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DATA LOST, DECISIONS MADE: TEACHERS IN ROUTINE AND EMERGENCY REMOTE TEACHING

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ABSTRACT

Aim/Purpose	This study explored teachers' data-driven decision-making processes during routine and emergency remote teaching, as experienced during the COVID-19 pandemic.
Background	Decision-making is essential in teaching, with informed decisions promoting student learning and teachers' professional development most effectively. However, obstacles to the use of data have been identified in many studies.
Methodology	Using a qualitative methodology (N=20), we studied how teachers make decisions, what data is available, and what data they would like to have to improve their decision-making. We used an inductive approach (bottom-up), utilizing teachers' statements related to decision-making as the unit of analysis.
Contribution	Our findings shed an important light on teachers' Data-Driven Decision-Making (DDDM), highlighting the differences between routine and Emergency Remote Teaching (ERT).
Findings	Overall, we found that teachers make teaching decisions in three main areas: pedagogy, discipline-related issues, and appearance and behavior. They shift between making decisions based on data and making decisions based on intuition. Academic-related decisions are the most prominent in routine teaching, and during ERT, they were almost the only area in which teachers' decisions were made. Teachers reported collecting data about students' academic achievements

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	and emotional state and considered the organizational culture, consultation with colleagues, and parents' involvement before decision-making.
Recommendations for Practitioners	Promote a culture of data-driven decision-making across the education system; Make diverse and rich data of different types accessible to teachers; Increase professional and emotional support for teachers.
Recommendations for Researchers	Researchers have the potential to expand the scope of this study by conducting research using other methodologies and in different countries.
Impact on Society	This study highlights the importance of teachers' data-driven decision-making in improving teaching practices and promoting students' achievement.
Future Research	Additional research is required to examine data-driven decision-making in diverse circumstances.
Keywords	data-driven decision-making, emergency remote teaching (ERT), qualitative research, COVID-19

INTRODUCTION

Pedagogical decision-making is a spiral and dynamic process, referring to teachers' decisions before, during, and after teaching. Decision-making is at the heart of the teaching process; thus, understanding how teachers make decisions is essential for improving teaching practices (Borko et al., 2008). Data-driven decision-making (DDDM) can consider many aspects of the student's characteristics and learning, e.g., demographics and familial information, academic level, meta-cognitive skills, or socio-emotional behavior; each of these could be described with quantitative or qualitative data. Teachers can use these in pedagogical decisions such as didactical practices, curricular considerations, assessment methods, resource allocation, implementation of digital tools, appraisal, disciplinary responses, etc. They may be taken at the moment, during lessons, or out of the classroom setting. Of course, DDDM is personal in nature, and the same data could lead different teachers to different decisions based on their educational agenda and contextual considerations (Škėrienė & Augustinienė, 2018). Still, teachers often make decisions intuitively and not systematically (Vanlommel et al., 2017).

During the rapid transition to emergency remote teaching (ERT), schools have faced several challenges related to technology (connectivity, access to equipment), teacher preparedness for online learning, availability of resource materials to support teaching and learning, and readiness of K-12 (from kindergarten to 12th grade) students and their parents for online learning (Arcueno et al., 2021).

In addition, teachers are faced with at least two significant challenges in ERT that may have affected their DDDM. First, the very setting of teaching changed during the COVID-19 pandemic, as schools shifted from face-to-face to remote teaching; this impacted the ways by which teachers could collect data about their students. Consequently, teachers needed to re-evaluate their pedagogical decision-making in supporting their students (Usher et al., 2021). Second, learning during a pandemic emphasized the affective aspects of learning, which may have impacted teachers' decisions, as well as the types of data required to support these decisions (Roman et al., 2021; Yang et al., 2021). These conditions of ERT during the pandemic caught teachers unprepared, requiring ongoing improvements in curriculum design and practice, which would normally rely on DDDM to be effective (Hodges et al., 2020; Zhang, 2020).

Although teachers' DDDM processes have been extensively researched, the study of teachers' DDDM during distance learning in general and ERT in particular is still in its early stages. This is the gap we aim to bridge in this study. In doing this, we defined the following research questions:

(1) In which areas did teachers use data to promote learners in their traditional teaching?

(2) In what ways did teachers' use of data to promote learners change during ERT?

(3) What considerations did teachers take when making informed decisions?

LITERATURE REVIEW

TEACHERS' DATA-DRIVEN DECISION-MAKING (DDDM)

New technologies have led to an exponential increase in the volume of data available for teachers, meaning that data literacy skills are increasingly necessary in workplace and everyday life (Ridsdale et al., 2015). In the education field, it is assumed that collecting and analyzing data, and basing a decision on it, will have a positive impact on the quality of educational decision-making, which will support students' learning achievements (van der Scheer & Visscher, 2018) and will contribute to reducing gaps in knowledge between students (Dodman et al., 2021). To address decision-making broadly, researchers have found several principles at the core of the teachers' pedagogical decision-making process: setting goals, gathering information, structuring decisions, making final choices, and implementation and evaluation. These can be affected by four groups of factors: the philosophy of education, the analysis of learners' needs, the adjustment of learners' and teachers' values, and the harmony of educational theory and practice (Škėrienė & Augustinienė, 2018). Furthermore, the use of data is also related to the context of teachers' data literacy. Teachers' values (i.e., their beliefs about data use), their identities (i.e., how they see themselves as data producers and users), and their epistemologies (i.e., how they justify beliefs and use justified beliefs in their thinking and decision-making) are also essential components that can contribute to how individuals' and teachers' work with data and make evidence-based decisions (Cui et al., 2023). However, obstacles to the use of data have been identified in many studies (Ho, 2022; Schildkamp, 2019). These obstacles include, among others, teachers' lack of training (Schelling & Rubenstein, 2023), common understanding regarding data use, struggles with multiple types of data, lack of technological literacy, or non-use of data altogether for making informed decisions (Villeneuve & Bouchamma, 2023).

The DDDM process includes teachers' use of technology-based data systems, interpreting the data, evaluating it, and applying data-driven insights in teaching (Dunn et al., 2013). Indeed, proper use of data for decision-making requires a certain set of skills for using technology-based systems, as well as engaging and communicating with data. These practices and context dramatically change during periods of emergency.

EMERGENCY REMOTE TEACHING (ERT)

While effective online learning requires thorough instructional design and planning (Hodges et al., 2020), the shift to online teaching and learning during the global COVID-19 pandemic was sudden. Face-to-face education was suspended in most countries. However, millions of school-age students live in homes without Internet service, which increases the inequity in learning opportunities (Karakose et al., 2021). In addition, teachers whose entire pedagogical training was adapted to face-to-face settings met the reality of teaching online without the necessary skills and knowledge (Arcueno et al., 2021; Marshall et al., 2020), and without prior familiarity with the various digital platforms offered by Ministries of Education, which may have impacted their decision-making (Lavidas et al., 2022).

This situation also led to priceless prospects for years ahead: the above-mentioned tasks highlighted the vitality of using data for making optimal decision-making in distance learning (Aguliera & Nightengale-Lee, 2020). Notably, this situation creates new professional development opportunities for in-service teachers and pre-service teacher training (Mumford & Dikilitaş, 2020). Indeed, teachers seemed to need further training to identify appropriate technological tools for their subject matter and plan instructional activities for their students (Pokhrel & Chhetri, 2021). They also needed to

utilize technological tools effectively to address their students' specific pedagogical and emotional needs (Walters et al., 2022), as well as data-driven decision-making (Arcueno et al., 2021).

Research Questions

1) In which areas did teachers use data to promote learners in their traditional teaching?
2) In what ways did teachers' use of data to promote learners change during ERT?
3) What considerations did teachers take when making informed decisions?

METHODOLOGY

We took a qualitative approach (N=20) to study teachers' DDDM routine usage and ERT via semi-structured in-depth interviews. This study is part of a broader research that also included a quantitative component; the quantitative data was reported in a previous publication (Botvin et al., 2023).

Research Field

The study was carried out in Israel, which has a national public education system that is centralized and typically divided into three school levels: elementary schools (first to sixth grades), middle schools (seventh to ninth grades), and high schools (tenth to twelfth grades). As in most of the world, the COVID-19 pandemic dramatically impacted the education system in Israel, with most schools operating remotely for a period of six months.

Research Participants

Participants included 20 Israeli teachers with significant experience in distance teaching during the pandemic in the 2019-2021 school years. Recruitment was done via the authors' professional and personal networks, as well as via social media such as Facebook and Instagram. Of the participants, 70% were women (14 out of 20) and 30% were men (6 out of 20). Three-quarters of the participants taught in the public Jewish sector (15 out of 20), and 25% in the public non-Jewish sector (5 out of 20). About a third of the participating teachers taught in elementary schools (6 out of 20), half of the participants taught in middle schools, and half taught in high schools (10 of 20 for each). Note that the sum of these shares is greater than 100% as a few teachers taught in both middle school and high school (4 of 20). Their average teaching experience was 13 years (SD=8), and they taught various subject matters. Participants' characteristics are detailed in Appendix A.

Research Tool and Process

We used semi-structured in-depth interviewing. The interviews were conducted remotely, using Zoom, during November 2020, lasting between 40 and 80 minutes. They were recorded through the Zoom system and fully transcribed by an external company specializing in transcription before analysis. Questions included addressing areas in which teachers made decisions in their work, how they made their decisions, what their considerations were when making their decisions, what data about the students were available to them, and what data about the students they would like to have for decision-making and teaching improvements. All questions were asked regarding teaching during routine, and then again regarding emergency remote teaching during the COVID-19 pandemic's initial outbreak (see Appendix B).

Data Analysis

Qualitative content analysis was conducted using the conventional (inductive) approach in a bottom-up manner (Hsieh & Shannon, 2005), with the unit of analysis being teachers' statements related to decision-making. First, three interviews were coded, with each of the authors independently coding a single transcript, and the three authors discussed these codes during joint sessions. Then, each author coded two additional transcripts, i.e., six additional interviews altogether, and again, they discussed the coding scheme until agreement was achieved. The first author then coded the remaining inter-

views, with frequent discussions among the authors to resolve any further conflicts. Finally, statements under each code were classified under high-level themes during joint meetings of all three authors.

Ethical Considerations

The study received approval from the University Ethics Committee (#0001224-1) and the chief scientist of the Ministry of Education (#11408), in accordance with their ethical requirements (among other things, it promises participants' anonymity, and that the actions involved in conducting the research will not harm anyone). Interviewees were assured that their identifying information would not be published, thereby protecting their safety, privacy, and confidentiality. Moreover, the authors de-identified the interviewees by attributing a number to each (1-20).

Findings

The authors were interested in knowing in which areas teachers had used data to promote learners in their traditional teaching, in what ways teachers' use of data to promote learners had changed during ERT, and what teachers considered when making informed decisions. Our findings suggest that teachers make frequent decisions during their work and acknowledge decision-making as an integral part of their professional identity. They make decisions in various areas using different kinds of data and actively collect data based on their educational agenda and needs. Presented herewith are the main themes that were identified: areas in which teachers make decisions; data collecting - information that is available and missing to teachers; and considerations in making decisions.

Area of Decision Making: Mostly Academic-Related in Routine, to a Greater Degree During ERT

Statements under this category referred to aspects of decision-making regarding teaching and learning. Overall, three aspects were identified: academic, students' discipline, and teachers' appearance and behavior. Academic-related decisions were the most prominent in routine teaching, and during ERT, they were almost the only area in which teachers' decisions were made. The numbers and percentages of statements for each area are summarized in Table 1.

Table 1. Frequencies and percentages of statements for each area of decision-making in times of routine and ETR (N=91)

Area of decision making / Teaching times	Academic	Discipline	Appearance and behavior	Total
Routine	62 (68%)	18 (20%)	11 (12%)	91 (100%)
ERT	45 (90%)	5 (10%)	-	50 (100%)

Academic

Regarding pre-pandemic teaching, 68% of all teachers' statements were coded as academic-related. These mostly included references to the content taught, the pedagogies involved, and the assessment and evaluation of students' learning. Participants mentioned these issues when stating that they were making decisions on "how to translate the curriculum into lesson plan" (T1), "how to teach and in what method" (T4), or "how to give out grades" (T14). One of the participants elaborated on the

task of writing an exam, demonstrating the richness in decision-making involved: "Every test construction is decision making. Which questions do you insert? How do you phrase them" (T2).

During their ERT experience, academic-related issues took over teachers' decision-making, and almost all statements (90%) were coded as such. Participants were busy in the emergency situation and asked themselves questions such as, "What should we be teaching? What things should we not be teaching because of the situation" (T20), assuming that "the idea is not to teach-everything-no-matter-what" (T15). Participants referred to the changing circumstances that often impacted basic aspects of their teaching, such as the duration of the lesson, considering students' limited attention span: "You are not designing a 45-minute lesson, you are designing a 25-minute lesson, and you take into account that not all students are with you" (T14). Being remote meant it was easier for students to disengage, so teachers thought they needed their lessons "to be more interesting; otherwise, the students would move to another screen to play a game" (T14).

Teachers were concerned with issues regarding students' evaluation during ERT since learning was fundamentally different: "because learning changes, then the way that I evaluate students' change" (T13); as part of this, some major questions were raised, such as: "Is an exam the right thing to have" (T15); "To have them take tests or not" (T17); "If I make them take tests, then how to do it" (T4); and "how will they cope with a Zoom test" (T8).

Students' discipline

Less prominent regarding pre-pandemic teaching were statements portraying decisions related to disciplinary issues (20%). Routinely, teachers felt that they "have the autonomy to decide how […] to run the class, how to respond to behavior problem" (T18), "how to deal with students who seek boundaries in the classroom" (17), and overall, what to do when they face a disciplinary situation.

Much less attention was allocated to discipline problems in ERT (10% of statements). Discipline issues in online learning were often associated with attendance: "How do you get [the students] to be in the lesson at all? Call them? […] Remind them? […] If someone does not come, what should I do" (T14). Test-taking was also an issue that raised discipline-related issues in ERT: "Should you give them time to print the test or not? How much time to give them? And if a student is delayed because the printer is downstairs, should I wait for him or not" (T8).

Teachers' appearance and behavior

Participants also addressed decision-making regarding their own appearance and behavior in routine teaching (12%). Teachers referred to the fact that "all day we are making decisions, all day. First thing in the morning, how to dress? What color is my shirt? Can I go to school in shorts? What does it mean" (T1). One of the participants referred to the way the students see her, wondering: "In what mode do I enter the class? How do I present myself in front of the class" (T3).

Teachers also referred to their relationship with students' parents, mentioning that they needed to make decisions regarding "what to answer to the students' parents" (T14), deciding not only on the "what" but also on the "how"; "where do you give up, where do you press, how do you say things to parents" (T2). Issues related to interpersonal relationships were not evident at all in ERT-associated statements. It can be assumed that since the teachers did not physically meet with the students, issues related to their visibility or routine engagement with the students were irrelevant during the emergency days and ERT.

Collection of Data: Actively Seeking for What is Missing

Teachers actively gathered data about students' academic achievement and emotional state in routine teaching (52% of statements) and ERT (48% of statements), as detailed in Table 2.

Table 2. Frequencies and percentages of statements for teacher collection of data (N=52)

Collection of data / Teaching times	Academic achievement and emotional state
Routine	27 (52%)
ERT	25 (48%)
Total	52 (100%)

In routine teaching, teachers indicated the need to constantly collect information: "I always look for what is lacking" (T17). They collect academic information to build a customized curriculum for their students: "I do mappings [of students' knowledge], I do tests and diagnose reading, writing, math – to see the level of the student, and according to that we build our work plans" (T18).

They may turn to their colleagues for this goal: "If I want to be specifically updated about a student, I ask other teachers how the student is in class, how the student behaves, and if the student is active. Does the student come ready for class? Is the student doing homework?" (T15). "I need to go deeper and know everything [about a student]. So, I keep coming to the school counselor asking and getting interested, and I find out a lot [about them]" (T10).

During ERT, due to teachers' concerns regarding their students' well-being, they gathered information directly from students, using conversations with them and questionnaires that were sent to them, "conversations, conversations, conversations, conversations, that is what matters!" (T17). The same teacher – like others – emphasized that the most important was the students' emotional situation, as "academically, we can teach everything in one month, but what about the social things? What about the emotional side? If I do not know how to handle such things, then I lose all the students" (T17).

Data was also collected from the parents. The teachers wanted to know, "What are the difficulties? How could we help them?" (T20). While data collection was also carried out during routine teaching days, there was greater emphasis during ERT. This was explained by the lack of on-site information, as "there is no face-to-face connection with the staff and all students" (T12).

Academic data: Available in routine, missing in ERT

In routine teaching times, 55% of all statements about information available to teachers referred to academic data. This type of data is available to teachers in school information systems that "provide full academic information" (T10), such as "absences, grades, interruptions, outfits" (T2). Teachers felt they "can take out any report from the system; you can compare, go back and forth, and do it in graphs, colors, basically in all the analysis and forms you want" (T2). Information is also available during class in real-time: "I see the work in the classroom, I see the student" (T14), and "I can know what his level of understanding is" (T8). This interaction in class was perceived by teachers as one that "helps me make a class decision, and then I can also make decisions that are personal for a particular student" (T13).

Unlike the availability of academic information for teachers in routine times, in ERT, 71% of all teachers' statements about the information they lacked were academic. They lacked "reliable academic information" (T4), which was difficult for them, making them "feel like they're in the dark" (T16). The distance from their students affected the quality and reliability of academic data available: "Routinely it was easier for us to make a decision, and why? Because when we practiced in class, we were present and even if a student sits with his friend, I knew very well what he knows and what he does not know" (T4). "I cannot conduct the lesson because I do not see what they are doing" (T8).

Emotional data: Available in routine, missing in ERT

Regarding emotional data about students, we found that in routine teaching times, 33% of overall teachers' statements about available information for decision-making concerned students' emotional state. When compared to times of ERT, 29% of teachers' statements referred to a lack of emotional data.

Teachers said that in routine teaching times, information such as "emotional difficulties [of students] hugely influenced my decision-making" (T15); this information may be used in several cases; for example, one teacher elaborated regarding interaction with a student: "If I receive information that the student dislikes being approached, then I will try not to approach him directly or embarrass him" (T4).

Teachers received emotional information from several sources, for example, from "the colleagues, the management or the students" (T14). As for the location of the data, they were available in the "teachers' class file" (T20) or in the "student's file that is with the school counselor" (T18). One of the teachers shared her personal experience regarding the importance of data regarding students' emotional state: "When you have emotional information about the students those other teachers do not have, the academic achievements of the students in your class are higher" (T14). Teachers believe that face-to-face interaction with students is essential for their work, as expressed by the following statement: "Only through the personal and emotional connection between teacher and student can things be achieved" (T18).

During the days of ERT, teachers felt that the lack of face-to-face communication with students affected their ability to make informed decisions: "We do not see them, we do not meet them physically, they are lost" (T16). One of the teachers referred to the easily absent mode of students when teaching remotely: "I have students that I have no data about; they did not attend any online class, have not answered the phone, I do not know what they look like and have never met them!" (T2).

This was elaborated upon by comparison between routine teaching and the ERT mode, emphasizing the cues that are missing in ERT: "When I see a student sitting during class with her head down, and yesterday she was not like that, I know something happened, something is wrong, now it just does not exist" (T15).

Behavioral information: available in routine, not in ERT

Behavioral information about students in routine times comprised 12% of all teachers' statements. Information that described students' social behavior was available to teachers from their colleagues and from observing students during class hours and in school altogether; for example, "We map [students] and use them [the mappings]. We create pedagogical, behavioral, and social mappings to know everything about the students" (T17). Teachers refer to the information they encountered by just observing the class: "I enter the classroom and can see the dynamics, the facial expressions, the attitude, the frustration, and the successes. All that helps me make decisions" (T13). "I can see the dynamics, I can see the group work, I can see the frustration of students, and from all these, I define goals for myself or make decisions" (T13). Reference to behavioral information was totally absent in statements regarding ERT. This type of data may have seemed more relevant in face-to-face teaching than in remote teaching when students were far away from each other.

Factors Affecting Teachers' DDDM: Different Patterns

Factors affecting participants' decision-making were school culture (46% of the statement in routine and 35% of the statement in ERT), consultation with colleagues (28% of the statement in routine and 20% of the statement in ERT), and parental involvement (12% of the statement in routine and 9% of the statement in ERT). Interestingly, we found that teachers relied on their experience and seniority when making decisions during routine teaching times (14% of the statement) but did not mention these factors at all regarding ERT. Conversely, in ERT, teachers considered students' emotional data (18% of the statement in ERT) and utilized trial-and-error practices (18% of the statement

in ERT), aspects that were not considered at all during routine teaching (see Table 3 - note that this table has no summary of the percentages due to overlaps).

Table 3. Factors affecting teachers' DDDM (N Routine = 112; N ERT = 122)

Factors affecting teachers' DDDM	Organizational culture	Consultation with colleagues	Parental involvement	Experience and seniority	Students' emotional data	Trial-and-error practice	Total
Routine	52 (46%)	31 (28%)	13 (12%)	16 (14%)			112
ERT	43 (35%)	24 (20%)	10 (9%)		22 (18%)	22 (18%)	122

Organizational culture: Similar impact in both settings

School culture may serve as a professional environment that encourages autonomous decision-making and allows teachers to enjoy "exceptional freedom of action and experience almost complete autonomy" (T11). One of the teachers elaborated: "I can consult with the principal as an experienced person, but I make my decisions alone" (T18). In most cases, teachers connected this to management characteristics, like "strong management" (T16), or to school policy, such as "an open-door policy" (T12).

Interestingly, a school climate that allowed autonomy in routine teaching continued to do so in ERT. In such cases, teachers felt that "the school encouraged us to make decisions, and even in the COVID-19 pandemic days, it was like that" (T12). On the other hand, in an organizational climate that did not encourage teachers to make decisions, this was also evident during remote teaching, for example: "many things are simply forbidden" (T11), "decisions come from the management, and there are not many choices" (T19). These teachers felt that they "have intense supervision, they [the management] make [top-down] decisions and do not consult with us" (T16). One of the teachers referred to the fact that management is probably in the same situation: "They too are under supervision" (T1), and therefore, this does not allow them to make decisions.

Consultation with colleagues: Important in both settings

Peer consultation was considered essential to teachers' decision-making on a variety of topics: "We always consult with our colleagues how we will teach, which student needs more help, how to approach one child or another, how to make him make more effort" (T4). Furthermore, they value their peers' judgment and "rely a lot on the opinions of teachers" (T16), so "everyone speaks in meetings, and in the end, we make one decision that will be acceptable to everyone" (T17). The age of the teachers who were consulted was unimportant: "[I] consult with old teachers and young teachers" (T12).

Even in ERT, when teachers did not meet with each other, they continued consulting with each other remotely: "We have a group of teachers we share and consult on all sorts of things, and it is very helpful" (T8); "[we held] meetings with the principal and the staff so that we could decide what should be done" (T18).

Parental involvement: A challenge during ERT

Teachers referred to parental involvement in their children's education before making routine traditional teaching and ERT decisions. Teachers stated that sometimes they did not make a decision "because of fear of what the parents will say" (T9) and said they "do not want to get into a confrontation with them [the parents]" (T20).

Teachers described additional difficulties in making pedagogical decisions during ERT because of parents' ability to witness classes from close, as students were learning from home, noting that "the parents were watching them [teachers] and could record them" (T10). This led teachers to feel that

"parents are looking at me and examining me. Thirty parents from the class examined how I teach, what I say, and how I treat [students …] and it affects me." (T9).

Seniority and experience: Less relevant in ERT

On routine teaching times, teachers relied on their seniority and experience, taking "knowledge, experience and research into account in their pedagogical decisions" (T2). The experience was considered vital to the quality of their decision-making, as they "understand situations better over the years, and sometimes one look from a student is enough to understand and know what he needs" (T14).

In ERT, teachers' experience or seniority was not mentioned as influencing decision-making; on the contrary, they all contemplated the quality of their decisions. ERT was described as "a chaotic period in which you have to decide what to do to minimize the damage" (T15). Teachers were baffled, stating they "had no idea what to do" (T11), they did not know "what is right or wrong" (T10), and therefore "decision-making was rash" (T8).

Participants empathized with the students, stating they "understood the students and their difficulty in learning from a distance" (T4). They realized that regardless of their seniority and prior experience, their major concern was to support the students: "What is important during this period is to give the students a feeling that I am there for them and to work on the emotional aspect more than the academic aspect" (T17). One of the teachers referred to academic versus emotional and social support, stating that "academic achievements are unnecessary this year. It does not matter what they will learn; first, we need to take care of the emotional and social aspects." As students' well-being had been jeopardized during the pandemic, she emphasized that "these are the crucial things that need to be considered before decision-making" (T12).

DISCUSSION

Data-Driven Decision-Making (DDDM) is an essential component of education policy in many countries, related to how teachers collect, analyze, and use data to support their professional decision-making (Vanlommel et al., 2017). One of the primary goals of the teachers' decision-making process is to improve students' learning and teachers' professional growth and development. In fact, it has been long suggested that "teaching is decision-making" (Hunter, 1979). The importance of this aspect in the teaching profession led us to explore teachers' DDDM in times of routine and emergency remote teaching (ERT) in our current study. Our research questions aimed to understand what data were used by teachers for decision-making during routine teaching during the COVID-19 pandemic and what data they would have liked to have to improve their decision-making.

Our findings shed important light on teachers' DDDM, highlighting the differences between routine and ERT times. We will now discuss these differences, looking at the roles of data and personal and school-related factors in each of these settings.

Areas of Decision-Making in Routine and in ERT

In routine times, teachers make decisions regarding their teaching in three main areas: pedagogy, students' disciplinary issues, and their own appearance and behavior. They move on a continuum between making decisions based on data and making decisions based on their intuition. This finding supports results from a previous study stating that teachers may collect data in a non-systematic manner and consequently encounter difficulties in decision-making; in many cases, making decisions based on intuition (van Geel et al., 2016). Hence, to transform data into actionable information, teachers needed, in addition to access to relevant data in a timely and systematic manner, which may promote sustainable processes of decision-making, knowledge regarding how to interpret it, and how to use it effectively (Reeves & Chiang, 2018). However, most teachers lack the knowledge and skills to do this (Mandinach & Gummer, 2016). This may indicate a need for teacher training and professional development, e.g., workshops, that focus on analyzing, interpreting, and using data so that

teachers can collect data and analyze it systematically and adequately, i.e., in a manner that is beneficial to their teaching (Schildkamp et al., 2014; Staman et al., 2014).

Academic-related decisions were the most prominent in routine teaching, and during ERT, they were almost the only area in which decisions were made. During ERT, teachers were mostly focused on maintaining some sort of academic continuity and, by doing so, abandoned other areas of decision-making, including those related to social-emotional aspects of teaching and learning. Furthermore, in ERT, teachers felt that distance teaching affected their ability to make informed decisions. Indeed, studies have shown that feelings of affection and mutual connection between teachers and students can provide students with a sense of security and well-being that reduces their frustration and anxiety (Furrer & Skinner, 2003; Oberle et al., 2014; Wang et al., 2013). A growing body of empirical evidence has also confirmed that supportive teacher-student relationships can enhance students' psychological involvement and academic achievement (Quin, 2017), as well as teachers' well-being (Spilt et al., 2011). These studies may explain teachers' need to approach students in order to attain emotional information, more in times of emergency than during routine teaching, when teachers are distant from their students, as demonstrated in the current study.

Supporting Decisions with Data

Teachers reported being busy collecting information about students' academic achievements and emotional states both during routine teaching and in ERT. Data was collected from various sources, including school management systems, colleagues, parents, and students themselves. These findings echo findings about schools' "shadow" generation and processing of "useful data," compared with the "compliance data" they generate and process for accountability purposes, and about the way by which school information systems often become a burden on teachers instead of helping them (Gilad & Hershkovitz, 2023; Selwyn et al., 2015). This may pinpoint that data must be relevant and approachable to teachers and presented regularly in an easy, accessible, and coherent manner. Furthermore, teachers should better expand upon their data usage and should get acquainted with the need for data, starting with their pre-service training (Neugebauer et al., 2021).

In addition to accessing relevant data in a timely manner, teachers should be equipped with knowledge regarding how to interpret it and how to use it effectively (Mausethagen et al., 2018; Reeves & Chiang, 2018). However, most teachers lack the knowledge and skills to do so (Mandinach & Gummer, 2016), which points to the need for relevant teacher training and professional development (Schildkamp et al., 2014; Staman et al., 2014). Besides that, the role of school culture is important in establishing a culture of DDDM (Blanc et al., 2010; Farley-Ripple & Buttram, 2014; Harris et al., 2020; Hoogland et al., 2016).

Personal and School-Related Factors Affecting DDDM

In this study, teachers indicated that during routine teaching times, they rely on their seniority and experience before making decisions, whilst during distance teaching, as experienced in ERT, they contemplated the correctness of their decision-making regardless of their seniority and teaching experience. This finding highlights the chaotic and frustrating reality teachers experienced when shifting to distance teaching and learning, which they had not experienced before, making their previous face-to-face experience irrelevant. In light of this finding, systemic guidance and support for DDDM is always important and, in extreme circumstances, is even more important.

Going beyond personal experience, we identified how teachers' decision-making is also affected by their school culture. Extensive studies on leadership and educational administration indicate that participative decision-making can cultivate teachers' sense of involvement, increase their feelings of belonging, and decrease their emotional exhaustion (Bogler, 2001). A recent study of teacher satisfaction found that school decision-making is the strongest predictor of teacher self-efficacy, job satisfaction, and occupational commitment (Huang et al., 2021). Therefore, an active approach of the

organization and management in favor of building an organizational culture that encourages teachers' decision-making in general, and making decisions based on data in particular, is essential.

LIMITATIONS

The current studies' limitations are as identified. First, as a qualitative exploration, this research is based on a limited number of participants. Moreover, we included teachers of a single country of origin with unique educational, cultural, and technological characteristics, which may have impacted the findings' transferability to other countries. Finally, we relied solely on teachers' self-reporting, which by its very nature may have biased the findings.

CONCLUSIONS AND IMPLICATIONS

We believe that our study has some significant implications for routine and ERT; therefore, we propose recommendations for policymakers, school management, education teams, teacher educators, and developers of e-learning environments:

PROMOTE A CULTURE OF DATA-BASED DECISION-MAKING ACROSS THE EDUCATION SYSTEM

The teachers' voices emerging from the research identified the importance of data in improving their teaching. DDDM is vital for the professionalism of the education system and should be carried out on an ongoing basis, encompassing all stakeholders at all levels. This way, teachers will be embedded in a DDDM culture and, hence, will be inspired and will inspire in this regard, starting from as early as the training stage and throughout the professional path.

MAKE DIVERSE AND RICH DATA OF DIFFERENT TYPES ACCESSIBLE TO TEACHERS

The basis for DDDM is the existence of data. The research findings showed that teachers are interested in data and look for it themselves. Therefore, comprehensive information on different types and representation modes should be made available to teachers: academic, emotional-social, and family-related. This information is essential in routine times, and especially during emergencies. Software developers should involve educators and administrators in developing user-friendly interfaces for collecting, organizing, and using data, and policymakers should make sure this data is available to teachers.

INCREASE PROFESSIONAL AND EMOTIONAL SUPPORT FOR TEACHERS

To maintain DDDM on an ongoing basis, teachers should receive significant support, beginning during their pre-service training period and again throughout their professional development. This support is especially significant in times of emergency and uncertainty.

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APPENDIX A – PARTICIPANTS' CHARACTERISTICS

No.	Gender	Teaching experience (years)	Age	School level	Teaching discipline	Interview time (min.)
1	Man	11	42	High School	New Media	60
2	Woman	17	47	High School	Agriculture and Environmental Sciences	49
3	Woman	10	46	High School	Literature	51
4	Woman	15	45	High School	Computer Science	40
5	Man	10	40	High School	Chemistry	82
6	Woman	13	46	Elementary School	Physical Education	33
7	Woman	4	46	High School	Computer Science	70
8	Woman	25	50	Elementary School	Hebrew	64
9	Woman	29	53	Middle and High School	English	53
10	Woman	11	48	Elementary School	Geography	71
11	Man	4	34	Middle and High School	History and Literature	54
12	Woman	4	34	Middle and High School	History and Literature	61
13	Man	6	46	Middle School	Geography	67
14	Woman	3	31	Middle School	History and Literature	43
15	Man	12	48	Middle and High School	History	45
16	Woman	18	41	Elementary School	Math	53
17	Woman	22	49	Middle School	Arabic	60
18	Woman	29	57	Middle School	Civics	60
19	Woman	6	46	Elementary School	Hebrew	63
20	Woman	10	42	Elementary School	Special needs education	68

APPENDIX B – INTERVIEW PROTOCOL

We are a team of three researchers [NAMES DETRACTED FOR ANONYMITY] from [DETRACTED] and [DETRACTED], who research decision-making in education. The issue is even more significant in these days of distance learning. For the study, we are interviewing teachers who will help us deepen our understanding of the research topic.

In order to understand things from your perspective, we will be happy to provide detailed answers and as many examples as possible during the interview. We estimate that the interview will take about 45 minutes.

Thank you very much for being willing to be interviewed!

We are interested in understanding professional experience and activities on "normal/routine" days, as well as your use of data and information for making decisions.

1. Tell us about yourself and your teaching under normal teaching conditions (elaboration about the place of teaching, experience in teaching, who you are, what you teach, what a typical workday looks like, etc.).
2. In which areas do you make decisions as a teacher (in organizational contexts, pedagogical, school, classroom, professional development, or work within the school team)?
3. Please tell me how you make decisions as part of your role as a teacher. What do you consider when you make such decisions? (Explained, demonstrated). You can refer to teaching in the classroom, with the students, the parents, and the school staff, and pedagogical issues, such as content, teaching methods, and evaluation methods.
4. What data would you like to have available to you about students for making decisions that improve your teaching? Please explain.
5. What data about students is available to you so you can make decisions about your teaching (personal, academic, social, emotional, etc.)? What are the sources of the data? Which information from all of this do you use to make teaching decisions? What do you not use, and why?

We are interested in understanding your professional experience and activities on "normal/routine" days and your use of data and information when making decisions.

6. Tell me about the experience of the rapid shift transitioning to teaching during the COVID-19 period. Tell us about your preparation for online teaching. Tell me about how you taught during this period (online, synchronous, asynchronous, etc.) and how you manage yourself professionally.
7. Please tell me how you made decisions during the COVID-19 period. What did you consider when you make such decisions? (Explained, demonstrated). You can refer to the teaching, the students, the parents, and the school staff, as well as pedagogical issues such as content, teaching methods, and evaluation methods.
8. What are the unique challenges of teaching in the days of COVID-19?
9. What data are available to you about students to make decisions about your teaching during the COVID-19 period (personal, academic, social, emotional, etc.)? What are the sources of the data? Which information from all of this do you use to make teaching decisions? What do you not use, and why?
10. What data would you like to have available to you about the students to make decisions about your online teaching in the days of COVID-19 to improve the teaching? Please be specific and explain.
11. How would you recommend that teachers prepare for distance online teaching in the future to be effective? What do teachers need to know to improve their performance under the conditions of fully online distance education?

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