

Teacher Survey: Remote Teaching Before and During the COVID-19 Crisis

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Taub Center for Social Policy Studies in Israel

The Taub Center was established in 1982 under the leadership and vision of Herbert M. Singer, Henry Taub, and the American Jewish Joint Distribution Committee. The Center is funded by a permanent endowment created by the Henry and Marilyn Taub Foundation, the Herbert M. and Nell Singer Foundation, Jane and John Colman, the Kolker-Saxon-Hallock Family Foundation, the Milton A. and Roslyn Z. Wolf Family Foundation, and the American Jewish Joint Distribution Committee.

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Michael Debowy and Nahum Blass

In March 2020, the COVID-19 pandemic resulted in a shut down of the education system. All at once, and without any possibility of preparing beforehand, the entire education system was closed and more than 2 million students were confined to their homes. No one had foreseen this and no one was ready for it.¹ The lockdown continued for almost 90 days and main tool to deal with this new situation was remote teaching. A step that previously appeared impossible, and almost surreal, became the new reality for the education system overnight, with the burden falling primarily on the teaching staff. In this situation, an examination of the opinions of teachers with regard to remote teaching is highly relevant. At the end of the first lockdown in the spring of 2020, the Taub Center in partnership with the Israel Teachers Union, conducted a survey of its members to ascertain their views on remote teaching.² The survey, which included a diversity of questions, was answered

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- 1 Remote teaching is not something new in the education system. The leading agency in this field in Israel is the Center for Educational Technology (CET), as well as the Open University, and a number of companies in the private sector who have been developing products in this area for quite a few years. However, the extent of remote teaching was very limited in terms of the number of students and the number of teachers participating in such programs and using the developed material. So, for example, during the 2019–2020 school year there were 43 classes in about 130 schools in all the districts, comprising about 1,000 students, participating in the [Virtual High School](#), a project of the CET.
- 2 Since the majority of the members of the Israel Teachers Union are female, the female grammar form is used in the Hebrew version of this paper.

by 5,063 teachers in its Hebrew version and 859 in its Arabic version.^{3, 4} In this document, which is the first of a series, we will focus on the responses to following four questions:

- How many hours of training in remote teaching did you receive prior to the COVID-19 crisis?
- Did you use remote teaching prior to the COVID-19 crisis?
- Did you use remote teaching during the COVID-19 crisis?
- How much time is needed to prepare a lesson for remote teaching relative to face-to-face teaching?

In the analysis of each of these questions, we will estimate to what extent training and experience prior to the onset of the COVID-19 pandemic influenced the use of remote teaching during the first lockdown and the time needed to prepare for online lessons. Since the survey was carried out at the end of the first lockdown, it does not necessarily reflect the teachers' attitudes toward remote teaching during the current school year (2020–2021), following the country's third lockdown, with most teachers having gained significant experience in remote teaching over this lengthy period of time.

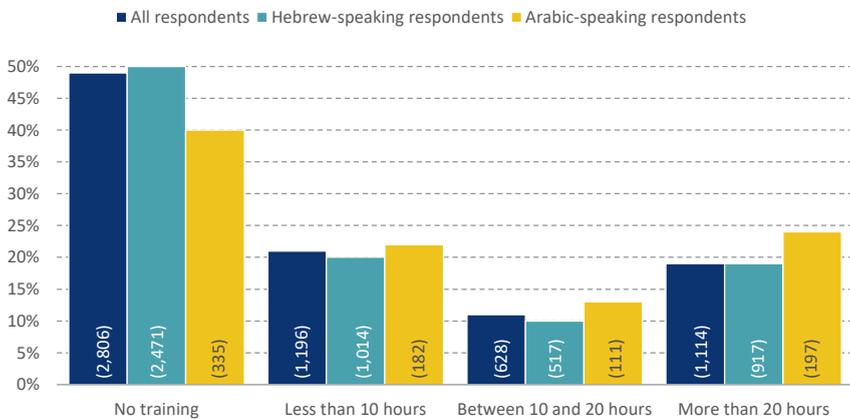
3 The share of Arabic-speaking respondents out of all respondents in the Arab education system totals about 24% including preschool, primary schools and middle schools. In the Hebrew State education system and the Hebrew State-religious education system, the share of respondents is even lower, about 29% out of about 375,000 Arab students and 911,000 Jewish ones.

4 Some of the teachers who answered in Arabic teach in the Hebrew education system, and some — particularly Druze teachers — teach in the Arab education system. In what follows, we relate to teachers who responded in Arabic as Arab teachers and teachers who responded in Hebrew as Jewish teachers, apart from a limited number of cases in which we relate to responses according to the educational sector.

1. Training in remote teaching prior to the COVID-19 pandemic

Figure 1 presents the amount of training received by all teachers prior to February 2020, that is, prior to the COVID-19 pandemic crisis. It turns out that almost 50% of the teachers had received no training in remote teaching prior the pandemic and about another 20% had less than ten hours of training.⁵

Figure 1. Extent of training in remote teaching prior to the COVID-19 crisis? Overall sample



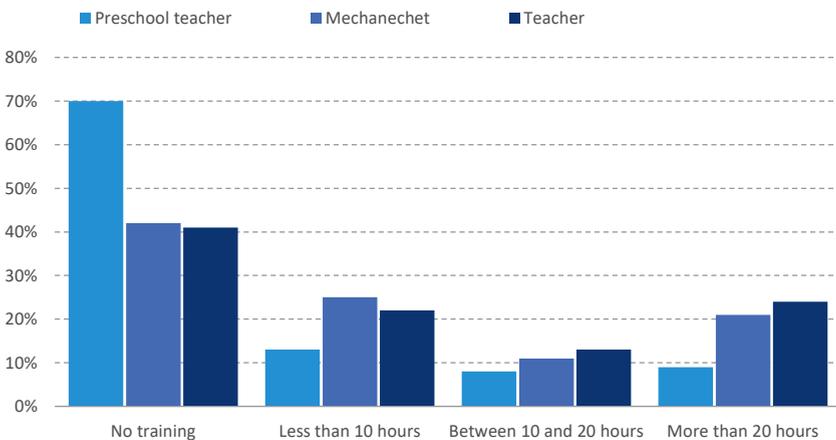
Note: The number of respondents appears in parentheses.

Source: Michael Debowy and Nachum Blass, Taub Center | Data: Taub Center and Teachers Union Survey

5 Research that has examined professional development programs of between 5 and 14 hours did not show any significant effect on students' achievements relative to programs of more than 14 hours. (Sperling, 2018; and also Avdor, 2015.)

Figure 2 shows that the result is not essentially different when the breakdown is by teachers and *mechanchot*⁶ (see Appendix Figure 1). Nonetheless, there is one noticeable result which is not surprising in view of the character of working with the various grades: the share of preschool teachers who had very little training or none at all was much higher than for teachers and *mechanchot* (70% versus about 40%).

Figure 2. Extent of training in remote teaching by teacher type (teachers, preschool teachers, and *mechanchot*), overall sample



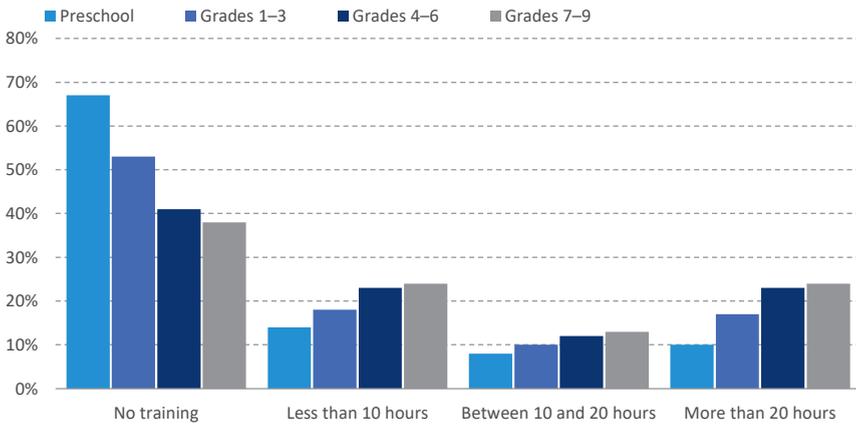
Source: Michael Debowy and Nachum Blass, Taub Center | Data: Taub Center and Teachers Union Survey

When we examine the data according to grade level (Figure 3), it is again clear and hardly surprising that the preschool teachers had the least training and that the share of teachers with training in remote teaching rises with the age

6 *Mechanchot* (singular: *mechanechet*): the term *mechanechet* is difficult to translate precisely. While technically, a *mechanechet* is a homeroom teacher, the term represents much more than just taking attendance at the beginning of the day. She is an educational leader responsible for the well-being of her students, educationally, personally and spiritually. She often teaches several subjects (usually Judaic) to the class, and serves as a point-person coordinating between students' different teachers, as well as the school administration and the parents. In addition to her formal teaching hours, she also coordinates social interaction and activities both inside and outside of school. She must be aware of her students' educational progress, personal and familial situations, as well as their emotional and spiritual well-being.

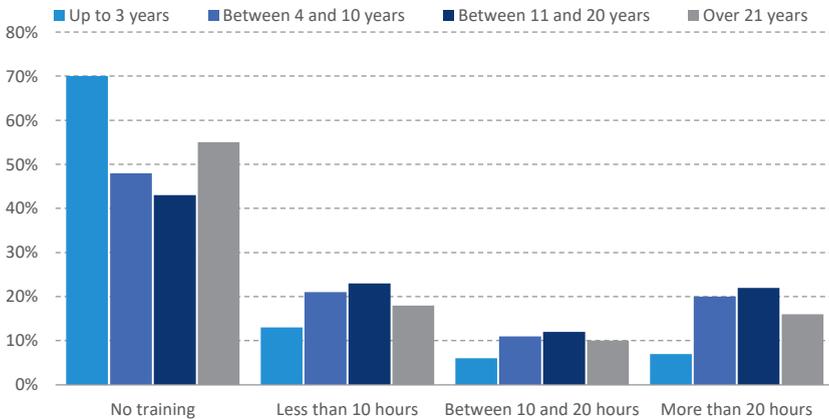
of the students. However, even in the case of middle schools, the share of teachers who did not receive any training was 39% and the share of those who received more than 20 hours was less than one quarter. A breakdown by sector shows that, overall, the share of teachers answering the questionnaire in Arabic who had received training in remote teaching was larger than for teachers who answered in Hebrew (see Appendix Figure 2).

Figure 3. Extent of training in remote teaching by grade level, overall sample



Source: Michael Debowy and Nachum Blass, Taub Center | Data: Taub Center and Teachers Union Survey

A breakdown by seniority (Figure 4) shows that the share of young teachers who received training in remote teaching was the lowest. Similarly, the share of senior teachers — and particularly those who answered the questionnaire in Hebrew — was much lower than among teachers with mid-range seniority. Also interesting is the difference between the sectors: Arabic-speaking respondents were the youngest and the share with no training in remote teaching was lower than for teachers who answered in Hebrew (see Appendix Figure 3).

Figure 4. Extent of training in remote teaching by teacher seniority, overall sample

Source: Michael Debowy and Nachum Blass, Taub Center | Data: Taub Center and Teachers Union Survey

The National Authority for Measurement and Assessment in Education (RAMA in Hebrew) also conducted a survey at the request of the Ministry of Education, which related to, among other things, the professional preparedness of teachers to teach remotely (Ratner et al., 2020). RAMA's survey also shows that about one-half of teachers had no professional training in remote teaching and learning during the preceding two years. This finding is consistent with our findings which, as noted, show that about one-half of the teachers had no prior training. Similarly, according to the RAMA survey, among teachers of Grade 1–6, the share who had professional training in remote teaching was considerably higher among Arabic-speaking teachers than among Hebrew-speaking teachers, a finding that was confirmed in our survey.

Overall, about one-half of the teachers did not have any training in remote teaching prior to the onset of the COVID-19 crisis. Of those who had some training, about 40% had only a short course of training (less than 10 hours).

The analysis so far has been descriptive relating to each variable separately. As a rule, adjusting for variance between background variables (like sector, seniority, grade level, and teaching position) is likely to blur the specific correlation between each characteristic and the amount of training. To control for this influence, we analyzed the survey findings using a Logit type statistical model. An analysis of the multi-variate model shows that sector, teacher

seniority and student grade level correlate with the probability of reporting having participated in training of some sort even when their influence is estimated separately (that is, none of the correlations of variables described above is spurious). The results of the model, together with a more detailed methodological explanation, appear in Appendix Table 1.

2. Extent of remote teaching prior to the pandemic

Table 1 shows that about 40% of the teachers had never used remote teaching prior to the COVID-19 crisis and another about 23% did so only rarely (not more than twice per school year). About 8% of teachers reported having used remote teaching “routinely” prior to the COVID-19 crisis. An interesting point is that, overall, the share of Hebrew-speaking teachers who responded that they had used remote teaching often or routinely prior to the onset of the crisis was double that among Arabic-speaking teachers.

Table 1. Prior to the COVID-19 crisis, did you use remote teaching in your work (in class or at a distance)?

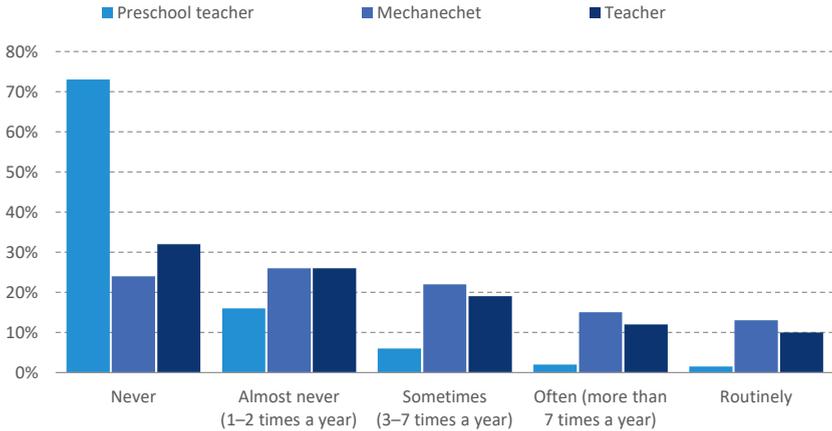
| Training | Arabic-speaking respondents | Hebrew-speaking respondents | Total | Arabic-speaking respondents | Hebrew-speaking respondents | Total |
|-------------------------------------|-----------------------------|-----------------------------|-------|-----------------------------|-----------------------------|-------|
| | Absolute numbers | | | Percent | | |
| Empty | 2 | 24 | 26 | 0.2% | 0.5% | 0.5% |
| Never | 389 | 1,977 | 2,366 | 47% | 40% | 41% |
| Almost never (1–2 times a year) | 241 | 1,119 | 1,360 | 29% | 23% | 23.5% |
| Sometimes (3–7 times a year) | 127 | 834 | 961 | 15% | 16.5% | 16% |
| Often (more than 7 times a year) | 41 | 557 | 598 | 5% | 11% | 10% |
| Routinely | 33 | 440 | 473 | 4% | 9% | 8% |

Source: Michael Debowy and Nachum Blass, Taub Center | Data: Taub Center and Teachers Union Survey

With respect to teachers and preschool teachers only, the results are not essentially different, although it can be seen that about 70% of preschool teachers did not use remote teaching prior to the crisis as opposed to about 25% of *mechanchot* and 30% of teachers (Figure 5). It is worth noting that the responses of Hebrew-speaking preschool teachers and Arabic-speaking

teachers are nearly the same. Thus, the gaps in experience seen are between teachers and *mechanchot* in the various sectors.

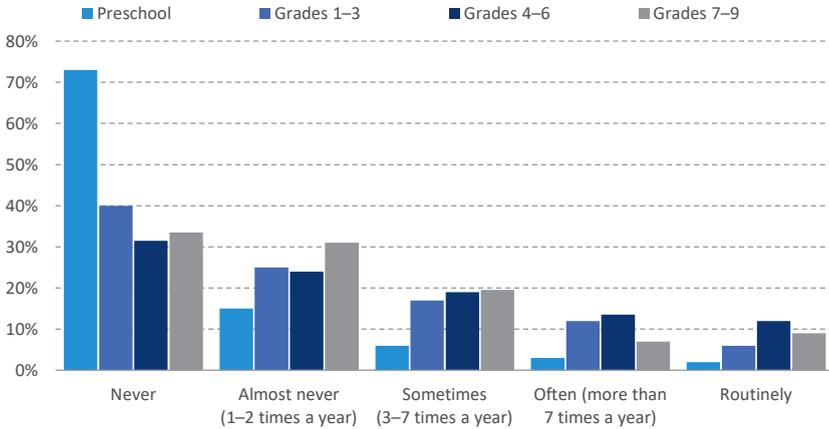
Figure 5. Extent of remote teaching prior to the COVID-19 crisis by teacher type (teachers, preschool teachers, and *mechanchot*), overall sample



Source: Michael Debowy and Nachum Blass, Taub Center | Data: Taub Center and Teachers Union Survey

An analysis of the differences according to grade shows a similar picture. It appears that the preschool teachers used remote teaching much less before the crisis. Similarly, while teachers in the schools used this tool much more extensively than preschool teachers, there is no consistent and continuous gap between school teachers of different grades with respect to this variable. In a breakdown according to sector (Appendix Figure 4), it appears that Arabic-speaking teachers had somewhat less experience in remote teaching prior to the COVID-19 crisis, even though the teachers in this sector tended to have more training.

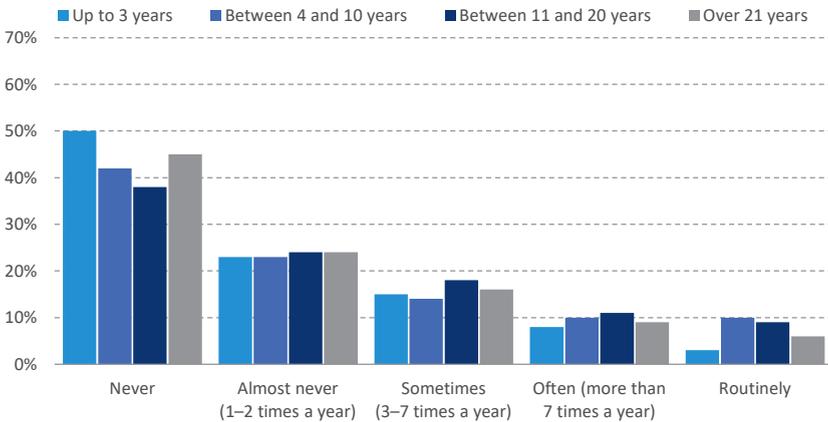
Figure 6. Use of remote teaching prior to the COVID-19 crisis according to grade level, overall sample



Source: Michael Debowy and Nachum Blass, Taub Center | Data: Taub Center and Teachers Union Survey

When results are broken down by teacher seniority, the share of young teachers who used remote teaching prior to the crisis — particularly those answering in Arabic — was the lowest (Appendix Figure 5b). The share of teachers with a high level of seniority who had used this tool was also very low relative to those teachers with mid-level experience; this was the case for both Hebrew and Arabic-speaking respondents (Appendix Figure 5a and 5b). Furthermore, for most of the seniority levels, there was less use of this tool among those who responded in Arabic. Nevertheless, for the respondents with seniority of 11–20 years (who constituted about one-half of the respondents to the survey, regardless of the language of response) the distribution of responses was similar across the sectors.

Figure 7. Extent of remote teaching prior to the COVID-19 crisis according to teacher seniority, overall sample

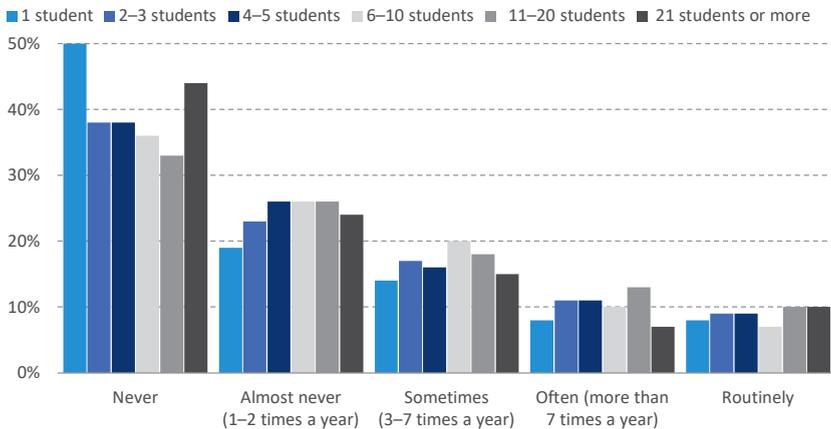


Source: Michael Debowy and Nachum Blass, Taub Center | Data: Taub Center and Teachers Union Survey

In a breakdown by the number of students in a class from weaker socioeconomic backgrounds, a number of interesting findings emerge.⁷ Roughly speaking, it can be said that as the number of students from weaker backgrounds increases, up to 20 such students per class, teachers tended to report more use of remote teaching prior to the crisis (especially “sometimes” and “often”). It is important to mention that this trend halted and reversed at the upper reporting bound, namely “21 or more students from weaker backgrounds per class” (a category that includes 80 respondents in Hebrew and 13 in Arabic). This phenomenon appears both in the overall sample and among respondents in Hebrew and is even clearer and more consistent among respondents in Arabic.

7 It is important to emphasize that the data are self-reported by the teachers rather than data submitted to the Ministry of Education by parents, which are used to define the Nurture Index of the students.

Figure 8. Use of remote teaching prior to the COVID-19 crisis according to number of students from weaker socioeconomic backgrounds, overall sample



Source: Michael Debowy and Nachum Blass, Taub Center | Data: Taub Center and Teachers Union Survey

A multivariate analysis shows that sector, seniority, teacher type, and age of students are correlated with the use of remote teaching (at all levels of use) both when the impact is estimated using each variable separately or at the same time. Regarding the number of students from weaker backgrounds per class, the difference is significant for a grouping of between 2 and 20 students, but it is not clear that there is a difference within this grouping. For a more detailed explanation of the analysis and methodology see Appendix Table 2.

3. Frequency of remote teaching during the COVID-19 crisis

The findings reported until now have related to remote teaching prior to the COVID-19 outbreak and the first lockdown. The main finding based on the survey responses is that about 90% of teachers reported using remote teaching more than once a week and more than one-third reported using it 4-6 times a week for a total of more than 10 hours. When the results are broken down by response language, it can be seen that Hebrew and Arabic-speaking respondents used the tool more than once a week at similar rates (86% and 90%, respectively), although a larger share of Hebrew-speaking respondents reported using it more than 10 hours a week.

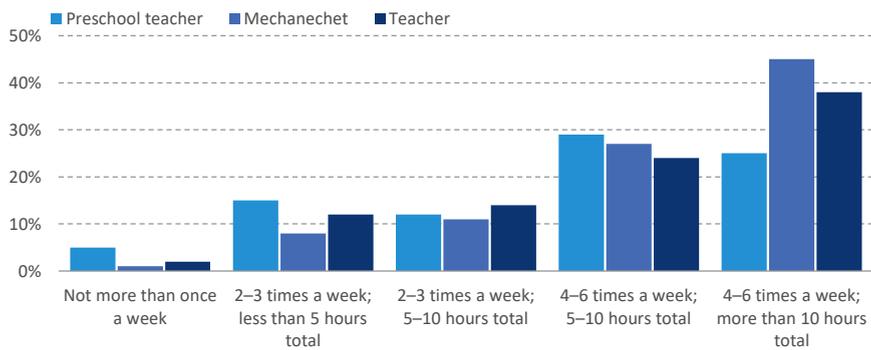
Table 2. How frequently and for how many hours per week did you teach remotely during the COVID-19 crisis?

| Frequency | Arabic-speaking respondents | Hebrew-speaking respondents | Total | Arabic-speaking respondents | Hebrew-speaking respondents | Total |
|--|-----------------------------|-----------------------------|-------|-----------------------------|-----------------------------|-------|
| | Absolute numbers | | | Percent | | |
| Empty | 52 | 558 | 610 | 6% | 11% | 10% |
| Not more than once a week | 32 | 128 | 160 | 4% | 2.5% | 3% |
| 2–3 times a week; less than 5 hours total | 155 | 555 | 710 | 19% | 11% | 12% |
| 2–3 times a week; 5–10 hours total | 133 | 636 | 769 | 16% | 13% | 13% |
| 4–6 times a week; 5–10 hours total | 281 | 1,199 | 1,480 | 34% | 24% | 26% |
| 4–6 times a week; more than 10 hours total | 180 | 1,875 | 2,055 | 21% | 38% | 36% |
| Total | 833 | 3,871 | 4,704 | 100% | 100% | 100% |

Source: Michael Debowy and Nachum Blass, Taub Center | Data: Taub Center and Teachers Union Survey

If we look only at teachers (including a separate category for *mechanchot*) and preschool teachers, the result is basically unchanged, although it appears that preschool teachers used remote teaching with a lower frequency (Figure 9). There are similar findings when differentiating between respondents in Hebrew and Arabic, with the same gap by sector.

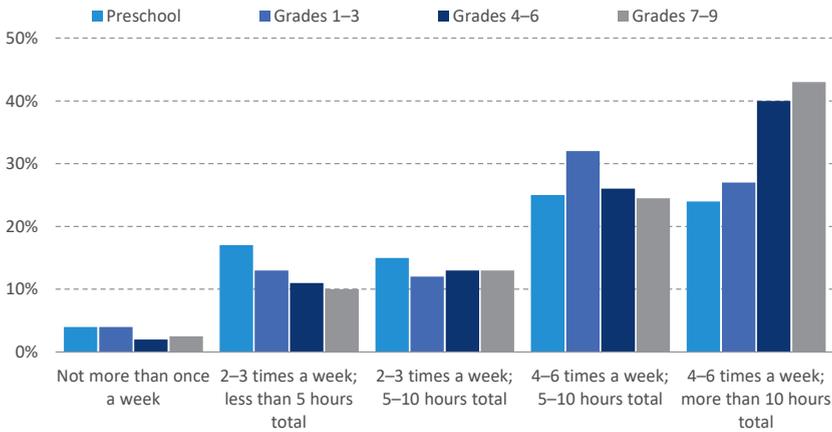
Figure 9. Frequency of remote teaching during the lockdown according to teacher type (teachers, preschool teachers and *mechanchot*), overall sample



Source: Michael Debowy and Nachum Blass, Taub Center | Data: Taub Center and Teachers Union Survey

A breakdown according to the age of the students shows that the frequency of using remote learning increases clearly and consistently with the age of the students, particularly between the Grade 1–3 level and the Grade 4–6 level. This result is the same when differentiating between Hebrew and Arabic-speaking respondents, and the sector gap previously noted remains as well.

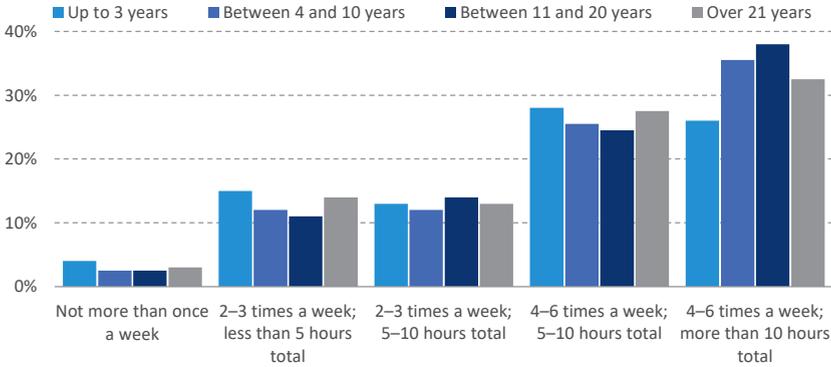
Figure 10. Frequency of remote teaching during the lockdown according to grade, overall sample



Source: Michael Debowy and Nachum Blass, Taub Center | Data: Taub Center and Teachers Union Survey

A breakdown according to teacher seniority (Figure 11) shows that the frequency of using remote teaching was lowest among younger teachers. Among the Arabic-speaking respondents, the frequency of use rises consistently with seniority. Among Hebrew-speaking respondents, on the other hand, it can be seen that the frequency of use among the most senior teachers is similar to that of teachers with 4–10 years of seniority (which is lower than that for seniority of 11–20 years). This trend is also seen in the overall distribution, due to the large number of respondents in Hebrew (about 82% of the total).

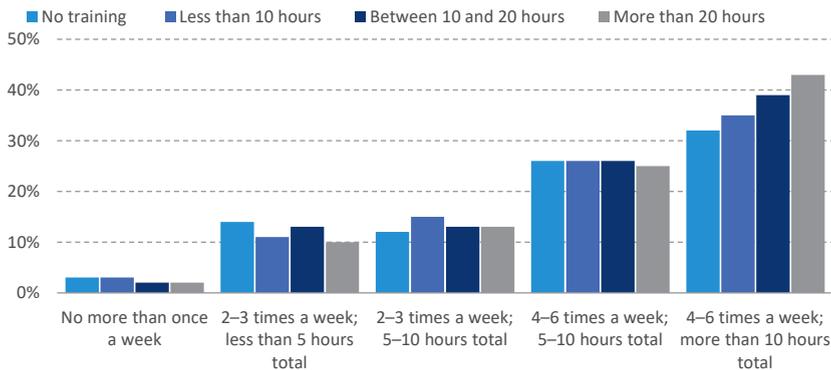
Figure 11. Frequency of remote teaching during the lockdown according to teaching seniority, overall sample



Source: Michael Debowy and Nachum Blass, Taub Center | Data: Taub Center and Teachers Union Survey

When we cross the frequency of remote teaching during the lockdown with the amount of training in remote teaching prior to the COVID-19 crisis (Figure 12), it is difficult to identify a clear and consistent correlation. Nonetheless, there appears to be a correlation between training of more than 10 hours — and especially, more than 20 hours — and reporting a high frequency of use (more than 10 hours among respondents in Hebrew and 5–10 hours among respondents in Arabic).

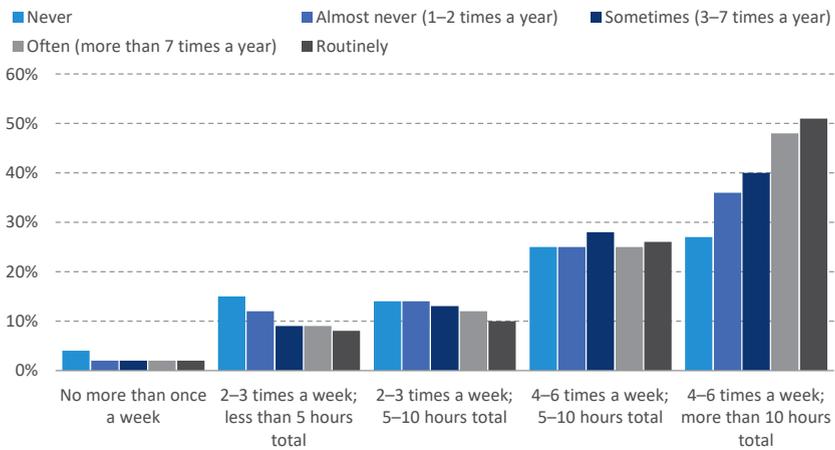
Figure 12. Frequency of remote teaching during the lockdown according to training in remote teaching prior to the crisis, overall sample



Source: Michael Debowy and Nachum Blass, Taub Center | Data: Taub Center and Teachers Union Survey

When we combine the reported frequency of use of remote teaching during the lockdown with the use of remote teaching prior to the onset of the crisis (Figure 13), it appears that the greater the use prior to the crisis the greater is the use during the crisis. This phenomenon is observed somewhat less among respondents in Arabic, where their reports converge to “4–6 times per week and a total of 5–10 hours” as the use of remote teaching prior to the crisis rises.

Figure 13. Frequency of use of remote teaching during the lockdown by its use before the COVID-19 crisis



Source: Michael Debowy and Nachum Blass, Taub Center | Data: Taub Center and Teachers Union Survey

A multivariate analysis shows that the teacher type and age of the students are correlated with the probability of reporting a higher frequency of remote teaching (which is lower among preschool teachers). Teacher seniority and number of students from weaker socioeconomic backgrounds are not correlated with the probability of any particular level of use. The results, together with a more detailed methodological explanation, see Appendix Tables 3a, b, and c.

4. The time needed to prepare a remote lesson relative to a face-to-face lesson

When we examine the reported time required to prepare an online lesson (at the time of the survey, after the teachers have already accumulated at least some experience in this area), an unambiguous picture emerges. About three-quarters of the respondents stated that more preparation time is required, with more than one-half stating that it took “much more” time than preparation for a face-to-face lesson. The findings are almost identical between respondents in Hebrew and respondents in Arabic.

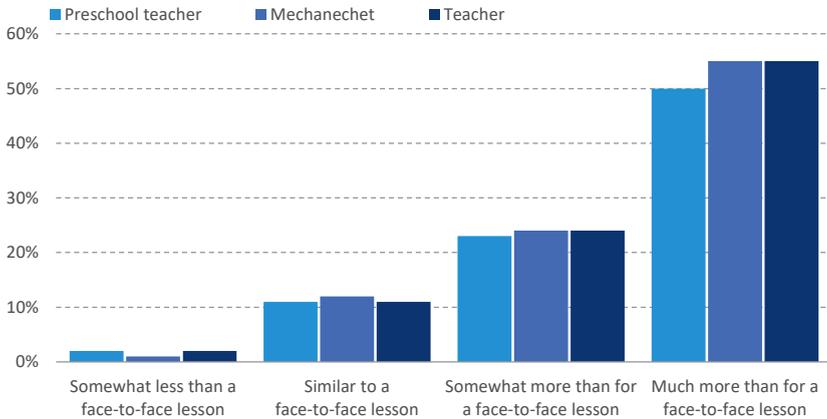
Table 3. After accumulating experience, how long did it take you to prepare an online lesson for remote teaching?

| Preparation time | Arabic-speaking respondents | Hebrew-speaking respondents | Total | Arabic-speaking respondents | Hebrew-speaking respondents | Total |
|--|-----------------------------|-----------------------------|-------|-----------------------------|-----------------------------|-------|
| | Absolute numbers | | | Percent | | |
| Empty | 50 | 559 | 609 | 6% | 11% | 10% |
| Somewhat less than a face-to-face lesson | 36 | 69 | 105 | 4% | 1% | 2% |
| Similar to a face-to-face lesson | 94 | 550 | 644 | 11% | 11% | 11% |
| Somewhat more than a face-to-face lesson | 210 | 1,174 | 1,384 | 25% | 24% | 24% |
| Much more than a face-to-face lesson | 443 | 2,599 | 3,042 | 53% | 52% | 53% |
| Total | 833 | 4,951 | 5,784 | 100% | 100% | 100% |

Source: Michael Debowy and Nachum Blass, Taub Center | Data: Taub Center and Teachers Union Survey

When we examine only teachers (including a separate category for *mechanchot*) and preschool teachers (Figure 14 and Appendix Figure 6), the result is similar and the distribution of reports is similar for teachers at all grade levels in the two sectors (Appendix Figure 7).

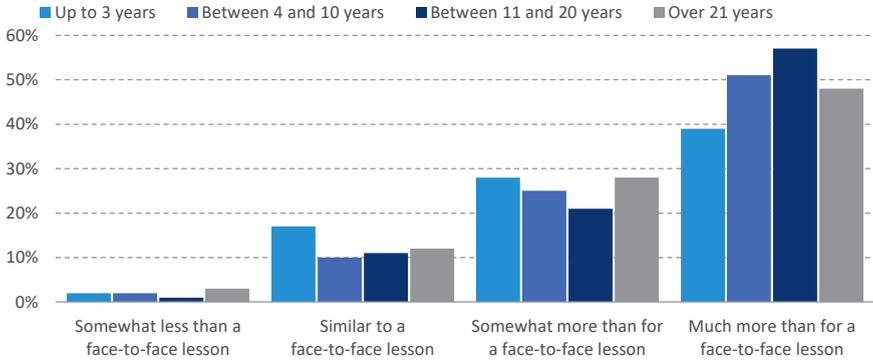
Figure 14. Preparation time required for an online lesson by teacher type (teachers, preschool teachers, and *mechanchot*), overall sample



Source: Michael Debowy and Nachum Blass, Taub Center | Data: Taub Center and Teachers Union Survey

With respect to lesson preparation by seniority (Figure 15), it can be seen that, in general, longer preparation time cuts across sectors and seniority levels. An exception worth mentioning is that the preparation time for an online lesson among young Arabic-speaking teachers was closer to the time required for a face-to-face lesson or at least was only somewhat longer. For most of the seniority levels, 4–5 respondents reported longer preparation time for every 1 who reported the same or shorter preparation time. The share of respondents with seniority of up to three years who responded in Arabic and reported equal or less preparation time exceeded the number of those who reported longer preparation time. It is important to mention that this finding is based on only 28 respondents.

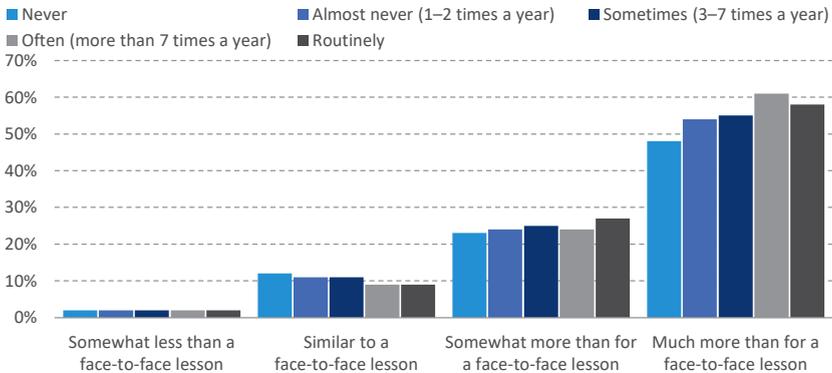
Figure 15. Preparation time required for an online lesson by teacher seniority, overall sample



Source: Michael Debowy and Nachum Blass, Taub Center | Data: Taub Center and Teachers Union Survey

When we cross the reported preparation time with the amount of training in remote teaching prior to the COVID-19 crisis (Figure 16), results are relatively the same across the various levels of experience. Thus we can assume that prior experience with remote teaching has no real influence on preparation time for remote teaching versus face-to-face teaching.

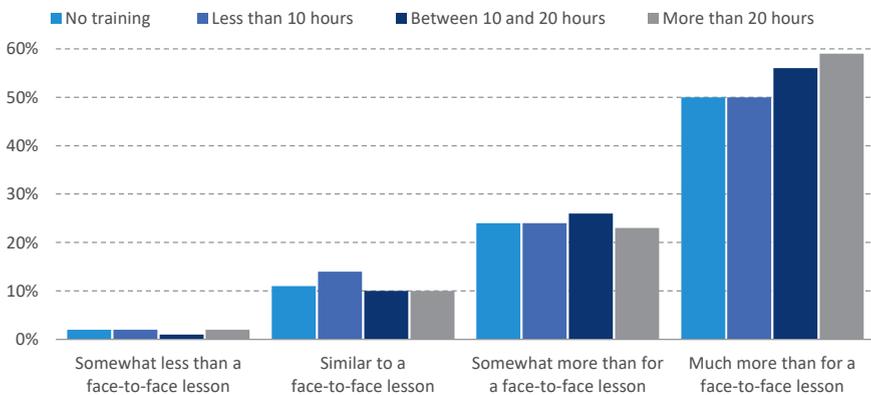
Figure 16. Preparation time required for an online lesson by the extent of remote teaching prior to the COVID-19 crisis, overall sample



Source: Michael Debowy and Nachum Blass, Taub Center | Data: Taub Center and Teachers Union Survey

When we combine the reported time for preparation with the amount of training in remote teaching prior to the COVID-19 crisis, it is difficult to identify a clear and consistent correlation (Figure 17). Nonetheless, it appears that in the case of training of more than 10 hours — and in particular more than 20 — the likelihood of reporting that preparation time is “much longer than for a face-to-face lesson” increases. Among Arabic speakers, we see a greater frequency of reporting that preparation time is “much longer” than in the case of teachers who did not have any training (see Appendix Figure 8).

Figure 17. Preparation time required for an online lesson by training prior to the COVID-19 crisis, overall sample



Source: Michael Debowy and Nachum Blass, Taub Center | Data: Taub Center and Teachers Union Survey

In the multivariate Logit model, there is a statistically significant constant but none of the explanatory variables are statistically significant. This implies a situation of a uniform distribution of estimated preparation times among the respondents.

The RAMA survey mentioned above also provides some insight into the preparedness of the teachers and the preparation of online lessons. More than 80% reported that they have lesson plans and teaching units that are needed for remote teaching (a figure that drops to 51% among Hebrew speakers in Grades 1–6 and 70% among Arabic speakers in the same grades, if we count only those respondents who answered “to a great extent / to a very great extent”). Nonetheless, only about 30% of Hebrew speakers (Grade 1–6) and about 40% of Arabic speakers (Grade 1–6) reported that they need

assistance in preparing lesson plans and teaching units. Our findings from the Teachers Union survey show that more than 75% of teachers reported longer preparation time for an online lesson than for a face-to-face lesson. If we combine the findings of the two surveys, it is perhaps possible to conclude that while preparation times are longer for remote teaching, the teachers do not necessarily believe that assistance in this task will shorten the time required.

Conclusion

The findings of the survey paint a clear picture of the extent of remote teaching and the preparedness of teachers to adopt this tool during the first lockdown. **About one-half of the teachers had no training** in remote teaching prior to the onset of the COVID-19 pandemic and about 70% had 10 hours or less of training, an amount that would appear to be insufficient. It is notable that there was more training among Arabic speakers, although even among this population about 40% of the respondents did not have any training prior to the crisis. Furthermore, teachers with greater seniority (more than 20 years of experience) and teachers of older students (Grade 4–9) reported more hours of training.

About 40% of the teachers had never used remote teaching prior to the COVID-19 crisis, while less than 20% had used it more than 7 times per year. Teachers with more seniority (more than 20 years of experience) and teachers of older students (Grade 4–9) reported making greater use of remote teaching prior to the crisis. An interesting finding is that the reported use of remote teaching rose together with the number of students from weaker socioeconomic backgrounds per class (more than 20 such students in a class).

Only about 3% of the respondents reported that they teach online not more than once per week and **more than one-half of the teachers teach online 4–6 times per week**, where 36% of them do so for more than 10 hours per week. Furthermore, it appears that the teachers of older students (Grade 4–9) teach online with greater frequency.

More than 75% of teachers reported **longer preparation time for an online lesson than a face-to-face lesson** where about 50% claimed that the time was “much longer.” The distribution of responses was the same across teacher type, sector, level of seniority, age group of the students, and students’ socioeconomic background.

One other interesting finding in this context involves the effect of training in remote teaching prior to the crisis. On the one hand, training of more than 10 hours, and in particular more than 20 hours, raised the frequency of remote teaching during the lockdown. On the other hand, the training also raised the reported lesson preparation time. In other words, there is no indication in this context that training saved time for the teachers. On the contrary, training led to greater investment by teachers in the work of teaching.

It appears therefore that teachers arrived at the crisis with little training and experience in remote teaching, at a time when the amount of remote teaching and the personal resources required to use this tool during the lockdown were particularly great. It is worthwhile repeating that the survey relates to the first lockdown only, when the constraints and difficulties of remote teaching had only started to become clear. Nonetheless, it is possible that the experience accumulated during this time improved teachers' functioning later on.

In coming papers, we will discuss additional findings from the survey, such as teachers' attitudes about remote teaching, their ability to use this tool and the support they received from various quarters, its effect on various types of students, the quality of the infrastructure, and the achievement of pedagogical objectives.

Given that teachers are the most influential factor in determining academic and educational achievement among students, we hope that the findings of this survey will help researchers and educators in carrying out an objective and in-depth evaluation of the effect of shifting to remote teaching on the various components of the education system.

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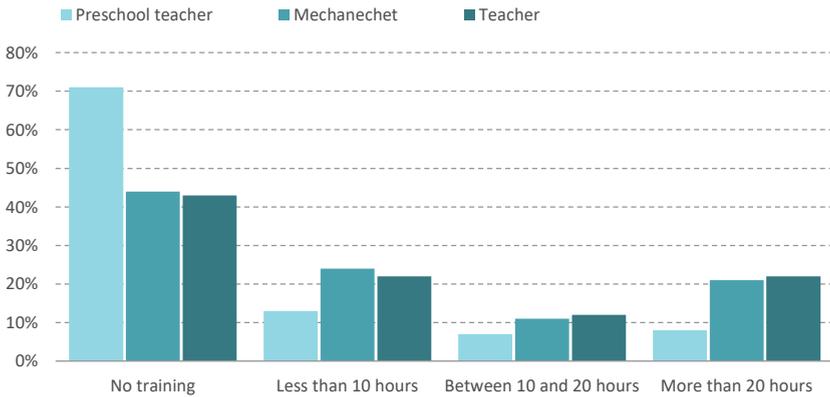
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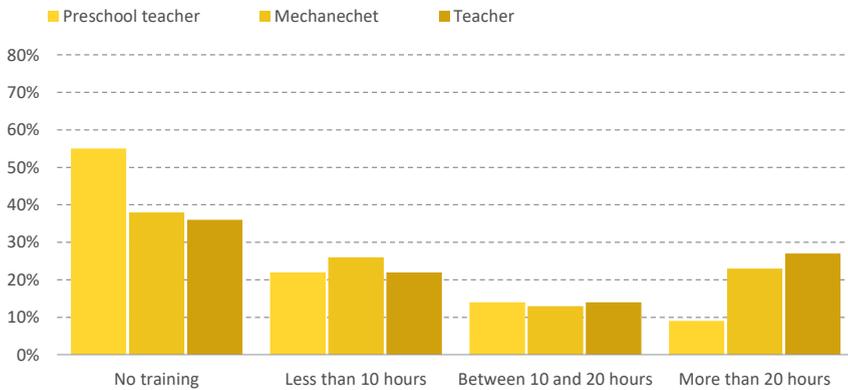
Appendix

Appendix Figure 1. Extent of training in remote teaching by teacher type (teachers, preschool teachers, and mechanechet)

a. Hebrew-speaking respondents



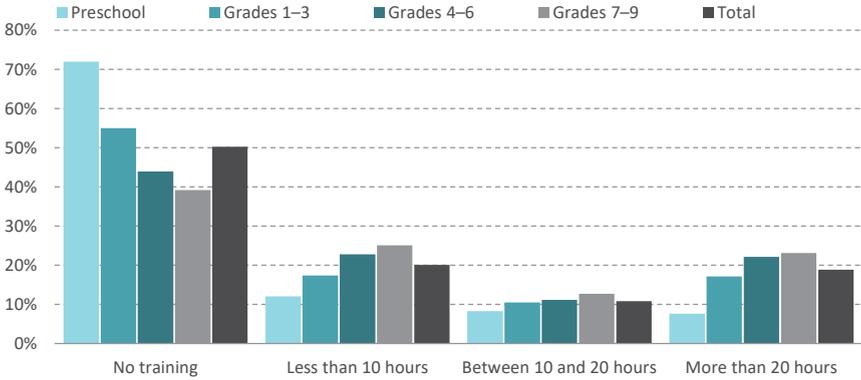
b. Arabic-speaking respondents



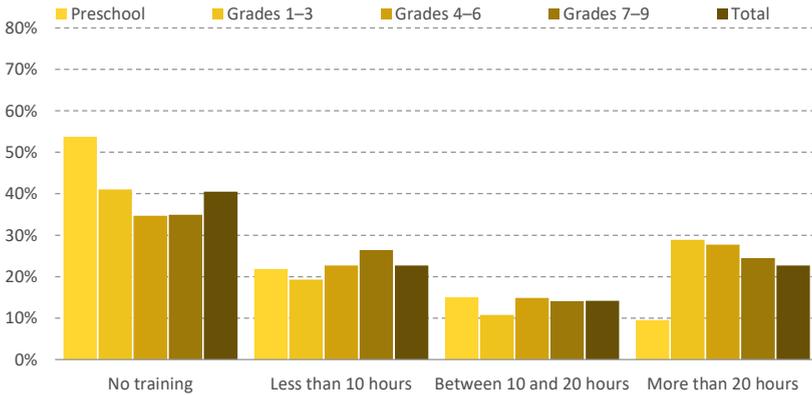
Source: Michael Debowy and Nachum Blass, Taub Center | Data: Taub Center and Teachers Union Survey

Appendix Figure 2. Extent of training in remote teaching by grade level

a. Hebrew-speaking respondents



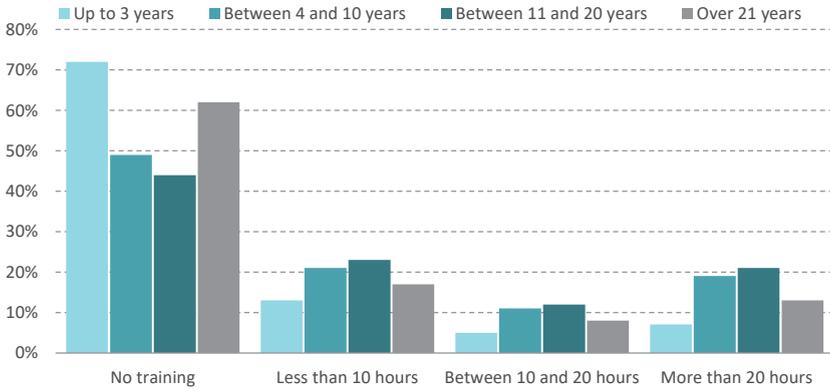
b. Arabic-speaking respondents



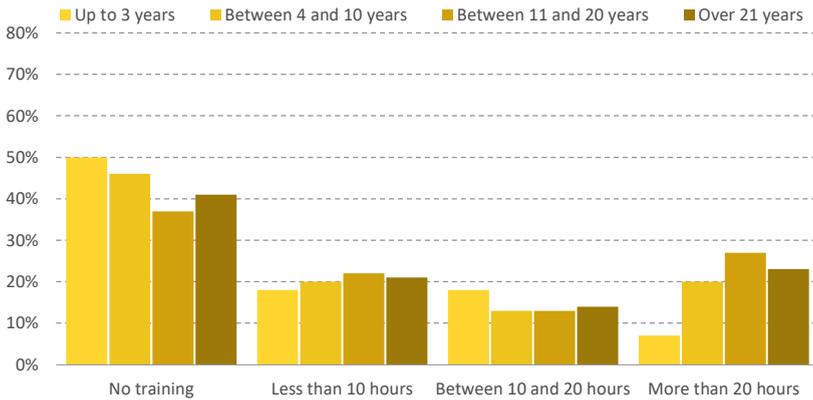
Source: Michael Debowy and Nachum Blass, Taub Center | Data: Taub Center and Teachers Union Survey

Appendix Figure 3. Extent of training in remote teaching by teacher seniority

a. Hebrew-speaking respondents



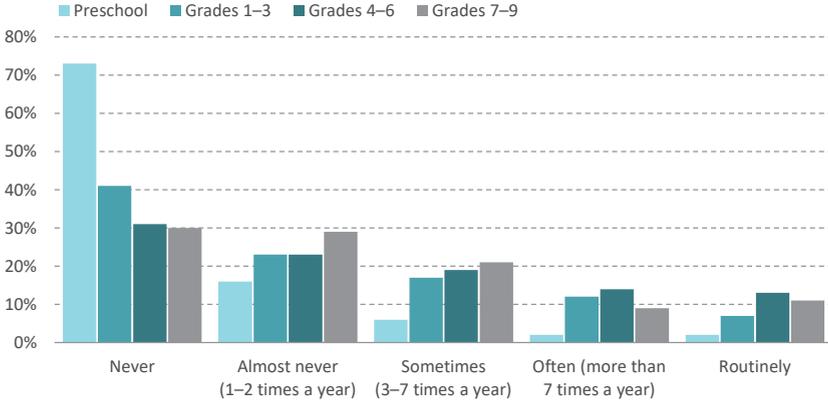
b. Arabic-speaking respondents



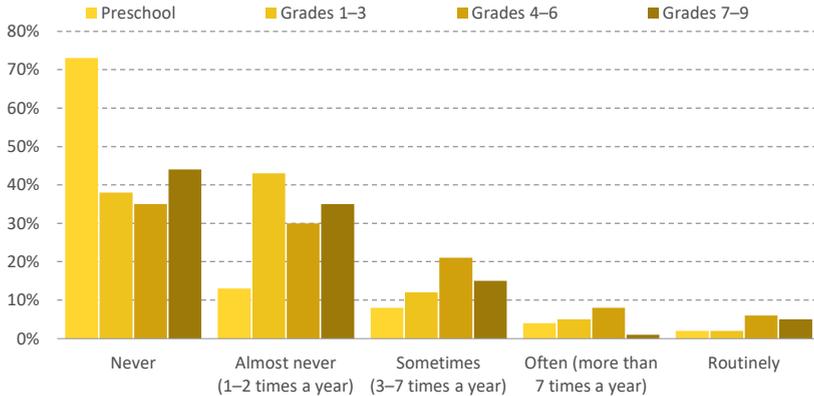
Source: Michael Debowy and Nachum Blass, Taub Center | Data: Taub Center and Teachers Union Survey

Appendix Figure 4. Extent of remote teaching prior to the COVID-19 crisis by teacher type (teachers, preschool teachers, and mechanchot), overall sample

a. Hebrew-speaking respondents



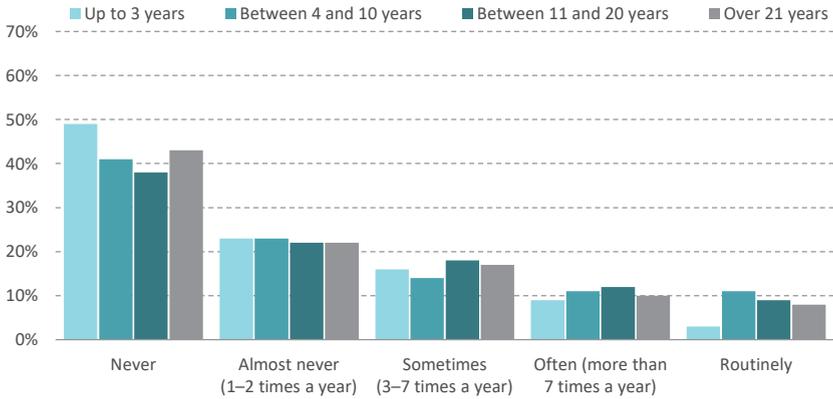
b. Arabic-speaking respondents



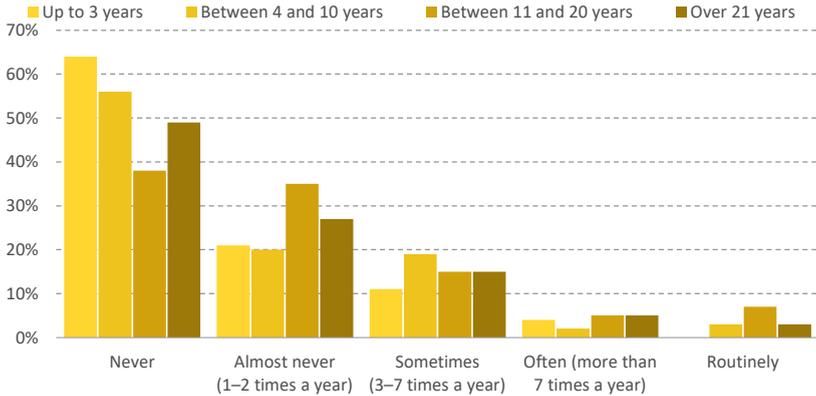
Source: Michael Debowy and Nachum Blass, Taub Center | Data: Taub Center and Teachers Union Survey

Appendix Figure 5. Extent of remote teaching prior to the COVID-19 crisis according to teacher seniority

a. Hebrew-speaking respondents



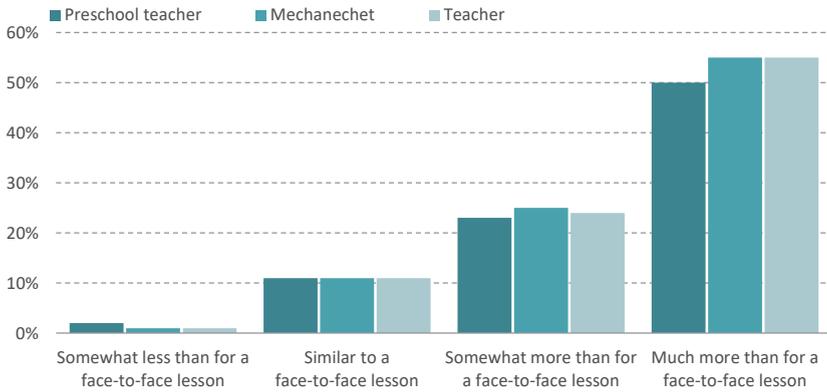
b. Arabic-speaking respondents



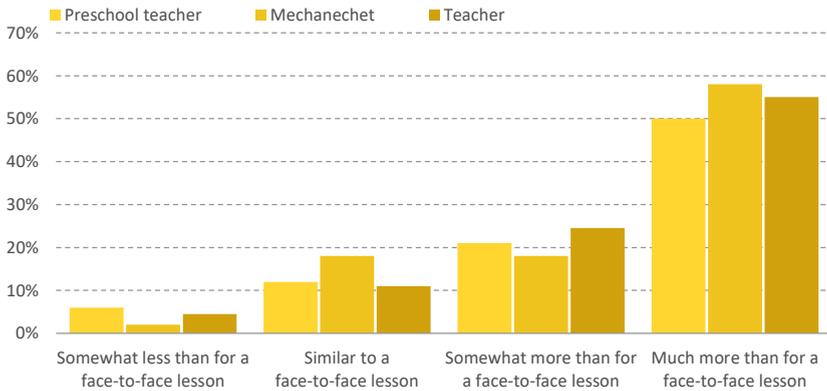
Source: Michael Debowy and Nachum Blass, Taub Center | Data: Taub Center and Teachers Union Survey

Appendix Figure 6. Preparation time required for an online lesson by teacher type (teachers, preschool teachers, and mechanechet)

a. Hebrew-speaking respondents



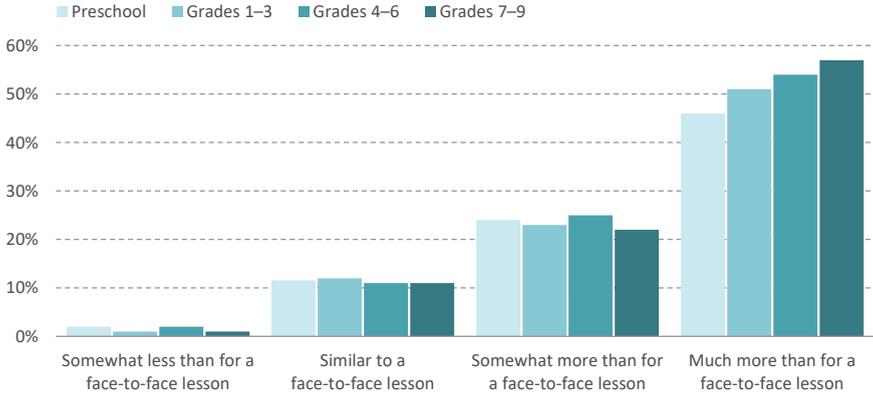
b. Arabic-speaking respondents



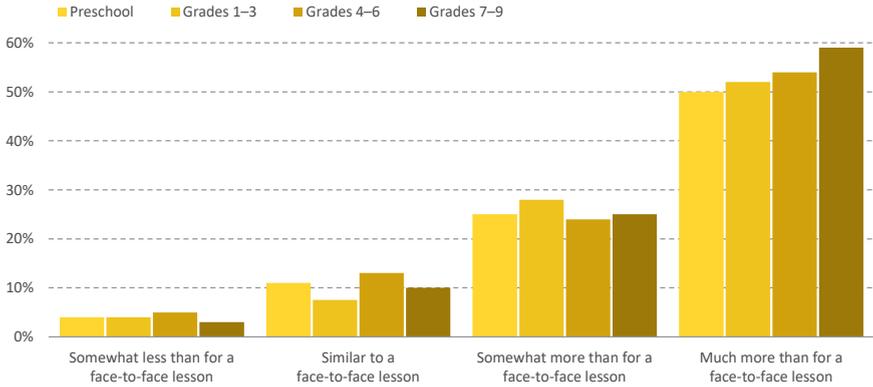
Source: Michael Debowy and Nachum Blass, Taub Center | Data: Taub Center and Teachers Union Survey

Appendix Figure 7. Preparation time required for an online lesson by grade level

a. Hebrew-speaking respondents



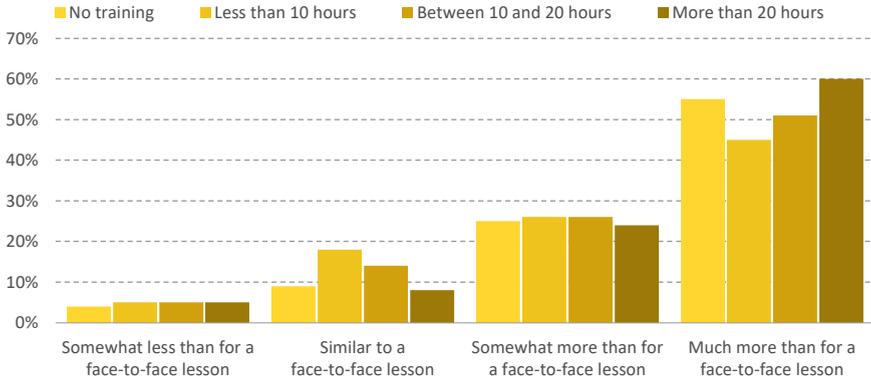
b. Arabic-speaking respondents



Source: Michael Debowy and Nachum Blass, Taub Center | Data: Taub Center and Teachers Union Survey

Appendix Figure 8. Preparation time required for an online lesson by training prior to the COVID-19 crisis

Arabic-speaking respondents



Source: Michael Debowy and Nachum Blass, Taub Center | Data: Taub Center and Teachers Union Survey

Multivariate analysis

The survey results in the body of the text were descriptive statistics, relating separately to the different variables. In general, the correlations between the various background characteristics (such as sector, seniority, age level, and teacher type) may blur the specific connection between each characteristic and the extent of training. In order to relate to these correlations, the survey findings were analyzed using a Logit model. This model estimates the effect of the independent variables on the odds ratio between the probability that the respondents chose a particular answer (or set of answers) and the probability that they did not. In general, the most reliable method of estimating categorical dependent variables is Ordered Logit, a model that estimates an approximation of the probability of giving a “higher” answer in the survey. However, it is possible to focus on a specific threshold between the possible answers and to construct a binary dependent variable that generates more comprehensible results and a more precise estimation for the relevant threshold.

1. Training in remote teaching prior to the onset of the COVID-19 crisis

Appendix Table 1 presents the findings of a model that examines the odds ratio between reporting any amount of training prior to the crisis and reporting no training. The results of the model show that the descriptive differentiations made in the body of the text — with respect to sector, seniority, and grade level — remain valid in a multivariate statistical analysis.

Appendix Table 1. How many hours of training in remote teaching did you receive prior to the COVID-19 crisis?

| Variable | Coefficient | Standard deviation |
|---|-------------|--------------------|
| Sector reference group: State and Haredi education system | | |
| State-religious | 0.085 | 0.092 |
| Arab | 0.366*** | 0.103 |
| Seniority reference group: Less than 4 years of experience | | |
| 4 to 10 years | 1.056*** | 0.179 |
| 11 to 20 years | 1.124*** | 0.171 |
| More than 20 years | 0.618*** | 0.179 |
| Grade level reference group: Preschool | | |
| Grades 1 to 3 | 0.207 | 0.138 |
| Grades 4 to 6 | 0.469*** | 0.136 |
| Grades 7 to 9 | 0.5847** | 0.163 |
| Teaching position reference group: Teacher | | |
| Counselor | 0.2405*** | 0.172 |
| Preschool teacher | 0.8531*** | 0.118 |
| Administration | 0.5303** | 0.249 |
| Mechanchet | 0.0188 | 0.086 |
| Other | 0.519** | 0.182 |
| Intercept | 1.3121*** | 0.234 |
| Log-Likelihood | -2,699.3 | |
| Pseudo R ² | 0.044655 | |
| “Never” respondents | 2,806 | |
| “At least some” respondents | 2,938 | |

Notes: This table presents the results of a Logit model using the survey data where the dependent variable of “How many hours of training in remote teaching did you receive prior to the COVID-19 crisis?” takes the value “yes” if any amount of training was reported and “no” if no training was reported. The model is used to test the correlation of this variable for all sectors, levels of teacher seniority, teacher types, grade level, and number of students from weaker socioeconomic backgrounds in the class. Statistical significance: **p < 0.05; ***p < 0.01.

Source: Michael Debowy and Nachum Blass, Taub Center | Data: Taub Center and Teachers Union Survey

2. Extent of remote teaching prior to the onset of the COVID-19 crisis

Appendix Table 2 presents findings from a model that generated the odds ratio between reporting any use of remote teaching prior to the crisis and reporting no use, where a variety of characteristics of the potential respondent are taken into account simultaneously as independent variables.

Appendix Table 2. Prior to the COVID-19 crisis, did you use remote teaching (in the classroom or at a distance)?

| Variable | Coefficient | Standard deviation |
|--|-------------|--------------------|
| Seniority reference group: Less than 4 years experience | | |
| 4 to 10 years | 0.4625*** | 0.171 |
| 11 to 20 years | 0.5342*** | 0.161 |
| More than 20 years | 0.2704 | 0.168 |
| Grade level reference group: Preschool | | |
| Grades 1-3 | 0.6559*** | 0.139 |
| Grades 4-6 | 0.7785*** | 0.140 |
| Grades 7 to 9 | 0.6428*** | 0.168 |
| Teaching position reference group: Teacher | | |
| Counselor | 1.0070*** | 0.166 |
| Preschool teacher | 1.4413*** | 0.117 |
| Administration | 0.2553 | 0.250 |
| Mechanechet | 0.3604*** | 0.098 |
| Other | -0.1588 | 0.175 |
| Population reference group: One student or less | | |
| Weaker group: 2 to 3 students | 0.4308*** | 0.121 |
| Weaker group: 4 to 5 students | 0.3803*** | 0.123 |
| Weaker group: 6 to 10 students | 0.4467*** | 0.133 |
| Weaker group: 11 to 20 students | 0.4222** | 0.174 |
| Weaker group: 21 students or more | 0.1806 | 0.306 |
| Intercept | 0.5107** | 0.226 |
| Log-Likelihood | -2,187.9 | |
| Pseudo R ² | 0.1303 | |
| "Never" respondents | 1,408 | |
| "At least some" respondents | 2,415 | |

Notes: This table presents the results of a Logit model using the survey data where the dependent variable of "Prior to the COVID-19 crisis, did you use remote teaching (in the classroom or at a distance)?" takes the value "yes" if any use was reported and "no" if no use was reported. The model is used to test the correlation of this variable for all sectors, levels of teacher seniority, teacher types, grade level, and number of students from weaker socioeconomic backgrounds in the class.

Statistical significance: **p < 0.05; ***p < 0.01.

Source: Michael Debowy and Nachum Blass, Taub Center | Data: Taub Center and Teachers Union Survey

It can be seen that the descriptive differentiations presented in the body of the text — sector, seniority, teacher type, and grade level — remain unchanged when all of these variables are taken into account simultaneously, and therefore it can be said that the relationships are relatively robust. An exception is the number of students from weaker socioeconomic backgrounds in the class. The descriptive correlation is “flattened,” such that when the number of students from weaker socioeconomic backgrounds in a class ranges from 2 to 20 the probability of reporting previous use of remote teaching is greater than for class compositions at the extremes of the socioeconomic spectrum. F-tests carried out for the coefficients in several configurations of the model could not reject the hypothesis that the effects of belonging to each of the categories in the range of 2–20 students from weaker socioeconomic backgrounds in the class are the same.

3. Frequency of use of remote teaching during the COVID-19 crisis

Appendix Table 3 presents findings from a pair of models used to test the odds ratio between reporting a frequency of remote teaching above or below a certain threshold, where all of the characteristics are taken into account simultaneously as independent variables. In one of the models, a lower threshold for use of remote teaching was set at “2–3 times per week and a total of between 5 and 10 hours” (the three “highest” possible answers). In the second model, a lower threshold was set at “4–6 times per week and a total of between 5 and 10 hours” (the two “highest” possible answers).⁸

The two models show that the gap between Hebrew and Arab education presented earlier remains. Furthermore, a parallel gap — though somewhat smaller — appears between the Hebrew State system and the State-religious system, where the teachers from the Hebrew State system reported a higher frequency of remote teaching. The gaps between the *mechanchot* and the teachers are also robust to the multiplicity of variables, while the gap between

8 In the survey, teachers were asked to choose from among five possibilities to describe the frequency and extent of remote teaching: not more than once a week; 2–3 times a week and a total of less than 5 hours; 2–3 times a week and a total of 5 to 10 hours; 4–6 times a week and a total of 5 to 10 hours; 4–6 times a week and a total of more than 10 hours. It is clear that these limited possibilities do not include all of the possible frequencies, since they also constrain the range of frequencies and total hours, as well as their combination. The possibilities do somehow preserve the original ranking between them, which facilitates statistical testing with respect to the correlation trends.

preschool teachers and teachers disappears (apparently due to the inclusion of the grade level, which overlaps the definitions of teacher type to a great extent). It is interesting that the increase in frequency of remote teaching with the age of the children is seen only in the second model (where the threshold of frequency is higher). Furthermore, in the first model it appears that teachers from the Hebrew State-religious system reported consistently lower frequencies of remote teaching.

In addition, and in view of our findings regarding the characteristics of the respondents and the training in remote teaching prior to the crisis, we carried out an additional estimation of the models with two additional binary explanatory variables: having had any amount of training (as about one-half of the teachers had) and use of remote teaching prior to the crisis. The results of these models appear in Appendix Table 3c (Appendix Table 3b shows the estimation results for the extent of training only). The analysis indicates that the gaps according to sector, level of seniority and the socioeconomic status of the students are not statistically significant and are fully “explained” by gaps in the age of the students, teacher type, and use of remote teaching in the past.

Appendix Table 3a. How frequently and for how many hours per week did you teach remotely during the COVID-19 crisis?

| Variable | Coefficient (A) | Standard deviation (B) | Coefficient (C) | Standard deviation (D) |
|--|--------------------|---------------------------|--------------------|---------------------------|
| Sector reference group: State education system | | | | |
| State-religious | 0.4446*** | 0.119 | 0.3520*** | 0.095 |
| Haredi | 0.7530 | 0.406 | 0.2553- | 0.372 |
| Arab | 0.6265*** | 0.130 | 0.4437** | 0.104 |
| Grade level reference group: Preschool | | | | |
| Grades 1 to 3 | -0.0320 | 0.156 | 0.2985** | 0.133 |
| Grades 4 to 6 | 0.2935 | 0.165 | 0.5460*** | 0.137 |
| Grades 7 to 9 | 0.5417** | 0.210 | 0.7261*** | 0.171 |
| Teaching position reference group: Teacher | | | | |
| Counselor | 0.6638*** | 0.201 | 0.4057** | 0.174 |
| Preschool teacher | 0.3152** | 0.145 | 0.0261 | 0.122 |
| Administration | -0.1411 | 0.283 | -0.2560 | 0.224 |
| Mechanechet | 0.4656*** | 0.129 | 0.4946*** | 0.097 |
| Other | 0.1235 | 0.129 | 0.2170 | 0.191 |
| Intercept | 1.5256*** | 0.273 | -0.3774 | 0.222 |
| Log-Likelihood | -1613.5 | | -2262.3 | |
| Pseudo R ² | 0.03942 | | 0.02884 | |
| Up to 3 times a week and less than 5 hours total = 0, respondents | | | 863 | |
| At least twice a week and more than 5 hours total = 1, respondents | | | 4,266 | |
| Up to 6 times a week and less than 10 hours total = 0, respondents | | | 1,639 | |
| At least 4 times a week and at least 10 hours total = 1, respondents | | | 3,535 | |

Appendix Table 3b. How frequently and for how many hours per week did you teach remotely during the COVID-19 crisis?

| Variable | Coefficient (A) | Standard deviation (B) | Coefficient (C) | Standard deviation (D) |
|--|--------------------|---------------------------|--------------------|---------------------------|
| Sector reference group: State education system | | | | |
| State-religious | -0.2273 | 0.335 | -0.2001 | |
| Haredi | -0.4401 | 0.380 | -0.2018 | 1.161 |
| Arab | -0.7164 | 0.669 | 0.5477** | 0.242 |
| Grade level reference group: | | | | |
| Preschool | | | | |
| Grades 1 to 3 | -0.0882 | 0.113 | 0.0959 | 0.087 |
| Grades 4 to 6 | 0.2382 | 0.135 | 0.3151*** | 0.057 |
| Grades 7 to 9 | 0.4166** | 0.177 | 0.4643** | 0.174 |
| Teaching position reference group: Teacher | | | | |
| Counselor | -0.4728 | 0.243 | -0.3432 | 0.314 |
| Preschool teacher | 0.3030** | 0.110 | -0.0919 | 0.083 |
| Administration | -0.2786 | 0.204 | -0.5174 | 0.284 |
| Mechanechet | 0.5519*** | 0.104 | 0.5237*** | 0.096 |
| Other | 0.0930 | 0.182 | 0.2224 | 0.205 |
| At least some training in remote teaching before the crisis | | | | |
| Intercept | 1.1370** | 0.137 | 0.2803 | 1.030 |
| Log-Likelihood | -2225.6 | | -3086.5 | |
| Pseudo R ² | 0.04236 | | 0.04313 | |
| Up to 3 times a week and less than 5 hours total = 0, respondents | | | 863 | |
| At least twice a week and more than 5 hours total = 1, respondents | | | 4,266 | |
| Up to 6 times a week and less than 10 hours total = 0, respondents | | | 1,639 | |
| At least 4 times a week and at least 10 hours total = 1, respondents | | | 3,535 | |

Appendix Table 3c. How frequently and for how many hours per week did you teach remotely during the COVID-19 crisis?

| Variable | Coefficient (A) | Standard deviation (B) | Coefficient (C) | Standard deviation (D) |
|--|--------------------|---------------------------|--------------------|---------------------------|
| Sector reference group: State education system | | | | |
| State-religious | -0.1933 | 0.273 | -0.1801 | 0.276 |
| Haredi | -0.1682 | 0.215 | -0.1344 | 0.221 |
| Arab | -0.5450 | 0.477 | -0.4987 | 0.465 |
| Grade level reference group: Preschool | | | | |
| Grades 1 to 3 | 0.0725 | 0.060 | 0.0688 | 0.093 |
| Grades 4 to 6 | 0.2855*** | 0.085 | 0.2813*** | 0.079 |
| Grades 7 to 9 | 0.4547** | 0.161 | 0.4500*** | 0.095 |
| Teaching position reference group: Teacher | | | | |
| Counselor | -0.2628 | 0.299 | -0.2513 | 0.240 |
| Preschool teacher | 0.0280 | 0.130 | 0.0393 | 0.134 |
| Administration | 0.5326*** | 0.177 | -0.5449 | 0.289 |
| Mechanectet | 0.5004*** | 0.104 | 0.5079*** | 0.105 |
| Other | 0.2530 | 0.182 | 0.2440 | 0.731 |
| At least some training in remote teaching prior to the crisis | 0.0051 | 0.069 | 0.1359 | 0.074 |
| Use of remote teaching prior to the crisis | 0.3750*** | 0.057 | 0.3491*** | 0.084 |
| נתחן | 0.1298 | 0.219 | 0.1237 | 1.678 |
| Log-Likelihood | -3082.2 | | -3080.3 | |
| Pseudo R ² | 0.03581 | | 0.03639 | |
| Up to 3 times a week and less than 5 hours total = 0, respondents | | | 863 | |
| At least twice a week and more than 5 hours total = 1, respondents | | | 4,266 | |
| Up to 6 times a week and less than 10 hours total = 0, respondents | | | 1,639 | |
| At least 4 times a week and at least 10 hours total = 1, respondents | | | 3,535 | |

Notes: These tables present the results of a Logit model for the survey data where the dependent variable is "With what frequency and for how many hours per week did you teach remotely during the COVID-19 crisis?" The model is used to test the correlation of this variable for all sectors, levels of teacher seniority, teacher types, grade levels, and number of students from weaker socioeconomic backgrounds in the class. Columns A and B give the dependent variable a value of 0 if a frequency of up to 3 times per week and less than 5 hours total per week were reported and 1 if a frequency of at least twice per week and more than 5 hours total per week were reported. Column C and D give the dependent variable a value of 0 if a frequency of up to 6 times per week and not more than 10 hours total were reported and 1 if a frequency of at least 4 times a week and at least 10 hours total were reported.

Statistical significance: **p < 0.05; ***p < 0.01.

Source: Michael Debowy and Nachum Blass, Taub Center | Data: Taub Center and Teachers Union Survey