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Public Statements on Mathematics Teaching Practices in the Kharkov Educational District in the Russian Empire in 1863

Artyom Yu. Peretyatko ^{a, b, *}

^a Cherkas Global University, Washington, DC, USA

^b Volgograd State University, Russian Federation

Abstract

An intense discussion on issues of teaching specific subjects took place in the Kharkov Educational District in the early 1860s. While the teaching of Russian language arts and geography prompted vigorous debate, in case of mathematics it is more appropriate to speak about public statements. They were associated with the 2nd teacher congress, organized in Kursk (May 12–18, 1863), which, on the initiative of the provincial educational authorities, discussed issues of teaching arithmetic and geometry. Fourteen reports were written by individual teachers for the congress, but the event failed to generate a general discussion on teaching as all participants followed similar methods and tried to make instruction in mathematics visual and practice-oriented; they all agreed that there were no good arithmetic and geometry textbooks (albeit, the main drawback of some textbooks was their high price). As a result, only general pedagogical issues, such as whether district schools should be specialized or general educational institutions, whether classes should be arranged as a dialog or monolog and aspects related to topic-specific teaching, caused some dispute. Therefore, we can argue that in case of mathematics generally accepted teaching practices took shape in the Kharkov Educational District in the early 1860s, in contrast to language arts and geography. In addition, with public statements on teaching mathematics, we can better understand the everyday life lived in provincial district schools in the Russian Empire in the 1860s: the materials show that children were instructed using methods of measuring classes and various objects, and even setting up topographic surveys by pupils.

Keywords: history of pedagogy, teaching methods, historical pedagogical concepts, Kharkov Educational District, E.I. Beyer.

* Corresponding author

E-mail addresses: ArtPeretatko@yandex.ru (A.Yu. Peretyatko)

1. Introduction

Our research papers “A Discussion of the Practices for Teaching Language Arts Employed in the Kharkov Educational District in 1863: The Case of Novocherkassk Host Gymnasium and “Discussion of Geography Instruction in 1863 in the Kharkov Educational District, the Russian Empire” explored respectively the debate, which took place in the Russian Empire, in the Kharkov Educational District in the early 1860s, on how Russian language arts and geography should be taught (Peretyatko, Svechnikov, 2022a: 981-993; Peretyatko, Svechnikov, 2022b: 1327-1338). The discussions, on the one hand, gave us an insight into the everyday life of provincial educational institutions in the Russian Empire in the middle of the 19th century, and on the other hand, helped us reconstruct the pedagogical concepts of ordinary provincial teachers, the category of people who seldom come into focus of pedagogical historians. This paper continues the series and is devoted to public statements on mathematics teaching methods in the Kharkov Educational District in 1863.

2. Materials and methods

Our research will review public statements on mathematics teaching methods, made in the Kharkov Educational District in 1863, in particular to the report “On teaching arithmetic and geometry in district schools” (Tsirkulyar, 1864: 47-60) by Postoev¹, a teacher at the Rylsk District School, “Proceedings of the sessions by the Pedagogical Congress of District School Teachers of Arithmetic and Geometry, which took place in Kursk in May 1863” (Tsirkulyar, 1864: 36-47) and the “Opinion of Acting Ordinary Professor Beyer of Kharkov University on the aforesaid congress” (Tsirkulyar, 1864: 60-63). Using the historical descriptive method, we will re-create the logic and chronology of the statements made by all participants in the described events on how instruction in mathematics should be provided, while with the historical comparative method, we will compare the situations around teaching mathematics, Russian language arts and geography in the Kharkov Educational District in the early 1860s.

3. Discussion

The discussions on teaching methods for Russian language arts and geography in the Kharkov Educational District in 1863 were shop floor initiatives. The discussion on Russian language arts was started by a teacher of the Novocherkassk Military Gymnasium, A.M. Savel'ev, who compiled the report “On teaching Russian language arts in gymnasiums” (Tsirkulyar, 1863a: 65-70). The discussion on geography is also linked to a report by an ordinary teacher, Spasskii, who taught at the 1st Kharkov Gymnasium and came up with a “Report on teaching geography in gymnasiums” (Tsirkulyar, 1863c: 113-123). Public debate on teaching mathematics had somewhat different origin – it was purposefully organized by the provincial educational authorities of the Kursk governorate.

The background of the initiative dates back to 1861, when a Kharkov University professor, N.A. Lavrovskii, looked at the experience of German teachers' meetings (Lehrer Konferenzen) (Tsirkulyar, 1861: 6). Although he recognized that implementing the German experience of pedagogical meetings by teachers of various institutions was impossible in the Russian Empire because of large distances between locations, the professor nevertheless proposed to try an experiment by bringing together teachers from at least several (from three to five) district schools to teacher congresses during holidays (Tsirkulyar, 1861: 7). However, in the same year, the director of the Kursk Gymnasium, D.G. Zhavoronkov, voiced his considerations regarding such congresses (Lavrovskii, 1863: 53). He offered his own concept of holding teacher congresses, in which each congress was to be dedicated to a specific topic and arranged in the provincial center during an academic year (Lavrovskii, 1863: 53). It was characteristic of the intellectual climate in the Kharkov Educational District in the early 1860s that it was permitted in the Kursk governorate to set up teacher congresses using the model. Despite this, N.A. Lavrovskii criticized their organization system not in the local press, but in the metropolitan Journal of the Ministry of Public Education.

The criticism was directed at the 1st teacher congress in Kursk, which was held January 8 through 14, 1862 (Lavrovskii, 1863: 53). N.A. Lavrovskii emphasized that the congress had been dedicated to teaching the Russian language, and along with teachers from Kursk governorate district schools, it was attended by the director of the schools (moreover, he was elected chairman),

¹ No initials are specified for the provincial teachers whose names and patronymics we have not precisely identified.

gymnasium teachers and outsiders (Lavrovskii, 1863: 53-54). Overall, N.A. Lavrovskii, with some reservations, considered it very useful to focus the congress on a specific subject and invite gymnasium teachers to the event, but he was adamantly opposed to the presence of the school director and outsiders (Lavrovskii, 1863: 53-54). From his viewpoint, teachers felt extremely fettered both by being exposed to public and, especially, by the fact that the congress was chaired by their immediate supervisor. N.A. Lavrovskii provided a very eloquent description of the teachers' fear of the director (we think the characterization, unfortunately, works out well for education systems in many countries even today): "Such chairmanship, in our firm belief, will entail restriction of freedom and ease of judgment, restriction of the independence and initiative of members, conspicuous silence, the dominance of the director's opinions and blind, involuntary submission to the opinions" (Lavrovskii, 1863: 54-55). Congress materials, N.A. Lavrovskii pointed out, fully confirmed his concern – they included "a rather voluminous report from the chairman", "a lengthy opinion of a gymnasium teacher" and "brief proceedings containing only a small extract from the latter opinion" (Lavrovskii, 1863: 55).

However, N.A. Lavrovskii stressed that the gymnasium teacher's opinion, which served as the basis for the congress, "is thoroughly thought out, carefully placed (against teachers' capabilities – Auth.) and reveals both in-depth knowledge of the best existing manuals to teach the Russian language at a primary level, as well as love for their work and pedagogical discretion" (Lavrovskii, 1863: 57). He also admitted that "the opinions handed down" could be even more useful for teachers than "the troublesome and, although not achieving the goal, but independent discussion of the same issues at other congresses" (Lavrovskii, 1863: 56). In general, N.A. Lavrovskii's criticism could be reduced to the essence that the discussion had been substituted with training, and even the personal opinions on the issues under discussion, prepared by almost every teacher, except one, were not attached to the congress materials (Lavrovskii, 1863: 56).

As a result, the 2nd teacher congress in Kursk (May 12–18, 1863), dedicated to the aspects of teaching mathematics, was organized as a discussion, and the authorities of the Kharkov Educational District published in their circulars both detailed materials of the event and their review by a representative of the Kharkov University (Tsirkulyar, 1864: 36-63). The administration also published the best report by one of the district school teachers, Postoev, "On teaching arithmetic and geometry in district schools" (Tsirkulyar, 1864: 47-60). We will begin with an analysis of this interesting document, although emotional and subjective at times.

The report "On teaching arithmetic and geometry in district schools" is largely comprised of generalities and ideas, obvious in terms of modern pedagogy, such as "They require that a child that left a general education institution should possess the mental and moral principles that are necessary for a person to become a valuable participant of social life over time" (Tsirkulyar, 1864: 47). However, the attention to the generalities was brought about by the specific context of Postoev's teaching reality – apparently, he encountered some difficulties precisely when he tried to put into practice pedagogical concepts that were already evident in his time. For example, the teacher put it before the pedagogical council of the Kursk Gymnasium as early as in 1857 that "The practice and theory of teaching arithmetic and geometry should go hand in hand and mutually help each other" (Tsirkulyar, 1864: 50). Postoev's colleagues did not object to the pedagogical idea (at least, he did not mention it), but his attempt to implement it in practice ended with the reproach that "I supposedly deviated from the purpose of general education institutions and imbued geometry with a specialized nature – as if I teach agriculture rather than geometry" (Tsirkulyar, 1864: 50). Referring to this case, Postoev concluded: "General unsubstantiated claims lead to misunderstandings" (Tsirkulyar, 1864: 50). For this reason, his own text mainly contains evidence to confirm the pedagogical generalities and describes how they should be implemented in practice.

As a result, Postoev's report cited many trite ideas already at the start, such as "district schools are general education institutions," and the goal of teaching arithmetic and geometry in them is "true education" (Tsirkulyar, 1864: 47). However, as he brought the trite ideas into practice, he came to conclusions that are hardly trite: in his opinion, arithmetic should train not only mental, but also "physical abilities to the greatest possible extent" and do it as part of general and not specialized education; in his pupils, a teacher should also shape skills of "self-initiated activity that primarily determines strength of will, love of learning and love of work in general"; and, finally, it was important to teach children not only "theory", but also give them "hands-on information required in life" (Tsirkulyar, 1864: 48). All this allowed Postoev to formulate the thought essential for his further arguments that, with the right system of teaching mathematics in

district schools, “pupils, guided by a teacher, pave the way to knowledge themselves using their own intellect” (Tsirkulyar, 1864: 48). Hence, proceeding from the trite ideas, Postoev was able to reach the original inference that a teacher’s task was not to give children knowledge, but to teach them to seek knowledge.

We will further omit the trite ideas cited by Postoev to focus precisely on the conclusions he derived from them. At the same time, it should not go unnoticed that, if compared with A.M. Savel’ev’s report “On teaching the Russian language arts in gymnasiums” and Spasskii’s “Report on teaching geography in gymnasiums”, Postoev’s report “On teaching arithmetic and geometry in district schools” is much more abstract, features much more statements on how to teach in general, and much fewer references to the actual situation in provincial educational institutions in the Russian Empire in the early 1860s. We would connect this with the origin of the texts: while A.M. Savel’ev and Spasskii composed their reports of their own accord, willing to address the problems that prevented them from teaching effectively, Postoev’s move was dictated by the request of his superiors. Accordingly, A.M. Savel’ev’s and Spasskii’s texts are devoted to specific problems of the educational system, and Postoev’s report concentrates on the theoretical dimension of the best teaching methods.

The first specific issue Postoev reviews serves as an excellent illustration of the difference. The issue deals with the textbook to be used at classes. It should be noted that A.M. Savel’ev and Spasskii also turned to the problem. Apparently, the lack of good textbooks was a sore point for teachers in general in the Russian Empire at that time. For example, Spasskii drew attention to the fact that there was no Russian geography textbook that would serve as a “guide” and a “manual” at the same time (i.e. combine theory and popularized presentation) (Tsirkulyar, 1863c: 114). A.M. Savel’ev resorted to a more laconic and harsher wording: “Everyone is convinced that we do not have any decent textbook on Russian language arts” (Tsirkulyar, 1863a: 65). Further, the teachers, after having pinpointed the problem, proposed ways to deal with it. For example, Spasskii recommended using additional literature at geography classes (Tsirkulyar, 1863c: 114). A.M. Savel’ev, on the contrary, wanted to accelerate the writing of a high-quality textbook and put forward his own ideas to this end, and also shared his own preliminary materials that he used instead of a textbook (in fact, popular essays on the history of Russian literature) (Tsirkulyar, 1863a: 66-78).

Postoev took a markedly different path. Instead of analyzing the situation with arithmetic and geometry textbooks for district schools, he formulated the question in the following form: “When teaching arithmetic and geometry in district schools, is it necessary to provide pupils with textbooks on the subjects?” (Tsirkulyar, 1864: 48). He further drew a conclusion that a textbook was necessary, because “a book, while compelling a pupil to resolve some of his perplexities, teaches him to rely more on his own efforts, teaches him to discover reasons behind everything using his mind and, therefore, better accustoms him to independence and work, and better strengthens his willpower” (Tsirkulyar, 1864: 48). Postoev’s only really interesting proposal here was not to give a textbook to first-grade pupils who could hardly read and were unable to understand it, and the bad experience with using a textbook resulted in the pupils “neglecting it in the upper grades as well” (Tsirkulyar, 1864: 49).

Having outlining this at the beginning of his report, Postoev turned to existing textbooks for district schools only at the very end – and attacked them without mercy and with much greater detail and emotion than A.M. Savel’ev and Spasskii. He lashed out at certain textbooks (without specifying their authors), rather than their entire set – his criticism demonstrated no system or consistency. For example, he most heavily criticized the first-grade textbook, the use of which Postoev considered a pedagogical mistake, regardless of the quality of the textbook itself (the teacher was, in particular, displeased with outrageously vague and ambiguous wording, such as the following: “Everything that one can envisage to increase and decrease is called magnitude”) (Tsirkulyar, 1864: 57-58). He gave the textbook for the second grade some credit (“much better than many other textbooks in the area”), but Postoev scolded it for many particular shortcomings, both seeming and false ones: for example, he did not like that operation rules for whole and fractional numbers were explained apart from each other (Tsirkulyar, 1864: 58-59). His criticism of the geometry textbook intended for the third grade appears more justified – Postoev pointed out here that it contained almost no guidelines on how to apply geometry in life, which made the textbook uninteresting for pupils (Tsirkulyar, 1864: 59-60). With the argument, the teacher came to a clear conclusion – the textbook was “absolutely of no benefit to pupils” (Tsirkulyar, 1864: 59).

What should be done if, on the one hand, third-grade pupils were supposed to use a geometry textbook, and the available textbook was totally useless? Postoev did not even raise the question. His criticism of the textbooks did not correspond to anything and led to nothing. As a result, his report merely stated that the available textbooks were bad, but it remained unclear how he himself addressed the problem in practice. To sum up, speaking of the textbooks, Postoev's report "On teaching arithmetic and geometry in district schools" outlined two separate, unrelated ideas: that instruction should be generally provided using a textbook, except for the first grade, in which children only started to learn how to read; and that specific arithmetic and geometry textbooks for district schools of the Russian Empire ranged from bad to completely useless.

After he touched on the need for textbooks, Postoev raised the question of what teaching method should be used – an "acroamatic" one (i.e. with a focus on lectures delivered by a teacher) or "Socratic" one (i.e. with a focus on the question-and-answer form) (Tsirkulyar, 1864: 49). It can be seen the question was again formulated in a very abstract way, suggesting a choice between two opposite methods that are rarely employed as they are. Indeed, Postoev concluded that, although the "Socratic" method was better (since it promoted the "self-initiated activity" of students, which, to his eye, was essential), its use also implies several concerns (Tsirkulyar, 1864: 49-50). In particular, he argued (it is not clear if he relied on his actual experience or theoretical ideas) that with the purely Socratic method, "pupils become accustomed to giving short, specific answers to a teacher's questions, and this lands them in difficulties in situations where it is necessary to explain several truths, which requires smooth and well-considered speech" (Tsirkulyar, 1864: 50). Eventually, Postoev came to the conclusion that "the Socratic and acroamatic methods should be combined" – he proposed conducting lessons in the question-and-answer form, but at the end repeating the lesson content clearly and consistently in the narrative form (Tsirkulyar, 1864: 50). This overall conclusion is very interesting as it shows that Postoev designed his lessons with a logical and consistent structure.

Next, he turned to the last theoretical issue in his report, the issue of whether lessons in district schools should give children both theoretical and practical knowledge. We have already described Postoev's general views on the matter; therefore, here we will constrain ourselves to pointing out that, as he promoted the importance of practical knowledge in the school program, he referred to real-world experience as well: because the theoretical study of the Pythagorean theorem will not catch a pupil's interest, but if you show him how to find the distance between opposite angles of the blackboard without measurements, if the length and width of the blackboard are known, the child will not only become interested, but can in a similar way calculate the distance between the corners of a sheet of paper or a classroom (Tsirkulyar, 1864: 51).

Only after this Postoev quite briefly described how he carried out his own classes. Interestingly, he himself positioned this part of his report as a description of "the order that I have followed until now when teaching arithmetic and geometry to pupils" (Tsirkulyar, 1864: 52). The author himself considered this portion of his paper to be of little importance and did not attach any major value to the sequence of delivering various topics (Tsirkulyar, 1864: 52). However, in fact, it is this part of his report "On teaching arithmetic and geometry in district schools" that is of the utmost interest – and not because it described the topic delivery order, but because it demonstrate how the topics were presented.

Postoev could not elaborate on the problems that hampered efficient teaching simply because the problems did not exist. The practice-driven, "hands-on information required in life," which received the greatest focus in the theoretical part of his report, gave him a clue as to a simple and elegant way to make his course interesting for children that were backward from the start. The very first classes with the children were a good illustration of Postoev's approach – his pupils began their training by measuring various objects and gold coins, counting, for example, how many kopecks there were in one ruble, or what length a map had in different measures, and putting down the numbers on the blackboard (Tsirkulyar, 1864: 52-53). Similarly, he taught geometry with an emphasis on practice, for example, by drawing up terrain plans and carrying out construction calculations (Tsirkulyar, 1864: 56). This, of course, did not mean that no problems affected Postoev's teaching work, but their scale was local, and the teacher realized quite well what caused them: for example, he encountered certain difficulties when he explained decimal fractions. He associated the problem with the fact that "Russian units of <measurement>" (i.e., the ones that are now obsolete, such as versts, poods, etc.) were not based on the decimal system (Tsirkulyar, 1864: 54).

To summarize, we should state that Postoev had devised his own teaching system by 1863, and his superiors recognized it as effective. Unfortunately, he provided little detail of the system in his report “On teaching arithmetic and geometry in district schools,” probably because he considered it self-evident and an extension from more general and well-known pedagogical ideas. However, in general, the system can be reduced to two main provisions – teaching mathematics should concentrate on developing children’s independent thinking and be practice-oriented. As for the problems that Postoev faced, they were not very significant, with most serious of them being the rejection of the practice-driven nature of the school mathematics course by some people in his environment and the lack of a good textbook. Postoev suggested no ways to address them, and they seemed to be of little worry for him. At least, he described them not on his own initiative, but on instruction from his superiors.

As for the teacher congress itself, its materials had as many as two publications in “Circulars for the Kharkov Educational District” (Tsirkulyary po khar’kovskomu uchebnomu okrugu). First, the “Extract from the session proceedings of the second pedagogical congress in Kursk, compiled by Ostrovskii, Senior Mathematics Teacher at the Kursk Gymnasium” was came out in 1863 (Tsirkulyar, 1863d: 175-180). And it was not until 1864 that the “Proceedings of the sessions by the Pedagogical Congress of District School Teachers of Arithmetic and Geometry, which took place in Kursk in May 1863” were published (Tsirkulyar, 1864: 36-47). It should be noted that the texts have certain distinctions: for example, the first one simply informs that congress participants had “agreed that district schools should be general education institutions” (Tsirkulyar, 1863d: 175), while the second one includes the discussion on the point (Tsirkulyar, 1864: 37-39). For this reason, we will only refer to the second, more detailed text.

The program of the teacher congress was aimed to answer three questions: “1) what role and purpose teaching arithmetic and geometry had as academic subjects in a school course; 2) what the best method and way to teach the subjects were; and 3) what advantages and disadvantages the textbooks, used as guidelines on the subjects, had” (Tsirkulyar, 1864: 36-37). So, it discussed no fundamental issues in teaching mathematics. Nevertheless, the congress was not limited to pedagogical debate: in the first half of the day, participants attended classes in Kursk educational institutions and made tours of classrooms (i.e. with their specialized equipment in the gymnasium and in the real school) (Tsirkulyar, 1864: 37). Apparently, the program was filled with activities and aroused interest among district school teachers: on May 17, 1863, the congress did not even have time to hold sessions, as the teachers were so carried away by experiments with an electric battery (Tsirkulyar, 1864: 46). The sessions were actually held in the evening and lasted nearly 5 hours (from 6 to 11 p.m.) (Tsirkulyar, 1864: 37). They were chaired, apparently, following the criticism by N.A. Lavrovskii, described above, by two mathematics teachers of the Kursk Gymnasium (Tsirkulyar, 1864: 37).

Certain originality lies in the efforts by mathematics teachers to give an answer to the first of the questions posed. The point is that the issue turned out to be connected with a broader problem of whether school education should, in principle, be practice-driven. According to the proceedings, some of the teachers (unfortunately, their names and information how many there were of them were not published) insisted on extreme practice orientation, arguing that without it, district schools “would not enjoy the trust of society,” because children were sent there with the expectation that the child could enter a job (“in a shop, in a craft or in the service”) immediately after graduation (Tsirkulyar, 1864: 38). The other faction opposed the approach, offering very diverse and sometimes curious arguments, ranging from the obvious objection that schools could not provide practical knowledge to merchants, artisans and officials at one time, to the point in which attempts to train boys in areas of no interest to them were compared to training girls in music, which required a lot of money, and then “pianos stand like furniture and decorate halls” (Tsirkulyar, 1864: 38). As a result, a position prevailed that was close to what Postoev set out in his report: that district schools should not provide any specialized training, but “imparting a variety of useful true-to-life information” was essential to give teaching “a character that awakes interest and love for the subject” (Tsirkulyar, 1864: 38). Based on this, the purpose of teaching arithmetic and geometry was defined as follows: “Developing the mind, reasoning, strict logical consistency in judgments, initiative and delivering the material benefit that is necessary for everyone, whoever they may be” (Tsirkulyar, 1864: 39).

As for the second question, based on Postoev's report (i.e. assuming the primacy of the "Socratic" method, which was arrived at after a brief and uninteresting discussion), teachers formulated nine rules that, with some abridgments, we consider it possible to quote here:

- 1) "An explanation should necessarily begin with a practical question";
- 2) "When giving explanations, a teacher takes the greatest possible care to avoid early corrections or hints";
- 3) "A teacher pays attention not only to the logic of conclusions, but also to the correctness and accuracy of expressions";
- 4) "When asking a question, one should give a pupil time to collect his thoughts, but not too much, so that the class do not become distracted and scattered";
- 5) "When teaching, one should not delve too deep into catechization" (i.e. not to ask questions to which a pupil cannot know answers – Auth.);
- 6) "A teacher strictly matches requirements for pupils' written homework with the development level of the pupils";
- 7) Home assignments of only five types were allowed – describing a problem solution; describing an operation studied at classes; making drawings; preparing problems by pupils; cutting geometric shapes from cardboard and calculating their volume;
- 8) Teachers were not only allowed, but ordered to deviate from available methodological guidelines that, supposedly, offered more "visibility" rather than "precision";
- 9) The main rule of the teaching methodology declared the following: "Everything to be explained should have a solid foundation in the material that preceded it, the easiest things should precede the most difficult ones, and everything useful should precede less useful" (Tsirkulyar, 1864: 40-41).

Although the rules were, of course, somewhat naive (we will return to the aspect later), on the whole they corresponded well to the key idea of the pedagogical congress, which can be formulated as follows: teaching arithmetic and geometry in district schools should be a practice-oriented process, but have no specialized focus. To achieve this, teachers were supposed to use relevant preliminary materials from Postoev's report: it was proposed to open the course with "an overview of coins, units of measure, weight, volume, surfaces, etc.", and complete, as part of the study of geometry, with making full-fledged terrain plans (Tsirkulyar, 1864: 41-43).

Conceptually, the least interesting solution was put forward by the Kursk teacher congress for the third question on the congress agenda. In general, teachers totally agreed with Postoev's report by coming to the conclusion that textbooks were needed in all grades except the first one, and no good mathematics textbook was available in district schools (Tsirkulyar, 1864: 43-44). However, the teacher congress provided a lot of new details. For example, it reviewed different textbooks for the same grades and divided them into three groups based on their drawbacks (but, unfortunately, without specifying which textbooks belonged to which group): the first group was criticized for "unclear presentation", the second one for a dull and abstract style, and the third one, which offered satisfactory content, for a high price (Tsirkulyar, 1864: 44). So, mathematics textbooks, which would satisfy district schools, existed in the early 1860s (we could see above that the situation with gymnasium textbooks in geography and Russian language arts was different at the time). The problem was that public schools had no money to buy them. With this in mind, the teacher congress proposed a simple and inexpensive solution to the problem – to buy new textbooks not for every pupil, but for the school library (obviously, in one copy) so that a teacher could use them (Tsirkulyar, 1864: 44). The practice of replacing a textbook with "sketches" written by teachers themselves (according to A.M. Savel'ev, the practice was widely adopted among gymnasium language arts teachers of the time (Tsirkulyar, 1863a: 65) was rejected by the teacher congress with a concern that illiterate children would find them difficult to understand; copying them for personal use would involve an unreasonably large amount of time, and teachers might make mistakes when compiling such "sketches" (Tsirkulyar, 1864: 44). Only short "sketches", supplementing and not replacing the textbook, were permitted (Tsirkulyar, 1864: 44).

Apparently, discussing all the issues took less time than congress organizers had planned, and the activity had ended by May 16, 1863 (Tsirkulyar, 1864: 43-46). Therefore, skipping the session on May 17 was not accidental. On May 18, teachers got down to an additional question that had no relation to mathematics: Postoev proposed organizing afternoon educational conversations with pupils, as modelled by the Rylsk district school, where he taught (Tsirkulyar, 1864: 46). The conversations were not a trifle – children could ask any questions during the activity, and

teachers jointly prepared answers and sometimes included experiments to clarify their explanations, and at times teachers themselves did not know right answers (on one occasion they even had to invite a medical doctor to explain to pupils what caused lethargic sleep) (Tsirkulyar, 1864: 46). Other teachers found the conversations brought some value, but were impossible to arrange without engaging the entire faculty (Tsirkulyar, 1864: 46). Congress participants also managed to review the proceedings of past sessions, and at the end, in the manner, typical of the Kharkov Educational District in the early 1860s, the teachers wrote a document, addressed to their administration, in which they thanked it, expressed regret for imperfections in their pedagogical research and at the same time urged that the teacher congress proceedings should be communicated to other schools (Tsirkulyar, 1864: 47).

Thus, the proceedings of the Kursk teacher congress (May 12–18, 1863) demonstrate the same trends in mathematics teaching practices in district schools of the Russian Empire as those described by Postoev's report "On teaching arithmetic and geometry in district schools." Although the teacher congress was set up to drive free debate, and the authorities and outsiders were removed from it this time, only two rather theoretical issues sparked some discussion – to what extent school education should integrate hands-on knowledge, and what principle, the "Socratic" or "acroamatic" one in-class instruction should predominantly follow. The issues of teaching proper did not provoke any argument: all teachers agreed that mathematics training should combine practice and theory in district schools, that teachers had the right to deviate from methodological guidelines, that there were no good textbooks, but in case of some of them the problem was not so much rooted in content, but rather in costliness, and it was quite achievable in the near future to buy such textbooks not for entire classes, but at least for teachers, etc. Accordingly, we can state that, at least in the Kursk governorate, a consistent principle of teaching mathematics had been developed in district schools by 1863 without the educational district authorities having to intervene. And again, we should note that the cases with teaching geography and Russian language arts in gymnasiums, which we explored in our previous papers, had a different context: they were characterized with lively debate on teaching methods between teachers, which generated appeals to the authority and experience of the district administration (Peretyatko, Svechnikov, 2022a: 981-993; Peretyatko, Svechnikov, 2022b: 1327-1338). As a result, the discussions on how to teach geography and Russian language arts were essentially ended in the "Circulars for the Kharkov Educational District" by Kharkov University professors – of literature N.A. Lavrovskii (Tsirkulyar, 1863b: 105-109) and geography A.P. Zernin (Tsirkulyar, 1863c: 123-127). In case of mathematics, the right to make a closing statement was given to the third university professor, Ye.I. Beyer, but he, however, took a slightly different role (Tsirkulyar, 1864: 60-63).

It is appropriate to mention here that Ye.I. Beyer was more of a practical teacher than a scholar. He had a diploma of the Main Pedagogical Institute in St. Petersburg and had almost no publications in the academic press, but in the 1850s taught most of the mathematical courses at the Kharkov University (Bobritskaya, 2014: 168-169). Later, he took part in preparing at least one textbook for schools, published in 1868, "The experience of a primer on arithmetic for public schools, approved by the Ordinary Professor of Kharkov University von Beyer, Doctor of Pure Mathematics" (Rovskii, 1868). So, engaging him to evaluate the results of the Kursk teacher congress was more than a logical move.

However, even the accomplished university professor did not break the unanimity on the key issues of teaching mathematics, which reigned between congress participants. On the contrary, he said that "if words always go hand in hand with deeds (i.e. the teachers, who attended the congress, were really guided by the principles they declared – Auth.), teaching arithmetic and geometry in district schools of the Kursk Directorate should then undoubtedly be successful" (Tsirkulyar, 1864: 63). When he considered the congress' answers to the three questions formulated, Ye.I. Beyer simply agreed with the answers to the first and third of them (i.e. about the purpose of teaching arithmetic and geometry in schools and about the quality of available textbooks), and it was only the second question (i.e. about teaching methods) on which he allowed himself to make several comments, all the more interesting as they were based on the reports that were written by other district school teachers besides Postoev, but have not survived to this day (Tsirkulyar, 1864: 60-61).

According to Ye.I. Beyer, there were 14 such reports in total (including Postoev's one), and they described a rather similar teaching process: "All teachers are concerned to avoid definitions and plain mechanicalism (i.e. mechanistic teaching – Auth.) at the beginning and strive, on the

contrary, for extremely illustrative, lively and diverse teaching” (Tsirkulyar, 1864: 61). Distinctions in teaching arithmetic and geometry by district school teachers were reduced by Ye.I. Beyer to their choice of teaching aids and the order they followed to introduce topics (Tsirkulyar, 1864: 61). From his perspective, the practical focus in teaching mathematics was not optimal, and some kind of balance should be sought: literally Ye.I. Beyer wrote that “practical teaching techniques sometimes make it easier for pupils to understand the subject being taught,” but “it is always the theory that gives the correct and strict direction to the reflective mind” (Tsirkulyar, 1864: 61).

However, Ye.I. Beyer considered that forcing a unified teaching methodology on all teachers was a fallacious approach in principle, openly calling it “fruitless scholasticism” (Tsirkulyar, 1864: 61). He argued that a teacher had the right to choose a method that was more consistent with his personality, and, in addition, the “Socratic” method was very time-consuming, which was especially inappropriate for district schools where the course was “short” (i.e. was studied for three years) (Tsirkulyar, 1864: 61). Thus, Ye.I. Beyer did not deny the value of the opinion shared by the participants of the Kursk teacher congress but argued against absolutizing it, against recognizing the opinion as the only right one and without alternative.

As a result, the major part of Ye.I. Beyer’s opinion on the Kursk teacher congress considered extremely specific issues, such as how to teach children specific mathematical operations, how to introduce the “parallel lines theorem,” etc. (Tsirkulyar, 1864: 61-63). Thus, the text turned out not to bring the discussion to a conclusion, but clarify the pedagogical principles and rules, commonly adopted among mathematics teachers in the Kursk governorate, and the clarification was insignificant, except for the question of more efficient pedagogical methods.

4. Conclusion

So, public speeches on how mathematics should be taught, published in the circulars of the Kharkov Educational District for 1863–1864, enable us to understand both how the process of teaching arithmetic and geometry was organized in district schools and what pedagogical views the process was built on.

1) There were no fundamental problems in teaching mathematics at the time, as teachers themselves believed: while in the same 1863, issues of teaching language arts and geography provoked hot debate in the Kharkov Educational District, initiated by ordinary teachers, discussion on teaching arithmetic and geometry was initiated by the authorities as part of the second teacher congress in Kursk (May 12–18, 1863).

2) The congress showed that there was no absolute unanimity among district school teachers on general pedagogical issues – some of them thought that district schools should focus on teaching specific professions, while others insisted on their general educational nature, some stood up for the “Socratic” method of teaching (through the teacher-student dialogue), while others for “acroamatic” (through a teacher’s monologue). However, speaking of the actual mathematics teaching practice, everyone was satisfied with the opinion that it should be practice-oriented without specialization: children were supposed to be taught using hands-on examples (“An explanation should necessarily begin with a practical question”), but without a focus on training for a specific profession. Moreover, according to the review by Kharkov University professor Ye.I. Beyer, all the congress participants who wrote individual reports had already employed the teaching technique.

3) No good mathematics textbooks for district schools were available at the beginning of the 1860s, but the point was not so much in conceptual problems as in the fact that the best textbooks were expensive and as a consequence there was no possibility to provide them to all children. For this reason, the absence of was not an urgent issue, and the teacher congress considered it possible to buy new textbooks only for teachers, so that they could use them in their activities.

4) There were no fundamental division in matters of teaching mathematics either between the participants of the second teacher congress in Kursk, or between them and the professor of Kharkov University Ye.I. Beyer, who provided his written opinion on the congress. Therefore, if there was some debate between all of them, it dealt either with general pedagogical issues, or, on the contrary, extremely specific issues, such as how to cover a specific topic in the best possible way.

The situation stood in stark contrast to the situation around teaching methods of Russian language arts and geography, which developed not even in district schools, but in gymnasiums of the Kharkov Educational District in the early 1860s. And this allows us to conclude that the progression in teaching methods for various subjects varied greatly, at least in the peripheral

regions of the Russian Empire. While the generally accepted methods of teaching language arts and geography just took shape in the Kharkov Educational District in the early 1860s, the situation with teaching mathematics was much better. An explanation might be exactly that the mathematics course could be directed to practice and designed with pupils' practical needs in mind – but the issue still requires further research.

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