individual groups according to the leading content creators.

The state structures and public organizations

In Table 4, the results of studying the state structures and public organizations are given for the period of 04/2011 – 01/2020 (as of 31/01/2020).

Table 4: The Internet Communities of the State Structures and Public Organizations

Popsters resource metrics	Jobs for blind people	The youth movement of sight-disabled people	All-Russian Society of the blind – Saint-Petersburg	Camerata	Library for the blind and visually impaired, SPb
Followers	993	1285	1374	1565	3394
Total likes	2900	6470	38976	22120	20395
Total reposts	935	4517	5361	4740	4283
Total comments	447	202	1056	1585	662
Total views	209690	184137	634044	406164	719842
Total posts	2823	4270	4059	2519	3065
ERday,%	0.185	0.312	1.325	0.543	0.249
ERpost,%	0.153	0.204	0.814	0.722	0.244
ERview,%	1.423	2.768	6.161	5.776	2.343
LR,%	0.103	0.118	0.699	0.561	0.196
TR,%	0.016	0.004	0.019	0.040	0.006
Average likes	1	2	10	9	7
Average reposts	0	1	1	2	1
Average comments	0	0	0	1	0
Average views	74	43	156	161	235

Source: According to the authors' data

The Internet community "All-Russian Society of the blind – Saint-Petersburg" is not the most numerous, according to the number of followers. However, it features the highest users' engagement and love rates in terms of the presentation of the material. In addition, this online community publishes legal information, which is important for this category of citizens ([Monakhov & Pronchev, 2020a](#)). According to the talk rate, this community is second to Camerata. The highest quantity of posts is observed in the community "Youth movement of sight-disabled people," while the maximum number of views – in the community "Library for the blind and visually impaired, SPb."

When analyzing the feed of posts of all communities, according to the number of likes, three posts of the Camerata community can be singled out: "My red-haired assistant" (20/03/2018, 310 likes) – the post about a smartphone and mastering it, "Vyacheslav Pomerantsev. The world in my eyes" (05/08/2019, 229 likes) – a work for a creative contest, and "Only the heart has kept sight" project" (15/07/2018, 165 likes) – the project aimed at creating comfortable conditions for training students with vision disability at Chuvash State Pedagogical University.

According to the number of reposts, one can note the post about the selection of feature films with typhlo comments of the Camerata community (10/06/2017, 50 reposts), the post about the musical evening "Great romanticists. Sergei Rakhmaninov and Edvard Grieg" by the music expert Larisa Vorontsovskaya in the community "Library for the blind and visually impaired, SPb" (02/10/2013, 49 reposts), and the Camerata post about the hotline on questions of non-visual (without the help of sight) use of smartphones and tablet PCs "Universal mobile assistant" (13/11/2019, 43 reposts).

According to comments, three posts by the Camerata community stand out: "Total PI coming again" – the post about aids for working in social networks, namely, uploading pictures, etc. (15/01/2020, 66 comments), the post "Do your duty" – on psychological support in communication with people and the attitude to the blind (20/11/2019, 47 comments), and the post "Total PI, the Pilot of truth" – the poll and information about the new feature (13/11/2019, 45 comments).

According to the number of views, two posts by the Camerata community are leading: "My red-haired assistant" (20/03/2018, 6956 views) – the post about a smartphone and mastering it, and "Only the heart has kept sight" project" (15/07/2018, 6947 views), the project aimed at creating comfortable conditions for training students with vision disability at Chuvash State Pedagogical University. They are followed by posts by the Library for the blind and visually impaired, SPb: "Making the planet cleaner has become one step easier! An eco-box for recycling batteries has been installed in the library conference hall at 11, Strel'nitskaya Str. Now you can drop by us more often, borrow more books,

and save nature!" (09/08/2017, 4939 views) and "A sensory kindergarten for blind children has been opened in Saint-Petersburg" (04/09/2019, 5268 views).

According to the engagement of posts, the Popsters analytical resource selects three posts by the community "Library for the blind and visually impaired, SPb" first. The first one is about a cycle of classes of the city scientific and practical workshop dealing with technologies of interacting with special readers within the cultural and educational space: "The first class was dedicated to questions of deviant behavior. Galina Grigorievna Fedorova, a candidate of sciences in pedagogy, associate professor of the department of upbringing and socialization of the Institute of Pedagogy of A. I. Herzen RSPU, gave a lecture on the problem of bullying as a form of deviant behavior" (31/01/2020, ERpost 2.326%, ERview 3.546%). The second post is the "English-speaking discussion club "Meetups at the Big Ben" with the topic "Technology" (26/12/2019, ERpost 1.768%, ERview 2.345%). The third post is about funding: "A 14.5% increase of funding will be up for the provision of the disabled with rehabilitation means: in the nearest three years, it will make 35.5 billion roubles per each year. Russia's vice prime minister, Tatiana Golikova, spoke about this during her meeting with representatives of public organizations of the disabled. This year, 31 billion roubles were allotted for technical rehabilitation means" (18.12.2019, ERpost 0.000%, ERview 0.000%).

The range of topics of the selected communities can be traced according to the quantity of posts with particular hashtags among the total of posts analyzed. Table 5 shows the results obtained for various hashtags in the Internet communities for the period of 04/2011 – 01/2020 (as of 31/01/2020). The search was performed according to both English and Russian hashtags.

Table 5: The Number of Posts according to Hashtags

Hashtags	Semantic translation of the hashtags into English	The Internet communities				
		St. Petersburg Regional Organization of the All-Russian Society of the Blind	Jobs for blind people	The youth movement of sight-disabled people	Camerata	State Library for the blind Saint-Petersburg
Blind	-	0	0	0	2	18
Gbss	-	0	0	0	0	24
kadrof-vacancy	-	0	40	0	0	0
Radiivos	-	48	9	30	5	2
Statusonline	-	0	0	0	18	0
besplatno (rus)	Free	13	0	0	0	256
biblioteka (rus)	Library	10	0	2	3	248
bibliotekadlyaslepyh (rus)	Library for the blind	26	0	0	2	354
brajl (rus)	Braille	3	0	0	0	18
vakansii (rus)	Jobs open	0	52	0	0	1
vos (rus)	All-Russian society of the blind	18	1	45	4	4
vystavka (rus)	Exhibition	2	0	1	0	18
gbss (rus)	State library for the blind and visually impaired	17	0	0	0	237
gbss-exlibris (rus)	State library for the blind and visually impaired – ex libris	0	0	0	0	33
gbss-afisha (rus)	State library for the blind and visually impaired – events	0	0	0	0	38
deti (rus)	Children	0	0	8	0	22
dostupnyasreda (rus)	Sccessible environment	8	1	8	13	11
druzyakameraty	Camerata friends	1	7	0	123	1

(rus)						
invalidnost (rus)	Disability	1	8	1	3	2
invalidy (rus)	The disabled	5	9	11	4	7
invalidyopozreniyu (rus)	Ones with vision disability	2	1	0	21	0
inklyuzivnoeobrazovanie (rus)	Inclusive education	1	2	0	16	1
inklyuziya (rus)	Inclusion	0	2	1	4	11
inklyuziyabezillyuzij (rus)	Illusions-free inclusion	0	3	0	82	1
internetgolosovanie (rus)	Internet voting	0	0	0	46	0
istoriyaputeshestviya (rus)	A travel story	0	0	0	25	0
kamerata (rus)	Camerata	1	0	3	158	1
kino (rus)	Cinema	1	0	6	0	13
kompyuterdyaslepyh (rus)	Computer for the blind	0	0	0	19	0
kompyuterplyus (rus)	Computer plus	0	0	0	29	0
koncert (rus)	Concert	3	0	1	0	89
lekcija (rus)	Lecture	5	0	0	0	128
molodezh (rus)	Young people	0	1	40	0	0
molodyozhnyjehfir (rus)	Youth broadcast	3	0	39	0	0
moskva (rus)	Moscow	3	23	3	6	7
muzyka (rus)	Music	4	0	2	3	103
nezryachie (rus)	The blind people	12	4	23	50	38
novosti (rus)	News	6	4	1	0	6
obrazovanie (rus)	Education	3	4	0	1	12
operator-dstantsiya (rus)	Remote operator	0	31	0	0	0
peterburg (rus)	Saint-Petersburg	17	0	0	0	313
rabota (rus)	Job	0	49	3	0	1
rabotaruhevskojmovos (rus)	Work of the All-Russian society of the blind	64	0	0	0	0
radiovos (rus)	Radio of the All-Russian society of the blind	48	9	110	7	2
slabovidyashchie (rus)	The visually impaired	10	4	2	44	15
slepye (rus)	The blind	5	0	0	3	10
sprovos (rus)	All-Russian society of the blind – Saint-Petersburg	16	0	0	0	0
sport (rus)	Sports	7	1	15	0	3
tiflokommentarij (rus)	Typhlocomments	4	0	6	8	2
trudoustrojstvo (rus)	Employment	1	14	2	0	1
uchimsyainklyuzii (rus)	Learning the inclusion	1	5	0	50	1

fondprezidentski hgrantov (rus)	Presidential grants foundation	10	3	0	16	0
fortepiano (rus)	Piano	0	0	0	0	16
centrkamerata (rus)	The Camerata center	1	7	0	144	3
chm2018 (rus)	2018 World Cup	2	0	13	1	0
shagiinklyuzii (rus)	Steps of inclusion	0	2	0	21	0
shriftbrajlya (rus)	Braille font	1	0	0	2	15
shchedryjvtornik (rus)	Generous Tuesday	0	0	0	41	4

Source: According to the authors' data

Table 5 demonstrates that users are segmented by various internet communities. Otherwise, the requests would be the same. Thus, the behavior of visually impaired people differs from ordinary users who prefer using several social networks at once (Osipova et al., 2017; Osipova et al., 2018).

Users content

In Tables 6 – 8, metrics of the Popsters resource for the Internet communities posting users content are presented for the period of 11/2020 – 02/2020 (as of 2/02/2020).

Table 6: The Popsters Resource Metrics

No.	Names of the Internet communities	Metrics of the Popsters resource					
		The number of followers	Total likes	Total reposts	Total comments	Total views	Total posts
1.	Tactile books (for blind children)	2438	12028	832	753	2138916	298
2.	au-books.com – Audio library for the blind people	2405	6838	582	177	836931	14595
3.	Massage and manual therapy – a blind specialist SPb	2351	1966	1018	25	141173	765
4.	Tours with a blind guide "Tangible Petersburg"	1818	2007	404	58	81805	341
5.	The typical blind	1622	14797	2169	1417	332813	184
6.	The blind massage therapist. Sevastopol	1197	1687	446	70	113359	130
7.	Jumble sale for the blind and visually impaired	1451	3358	680	1060	332450	1800
8.	Problems of blind users of the vk.com website	1025	1017	110	3030	8794	734
9.	Guide – device for the blind and visually impaired	1017	11	2	6	1771	3
10.	All about electronics for the blind	999	4941	511	6667	230235	1420
11.	BlindDroid "The Android world through the eyes of the blind"	796	471	68	516	3081	4041
12.	Memes for the visually impaired	760	1590	55	165	76920	110
13.	Manual medicine – blind massage therapists	651	471	68	516	3081	404
14.	Group for the blind and visually impaired. I can do everything	581	368	2	82	220	358

Source: According to the authors' data

Table 7: The Popsters Resource Metrics

No.	Metrics of the Popsters resource								
	ERday, %	ERpost,%	ERview,%	LR,%	TR,%	Average likes	Average reposts	Average comments	Average views
1.	0.600	1.874	2.273	1.656	0.104	40	3	3	7178
2.	0.135	0.022	0.854	0.019	0.001	0	0	0	57
3.	0.043	0.167	2.364	0.109	0.001	3	1	0	185
4.	0.095	0.398	1.344	0.324	0.009	6	1	0	240
5.	2.271	6.160	5.303	4.958	0.475	80	12	8	1809
6.	0.393	1.416	1.871	1.084	0.045	13	3	1	872
7.	0.286	0.195	1.080	0.129	0.041	2	0	1	185
8.	0.156	0.553	4.352	0.135	0.403	1	0	4	12
9.	0.011	0.623	1.080	0.361	0.197	4	1	2	590
10.	0.769	0.853	4.736	0.348	0.469	3	0	5	162
11.	0.060	0.327	6.516	0.146	0.160	1	0	1	8
12.	1.895	2.171	3.021	1.907	0.198	1	0	0	1
13.	0.060	0.327	6.516	0.146	0.160	1	0	1	8
14.	0.048	0.217	1.364	0.177	0.039	14	3	0	577

Source: According to the authors' data

Our research has shown that online communities with user-generated content are most attractive to visually impaired people (65%, see 4.1). In this sense, disabled people behave like sighted users who are interested in non-formalized topics of communication ([Korkiya et al., 2016](#); [Vasenina et al., 2018](#)).

The posts of the "Tactile books (for blind children)" community have the highest number of views and likes marked. The "Typical blind" community comes forward, according to the number of comments and engagement in their posts.

When analyzing the feed of posts of all communities according to love rate (the number of likes), the post by the "Typical blind" community stands out. One cannot just pass it by without responding: this is the post about a blind boy refused by his mother, so they were looking for a family for him (26/10/2019, 404 likes). "Loneliness is worse than blindness. We receive many requests for publishing notices, advertisements, etc. Usually, we reject them. But there are situations when one cannot say no, and this story is one of them. The little boy you see in the pictures is blind; his name is Sasha. But this is not a call for crowdfunding his treatment or such. The boy has a problem several times bigger in gravity than his lack of sight. There is no mother for the kid. Well, there surely is one, but she refused him. We have no right to judge her, but we can do everything within our forces to help the little guy find a family...". Similarly, two posts of Alexander Fedorchenko in the Internet community "Tactile books for blind children" are noted where he tells and shows how one can make tactile books oneself (23/10/2019, 299 likes), (25/10/2019, 266 likes).

According to reposts, the leaders are the post "Loneliness is worse than blindness" by the "Typical blind" community (the one about the blind boy refused by his mother, so they were looking for a family for him – 26/10/2019, 166 reposts); the post by the "Jumble sale for the blind and visually impaired" community about the sale of smartphones (05/04/2017, 86 reposts), and the post of the "Tactile books for blind children" community by Alexander Fedorchenko (16/07/2017, 66 reposts).

According to comments, the most popular posts are those of the Internet community "Problems of blind users of the vk.com website" about issues of the blind in the VKontakte social network (15/08/2017, 116 comments), the offer of the Jumble sale community about rendering remote assistance services for working with a PC (06/08/2018, 103 comments), and the "Medical alternatives" post by the "Typical blind" Internet community (22/02/2019, 73 comments).

According to views, the most popular ones are the three posts on tactile books by the community "Tactile books for blind children" (25/10/2019, 412694 views), (29/03/2018, 195985 views), (23/10/2019, 149458 views).

According to the post-engagement rate, the Popsters analytical resource selects the three posts by the "Typical blind" community at the top of the feed: "Loneliness is worse than blindness" – about the blind boy abandoned by his mother (26/10/2019, ERpost 35.327%, ERview 4.840%); the "Thirst for going forward" post of a young man who has lost his sight, but not his courage, and who is open for communication and morally supporting the others (03/06/2019, ERpost 18.866%, ERview 4.785%); and the post "My development, or the road to success" by a young girl having lost both eyesight and hearing (24/01/2020, ERpost 18.126%, ERview 10.781%).

Commercial organizations

According to Table 3, only one community, the content of which is determined by a commercial organization, has been found among the most popular Internet communities – "Nezrya (lit. Not in vain) – assistance to the blind people". This

indicates that commercial organizations in Russia have very little interest in visually impaired people and civil society is little involved in the problems of people with disabilities (Denisova & Lekhanova, 2020).

Table 8 presents the Popsters resource metrics for the Internet community "Nezrya – assistance to the blind people" for the period of 04/2011 – 01/2020 (as of 02/02/2020).

Table 8: The Popsters Resource Metrics

Total likes	Total shares	Total comments	Count of views	Total posts
3279	736	89	132807	230
Count of followers	ER day, %	ER post, %	ERview, %	LR, %
874	0.460%	2.042%	3.248%	1.631%
TR, %	Average likes	Average shares	Average comments	Average views
0.044%	14	3	0	577

Source: According to the authors' data

The following posts are the most popular in the feed according to the quantity of likes: "I organize city tours, tactile quest games in libraries, teambuilding "Tangible trust" for young entrepreneurs, businessmen, and students. I can also audio record children's fairy tales for the little ones and help parents of blind children in questions of upbringing and development" (10/10/2018, 224 likes); the post about Braille studying workshops (08/04/2019, 129 likes); the post about the LEGO company presenting Braille Bricks construction set for blind and visually impaired children (14/05/2019, 94 likes); and the "Rubik's cube brain-teaser for the visually impaired" post (25/12/2018, 81 likes).

According to reposts, the most shared one was the post about Braille studying workshops (10/10/2018, 69 reposts). It is followed by the post about the LEGO company presenting Braille Bricks construction set for blind and visually impaired children (14/05/2019, 25 reposts), and the post by volunteers about classes for the visually impaired "Show me the world" (15/04/2017, 25 reposts).

According to comments, it is two posts about Braille studying workshops (28/10/2018, 15 comments), (10/10/2018, 11 comments) and the post about the "Braille in 30 minutes" application (10.12.2018, 8 comments) that are the most popular.

According to views, the most popular posts are ones about Braille studying workshops and training sessions (10/10/2018, 11146 views), about the successful businessman (08/04/2019, 7082 views), and the "Show me the world" volunteers' workshops (15.04.2017, 6147of views).

According to engagement rate, the following posts are the top popular ones: about Braille studying workshops and training sessions (10/10/2018, ERpost 34.783%, ERview 2.727%); about the successful businessman (08/04/2019, ERpost 16.819%, ERview 2.076%); and the post about the LEGO company presenting Braille Bricks construction set for blind and visually impaired children (14/05/2019, ERpost 14.073%, ERview 4.846%).

It should be noted that posts about Braille studying workshops proved to be popular across all the categories considered. Thus, for the visually impaired, the opportunity to learn is a very hot topic. Along with the changes in the education system during the period of globalization, we can expect an increase in the attention to the problem of teaching people with disabilities (Scott, 2000; Denisova et al., 2016; Tarman & Chigisheva, 2017).

CONCLUSION

The principal objective of this work was the study of communication topics being the most relevant for the sight-disabled in the virtual social environments. The analysis of their communication topics allows finding out the needs of such citizens and identifying the key focus areas of social work to be tackled by the public. It also helps create conditions for people with sight disabilities to become members of the civic society in their own right.

The toolkit used in the work (Popsters analytical service) has enabled the authors to perform a content analysis of the communication of the sight-disabled and to find out the most relevant topics as of today. Meanwhile, the toolkit has ensured higher selectivity and precision over previous studies. As compared to studies conducted earlier, the growth of the number of people with sight disabilities is marked in virtual social environments. Thus, the resulting statistical sample becomes increasingly representative.

The research conducted has shown that the development of information and communication technologies promotes socialization and integration of sight-disabled people into the civic society. The Internet communities of sight-disabled people focused on various topics are registered in the VKontakte social network. Currently, communities featuring user-supplied content have the highest quantity of members. The range of topics in which the users of these Internet communities are interested is diverse. Nevertheless, the main life principles of the traditional society – compassion, assistance, overcoming the difficulties associated with the terrible illness – are of interest to a greater number of the Internet users, evoking a keen response in them.



The state has to more extensively support and develop technologies contributing to socialization and integration of sight-disabled people into the civic society. According to the authors, one of the priority focus areas has to be the development of information and communication technologies. Feedback about the quality of such technologies can be obtained using the analysis of communication topics of sight-disabled people in the Internet social networks.

LIMITATION AND STUDY FORWARD

The authors proceeded from some assumptions when conducting this research. Firstly, as noted in the Research methodological framework section, the authors used the hypothesis about the existence of a stable and significant statistical relation between the user activity in the Internet communities, associated with a particular topic, and the level of significance of the selected topic for the users. Secondly, the authors extend the data obtained during the study of the VK social network to the general total of the Russian visually impaired. Discussing this topic, it should be noted that the former assumption is used in modern studies quite frequently. As an example, the authors' works can be given that address modeling the downturn of the public attention to a passed one-time political event (Mikhailov et al., 2018) and studying the Russians' attitude to the distance form of learning (Pronchev et al., 2019a).

The second assumption is backed up by the fact that the VK social network is Russia's largest and most popular one. So, it is this network that is used by the greatest number of people having sight disabilities. Possible lines for continuing this research can be comparative situational studies of topics that are the most relevant for people with sight disabilities in various time spans, as well as comparison of communication subjects that are relevant for the Russian and for the foreign sight-disabled.

AUTHORS CONTRIBUTION

The roles were distributed within the research group as follows:

Dr. Gennadi B. Pronchev, the head of the laboratory, determined the objective of the research, stated the research tasks, discussed the research results. He also wrote the introduction, literature review, and worded the conclusions.

Dr. Inna V. Goncharova selected the research toolkit, obtained the empirical data, discussed the research results, and penned the methodology section.

Dr. Nadezhda G. Proncheva processed and analyzed the empirical data, discussed the research results, and wrote the empirical section.

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