Check for updates

In Research of School Resiliency or What Does a Good School Represent in a Digital Society?

Vladislav Vinogradov[1], Olga Shatunova[1]*, Elena Merzon[1] and Shamil Sheymardanov[2]

[1] Elabuga Institute, Kazan Federal University, Kazan, Russia, [2] Institute of Psychology and Education, Kazan Federal University, Kazan, Russia

The role of education as a vertical mobility channel in the digital society engenders the need to assess schools on a "better or worse" scale, both from the perspective of parents (which school should we take our child to?) and education authorities (what measures should be taken?). It is proposed to take the resiliency indicator as a basis for assessing the status of a school, which characterises its ability to ensure the pupils' results exceeding those expected, with regard for the challenging social context of educational activities and the troubled social structure of the learners' body. At the same time, the school's high resiliency ratio does not necessarily secure its high rating positions. Conversely, high rating positions do not condition high extent of the resiliency of the educational organisation. It is proposed to use, as the main indicators pointing at school resiliency, the stability of educational results of schoolchildren for at least 3 years and the ratio of the school's absolute rating, which does not take into account the conditions of its functioning, vs. its rating with regard for deprivation. The above markers in their totality point to the quality of the school's educational activities which allow it to achieve better results than in other schools in similar conditions. The research results show that school resiliency in the context of the digitalisation of education is determined not by specifics of its strategy, but by qualitative characteristics of its educational activity.

Keywords: school resiliency, deprivation of educational activity, quality of education, digital society, resilience

INTRODUCTION

Research by scientists in recent decades shows that reforms in the education system are not very effective (Elliott, 2017). Today, the number of jobs that require high levels of general literacy and computer-aided problem-solving ability from employees has increased markedly since the mid-1990s. Moreover, the number of employees capable of performing such work at a high level has not increased (Uvarov et al., 2019, p. 24). To meet the challenges posed by the fourth industrial revolution, general education, as well as the economy, must go through a digital transformation (Frolova et al., 2020). The first industrial revolution gave rise to a mass school, the second one made it general educational, the third one led to universal secondary education, while the fourth one forms a personalised, result-oriented educational model. The improvement of the quality of

school education in the era of digitalisation is becoming an urgent global problem (Gaiduk et al., 2021; Hove and Dube, 2021; Omodan and Diko, 2021; Tsakeni, 2021; Wolhuter and Jacobs, 2021).

The main thing that happens in the process of digital transformation of education is not the creation of computer classes and the Internet connection, but the formation and distribution of new models of educational organisations' work. They are based on the synthesis of:

- New highly effective paedagogical practices, which are successfully implemented in the digital educational environment and are based on the use of digital technologies.
- Teacher's continuous professional development.
- New digital tools, information sources and services.
- Organisational and infrastructural conditions for the implementation of the necessary changes (including support for an educational institution, its leaders and founders by parents, the formation of an appropriate mood in the team, support for teachers in mastering new roles and methods of work) (Uvarov et al., 2019; Evans-Amalu and Claravall, 2021; Kalimullina et al., 2021).

Understanding the need to support schools with poor educational results and organising systematic work with them is becoming a sustainable educational trend determined by dynamic changes in the education system at all its levels (Grunicheva et al., 2012; Tarman, 2020; Gaiduk et al., 2021).

However, this position of supporting schools with low educational results has methodological and technological flaws, since it is necessary to take into account a larger number of defining negative (educational technologies lagging behind the scientific-technological progress, social struggle at school, false literacy, maladjustment of teaching staff, emotional burnout and supercritical load of a teacher, students' low functional literacy and motivation, etc.) and promising (priority of creative, project activities in education, remote network activities in education, the need for new technologies for managing and assessing the quality of education, the balance of education differentiation and individualisation, education pragmatisation, activity-based learning, the creation of educational robot programmes and the convergence of virtual and everyday reality in education, etc.) factors of the education system (Evans et al., 2017; Nazarenko-Matveeva, 2021; Öztürk, 2021; Shatunova et al., 2021).

These factors lead to new trends in the development of primary general, basic general, and secondary general education: an increase in the demand for improving the quality of education, the requirement to change the content of education in the face of increasing uncertainty and the rate of change and digitalisation of the socio-economic environment (Sari et al., 2019), the requirement to change the organisation of education, the individualisation of educational trajectories, and increasing the importance of social effects of education for an individual (Volkova et al., 2020; Otts et al., 2021).

Schools will be able to achieve the goals of sustainable development of education if they learn to take into account these development factors and trends in the design and deployment of basic educational programmes and reach a level of resiliency (Raikhelgauz, 2021).

The concept of resiliency, borrowed from physics relatively recently and meaning the ability of bodies to spontaneously restore their original configuration upon termination of the external impact (Physical Encyclopaedic Dictionary)[1] has become quite popular in the humanities. This popularity is accounted for by the dynamism of the present situation. The more changeable the conditions of our activity, the more attractive stability and unalterability become (Jeladze and Pata, 2018; Kopnina, 2018; Budowle et al., 2021; Movchan et al., 2021). On the other hand, the stable result of a particular activity is the main characteristic of its professional performance where the factual result is formed by the internal characteristics of activity, not by the casual external conditions of its implementation (Redjeki and Sukirman, 2021; Wiranto and Slameto, 2021).

Resiliency in paedagogical studies was initially considered as an individual positive quality – an object of targetted development, and was interpreted as a pupil's meta-competence characterising his ability to achieve high educational results despite external limiting circumstances. The first scientific research on the study of individual resiliency dates back to the second half of the 20th century. Research shows that resiliency is an acquired quality, not an innate characteristic (Luthar et al., 2000). It correlates with the individual characteristics of a person, providing him with flexibility and stability in situations of risk, stress, and crisis, contributing to the rapid normalisation of his state and ensuring further effective development (Masten et al., 1990; Grotberg, 2003; Suntana and Tresnawaty, 2021). The major research in this area was carried out in the context of searching for resiliency mechanisms (Rutter, 1990; Cove et al., 2005; Masten and Obradovic, 2006). An important factor in increasing individual resiliency is the support of a teacher in the development of abilities and the motivation of a student (Zhou and Urhahne, 2013; Kent Kükürtcü et al., 2021; Marais, 2021).

A number of studies focussed on the teacher's resiliency treated it as the ability to cope with extreme professional situations (Doney, 2013) or the ability to efficiently cope with daily challenges of teaching (Gu and Day, 2013; Gu and Li, 2013; Panova et al., 2021). Empirical research has made it possible to determine the professional, motivational, social, and emotional aspects of teachers' resiliency (Mansfield et al., 2012, 2014).

Internal (personal) resources influencing the teachers' resiliency include motivation (Kitching et al., 2009), self-efficacy (Howard and Johnson, 2004; Le Cornu, 2009), personal moral purpose (Day, 2014), a feeling of vocation (Hong, 2012), social, and emotional competence (Ee and Chang, 2010).

School resiliency is viewed as the ability to be efficient while functioning in unfavourable conditions (within a complex social context, with pupils representing a difficult-to-handle learners' body), became a subject of discourse quite recently (Pinskaya et al., 2018; Subedi and Subedi, 2020), although "organisational

---

[1] https://gufo.me/dict/physics/%D0%A3%D0%9F%D0%A0%D0%A3%D0%93%D0%9E%D0%A1%D0%A2%D0%AC

resiliency" and its different aspects had been studied by scholars from different countries for a long time. The covered aspects comprised general issues of organisational sustainability (Seville et al., 2006); system performance and stability (Dalziell and McManus, 2004); the sustainability of enterprises (Sheffi, 2005, 2007), etc. In the aggregate, these and similar studies do not subdue the relevance of studying the educational organisations' resiliency. Considering the specific features of education – according to a fair remark of Drucker (1990), voicing that the product of education is represented not by goods or services, but by a changed personality – it is fair that the content and mechanisms ensuring school resiliency should have a different basis in comparison with the organisations in the production sphere or service sector. In a digital society, this problem has become even more acute than it was before the emergence and total introduction of information technology and gadgets (Hoffmann, 2017; Aznar-Díaz et al., 2019; Balganova, 2021; Hoe et al., 2021; Medvedeva and Mitina, 2021; Romanova and Frolkina, 2021).

Researchers of the phenomenon of school resiliency recognise the following factors as those that ensure high results in educational activities: a high level of teachers' qualifications (Derbishir and Pinskaya, 2016), active interaction between the school and students' parents, the use of effective teaching methods, including digital ones (Liu et al., 2019), a favourable school climate, high expectations regarding schoolchildren's achievements on the part of the school (Tarman and Kilinc, 2022), parents and students themselves (Pinskaya et al., 2018; Chung, 2020), high level of parents' education, family income (Pinskaya et al., 2012; Cantu et al., 2021), motivation of school administrators, teachers and students (Kuznetsov et al., 2018; Baharuddin and Dalle, 2019) and some others.

Thus, considering the "springtime" of resiliency as a concept that emerged from the jurisdiction of natural sciences, and the peculiarities of education as an organisational activity, one can point to an urgent need to clarify the meaning of resiliency for describing educational phenomena. In particular, the following issues require clarification:

1. What is the specific meaning of "resiliency" for schools?
2. How can school resiliency be defined in the context of digitalisation?
3. Why does a resilient school achieve good results?

By answering the proposed questions, the paedagogues will be able not only to treat school resiliency as a specific integrative indicator of efficiency of an educational organisation, but also to find optimal ways to increase the efficiency of its activities in the digital society on this basis.

METHODOLOGY, METHODS, AND RESEARCH DESIGN

Methodology

The consideration of school functioning in its relationship with external conditions influencing the productivity of educational work taken in general suggests using the concept of the unity of politics and nature (Latour, 2004, 2005) as a theoretical basis of the present research. It makes it possible to view the problem of school resiliency not from the position of opposing schools, teachers, and pupils to the negative environment and to each other, but from the point of view of their unity as equal actors of the paedagogical process created on a basis of a variety of current and prospective activities. The methodological potential of the said concept is complemented by the synergistic approach (Fuller, 1979; Haken, 1982) in postulating the educational system openness as the main condition for its development, as well as focussing on self-organisation of the educational influence in the structure of a personality through a complex system of interaction with the world bordering on chaos and maintained by positive nature of feedback. In combination with the activity approach (Davydov, 1996; Dewey, 2007), the outlined grounds make it possible to present the educational activity of a resilient school functioning in unfavourable conditions as a specifically structured non-equilibrium process of pupils' interaction with various manifestations of the macrocosm, resulting in steady changes in their personality. The character of these changes, as shown further, conditions the nature of school resiliency.

In search for resilient schools, the authors relied primarily on dialectical treatment of the qualitative difference between the whole and the totality of its constituent parts. This was expressed in understanding of a school as an educational integral entity, a collective body (Latour, 2004, 2005) that has its own qualitative distinctness and is characterised by a stable interrelation of elements and their bonds with the environment, the established principles and mechanisms of their maintenance and renewal. Accordingly, school resiliency is manifested in the stability of achieved educational results available for statistical analysis. In addition, if a resilient school exists, then it should be distinguished by the presence of a special educational strategy aimed either at minimising the negative influence of several actors in education or at supporting the schoolchildren's individual abilities that may become a basis for their positive personal development.

Methods and Research Design

The concretised treatment of resiliency through stability of results served as a ground for the first stage of this research – identifying the schools with stable performance results. At that stage, the selection comprised 12 schools within one municipal district, which ensures principal equality of conditions for educational organisations' work in a strategic context and at the same time does not eliminate their differences in a tactical context which outlines the actual "unfavourable conditions" that are to be the overcome successfully by resilient schools. The inclusion of educational institutions of different municipal districts and, moreover, of different regions and countries into the aggregate selection would have required the analysis of additional variables connected with the specific features of educational systems in a broader context. In describing schools, we changed their official names for more general ones: "High school," "(Ordinary) School," and "Village school," assigning numbers to them in random order.

During the second step, we identified a list of "unfavourable conditions" complicating the work of the schools on the basis of the educational resiliency research results. The compilation of this list did not cause any difficulties, considering the factual absence of significant disagreements on the outlined issue. However, the extent of influence of each of these conditions on the efficiency of the school's educational activity still remained an open issue. To clarify it, the authors questioned 27 school directors in Russia (21 schools from six settlements in three regions) and Kazakhstan (six schools from three cities). The questioning was made using Google resources based on random selection. Its results made it possible to find a relevance ratio for each condition of those adversely affecting the results of the school's educational activity.

The next issue to be considered (on the third stage of the research) was the extent of pronouncement of particular conditions impairing the efficiency of educational work in each particular school. To find an answer to this query, the authors used the expert assessment method. The all-round questioning of directors of a number of municipal-district educational institutions (21 schools) made it possible to assess the deprivation ratio (extent of severity of unfavourable conditions) for each school from the selected group.

Based on the derived aggregate information, the authors identified the schools showing the results above the level assumed by the conditions of work.

The last and fourth stage of the research involved a detailed analysis of these schools with a view to outlining the features that allow obtaining results above the assumed ones. For this purpose, the authors developed survey sheets for teachers, pupils, and parents of the above 12 schools. A total of 3,656 respondents were interviewed, including: schoolchildren (year streams 5–11) – 1,765; teachers – 234; parents – 1,657.

RESULTS AND NEW QUERIES

In Search of a Resilient School

Recognising the school's ability to achieve stable performance results to be one of the principal manifestations of its resiliency characterising the educational organisation, the authors used the results that affected the school rating in the municipal education system most of all. These comprise the results of the Unified State Examination in the Russian language, mathematics, and a selected subject, on the one hand, and the share of graduates who scored 80 points or more according to the results of the final examinations (high achievers), on the other hand (Pinskaya et al., 2018). Consequently, from the standpoint of statistics, school resiliency is conditioned, in the first place, by the standard deviation of the cited educational results, as based on the selection. The authors selected a period of 3 years as the reporting depth. The analysis results are given in **Table 1**.

The results obtained during the first stage of the study made it possible to identify the leaders from among the involved educational organisations, based on the stability of results. At the same time, the same study raised new questions. The schools showing the performance results being far from the best proved

TABLE 1 | Schools' position in terms of academic performance and stability of results.

		In terms of results (average over 3 years)	In terms of stability of results (within 3 years)
1	High school No. 1	5.75	12
2	High school No. 2	1.25	10
3	School No. 1	7.25	11
4	School No. 2	9	1
5	School No. 3	10	2
6	School No. 4	12	9
7	School No. 5	5.75	8
8	School No. 6	6	4
9	School No. 7	2	6
10	School No. 8	3	3
11	Village school No. 1	10.25	7
12	Village school No. 2	5.75	5

to be most stable. Are these schools resilient? To resolve this ambiguity, it is necessary to come to a position in respect of the following main problems.

Can School Resiliency Be Negative?

If resiliency is understood as close as possible to its initial meaning, then a school showing consistently low educational results is, undoubtedly, actively influenced by the management structures. For instance, in the United States, there is a system of School Improvement Grants (SIG)[2]; in case of failure the school faces a situation of dissolution, replacement of director or replacement of up to 50% of the teaching staff. In Great Britain, low-performing schools are a subject of pivotal impact: the school's name, teaching staff, and directors are changed. In some cases, a partnership between low-performing and efficient schools is practiced, with the exchange of experience and best teaching methods, etc (Creemers et al., 2010; Hallinger and Heck, 2011). Similar measures are used in all countries with well-developed educational systems[3].

"Punitive" measures are not supported by the professional community. However, going back to the original physical analogy of resiliency, an elastic object cannot be bent, but can be broken. It is the staff and the moral and psychological climate in a school with persistently low academic results that represent the resilient core which in this case is replaced or/and broken. If we recognise the existence of negative school resiliency then the respective identification of the school makes emergency measures the only efficient tool.

A more profound meaning of negative school resiliency is rooted in the reasons and mechanisms for ensuring the sustainability of educational progress. They also should be the same if the school resiliency phenomenon has the same nature regardless of specifics of the school's sustained results. This means that the study of negative resiliency is a significant help in moving toward efficient school and its scientific justification (Fernández-Sogorb et al., 2020).

[3]The detailed analysis of world practices in the sphere of working with low-performing schools is presented in Grunicheva et al. (2012).

As to positive resiliency, this is true for a school that functions in unfavourable conditions and, at the same time, achieves higher results than those assumingly expected to be the best in these conditions. To clarify the above, this should not necessarily be a result from among the top of the best achievements (in the first third of the list). It should be just higher than expected. And the more striking this difference is, the more resilient the school turns out to be. This way the problem of correlation of the extent of school deprivation with unfavourable conditions is actualised.

How Can One Assess the Extent of Deprivation of Educational Process at School?

Obviously, if the conditions in which the school functions change, then its results will also change, including those deemed by the authors as criterial. The nature of these conditions is described in multiple publications, more often devoted to efficiency of education in general than to the problems of resiliency. The most discussed are the below groups of such conditions:

1. School's attitude to the formation of a social structure of the learners' body.
2. Features of the parent community.
3. Location of the school.

The questioning of school directors, intended to assess the influence of each group of conditions on efficiency of the school's educational process, showed the expediency of excluding the factors connected with location of the educational organisation from the analysis. The factors relevant for this group were as follows:

3.1. Location in the area of high-density multi-storey housing development of the 1960s.
3.2. Location in a new modern-layout neighbourhood unit.
3.3. Location in the historical part of the city or in the built-up area of the 1940s and 1950s.
3.4. Countryside location.
3.5. Location in an area of private housing development erected prior to the 1980s.

The standard deviation in assessing the impact of different options of school location on the educational results showed the distribution within the range of 2.8–3.2 points against the 5-point assessment scale. At the same time, the assessment value varied, in some cases from definitely negative (−5) to absolutely positive (+5). Obviously, school location in terms of its influence on educational outcomes is a variable dependent on a multitude of other conditions that are specific for a particular territory. For instance, "the historical part of the city" or "the housing area of the 1940s, 1950s" can mean the area of elite housing in one case, and dilapidated, uncomfortable housing in another case. Accordingly, in the first case this will involve families with high incomes and high educational aspirations; in the second case – on the contrary, families with low incomes and life aspirations.

School location is an indirect indicator pointing to more significant conditions for its functioning. For instance, the statistical analysis of questioning results involving school directors showed a negative correlation between the location of a school in rural areas and its ability to enlist the most promising pupils irrespective of its location, which is obvious. It also demonstrated a positive correlation between the location of a school in the historical part of the city, or a rural area, or a private development zone built before the 1980s, on the one hand, and a low proportion of parents with higher education, on the other hand, etc. In any case, location has no substantive influence on the educational process.

The questioning made it possible to form a list of principal conditions negatively affecting the efficiency of school education; subsequently, the assessment of this influence by school directors (the third stage of the study) made it possible to rank them according to the extent of significance.

The dependence of deprivation of the educational process on various conditions makes it possible to assess the state of every school separately according to a particular criterion. For this purpose, all directors of the municipal district schools (21) were asked to evaluate the state of educational institutions selected for the study (including own school if it was part of the selection) according to all of the above criteria. Further, calculations were made on the basis of the obtained results, to be illustrated with the example of High school No. 1, with regard for the factor "The school enrols, among the others, troubled pupils abandoned by other schools."

The experts estimated the extent of absolute negative impact of this factor on the efficiency of education as 3.8 points out of 5 possible (the extent of deprivation as per the first condition in the list $D_1 = 3.8$). Relative to the high school, the impact of this factor was estimated as 1 point out of 5 possible, or 20%, which equals 0.76 in absolute amount (the extent of deprivation under the first condition in the list relative to the first educational organisation in the list $V_{1.1} = 0.76$). The total value for all 7 factors that reduce the efficiency of educational training was 2.5 points out of 16.9 possible, which proportionally amounts to 0.15, allowing us to derive the deprivation ratio as follows:

$$KDn = 1 + \frac{\sum_{i=1}^{7} Di.n}{\sum_{i=1}^{7} Di}$$

Where: KDn – deprivation ratio of the n-th school.

$\sum_{i=1}^{7} Di.n$ – The sum of deprivation ratios of the n-th school for all seven conditions impairing the efficiency of education.

$\sum_{i=1}^{7} Di$ – Maximum possible cumulative value of deprivation ratios (its value is 16.9 for the given research).

The deprivation ratio for "High school No. 1" is:

$$KD_1 = 1 + \frac{2.5}{16.9} = 1.15$$

The deprivation ratios for all schools that formed the selected material for the study were calculated in a similar way.

How Can School Resiliency Be Determined?

The obtained information makes it possible to assess the degree of school resiliency, i.e., to what extent the results obtained

by it are above the level specified by the educational activity conditions (**Table 2**). For this purpose, it is necessary to multiply the schoolchildren's average end-of-course assessment results by the deprivation ratio and thus to obtain the education efficiency ratio with regard for the influence of negative conditions (**Table 2**, column 7).

The data presented in the table show that the rating situation has changed significantly. The schools that used to be outsiders rose to a higher level, and vice versa, the leaders gave up their positions.

For a school to be classified as resilient, it should demonstrate the results above those expected under the conditions of deprivation. That is, the rating position with regard for the deprivation ratio should be higher than the initial (absolute) rating that does not take into account the educational

organisation's conditions of work. Therefore, the resiliency factor can be calculated as a ratio of the school's absolute rating to its rating with regard for deprivation:

$$KRn = \frac{PAn}{PDn}$$

Where: KRn is the resiliency ratio of the n-th school.

PAn is the absolute rating of the nth school which does not take into account its conditions of functioning.

PDn is the rating of the nth school with regard for deprivation.

The indicated ratio for resilient schools must be higher than one. As can be seen, the number of such schools is five. Moreover, we see that three of them, designated in this study as Schools No. 2, 3, 8, are leaders, with regard for the stability of the achieved results (**Figure 1**).

TABLE 2 | Correlation of deprivation ratios, results of educational work at schools and their stability.

		Deprivation ratio	Position in terms of extent of deprivation	Unified State Examination (average progress)	Position in terms of Unified State Examination results	Unified State Examination results with regard for deprivation	Position with regard for deprivation	Position based on "Stability" factor
1	2	3	4	5	6	7	8	9
1	High school No. 1	1.15	11	62.33	7	71.42	12	12
2	High school No. 2	1.12	12	68.32	1	76.24	8	10
3	School No. 1	1.25	6	60.69	8	75.98	9	11
4	School No. 2	1.47	1	59.16	9	87.07	1	1
5	School No. 3	1.38	2	58.53	11	80.65	4	2
6	School No. 4	1.33	3	56.43	12	74.82	10	9
7	School No. 5	1.28	4	62.86	6	80.33	5	8
8	School No. 6	1.22	9	63.74	4	77.89	7	4
9	School No. 7	1.22	10	66.99	2	81.39	3	6
10	School No. 8	1.26	5	65.65	3	82.65	2	3
11	Village school No. 1	1.24	7	63.40	5	78.81	6	7
12	Village school No. 2	1.24	8	58.66	10	72.91	11	5

FIGURE 1 | Schools' resiliency ratios.

FIGURE 2 | General school-specific characteristics influencing resiliency.
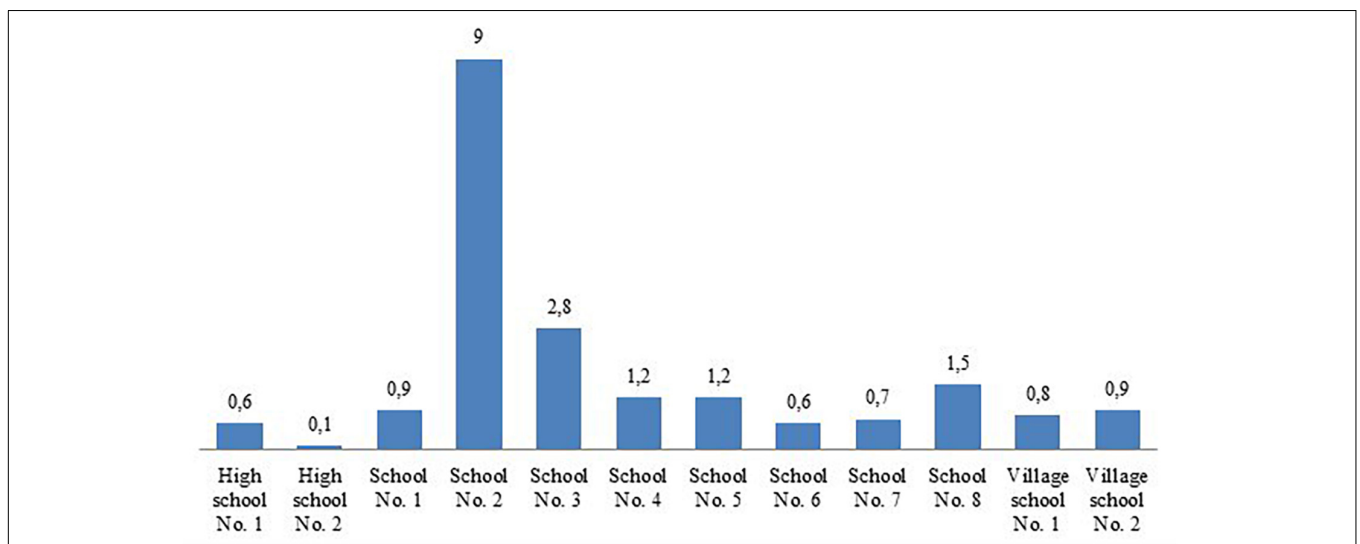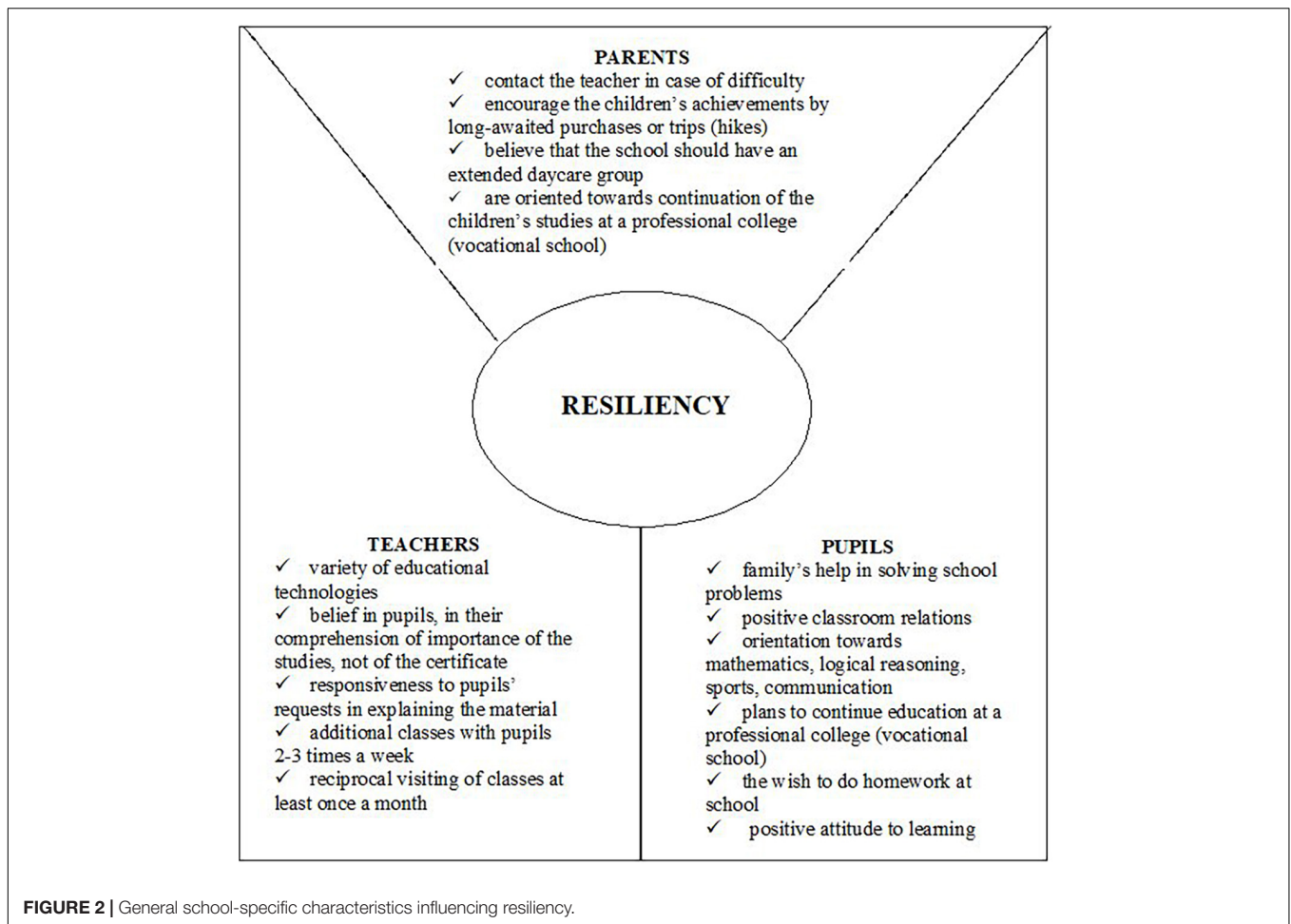
The Resilient School: General and Special Aspects

General Aspects

Defining the school resiliency ratio as its ability to overcome the impact of negative conditions makes it possible to use statistical methods in order to identify some general features of the educational process connected with resiliency.

The below correlations presented in **Figure 2** proved to be most obvious ($H_0 = 5\%$).

The analysis of the identified connection points, in the first place, to the dependence of school resiliency on the extent of development of partner relations between the teachers, pupils, and parents, although such relations are most likely to be a general condition for the efficiency of education. The only thing that raises some questions and requires clarification is the orientation of pupils toward continuing their education at a professional college or vocational school, supported by their parents. The significance of this dependence is confirmed by the statistically valuable negative correlation between the resiliency ratio and the pupils' striving to get higher education.

The problem is that some researchers treat continued education in the higher education system (academic trajectory duration) as one of the main factors of school resiliency (Pinskaya et al., 2018). At the same time, continuing education in the system of secondary vocational education may not decrease, but, on the contrary, increase this trajectory if the pupils continue education, further at higher educational establishments.

In addition, the equally positive assessment by the pupils and the parents of extended daycare groups at school, aimed mainly at preparing homework, is noteworthy. This feature should be classified as specifically resilient, since the extended daycare group compensates for the negative influence of improper living conditions of families burdened with social problems.

It is of interest that neither feature is supported by the teachers. This is explained by the fact that the share of graduates who entered higher educational institutions is deemed to be a significant, although not the main, criterion of efficiency of a teacher's work and the school's efforts in general. It might be noted that the work in the extended daycare group is practically not paid for, although it presents a significant burden for the teacher.

Special Features of a Resilient School

In order to identify the specific features of a resilient school distinguishing it from other (non-resilient) educational organisations, let us compare "(Ordinary) School 2" as having

the highest resiliency ratio and "High school 2" – an educational organisation with top ratings and the lowest resiliency ratio (**Figure 1**). The authors assumed that this difference should be most pronounced in the said educational organisations. The teachers' questioning showed the following results.

In both cases[4], the dominant mood is "buoyant, cheerful" – a "working" spirit with which teachers come to work. In total, both of these answer options, being the most positive, account for 94.1 and 93.9%, respectively. However, the working spirit in the resilient school is of more practical character ("this is my profession") – 70.6 vs. 57.6%; while in the high school "elated" and "cheerful" mood is predominant – 36.4 vs. 23.5%.

Teachers at resilient schools are less likely to spend their leisure time with colleagues on weekends. Whereas 9.1% of the high school teachers answered this question unequivocally in the affirmative ("Yes, we like to spend leisure together"), no one chose this option at the ordinary school. The softer option "Yes, and quite often" was chosen by 2.9% of the ordinary school teachers and by 15.2% of the high school paedagogues. The option "It happens, but very seldom" won a majority of votes in both cases, however, with a pronounced preponderance of the ordinary school staff – 64.7 vs. 45.5%. The percentage of ordinary school teachers who deem it inconceivable to meet on weekends was 32.4%, and the respective number in the high school was 30.3%.

As to the joint celebration of anniversaries, the situation changes significantly. The predominant majority of teachers from both organisations noted that they "would be pleased to celebrate a jubilee with the colleagues" or were "generally not against it." In total, the said answer scored 73.5% of the resilient-school teacher votes and 72.7% – in the high school. However, in this case, the ordinary school teachers were a little more cautious – the option "in general" got some more votes – 38.2 vs. 33.3%. Some of the resilient school teachers (5.9%) noted that the idea of joint celebration of a jubilee was most probably "not to their liking". No such answer options were registered among the high school teachers.

In case of problems with former pupils, teachers prefer to apply to the administration for help (44.1% in the resilient school, 48.5% in the high school). Also, the share of teachers who seek advice from the head of the methodological association or from colleague teachers proved to be not in favour of the ordinary school (8.8 vs. 12.1% and 20.6 vs. 21.2%, respectively). However, the share of self-dependent teachers ("I will not turn to anyone for assistance – these problems are entirely mine") is higher in the resilient school – 26.5 vs. 18.2%.

As concerns, the use of digital resources, the teachers of the resilient school and of the high school in fact voiced the same position. The share of teachers having a "personal professional website (web page, e-portfolio, and professional blog)" is 73.5 and 75.8%, respectively. More significant differences are observed in the use of digital educational resources (DER). The percentage of ordinary school teachers using DER in the class is 97.1%; and those using it in extracurricular activities – 38.2%, whereas the

corresponding figures in the high school were 90.9 and 63.6%. Possibly, the said differences are explained by the disadvantaged financial situation of resilient school pupils, which impedes their access to digital technologies outside of school.

The differences between the paedagogues in terms of methodological aspects of teaching are notable. Both in the ordinary and high school, teachers prefer to formulate the purpose of a lesson through "Creating conditions for..." Meanwhile, this form is adhered to by 55.9% of teachers in the resilient school and by 66.7% in the high school. At the same time, in the ordinary school, a significantly higher percentage of teachers (32.4 vs. 21.2%) view the target of a lesson through the pupil's actions: "The learner justifies (reveals, explains...)". "To explain..." is the way practiced by 8.8 and 6.1%, respectively; "to provide..." is the manner preferred by 2.9 and 9.1% of the school paedagogues and the high school teachers.

When asking the next question "What should a teacher do for the pupils' most complete assimilation of course themes?", the authors relied on Bloom's taxonomy in its basic version (Bloom, 1956). Russian teachers practically do not know and never use this taxonomy in their work; they did not study it at the university. Considering that Bloom's taxonomy has proved its efficiency in structuring of training sessions by teachers in many countries, its use (conscious or unconscious) by the paedagogues of the analysed schools was considered by the authors of this article as a significant factor of usefulness of the teachers' work. For due assessment, the teachers were offered 12 items for consideration, that are presented in **Table 3** together with the questioning results.

Comparing the six learning objectives, most important for the respondents, with Bloom's taxonomy, one can see more exact match with it among the high school teachers – five out of six. The resilient school teachers demonstrated four out of six. In both cases, "Evaluation" is missing in the list, while "Conceptualisation" is present either way. It is necessary to note that "Conceptualisation" originates from the concept of "Sense" which means, among other things, "a reasonable ground, intention, purpose" (Small Academic Dictionary/Compiled by A.P. Evgenieva, 1957–1984; Moscow: Russian Language Institute

---

TABLE 3 | Importance of learning objectives, as viewed by the teachers.

Learning objectives	School (%)	High school (%)
1. Analysis	61.8	66.7
2. Perception	50	36.4
3. Reproduction	41.2	27.3
4. Knowledge	64.7	72.7
5. Generalisation	47.1	27.3
6. Conceptualisation	79.4	78.8
7. Evaluation	47.1	36.4
8. Comprehension	79.4	72.7
9. Application	64.7	72.7
10. Regulation	17.6	18.2
11. Retranslation (conveyance)	23.5	36.4
12. Synthesis	35.3	42.4

---

[4]Hereinafter, in the course of presenting the survey results, the first data are given for the resilient school, followed by those for the high school.

of the Russian Academy of Sciences)[5]. In this sense, it is simultaneously close to both "comprehension" and "evaluation." However, something else is more important. The resilient school teachers point to the need to provide for "Perception" of material by their pupils. Considering the troubled social structure of the learners' body of resilient schools, the said difference is very important: the efficiency of educational interaction depends on how the pupils will be able to perceive its content.

The resilient and high school teachers are distinguished by their treatment of the ideal teacher. The teachers "who, knowing the pupils well, provide for their individually oriented education" are deemed good specialists by the staff of ordinary and high schools to the respective extent of 70.6 vs. 78.8%; meanwhile the teachers "who, observing the pupils' work, give them an opportunity to complete assignments as they deem proper" are considered good specialists by 29.4 vs. 21.2%, respectively. At the same time, ordinary school teachers are more focussed on control, believing that "If one does not control pupils they will idle away". This is the position fully favoured by 20.6% of them against 15.2% of the high school teachers, being generally accepted by 61.8% of the resilient school teachers and 63.6% of the high school teachers.

The resilient school teachers are more subject-oriented, considering that "The formation of metasubject competencies provides for better assimilation of subject-specific knowledge" (64.7 vs. 54.5%). The high school teachers tend to believe that "Correct assimilation of a subject means purposeful formation of metasubject competences" (45.5 vs. 35.3%).

Most of the teachers, answering the question "Does your school have common requirements for procedure sheets (synopses) of lessons?" i.e., common requirements for their structuring, replied in the affirmative – 58.8 and 54.5%. "There are certain requirements, but only few people meet them", noted 5.9% of the resilient school teachers and 6.1% of the high school paedagogues. The option "There are some general recommendations, but they are not obligatory" was chosen by 8.8 and 9.1% of the teachers, respectively. The option "We periodically discuss these issues, but everyone chooses independently which option to use" was selected by 26.5% of the ordinary school teachers and 21.2% of the high school teachers. The option "No procedure sheets of lessons are needed at all" was chosen by 9.1% of the high school teachers. No one among the ordinary school teachers chose this option.

Teachers from the resilient school are generally more likely to attend their peers' class than the teachers from high school. Whereas the frequency of "once a week" visits is slightly less than in the high school (8.8 vs. 9.1%), the "once a month" visits more than compensate for this lag – 50 vs. 39.4%. The figures for "once every 6 months" are 32.4 and 36.4%, the option "even less often" – 8.8 and 15.2% of the teachers, respectively.

A similar situation is observed with regard to school administration inspecting school classes. The supervisors attend classes and events held by the teachers: "once a week" – 2.9% of the resilient school paedagogues and 3.0% of the high school

paedagogues, "once a month" – 50 and 45.5%, "once in half-year" – 41.2 and 42.4%, "even less frequently" – 5.9 and 3%. Nobody chose the option "was not attended" in the resilient school, although the figure in the high school amounted to 6.1%.

In the situation when a teacher is "approached by a pupil with a request to help with the educational material," 26.5% of the resilient school teachers and 21.2% of the high school teachers find time to help him. The answer option "I try to help right away if I have time" was given by respectively, 64.7 and 66.7%; "I explain how the pupil can cope with the material on his/her own" – 8.8 and 12.1%. The options "Most often I have no time for it…" and "No time at all for additional classes" in both cases did not get a single affirmative answer.

A proposed option: every day after school pupils ask to explain the material they don't understand. They apply to the teachers: 8.8% in the resilient school and 3% in the high school (as confirmed by the paedagogues being applied to); the same request taking place two or three times a week – 35.3 and 45.5%, respectively; once a week – 26.5 and 15.2%; Two or three times a month – 17.6% at the ordinary school and 15.2% at the high school; once a month or less frequently – 11.8 and 21.2%.

When asked about the need for extended daycare groups at school, 26.5% of the resilient school teachers and 45.5% of the high school teachers answered in the affirmative without hesitation ("Yes, this will significantly improve the results"). "I doubt it, but why not?" – 38.2 and 24.2%; 26.5 and 24.2% found it difficult to answer.

The parents of the resilient school pupils are less responsive to the teachers' requests for help in educating and upbringing the children. Such requests from the teachers are always responded to in the correlation 29.4 vs. 42.4% (the ordinary against the high school). The answer "in most cases they help if one asks them" was provided by 55.9 vs. 39.4% of the teachers in respect of the parents of the said schools' pupils, respectively, as above.

The school teachers believe that the pupils like their subject: 20.6 and 30.3% (respectively, as above); the teachers believe that pupils basically like it – 70.6 and 54.5%.

In the resilient school, the teachers tend to believe in pupils' motivation (Zhou and Urhahne, 2013). Answering the question "What would the pupils do if they were offered to get a certificate without studying at school?", 20.6% answered unequivocally that "They would refuse, since they know that studying guarantees their future"; this answer scored 15.2% at the high school. The option "Most of the pupils would refuse, but some of them would agree" was chosen by 50 vs. 21.2% (the ordinary against the high school). Some respondents found it difficult to answer ("this cannot be true") – 26.5 and 57.6%, respectively.

Comparing the questioning results, the authors do not find any statistically significant differences in the work of the school with a high resiliency ratio and the high school.

The results of questioning the ordinary and high school pupils are absolutely similar. Since the survey sheets for the teachers and the pupils contained mutually consistent questions, the authors had an opportunity to compare the answers not only of different pupils, but also of pupils vs. teachers.

Unlike their teachers, the pupils from the school with high resiliency ratio come to school in a more elevated mood (27.4%).

---

[5]http://rus-yaz.niv.ru/doc/small-academic-vocabulary/fc/slovar-209-37.htm#zag-65186

The high school pupils, on the contrary, are not so enthusiastic (24.1%). In both cases, some negative attitudes are observed: "More often, I am not in high spirits, but this does not matter" (15.4 and 14.4%) and "I am coming to school in depressed mood" (6.7 and 6.4%). The teachers, as mentioned above, did not give such answers. In case of problems, the ordinary school children rely on the relatives' help to a greater extent than the high school pupils (25.3 vs. 18.7%). The schoolchildren, as expected, communicate with each other on weekends more often than the teachers (23.6% ordinary school vs. 16.1% high school); the answer "quite often" was given by 22.3 and 19.7%. Those willing to celebrate their birthday with their classmates "with pleasure" account for 37.3 and 32.8%; the answer "principally I do not mind" was given by 38.7 and 41.8%, respectively. The same statistically insignificant differences are observed for all other items.

The parent questioning also revealed no significant differences. The differences in choice of methods for motivating their children to study well constitute no more than 0.4 points out of 10 possible. In both cases, material incentives proved to be the least significant method (4.5 and 4.1 points); the most significant instrument, that appeared to be absolutely identical in terms of value, was demonstrating pride in the child's achievements and emphasising their importance (8.2 points). The parents are unanimous about the purport of learning, both at the ordinary and the high school. The answers to the questions "Why do you need to learn? What future benefits are conditioned by your child's present academic progress?", being rated according to a 10-point scale, revealed the following opinions: material well-being 7.1 (Ordinary school), 7.6 (High school); an opportunity to be happy 6.2 (Ordinary school), 6.8 (High school); an opportunity to engage in mental work in the future 7.1 (Ordinary school), 7.4 (High school); an opportunity to achieve high standing in the society, to become a respected person 7.5 (Ordinary school), 7.7 (High school); an opportunity to do something worthy in life, to be of tangible benefit to people 7.6 (Ordinary school), 7.8 (High school).

The parents' reactions to the child's difficulties in doing homework are also similar: we try to help the child or sort it out together 7.7 (Ordinary school), 7.4 (High school); we try to find someone who will help 4.9 (Ordinary school), 4.6 (High school); we release him from household chores, for him to study more profoundly 5.5 (Ordinary school), 5.4 (High school); we explain that he must figure it out himself – this is his job 4.6 (Ordinary school), 4.7 (High school); we try to talk to the teacher so that he/she can help 3.9 (Ordinary school), 3.4 (High school); if the child is not able to cope with the assignment that's not a big deal, we just have to put up with it 2.5 (Ordinary school), 2.3 (High school).

The only statistically significant differences between the parents of the ordinary- and high-school pupils deal with the prospects for continuing education. Whereas 68.8% of the

TABLE 4 | Conditions negatively affecting school performance.

No.	Condition	Extent of significance (deprivation) (0–5)
1	The school enrols, among the others, troubled pupils abandoned by other schools	3.8
2	Significant share of families (20% and more) are registered as disadvantaged	3.5
3	The majority of parents (over 50%) do not have higher education	3.4
4	The school, among the other pupils, educates orphanage children	3.3
5	The school caters for a certain area (neighbouring unit), accepting all children living in it without exception	1.0
6	Significant share of families (20% and more) where only one of the parents works	1.0
7	Significant share of single-parent families (20% and more)	0.9
	Amount:	16.9 = 100%

TABLE 5 | Ways to minimise the factors negatively affecting the efficiency of education.

No.	Factor	Nature of influence	Ways to minimise the impact
1	The school enrols, among the others, troubled pupils abandoned by other schools	Negative educational experience of children	Positive atmosphere Responding to learning difficulties
2	Significant share of families (20% and more) are registered as disadvantaged	Insufficient attention to children, poor conditions for their self-education (places duly equipped for learning, computer facilities, etc.)	Extended daycare group Optional courses and hobby groups
3	The majority of parents (over 50%) do not have higher education	Lack of opportunities in helping children to solve educational problems	Additional classes Extended daycare group Optional courses and hobby groups
4	The school, among the other pupils, educates orphanage children	Insufficient attention to children, developmental delay	Positive atmosphere Additional classes Extended daycare group
5	The school caters for a certain area (neighbouring unit), accepting all children living in it without exception	Inhomogeneity of the learners' body. Actualisation of other conditions in case of living in a disadvantaged neighbourhood	Individualisation of education Trust in pupils Motivation toward self-education
6	Significant share of families (20% and more) where only one of the parents works	Unfavourable atmosphere in the family, lack of spare funds for additional education	Extended daycare group Optional courses and hobby groups
7	Significant share of single-parent families (20% and more)	Insufficient attention to children due to the parent's being busy all the time	Extended daycare group Optional courses and hobby groups

parents of ordinary-school pupils believe it possible for their child to enter a higher educational institution, the respective figure relating to the parents of high school pupils is 81.7%. Accordingly, 30.5 and 18.3% of the parents view the child's educational prospects as connected with a professional college or a vocational school.

CONCLUSION

So, Do Resilient Schools Really Exist?

Summarising the results of the questioning of teachers, schoolchildren, and their parents, the authors wish to emphasise that the businesslike attitude to work and to colleagues is slightly more expressed in the teachers and pupils of the school characterised by a high extent of resiliency, i.e., experiencing a permanent negative impact of a significant number of education actors. Trust-based and friendly relations are less pronounced among the ordinary school teachers than in the high school which functions in much more favourable conditions. However, the trust relations among the schoolchildren, on the contrary, are better developed in both cases, which, given the age-specific characteristics, is quite understandable.

The ordinary school is a bit more democratic, more pupil-oriented (including in the structuring of lessons), which does not preclude its' controlling pupils to a greater extent. The pupils' positions are consistent with those of the teachers. The position voicing that the teachers "must provide" is slightly less expressed with the ordinary school children than with the high school pupils (64 vs. 67.6%), and the view that the teachers "should provide an opportunity" is more specific of the former (36 vs. 32.4%); the need for external control is accepted unequivocally in the respective proportion 27.4 vs. 14.4% and is accepted in general in the proportion 34.3 vs. 47.8%.

The parents of both educational organisations are practically unanimous in assessing the ways of motivating the academic progress of children, its notional component and ways to help the children in case of learning difficulties.

The ordinary school teachers are more independent in the solution of emerging problems, are less focussed on the administration and less orientated at their colleagues, although they attend the peers' classes more often than the high school teachers. The school having the attributes of resiliency is slightly more responsive to pupils' requests for help in coping with the material, which accounts for the pupils' higher activity in this area.

In general, everything seems to be alike. The outlined differences are not statistically significant. The probability of zero hypothesis (H_0 = 5%) exceeds the permissible value in all cases, which serves as a basis for assessing the quantitative differences as having a random character and not suggesting any fundamental difference between the educational organisations.

Summarising the above, do resilient schools exist? If this is true, they should differ, as suggested in the preamble of the research, in the educational strategy aimed either at minimising the negative impact of some education actors or supporting the schoolchildren's individual abilities?

There is not a single factor out of the entire list of conditions (that negatively affect the educational process (**Table 4**) and that provide for the assessment of an educational organisation under the "resiliency" scale) that can be directly influenced by educational tools. A school can only change its mission and refuse, for instance, to accept disadvantaged pupils "pushed out" from other educational organisations, or to work with orphanage learners. But this will tacitly lead to a decreased deprivation ratio, impaired resiliency ratio and, accordingly, to a deflation of the overall efficiency of the educational organisation. In addition, using such methods to improve education performance is incorrect in relation to other schools that take on the burden of working with disadvantaged children to the detriment of their rating position.

On the other hand, a school can take special actions to minimise the educational impact of the negative conditions (**Table 5**).

The questioning results show that the school having the attributes of resiliency practices all of the methods for the minimisation of conditions that negatively affect the efficiency of education, almost to the same extent as the high school. Formulated differently, the research did not reveal any features of educational strategy that, with regard for the conditions of its functioning, would allow the school to achieve the result exceeding expectations.

However, the research confirms the presence of certain result as such, manifested through its stability, despite the high extent of deprivation by negative conditions. The (ordinary) school is indeed characterised by a high extent of resiliency. This means that school resiliency is defined not through the difference in educational strategies, but through higher academic performance, which is a consequence of the differing qualitative content of quantitative indicators.

Thus, the obtained results give rise to the following answers to the posed research questions.

1. School resiliency characterises a school in terms of its ability to ensure the pupils' results exceeding those expected, with regard for the challenging social context of educational activities and the troubled social structure of the learners' body. At the same time, the school's high resiliency ratio does not necessarily secure its high rating positions. Conversely, high rating positions do not condition the high extent of resiliency of the educational organisation.
2. The key indicators testifying to a school's resiliency are the stability of educational results of schoolchildren for at least 3 years and the ratio of the school's absolute rating, which does not take into account the conditions of its functioning, vs. its rating with regard for deprivation. The above markers in their totality point to the quality of the school's educational activities which allows it to achieve better results than in other schools in similar conditions.
3. School resiliency is determined not by the specifics of the educational strategy of a school, but by the qualitative characteristics of its activities in the context of digitalisation of education.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author/s.

AUTHOR CONTRIBUTIONS

SS, OS, and VV contributed to the conception and design of the study. VV organised the database and performed the statistical analysis. OS wrote the first draft of the manuscript. SS, OS, VV, and EM wrote the sections of the manuscript. All authors contributed to manuscript revision, read, and approved the submitted version.

FUNDING

REFERENCES

Analysis of the resilience of Russian Schools. *Federal Institute for Education Quality Assessment: Official Website (In Rus.)*. Moscow: FIOKO, 35.

Aznar-Díaz, I., Trujillo-Torres, J.-M., Alonso-García, S., and Rodríguez-Jiménez, C. (2019). Sociodemographic factors influencing smartphone addiction in university students. *Res. Soc. Sci. Technol.* 4, 137–146. doi: 10.46303/ressat.04.02.10

Baharuddin, B., and Dalle, J. (2019). Transforming learning spaces for elementary school children with special needs. *J. Soc. Stud. Educ. Res.* 10, 344–365.

Balganova, E. (2021). Digitalization trends and risks professional education. *Russ. J. Educ. Psychol.* 12, 19–31. doi: 10.12731/2658-4034-2021-12-3-19-31

Bloom, B. S. (ed.) (1956). *Taxonomy of Educational Objectives: The Classification of Educational Goals. Handbook I: Cognitive Domain*. New York, NY: Longmans, Green and Company.

Budowle, R., Krszjzaniek, E., and Taylor, C. (2021). Students as change agents for community–university sustainability transition partnerships. *Sustainability (Switzerland)* 13:6036. doi: 10.3390/su13116036

Cantu, N., Varela, D., Jones, D., and Challoo, L. (2021). Factors that influence school choice: a look at parents' and school leaders'. *Percept. Res. Educ. Policy Manag.* 3, 19–41. doi: 10.46303/repam.2021.2

Chung, M. (2020). "I Call Them My Little Chinese Kids": parents' identities and language ideologies in a mandarin-english dual language immersion school. *J. Culture Values Educ.* 3, 179–195. doi: 10.46303/jcve.2020.19

Cove, E., Eiseman, M., and Popkin, S. J. (2005). *Resilient Children: Literature Review and Evidence from the HOPE VI Panel Study*. Washington, DC: The Urban Institute Metropolitan Housing and Communities Policy Center street. Final Report. doi: 10.1037/e691092011-001

Creemers, B. P. M., Kyriakides, L., and Sammons, P. (2010). *Methodological Advances in Educational Effectiveness Research*. London: Routledge. doi: 10.4324/9780203851005

Dalziell, E., and McManus, S. (2004). "Resilience, vulnerability, and adaptive capacity: implications for system performance. implications for system performance," in *Proceedings of the 1st International Forum for Engineering Decision Making (IFED)* (Stoos).

Davydov, V. V. (1996). *Theory of Developing Learning*. Moscow: INTOR Publ.

Day, C. (2014). Resilient principals in challenging schools: the courage and costs of conviction. *Teachers Teach. Theory Practice* 20, 638–654. doi: 10.1080/13540602.2014.937959

Derbishir, N. S., and Pinskaya, M. A. (2016). Management strategies of directors of effective schools. *Educ. Issues* 3, 110–129.

Dewey, J. (2007). *Experience and Education*. New York, NY: Touchstone (Simon & Schuster).

Doney, P. A. (2013). Fostering resilience: a necessary skill for teacher retention. *J. Sci. Teacher Educ.* 24, 645–664. doi: 10.1007/s10972-012-9324-x

Drucker, P. F. (1990). *Managing the Nonprofit Organization: Principles and Practices*, 1st Edn. New York, NY: HarperCollins.

Ee, J., and Chang, A. (2010). How resilient are our graduate trainee teachers in Singapore? *Asia-Pacific Educ. Research.* 19, 321–331.

Elliott, S. W. (2017). *Computers and the Future of Skill Demand*. Paris: OECD Publishing. doi: 10.1787/9789264284395-en

Evans, C., Waring, M., and Christodoulou, A. (2017). Building teachers' research literacy: integrating practice and research. *Res. Papers Educ.* 32, 403–423.

Evans-Amalu, K., and Claravall, E. (2021). Inclusive online teaching and digital learning: lessons learned in the time of pandemic and beyond. *J. Curriculum Stud. Res.* 3, i–iii. doi: 10.46303/jcsr.2021.4

Fernández-Sogorb, A., Vicent, M., Gonzálvez, C., Sanmartin, R., Pérez-Sánchez, A. M., and García-Fernández, J. M. (2020). Attributional style in mathematics across anxiety profiles in Spanish children. *Sustainability (Switzerland)* 12:1173. doi: 10.3390/su12031173

Frolova, E. V., Rogach, O. V., and Ryabova, T. M. (2020). Digitalization of education in modern scientific discourse: new trends and risks analysis. *Eur. J. Contemporary Educ.* 9, 313–336. doi: 10.13187/ejced.2020.2.313

Fuller, R. B. (1979). *Synergetics. Explorations in the Geometry of Thinking*. London: Macmillan Publishing Co. Inc.

Gaiduk, T. A., Pirozhkova, O. B., and Yakovlev, E. V. (2021). Mechanisms of the regional system of work with schools with low educational results. *Pedagogical Perspect.* 1, 3–14.

Grotberg, E. H. (2003). *Resilience for Today: Gaining Strength from Adversity*. Greenwood, SC: Praeger Publishers.

Grunicheva, I. G., Pinskaya, M. A., and Kosaretsky, S. G. (2012). "Support of schools showing low educational results as part of the national educational policy. review of the world experience," in *Voprosy obrazovaniya/Educational Studies* (Moscow: National Research University Higher School of Economics), 30–63. doi: 10.17323/1814-9545-2012-3-30-63

Gu, Q., and Day, C. (2013). Challenges to teacher resilience: conditions count. *Br. Educ. Res. J.* 39, 22–44. doi: 10.1080/01411926.2011.623152

Gu, Q., and Li, Q. (2013). Sustaining resilience in times of change: stories from Chinese teachers. *Asia-Pacific J. Teacher Educ.* 41, 288–303.

Haken, H. (1982). *Synergetik*. Berlin: Springer-Verlag.

Hallinger, P., and Heck, R. H. (2011). Exploring the journey of school improvement: classifying and analyzing patterns of change in school improvement processes and learning outcomes. *School Effect. School Improvement* 22, 1–27. doi: 10.1080/09243453.2010.536322

Hoe, L., Manja, M. A. Z., Mathew, V., Engkamat, A., Ibrahim, Z., and Anis, A. L. (2021). Effectiveness of online training for rural entrepreneurs during a global pandemic. *Res. Soc. Sci. Technol.* 6, 194–212. doi: 10.46303/ressat.2021.38

Hoffmann, M. (2017). An exploratory study: mobile device use for academics. *Res. Soc. Sci. Technol.* 2, 18–52. doi: 10.46303/ressat.02.01.2

Hong, J. Y. (2012). Why do some beginning teachers leave the school, and others stay? understanding teacher resilience through psychological lenses. *Teachers Teaching: Theory Practice* 18, 417–440. doi: 10.1080/13540602.2012.696044

Hove, B., and Dube, B. (2021). Covid-19 and the entrenchment of a virtual Elite private school: rethinking education policies in Zimbabwe. *J. Culture Values Educ.* 4, 84–94. doi: 10.46303/jcve.2021.5

Howard, S., and Johnson, B. (2004). Resilient teachers: resisting stress and burnout. *Soc. Psychol. Educ.* 7, 399–420. doi: 10.1007/s11218-004-0975-0

Jeladze, E., and Pata, K. (2018). Smart, digitally enhanced learning ecosystems: bottlenecks to sustainability in Georgia. *Sustainability (Switzerland)* 10:2672. doi: 10.3390/su10082672

Kalimullina, O., Tarman, B., and Stepanova, I. (2021). Education in the context of digitalization and culture: evolution of the teacher's role, pre-pandemic overview. *J. Ethnic Cultural Stud.* 8, 226–238.

Kent Kükürtcü, S., Erkan, N. S., and Seyfeli, Y. (2021). The development of the democratic behavior scale: a validity and reliability study. *Theory Practice Child Dev.* 1, 56–70. doi: 10.46303/tpicd.2021.5

Kitching, K., Morgan, M., and O'Leary, M. (2009). It's the little things: exploring the importance of commonplace events for early-career teachers' motivation. *Teachers Teaching: Theory Practice* 15, 43–58. doi: 10.1080/13540600802661311

Kopnina, H. (2018). Teaching sustainable development goals in the Netherlands: a critical approach. *Environ. Educ. Res.* 24, 1268–1283. doi: 10.1080/13504622. 2017.1303819

Kuznetsov, V. M., Solovyova, T. V., and Troshkov, S. N. (2018). Modeling of motivational management of innovative activities of teachers in the formation of a resilient school. *Pedagogical IMAGE* 12, 5–17. doi: 10.32343/2409-5052-2018-12-4-5-17

Latour, B (2004). *Politics of Nature: How to Bring the Sciences into Democracy*. transl by Catherine P. Cambridge, MA: Harvard University Press. doi: 10.4159/9780674039964

Latour, B (2005). *Reassembling the Social – An Introduction to Actor-Network-Theory*. Oxford: Oxford University Press.

Le Cornu, R. (2009). Building resilience in pre-service teachers. *Teach. Teacher Educ.* 25, 717–723. doi: 10.1016/j.tate.2008.11.016

Liu, M., Zha, S., and He, W. (2019). Digital transformation challenges: a case study regarding the MOOC development and operations at higher education institutions in China. *TechTrends* 63, 621–630.

Luthar, S. S., Cicchetti, D., and Becker, B. (2000). The construct of resilience: a critical evaluation and guidelines for future work. *Child Dev.* 71, 543–562. doi: 10.1111/1467-8624.00164

Mansfield, C. F., Beltman, S., and Price, A. (2014). 'I'm coming back again!' the resilience process of early career teachers. *Teachers Teach.* 20, 547–567. doi: 10.1080/13540602.2014.937958

Mansfield, C. F., Beltman, S., Price, A., and McConney, A. (2012). "Don't sweat the small stuff:"Understanding teacher resilience at the chalkface. *Teach. Teacher Educ.* 28, 357–367. doi: 10.1016/j.tate.2011.11.001

Marais, E. (2021). A journey through digital storytelling during COVID-19 Students preparedness to use technology for learning in the language classroom. *Res. Soc. Sci. Technol.* 6, 169–182. doi: 10.46303/ressat.2021.17

Masten, A. S., and Obradovic, J. (2006). Competence and resilience in development. *N. Y. Acad. Sci. Annals* 1094, 13–27.

Masten, A. S., Best, K. M., and Garmezy, N. (1990). Resilience and development:contributions from the study of children who overcome adversity. *Dev. Psychopathol.* 2, 425–444. doi: 10.1017/s0954579400005812

Medvedeva, G., and Mitina, G. (2021). Professional development of higher education institutions pedagogical workers in the context of the federal project «new opportunities for everyone». *Russ. J. Educ. Psychol.* 12, 32–47. doi: 10. 12731/2658-4034-2021-12-3-32-47

Movchan, I. B., Shaygallyamova, Z. I., Yakovleva, A. A., and Movchan, A. B. (2021). Increasing resolution of seismic hazard mapping on the example of the north of middle russian highland. *Appl. Sci. (Switzerland)* 11:5298.

Nazarenko-Matveeva, T. M. (2021). Modern trends and directions of development of general and additional education. *Bull. RMAT* 1, 44–50.

Omodan, B., and Diko, N. (2021). Editorial: education and the quest for educating in the current and the Post-COVID-19 era. *Res. Soc. Sci. Technol.* 6, i–iii. doi: 10.46303/ressat.2021.21

Otts, E. V., Panova, E. P., Lobanova, Y. V., Bocharnikova, N. V., Panfilova, V. M., and Panfilov, A. N. (2021). Modification of the role of a teacher under the conditions of distance learning. *Int. J. Emerg. Technol. Learn.* 16, 219–225. doi: 10.3991/ijet.v16i21.25675

Öztürk, İ (2021). Book review: democracy, schooling and political education. *Res. Educ. Policy Manag.* 3, 73–77. doi: 10.46303/repam.2021.7

Panova, E. P., Tjumentseva, E. V., Koroleva, I. A., Ibragimova, E. R., and Samusenkov, V. O. (2021). Organization of project work with the help of digital technologies in teaching russian as a foreign language at the initial stage. *Int. J. Emerg. Technol. Learn.* 16, 208–220. doi: 10.3991/ijet.v16i22.20573

Pinskaya, M. A., Havenson, T. E., Kosaretsky, S. G., Zvyagintsev, R. S., Mikhailova, A. M., and Chirkina, T. A. (2018). Above the barriers: exploring resilient schools. *Educ. Issues* 2, 198–227. doi: 10.17323/1814-9545-2018-2-198-227

Pinskaya, M. A., Kosaretsky, S. G., and Krutiy, N. S. (2012). Accounting for contextual information in assessing the quality of school work. *Public Educ.* 5, 31–35.

Raikhelgauz, L. B. (2021). Factors of formation of academic resistance. *Yaroslavl Pedagogical Bull.* 1, 29–36. doi: 10.20323/1813-145x-2021-1-118-29-36

Redjeki, H., and Sukirman, S. (2021). Education and training technology increases teacher competence. *J. Phys. Conf. Series* 1823:012082. doi: 10.1088/1742-6596/1823/1/012082

Romanova, M., and Frolkina, A. (2021). Features of school bullying in adolescents. *Russ. J. Educ. Psychol.* 12, 63–73. doi: 10.12731/2658-4034-2021-12-3-63-73

Rutter, M. (1990). "Psychosocial resilience and protective mechanisms," in *Risk and Protective Factors In the development of psychopathology*, eds J. Rolf, A. S. Masten, D. Cicchetti, K. H. Nuechterlein, and S. Weintraub (New York, NY: Cambridge).

Sari, E., Koul, R., Rochanah, S., Arum, W. S. A., and Muda, I. (2019). How could management of school environment improve organizational citizenship behaviors for the environment? (case study at schools for specifics purposes). *J. Soc. Stud. Educ. Res.* 10, 46–73.

Seville, E., Brunsdon, D., Dantas, A., Masurier, J., Le, Wilkinson, S., et al. (2006). *Building Organizational Resilience: A Summary of Key Research Findings. Resilient Organisations*. New Zealand: university of canterbury. Research Report 2006/04.

Shatunova, O., Bozhkova, G., Tarman, B., and Shastina, E. (2021). Transforming the reading preferences of today's youth in the digital age: intercultural dialog. *J. Ethnic Cultural Stud.* 8, 62–73. doi: 10.29333/ejecs/347

Sheffi, Y. (2005). *The Resilient Enterprise: Overcoming Vulnerability for Competitive Advantage*. Cambridge, MA: MIT Press.

Sheffi, Y. (2007). Building a resilient organization. *Bridge-Washington-Natl. Acad. Eng.* 37:30.

Subedi, D., and Subedi, R. (2020). Practicing self learning of ICT for resilience amidst the COVID-19 outbreak: experiences from kathmandu valley. *Res. Educ. Policy Manag.* 2, 78–96. doi: 10.46303/repam.2020.5

Suntana, I., and Tresnawaty, B. (2021). Multidimensional social crisis and religious violence in southeast asia: regional strategic agenda, weak civilian government, triune crime, wealth gaps, and coopted journalism. *J. Culture Values Educ.* 4, 1–13. doi: 10.46303/jcve.2021.2

Tarman, B. (2020). Editorial: reflecting in the shade of pandemic. *Res. Social Sci. Technol.* 5, i–iv. doi: 10.46303/ressat.05.02.ed

Tarman, B., and Kilinc, E. (2022). Predicting high school students' global civic engagement: a multiple regression analysis. *J. Soc. Stud. Res.* doi: 10.1016/j.jssr. 2022.02.001

Tsakeni, M. (2021). Transition to online learning by a teacher education program with limited 4IR affordances. *Res. Soc. Sci. Technol.* 6, 129–147. doi: 10.46303/ressat.2021.15

Uvarov, A. Yu, Gable, E., Dvoretskaya, I. V., Zaslavsky, I. M., Karpov, I. A., Mertsalova, T. A., et al. (2019). *Difficulties and Prospects of Digital Transformation of Education*. Moscow: Publishing House of the Higher School of Economics.

Volkova, P., Luginina, A., Saenko, N., and Samusenkov, V. (2020). Virtual reality: pro et contra. *J. Soc. Stud. Educ. Res.* 11, 190–203.

Wiranto, R., and Slameto, S. (2021). Alumni satisfaction in terms of classroom infrastructure, lecturer professionalism, and curriculum. *Heliyon* 7:e06679. doi: 10.1016/j.heliyon.2021.e06679

Wolhuter, C., and Jacobs, L. (2021). COVID-19, the global education project and technology: disrupting priorities towards rethinking education. *Res. Soc. Sci. Technol.* 6, 96–109. doi: 10.46303/ressat.2021.13

Zhou, J., and Urhahne, D. (2013). Teacher judgment, student motivation, and the mediating effect of attributions. *Eur. J. Psychol. Educ.* 28, 275–295. doi: 10.1007/s10212-012-0114-9