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Educational Online Activity in Adolescents with Various Academic Achievements

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Abstract

This paper presents the results of an empirical study aimed at analyzing the use of educational opportunities of the Internet by Russian secondary school pupils. The study involved 582 participants (aged 11-16 years), all of them were pupils of 5th-9th school grades. The research questions were focused on the prevalent forms of online educational activity and the sources of information about educational online resources among secondary school pupils, as well as on correlations between the use of the Internet for educational purposes and the academic achievement. The results show that Russian secondary school pupils consider the Internet primarily as a tool for communication, entertainment and recreation. In educational context, they apply the Internet mainly to search for additional information using common engines such as Google and Yandex. Pupils do not get enough information about online educational resources from teachers and parents, so they prefer those educational online resources that they have found on their own. Higher academic achievements are associated with using wide variety of educational opportunities of the Internet and high degree of pupils' independence in choosing educational online resources. According to empirical results the authors suppose that the main goals related to developing the educational potential of the Internet use in secondary school are both developing the subjectness of pupils as Internet users and strengthening the authority of teachers and parents as agents of adolescents' digital socialization.

Keywords: educational online activity, adolescents, secondary school, academic achievement, online resources, e-learning.

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Introduction

The Internet provides many educational opportunities for contemporary schoolchildren. However, today Russian education is facing various difficulties connected with the process of assimilating digital technologies into educational process and the Internet-socialization of children and adolescents it often happens spontaneously. So, one of the important issues for further development of digital technologies for schools is the searches for science-based psycho-pedagogical strategies which could improve the efficiency of the Internet use for various educational purposes. Undoubtedly, this work should be based on the schoolchildren's current experience as well as should apply the most successful forms of their educational activity on the Internet.

Purpose and objectives of the study

This article presents the results of the empirical investigation aimed at analyzing the differences in the use of educational opportunities of the Internet by secondary school pupils (grades 5th-9th) with various academic achievements.

Literature review

According to recent research, more than 90 % of Russian adolescents visit the Internet every day (Soldatova, Nestik, Rasskazova, & Zotova, 2013; Pecherskaya, et al., 2013). Digital environment is becoming a full-fledged space for their growing up. The development of technologies leads to changes in the conditions of socialization, including the practice of school education. The deployment of digital technologies in education is an irreversible and unavoidable process (Milenkova, Peicheva, & Marinov, 2018), despite discussions about their advantages and risks for educational results (Elmore, 2004; Jonson, 2010; Strekalova, 2019). In this regard, the monitoring of qualitative and quantitative characteristics of the digital transformations in education is an urgent task for pedagogy and psychology. The normativity of this monitoring will be strongly determined by the compliance of the assessed parameters with the reality of children and adolescents' digital socialization (including the practice of implementing digital technologies in education).

Soldatova has defined digital socialization as "a process of mastering and appropriating a person's social experience which is mediated by available digital technologies ..." (Soldatova, 2018, p.76). The Internet is a special sphere for social interaction that successfully competes traditional socialization contexts (Zizek, 2017). Despite the fact that Russian adolescents consider the Internet primarily as a space for communication and recreation (Soldatova, 2018; Popov, 2008; Savkina, & Slobodskaya,

2010, 2011; Twenge, & Martin, 2020; Pecherskaya, et al., 2013), some of their online activities are related to doing schoolwork.

The researchers note that in contrast to popular beliefs that the generation of “digital natives” masterfully owns a variety of online technologies, in fact children and adolescents do not always know how to use electronic devices in the most effective ways (de Almeida, Ponzo, & Lopes, 2017). The quality of using the Internet in education is largely determined by the situation in education (Velickovic, & Stosic, 2016), in particular, the technological literacy of teachers and their readiness to use online technologies in the educational process (Dyakova & Sechkareva, 2019; Lapchik, & Fedorova, 2016). A great contribution to the quality of the adolescents’ educational online activities is provided by the level of Internet access regulation and the goals of the Internet use (Smith, Hewitt, & Skrbiš, 2015). At the earlier stages of digital socialization, the children’s patterns of online activity depend on models of parents, teachers and peers (Tupou, & Loveridge, 2019). The varying levels of Internet access and prevalent models of using the Internet in the social environment determine the “digital divide” which specifies the qualitative and quantitative characteristics of educational online activity in children and adolescents (Talaeea, & Noroozib, 2019). Children and adolescents’ reflection of online experience also affects their educational online activity (Marchetta, Masiello, & Rosenblatt, 2018).

Thus, among other things, the monitoring of the digital transformation of education should include an assessment of schoolchildren’s awareness of the educational opportunities of the Internet, the impact of various sources for informing about these opportunities, the experience of their use in educational activity as well as their contribution to the academic achievement. Our research was aimed at analyzing these parameters of educational online activity of adolescents - secondary school pupils.

Methodology

Purpose and research questions. The purpose of current study was to analyze the differences in the use of educational opportunities of the Internet by 5th-9th grades pupils with various academic achievements. At the research planning stage, we have formulated the following research questions:

- How common is the use of educational Internet resources by schoolchildren?
- How do pupils get information about the educational opportunities of the Internet?
- What educational Internet resources do students prefer to use?

- How does the preference for one Internet resources to other relate to the academic achievements of secondary school pupils?

Methods. Empirical data were collected using a questionnaire. Participants were asked to answer the questions presented in Table 1. The range of responses to the questions suggested the following answers: "Never" (0 points), "Rarely" (1 point), "Sometimes" (2 points), "Often" (3 points). In addition to these questions, the questionnaire included items about the academic achievements of participants as well as socio-demographic information.

Table 1. The structure of the questionnaire

Question category	Question specification
1) How often do you use the Internet for:	communication entertainment and recreation schoolwork searches for non-educational information purchases
2) How often do you use the Internet to:	search for ready-made solutions and answers, completed tasks search for additional information that is not available in textbooks search for reference information (dictionaries, reference books, etc.) view video tutorials view popular science and feature films that you need for your school learning check yourself with tests and simulators for preparing for exams simulate of experiments get additional classes (for example, via Skype) participate in online olympiads and competitions
3) How often do you use for schoolwork	resources recommended by a teacher resources recommended by parents resources recommended by friends resources that you found yourself search engines (Google, Yandex, etc.)

Processing of the empirical data was conducted with the use of descriptive statistics, correlation (r_s) and variance (F) analysis by Statistica 12.0.

Participants and procedure. The study involved 582 adolescents aged 11-16 years, studying at 5th-9th grades in schools of St. Petersburg, 56.01 % among them were girls. Data collection was conducted with the online tool "Google forms". All participants were provided with online access to fill out the questionnaire at school.

Results

According to empirical results, adolescents' assessment of the educational potential of the Internet is significantly inferior to the assessment of the opportunities that the Internet provides for communication, entertainment and search for information not related to learning. Educational online activity takes only the fourth place in the frequency rating of the Internet activities, losing the first position to such forms as "recreation and entertainment", "communication" and "searches for non-educational information". For example, only 29.8% schoolchildren gave the answer "often" to the question about the frequency of Internet use for educational purposes, while for the question about the use of the Internet for communication purposes the share of these answers was 69.9%, for recreational and entertainment purposes – 61.7%, and for the searches of non-educational information – 44.8%. By 9th grade, the frequency of Internet use for educational purposes increases consistently ($F=10.57$, $p<0.001$), but even in 9th grade, the frequency rating of communication, recreational and informational online activities is higher than the rating of using the Internet for educational purposes. There were no differences between the ratings of boys and girls.

The next stage of the analysis showed that the use of educational opportunities of the Internet by 5th-8th grades pupils is limited by the search for additional and reference information. In 9th grade, along with searching for educational information, teenagers are relatively active in using the Internet simulators and tests to prepare for exams. As adolescents grow older, they become more active in searching the Internet for reference information, viewing educational videos, feature film and popular science movies related to the content of educational programs, as well as in searching for ready-made solutions for tasks offered to them for individual work (see Table 2). As a rule, girls are slightly more likely than boys to use the Internet to search for additional and reference information ($F=7.83$, $p<0.01$ and $F=6.13$, $p<0.05$, respectively), and also significantly more likely to use the Internet resources to prepare for tests and exams ($F=16.32$, $p<0.001$). In turn, boys more often prefer to use the Internet resources that allow them to model experiments ($F=4.09$, $p<0.05$).

At the third stage of analyzing the empirical results we found that adolescents mostly prefer to use conventional search engines (such as Google, Yandex, etc.) to solve educational problems throughout secondary school grades. The activity of their use consistently increases from 5th to 9th grade. The frequency of using specialized educational online resources also gradually rises by the 9th grade. It is important to note that adolescents often prefer those online resources that they have found themselves, or resources recommended by their friends. Parents make quite limited contribution to developing adolescents' ideas about the educational opportunities of the Internet. Parents' attention to educational

online resources accrues slightly at 9th grade in the context of exam preparing. Teachers also become more active in introducing educational opportunities of the Internet to adolescents only at 9th grade (see Table 3). Girls are slightly more likely to use sites that are recommended by teachers than boys do ($F=4.47$, $p<0.05$).

Table 2. Types of educational activity on the Internet

Types of educational activity on the Internet	5 th grade	6 th grade	7 th grade	8 th grade	9 th grade	F
Searches for ready-made solutions and answers, completed tasks	1,06	1,32	1,22	1,54	1,54	18,66***
Searches for additional information that is not available in textbooks	1,99	2,00	2,11	2,18	2,25	2,14
Searches for reference information (dictionaries, reference books, etc.)	1,76	1,53	1,82	1,82	2,05	4,41**
Viewing video tutorials	0,66	1,00	1,39	1,64	1,88	23,64***
Viewing popular science and feature films for your school learning	1,18	0,98	1,11	1,03	1,54	6,71***
Tests and simulators for self-checking, preparing for exams and tests	1,22	1,32	1,41	1,33	2,10	16,48***
Simulation of experiments	0,82	0,45	0,64	0,52	0,56	1,94
Additional classes (for example, via Skype)	0,71	0,61	0,56	0,51	0,76	1,71
Participation in online Olympiads and competitions	0,74	0,78	0,84	0,72	0,65	2,02

Note: * - $p<0.05$; ** - $p<0.01$; *** - $p<0.001$

Table 3. Sources of information about educational opportunities of the Internet

The Internet resources used by teenagers in educational activities	5 th grade	6 th grade	7 th grade	8 th grade	9 th grade	F
Resources recommended by the teacher	1,29	1,08	1,39	1,37	1,87	11,87***
Resources recommended by parents	1,16	1,05	1,22	1,16	1,43	2,60*
Resources recommended by friends	1,16	1,06	1,18	1,21	1,67	7,14***
Resources that they found themselves	1,60	1,63	1,58	1,81	2,15	6,60***
Search engines (Google, Yandex, etc.)	2,49	2,43	2,29	2,53	2,57	2,13

Note: * - $p<0.05$; *** - $p<0.001$

The final stage of analysis included describing correlations between the adolescents' use of educational online resources and their academic achievements. Correlation analysis suggested that higher academic achievements are typical for those adolescents who do not practice online search for ready-made solutions completing homework ($r_s=0.23$, $p<0.01$), but prefer to search for additional information ($r_s=0.32$, $p<0.01$),

to view educational videos ($r_s=0.29$, $p<0.01$) as well as to participate in online competitions and olympiads ($r_s=0.17$, $p<0.05$). Moreover, adolescents with higher academic achievements widely use the capabilities of Internet search engines ($r_s=0.18$, $p<0.05$) and those educational Internet resources that they found themselves ($r_s=0.35$, $p<0.01$). The resources offered by teachers prefer to be used mainly by adolescents with lower academic achievements ($r_s=0.22$, $p<0.01$).

Discussions

According to our findings, secondary school pupils consider the Internet primarily as a tool for communication and entertainment, and they are much less focused on using its educational opportunities. These facts correspond with the results of other researchers (Soldatova, 2018; Popov, 2008; Savkina, & Slobodskaya, 2010, 2011; Pecherskaya, et al., 2013). Taking into account that similar results have been found over the past decade, we can argue that schoolchildren's ideas about the educational opportunities of the Internet remains largely unchanged, despite the active development of digital educational technologies and the appearance of various educational online resources in recent years.

One of the possible reasons for the relatively low activity of adolescents in using the educational opportunities of the Internet may be due to their lack of awareness of what educational tasks can be completed using the Internet resources. They apply the Internet primarily as a source of additional information. As they grow older, the range of educational online activities expands, but online search for information on the Internet remains the most frequent educational action throughout secondary school. At the same time, we can observe the increasing of ideas that it is possible to find ready-made answers for individual schoolwork. Thus, in some cases the Internet can turn from a "resource" to a "risk factor" for the quality of education.

Probably, this situation is determined by spontaneity of adolescents' digital socialization (especially in the field of educational opportunities of the Internet). Throughout secondary school, they are significantly more likely to use common search engines or specialized educational sites that they have found themselves. Our empirical results show that "adult" Internet users who could help adolescents navigate their educational opportunities (teachers and parents) more or less actively pay attention to this problem only at 9th in connection with the General State Examination. However, by this point, most pupils have already developed some skills in using the Internet to complete educational tasks, and suggestions from parents and teachers often do not stimulate the readiness of adolescents to use them.

According to the results of the correlation analysis, a higher level of academic achievements is related to schoolchildren's use of various educational opportunities of the Internet, but not just information search

(although information search remains important regardless of academic achievements). It is interestingly that the pupils with a high level of academic achievements prefer to use the Internet resources that they have found on their own (but not those that were offered to them by adults). We assume that this fact shows the developed subject activity as an integral component of the educational activity of well-performing pupils. Subjectivity manifests in the ability to independent planning own learning activity, set educational tasks, formulate ways to complete them, choose appropriate tools and evaluate the results that were achieved. As other Russian studies show, these opportunities are extremely important for effective educational online activity (Milenkova, Peicheva, & Marinov, 2018). Thus, the results of our research suggest that one of the tasks related to improving the methodological support for digitalization of education should be the search for technologies to facilitate the developing of the subject position of schoolchildren as Internet users in the context of their educational activity.

Conclusion

Answering our research questions, we can assume that secondary school pupils do not fully use the educational opportunities of the Internet and consider the educational potential of the Internet primarily as a source of additional information. Meanwhile, teachers and parents are not sufficiently involved in the process of educational socialization of schoolchildren in the digital space. So, an important role of the schoolchildren' subject activity in the effective use of educational opportunities of the Internet is suggested.

The results indicate the need to strengthen the authority of adults (especially teachers) as agents of digital socialization of adolescents, creating conditions for expanding their ideas about the educational opportunities of the Internet, developing their subjectness as the Internet users, as well as increasing the awareness of the use of the Internet for educational purpose, which together will increase the effectiveness of the use of the Internet in secondary school.

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