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Analysis of the challenges and needs of students with disabilities during COVID-19 online teaching

IO1 Final report

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Introduction

On the 11th of March 2020, the World Health Organization declared the COVID-19 outbreak as a global pandemic (WHO, 2020). Education systems, all around the world, decided to interrupt on site learning and teaching and to initiate some sort of online activities. UNESCO estimated that by the end of 2020, approximately 139,000,00 learners were still being affected by school closures (UNESCO, 2020) that continued during 2021 in many countries.

Those millions of learners constitute a very heterogeneous group in various aspects, and one of them is the presence of a condition (e.g., a disability) that requires the attribution of additional support to guarantee a successful educational path. In Europe, according to the European Agency for Special Needs and Inclusive Education, the percentage of students with an official decision of Special Educational Needs (SEN) in Europe averages 4,75% in primary and lower-secondary (ranging from 1,02% in Sweden to 25,12% in Scotland), and 2,41% in higher-secondary (ranging from 0,61% in Germany to 23,25% in Scotland) (EASNIE, 2018).

The school closures, after March 2020, took all countries by surprise, and evidence points to the fact that "the inclusive dimensions of education received less public attention than its more general or traditional dimensions" (EASNIE, 2021, p. 58). Nevertheless, a clear picture of what happened with European students with disabilities, their parents and caregivers, and teachers and therapists is yet to be accomplished. Much research has been published since the year of 2020, but either focusing on specific country situations in a quantitative approach (e.g., Jeste et al., 2020; Kast et al., 2021; Parmigiano et al., 2021; Tomaino et al, 2020) or addressing a limited number of cases within a qualitative approach (e.g., Canning et al., 2021; Couper-Kenney et al., 2021; Pozas et al., 2021; Yazcayir et al., 2021).

The goal of our study was to describe and compare the perceptions of teachers (regular and special education), parents or other caregivers, and therapists about the educational process implemented during the lockdown, in the six countries participating in the project. The results were used as a part of the basic information needed to implement the ErasmusPlus project "Supporting success for all – Universal Design Principles in Digital Learning for students with disabilities" (SUCCESS4ALL).

To accomplish this task, we focused on three research questions:

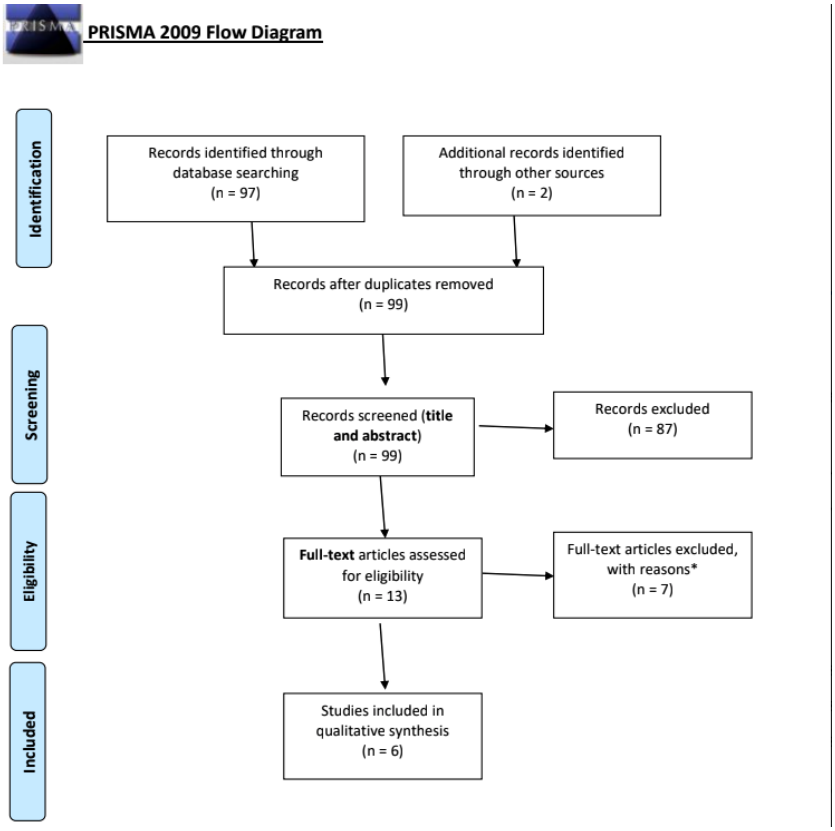
1. What were the challenges faced by parents and caregivers during lockdown remotely teaching students with disabilities?
2. What were the pedagogical adaptations implemented during lockdown?
3. Which materials, technologies and resources were used to support students with disabilities in remote teaching?

2 Methodology

To analyze the topic of distance learning for students with SEN, it was decided to use an online questionnaire as a research tool, as it allows information to be collected from a large and representative sample of people. Following the analysis of the research results previously carried out, it was possible to proceed with the creation of a questionnaire which, in addition to including multiple target figures, also studied new areas not yet explored.

2.1 Preparation

In figure 1 it is possible to observe the PRISMA 2009 Flow Diagram describing the first steps of our research:



The diagram in fig. 1 describes the process adopted to analyze the international literature available in English. The results of this review were then integrated with literature in the national language.

In table 1 is possible to see the description of the material collected during this research phase and to which of the three research questions described above the surveys answered:

Survey	Reference	Sample	Characteristics	Research question it addresses/ Notes

Perceptions about UDL (Students and Faculty)	Kennette, L. N., & Andrew Wilson, N. (2019). Universal Design for Learning (UDL): Student and Faculty Perceptions. Journal of Effective Teaching in Higher Education, 1(2), 1–26.	HE Students Faculty members	36 items concerning the 9 general dimensions of UDL	2 (Pre-covid)
Feasibility and effectiveness of distance learning for students with severe developmental disabilities and high behavioral needs	Tomaino, M. A. E., Greenberg, A. L., Kagawa-Purohit, S. A., Doering, S. A., & Miguel, E. S. (2021). An Assessment of the Feasibility and Effectiveness of Distance Learning for Students With Severe Developmental Disabilities and High Behavioral Needs. Behavior Analysis in Practice. https://doi.org/10.1007/s40617-020-00549-1	Parents Teachers	Four section survey: Student demographics 11 statements related to feasibility and effectiveness. Level of support required by the child. 3 open-ended questions	1
Assistive technologies, educational engagement and psychosocial outcomes among students with disabilities in higher education	McNicholl A, Desmond D, Gallagher P. Assistive technologies, educational engagement and psychosocial outcomes among students with disabilities in higher education. Disabil Rehabil Assist Technol. 2020 Dec 15:1-9. doi: 10.1080/17483107.2020.1854874. Epub ahead of print. PMID: 33320728.	HE Students	5 surveys/inventories College learning effectiveness inventory scales (51 items) The student course engagement questionnaire (22 items) Self-efficacy for learning (57 items) Warwick-Edinburgh Mental Well-being Scale Psychosocial impact of assistive devices	1/3 (does not focus on remote or distance learning, pre-COVID).
Learning at home during COVID-19 school closures – How do German	Lena Nusser (2021) Learning at home during COVID-19 school closures – How do German students with and without special educational needs manage?, European Journal of Special Needs Education,	Parents	9 questions using a 4/5.-point Likert scale	1

students with and without special educational needs manage?	36:1, 51-64, DOI: 10.1080/08856257.2021.1872845			
An Assessment of the Feasibility and Effectiveness of Distance Learning for Students With Severe Developmental Disabilities and High Behavioral Needs	Tomaino MAE, Greenberg AL, Kagawa-Purohit SA, Doering SA, Miguel ES. An Assessment of the Feasibility and Effectiveness of Distance Learning for Students With Severe Developmental Disabilities and High Behavioral Needs. Behav Anal Pract. 2021 Mar 1:1-17. doi: 10.1007/s40617-020-00549-1. Epub ahead of print. PMID: 33680340; PMCID: PMC7919623.	Parents and educators (teachers and paraeducators)	open (3) and closed (11) questions using a 5-point Likert-type scale for each target category	1 / 3
DIGITAL LEARNING FOR STUDENTS WITH DISABILITIES IN PRIMARY SCHOOL: FROM THE MANAGEMENT OF THE PANDEMIC EMERGENCY SITUATION TOWARDS A NEW	Montanari, Marco & Santos, Miguel & Third, Allan & Pellegrini, Claudio & Prasauskiene, Audrone & Lariccia, Stefano & Grammatikou, Mary & Pantazatos, Dimitris. (2021). DIGITAL LEARNING FOR STUDENTS WITH DISABILITIES IN PRIMARY SCHOOL: FROM THE MANAGEMENT OF THE PANDEMIC EMERGENCY SITUATION TOWARDS A NEW NORMALITY. 10.21125/inted.2021.1104.	Teachers	10 open and closed questions	2 / 3

NORMALITY				
Supporting Families with Children with Special Educational Needs and Disabilities During COVID-19	Toseeb, Umar & Asbury, Kathryn & Code, Aimee & Fox, Laura & Deniz, Emre. (2020). Supporting Families with Children with Special Educational Needs and Disabilities During COVID-19. 10.31234/osf.io/tm69k.	Parents	3 open questions	1
The Influence of Factors Such as Parenting Stress and Social Support on the State Anxiety in Parents of Special Needs Children During the COVID-19 Epidemic	Ren, J., Li, X., Chen, S., Chen, S., & Nie, Y. (2020). The Influence of Factors Such as Parenting Stress and Social Support on the State Anxiety in Parents of Special Needs Children During the COVID-19 Epidemic. Frontiers in psychology, 11, 565393. https://doi.org/10.3389/fpsyg.2020.565393	Parents	THE PARENTS' MENTAL AND BEHAVIORAL PROBLEMS QUESTIONNAIRE (PMBP): 11 questions / 4-point Likert-type PARENTING STRESS INDEX—SHORT FORM-15 (PSI-SF-15): 15 questions / 5-point Likert MULTIDIMENSIONAL SCALE OF PERCEIVED SOCIAL SUPPORT (MSPSS): 12 items / 7-point Likert NEO FIVE-FACTOR INVENTORY (NEO-FFI): 12 items, each with five levels STATE ANXIETY INVENTORY (S-AI): 20 questions, which were graded 1–4	1 (does not focus on remote or distance learning, pre-COVID).
Didactics put to the	Ranieri, M., Gaggioli, C., & Borges, M. K. (2020). La	Teachers	62 closed questions:	2 / 3

test by Covid-19 in Italy: a study on Primary School	didattica alla prova del Covid-19 in Italia: uno studio sulla Scuola Primaria. Praxis Educativa, 15, 1–20. https://doi.org/10.5212/praxeduc.v.15.16307.079		• socio-demographic data and training • didactic planning • teaching methodologies adopted • evaluation methods • visions of teachers	
Loneliness and social relationship difficulties of students with disabilities at the time of the Covid-19 lockdown: from enclosure to care networks		Teachers	12 open questions (inclusive distance learning and teaching methodology - Peer Tutoring)	2 / 3
	Didattica a distanza per gli studenti con disabilità – Questionario per il monitoraggio della qualità della didattica a distanza in relazione agli studenti con disabilità rivolto alle famiglie	Parents	16 closed questions	1 / 3
Distance learning in university during lockdown: critical aspects and	Arenghi, A., Bencini, G., Pavone, M., & Savarese, G. (2020). Distance learning in university during lockdown: critical aspects and possibilities The perspectives of university students with disabilities and specific learning	University students	5 closed questions	3

possibilities The perspectives of university students with disabilities and specific learning impairments	impairments. L'integrazione Scolastica e Sociale, 19, 48–67. https://doi.org/10.14605/ISS1932005.			
Inclusion, Dyslexia, Emotional State and Learning: Perceptions of Ibero-American Children with Dyslexia and Their Parents during the COVID-19 Lockdown	Menendez Alvarez-Hevia, David. (2021). Inclusion, Dyslexia, Emotional State and Learning: Perceptions of Ibero-American Children with Dyslexia and Their Parents during the COVID-19 Lockdown. Sustainability. 13. 2739. 10.3390/su13052739.	Parents and students	35 closed questions using a 5-point Likert scale + 1 open question (sociodemographic profile; learning processes during the COVID-19 pandemic and the school lockdown; and personal and family experiences and relationships with friends)	1
Students with special educational needs in distance learning during the COVID-19 pandemic – parents' opinions.	Trzcińska-Król, M. (2020). Students with special educational needs in distance learning during the COVID-19 pandemic – parents' opinions. Interdisciplinary Contexts of Special Pedagogy, 29, 173–191. Adam Mickiewicz University Press. ISSN 2300-391X. e-ISSN 2658-283X.	Parents	5 open questions, concerning the situation and learning of a child during the period of distance learning	1

	https://doi.org/10.14746/ikps			
Remote learning among students with and without reading difficulties during the initial stages of the COVID-19 pandemic.	Zawadka, J., Miękisz, A., Nowakowska, I. et al. (2021). Remote learning among students with and without reading difficulties during the initial stages of the COVID-19 pandemic. Education and Information Technologies, https://doi.org/10.1007/s10639-021-10559-3	University students	A two-part questionnaire regarding academic achievements in the academic year 2019/2020, living conditions and stress related to learning and pandemic, as well as basic demographic information, and Dyslexia Diagnosis Questionnaire (DDQ). DDQ - 30 items, 4-point Likert scale.	3
Understand how digital technologies were used by families with children during the lockdown, including remote teaching.	Dias, P., & Brito, R. (2021). *A Vida Digital das Crianças em Tempos de Covid-19 Práticas digitais, segurança e bem-estar de crianças entre os 6 e os 18 anos. Relatório Nacional - Portugal*. https://repositorio.ucp.pt/bitstream/10400.14/32132/1/relatorio_FINAL_KIDICOTI%281%29.pdf	509 families	Two part questionnaire: first one for parents and the second for their children. The first part had 31 questions, and the second 27 closed questions. Questions were, in general, answered in a 5-point likert with a 6th “don’t know” option.	1, 2, 3
Self-reflection on Effective Learning by Fostering Innovation through Education	Trovão, J., & Lobato, M. (2020). Mobilizar para a mudança em contexto de pandemia. Conferência Virtual A Transformação Digital e Tecnologias em Tempo de Pandemia. *Revista Da UI_IPSantarém*, *8*(4), 47–59.	61 teachers	Used 18 closed questions directed at teachers, answered in a 5-point likert scale. Three subscales: continuous professional development;	1, 2, 3

al Technologies (SELFIE) - Digital Competent Educational Organizations (DigCompOrg)			Teaching and Learning; Assessment Practices https://ec.europa.eu/education/schools-go-digital/about-selfie_en	
Students with special educational needs in distance learning during the COVID-19 pandemic – parents' opinions			https://pressto.amu.edu.pl/index.php/ikps/article/view/25298/23202	

2.2 The questionnaire

After the analysis of previous existing surveys, a new questionnaire was created. The goal of it was to study how caregivers, teachers and therapists have faced the challenge of supporting students with BES in a new technological environment during distance learning. In accordance with the initial research questions, any tools used to support the student with BES were investigated to identify the needs identified and the specific resources to be made available to them. In addition, it was considered important to analyze the methods of interaction between the different figures surrounding the student and the perception of effectiveness by each of them.

For the creation of the questionnaire, it was necessary to plan the sequence of topics and questions to be treated, prepare filter questions, formulate them, define the response

methodology, write the initial instructions to facilitate the compilation and explain the purpose of the study, choose the method and the platform to be used. This questionnaire contains three sub-questionnaires: one dedicated to caregivers, one to teachers and one to therapists. Four sections have been created for each target figure: the first is dedicated to describing the lived situation, the second section focuses on the pedagogical processes and didactic adaptations that have become necessary, the third focuses on the resources that have been available and, finally, the final section focuses on one's own personal assessments of the process. Following the first general questions, the other sections provide specific questions by category.

In order to define the main characteristics of the sample made up of people who answered the questionnaire, specific questions were formulated for each category.

The following questions were dedicated to teachers:

- A1: How long have you been teaching (years of practice)?

- A2: Have you had specific training to work with students with disabilities and special educational needs?

- A3: At what school level do you teach?

- A4: What kind of disability does your student (s) have?

- A5: Does your student benefit from specific support services from the public service?

- A6: Does your student follow an individualized educational program?

- A13: What is the maximum level of support your student with disabilities needed to participate in distance learning activities at the 2019/20 or 2020/21 lockdown?

Therapists were asked:

- A1t: What is your specialty?

- A2t: What kind of disability does your patient have?

- A7t: How many school-age patients did you give online support during the A.S. lockdown? 2020/21?

- A10t: What level of support does your patient with a disability or SEN need to participate in distance learning activities?

Caregivers, on the other hand, were asked:

- A1c: Age of the child?

- A2c: Educational level?

- A3c: What kind of disability does your child have?

- A4c: Does your child have a support teacher or is he assisted in his studies?

- A5c: Does your child follow an individualized educational program? - A15c: What level of support does your child need to participate in distance learning activities?

- A14c: Did school support activities continue during the lockdown with the same frequency as before?

- A16c: Did you support your son while he lectured remotely?

- A15: Did I prepare new materials for learners who needed special support during periods without face-to-face lessons?

- B4: Did I present lesson content using multiple formats (e.g. audio, text, graphics, video, sign language)?

- B5: Did I apply different strategies to make the lesson contents understandable to all students (for example, by presenting glossaries, examples)? - B7: Have I based my lessons on using suitable strategies to stimulate students to set personal goals so that they can plan and monitor their performance?

B8: Have I included in all my courses different strategies to encourage student interaction (e.g. drawing, conversation, dramatization, dance, video)?

- B9: In my lessons have I allowed my students to present their works using one or more formats of their choice (e.g. written text, video, sign language)?

- C6: During the lockdown of the A.S. 2020/21, did I have enough time to support all my students during remote lessons and activities?

- Q3: Have the needs and skills of my student been addressed and oriented according to his / her problems?

- Q9: Was the program of learners with disabilities and special needs significantly reduced during the lockdown?

- Q10: In general, were teachers able to select and implement adequate tools to ensure the participation of students with disabilities and special educational needs?

- B1: It was easy to organize the online lessons and related materials so that all students were able to self-regulate their learning (e.g. knowing what to do, when to do it, for how long and why)?

- B2: Was it easy to organize my lessons and materials online to keep all students engaged and motivated, while respecting their personal characteristics (for example, explaining the importance of the topics)?

- B3: Was it easy to organize my online lessons considering the interests, profile and resources of all the students?

- B6: It was easy to organize my lessons so that all the students understood what they were supposed to be learning (for example, I started lessons with an outline of the didactic contents, periodically remembering the objectives of the activities)?

- Q2: Overall, has the quality of the educational process decreased?

- Q4: Should some of the teaching adjustments that were made during the lockdown continue in the future?

- Q5: Has my student been prevented from accessing inclusive and quality education due to the lack of accessibility of the information and communication technologies used?

- Q6: Did my student / ssa demonstrate a positive attitude towards e-learning?

- Q8: Was the feedback given to my student during online teaching effective, as it was before the pandemic in the presence?

The questionnaire was created using the "Google Forms" application and was administered by self-filling online. An English version was first developed in collaboration with the SUCCESS project partners which was subsequently translated into Italian. The three parts of the questionnaire were reviewed by a teacher, a therapist and a caregiver respectively. The grammatical correctness of the items, the uniqueness of the interpretation, the comprehensibility and the adequacy of the terminology used were verified. It was subsequently disseminated to a small number of people with the aim of carrying out an initial data analysis. The questionnaire was then disseminated from 16 to 30 June 2021, then the first results were collected and analyzed. It was later shared again in September 2021 until October. All partners contributed to gather the maximum number of answers for an overall total of . In the table 2 below there are the specific numbers.

Country	Total	Teacher	SEN Teachers	Therapists	Caregivers
Portugal	40	0	26	5	9
Italy	160	33	13	57	57
Poland	103	49	23	7	24
Spain	80	0	16	9	55
Greece	89	26	24	22	17
Lithuania	43	0	0	3	40
Totale	515	108	102	103	202

Participation in the questionnaire was voluntary and provided for the participation of adults only. Another inclusion criterion to proceed with the completion of the

questionnaire was belonging to the category of teacher, SEN teacher, caregiver, or therapist.

The time taken to complete the questionnaire was less than about 10 minutes.

3 Results

Because there were 4 categories of responders (teachers, special educational teachers, therapists, and caregivers) the answers of the demographic part from each category will be presented independently in sections 3.1.2, 3.1.2, 3.1.3, and 3.1.4. In section 3.2 the answers from the different categories will be compared to each other, especially when talking about the efficacy of the pedagogic approach applied during the emergency.
The categories will be considered together independently from their nationality. Data will be shown in percentage in one figure for selected questions.

3.1 Teachers

Most of the teachers were veterans with more than 11 years of practice.

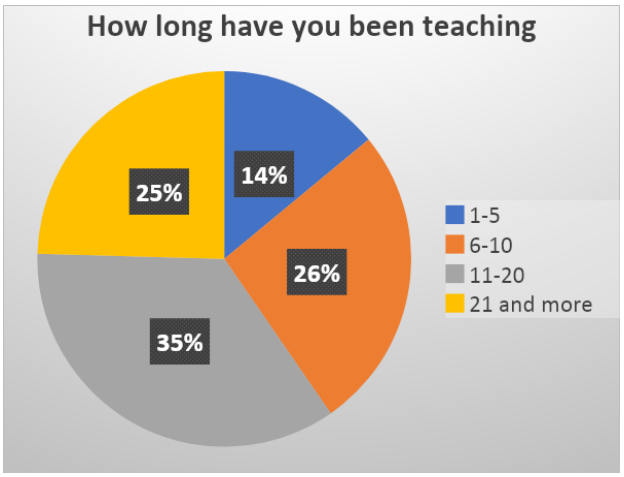


Figure 1. “a1. How long have you been teaching (years of practice)”

Most of them teach in elementary or Middle school. It is interesting to stress that the 24% declared to be working in a special school.

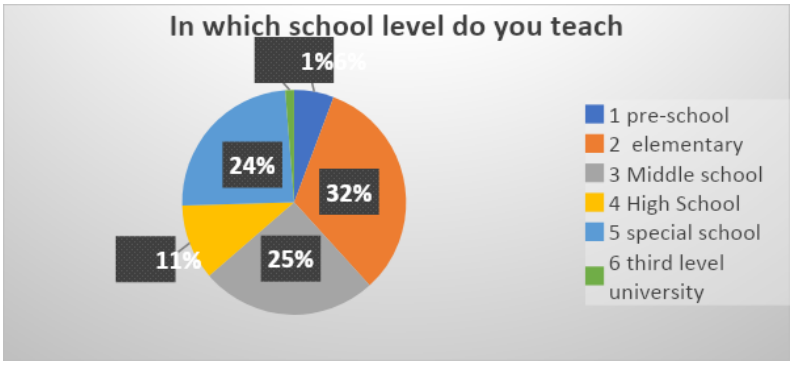


Figure 2. “In which school level do you teach?”

When talking about resources and materials adopted for online lessons it is interesting to stress that most of people used videos.

Figure 3: c4. What resources/materials have you used in your online lessons?

3.2 Special education teachers

Most SEN teachers were made by veterans. It is interesting to stress that very few of them were new at their work with less than 5 years of experience.

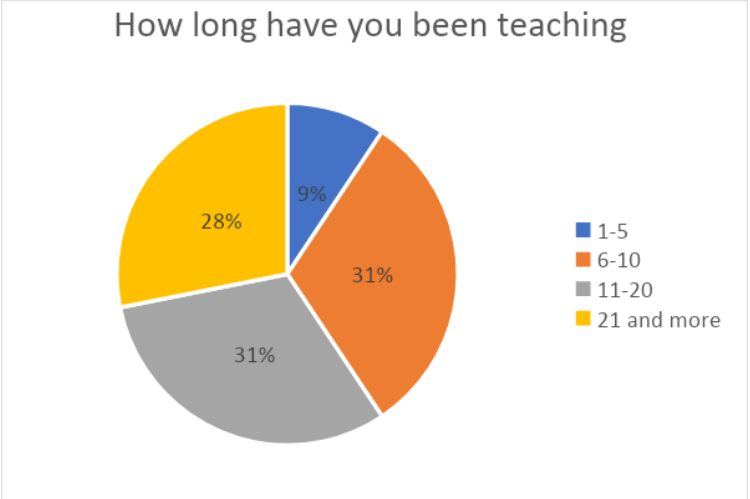


Figure 5. a1. How long have you been teaching (years of practice)?

About their place of work, it is interesting to observe that very few of SEN teachers work in Special schools.

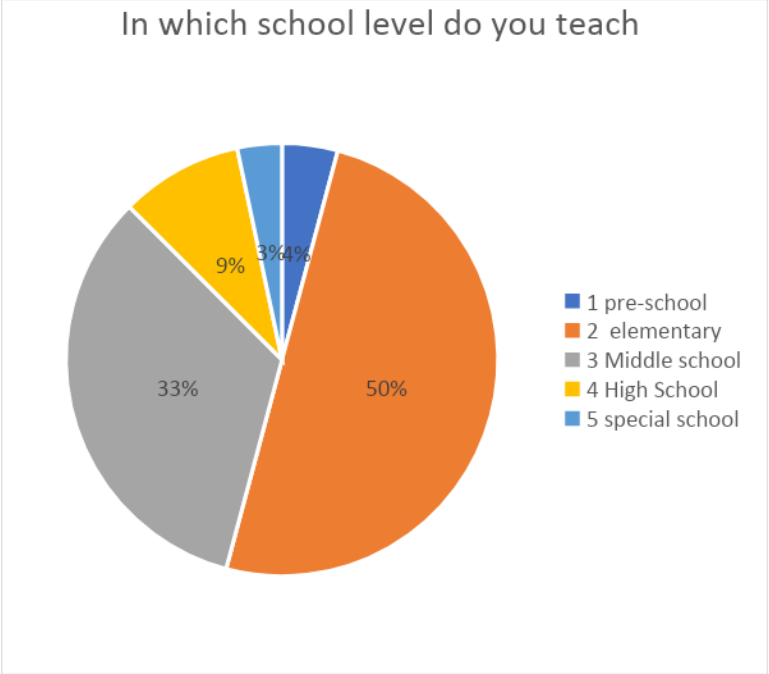


Figure 6: a3. In which school level do you teach ?

At the question about the tools they use for their lesson we can notice the importance of power points in their practice.

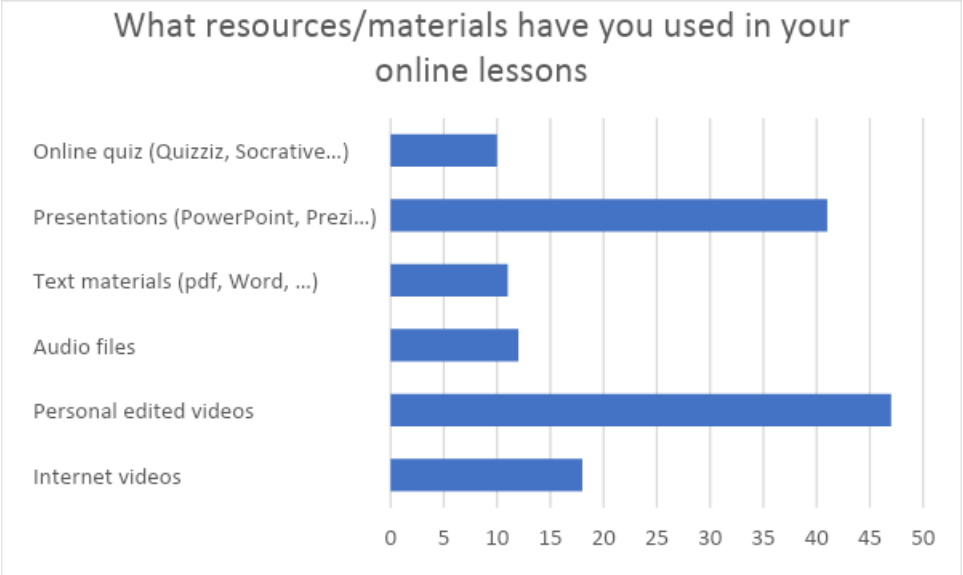


Figure 6: c4. What resources/materials have you used in your online lessons?

3.3 Therapists

The therapist identity varied very much: as shown in figure 7, 22% were psychologists, 20% occupational therapists, 19% speech therapists, 18% physiotherapists, 14% children specialists.

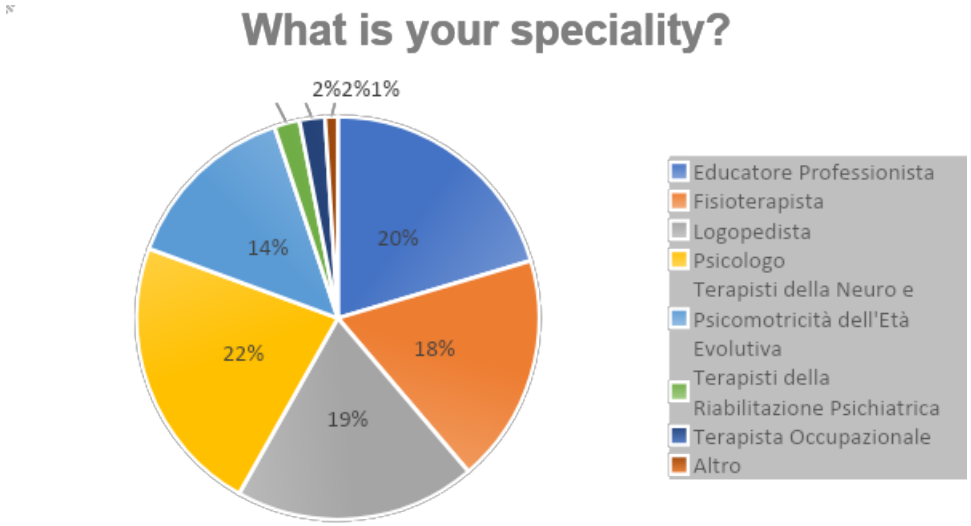


Figure 7: what is your speciality?

The figure below show us as most therapist supported from 1 to 10 children during the pandemics

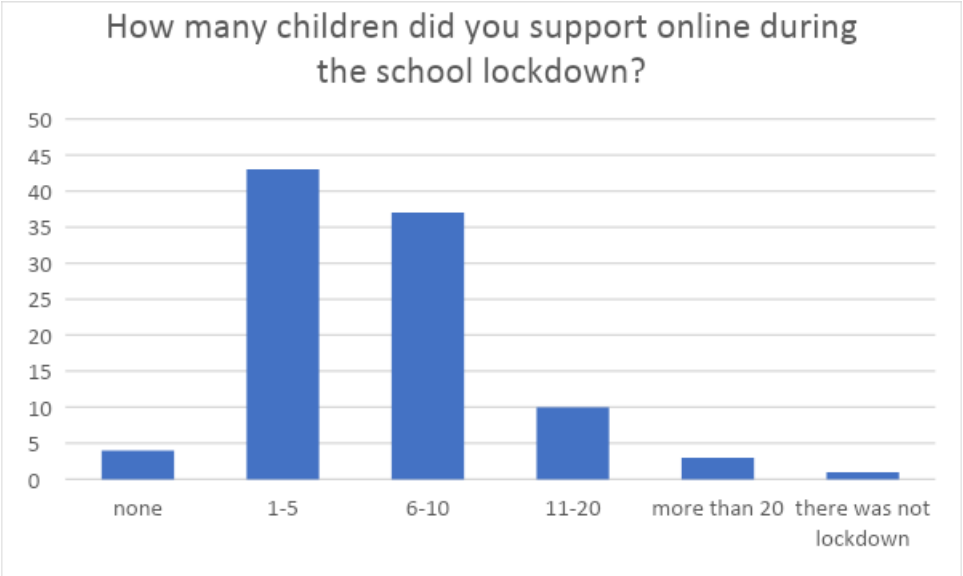


Figure 8: a7t. How many children did you support online during the school lockdown?

Almost the entirety of the therapist allowed caregivers to contact them directly during the emergency providing an important support in such a difficult period.

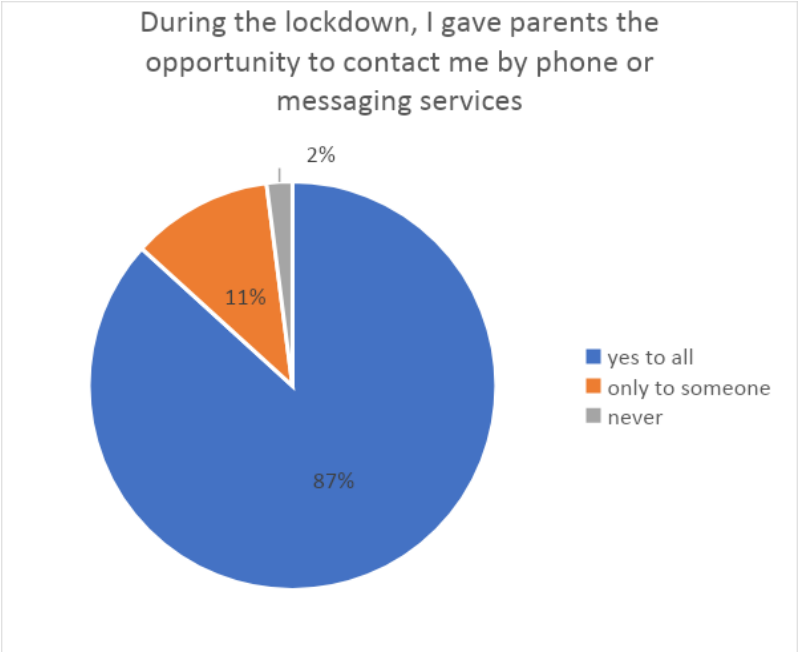


Figure 9: c4t. During the lockdown, I gave parents the opportunity to contact me by phone or messaging services

The lockdown did not make it difficult for them to support their patients: 94% of the therapists had enough time to spend with them.

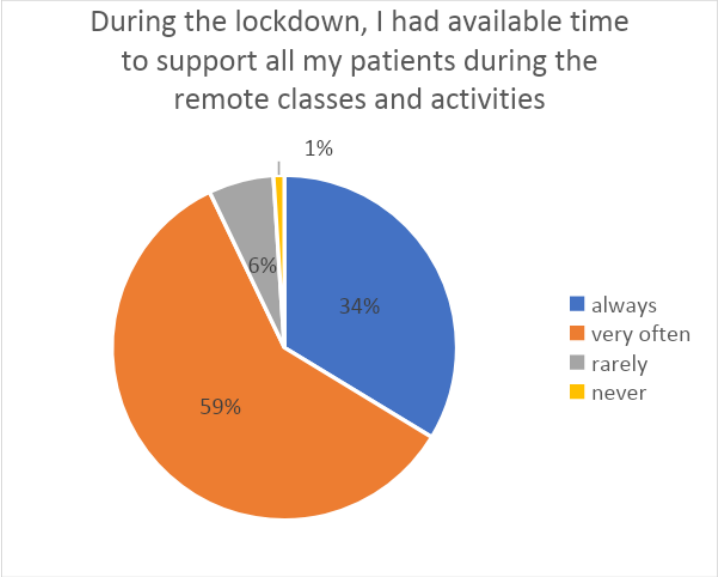


Figure 11: c5t. During the lockdown, I had available time to support all my patients during the remote classes and activities

3.4 Caregivers

The age of the SED students involved vary, but the caregivers who answered to the survey described children attending elementary or middle school.

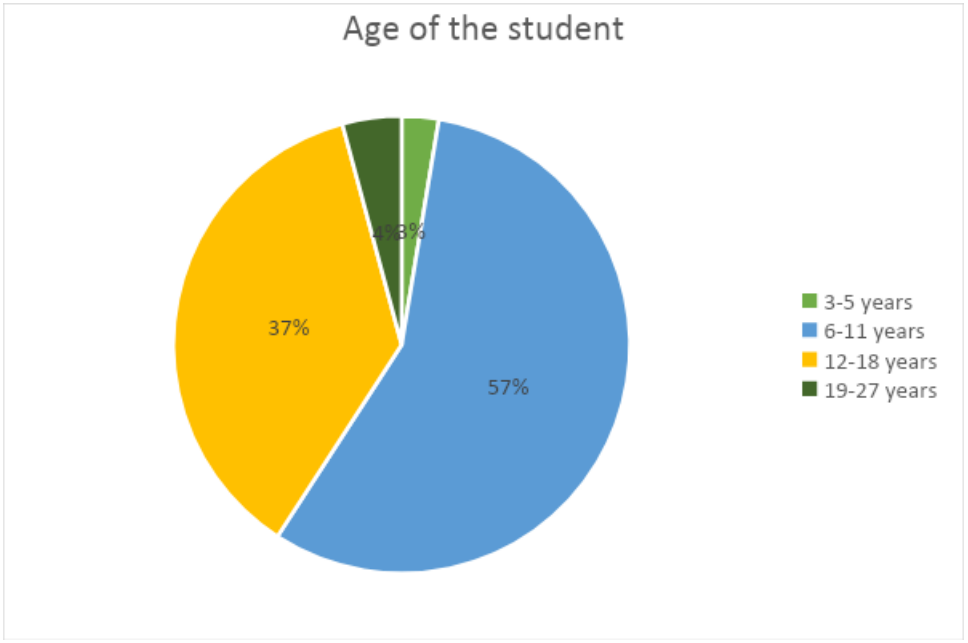
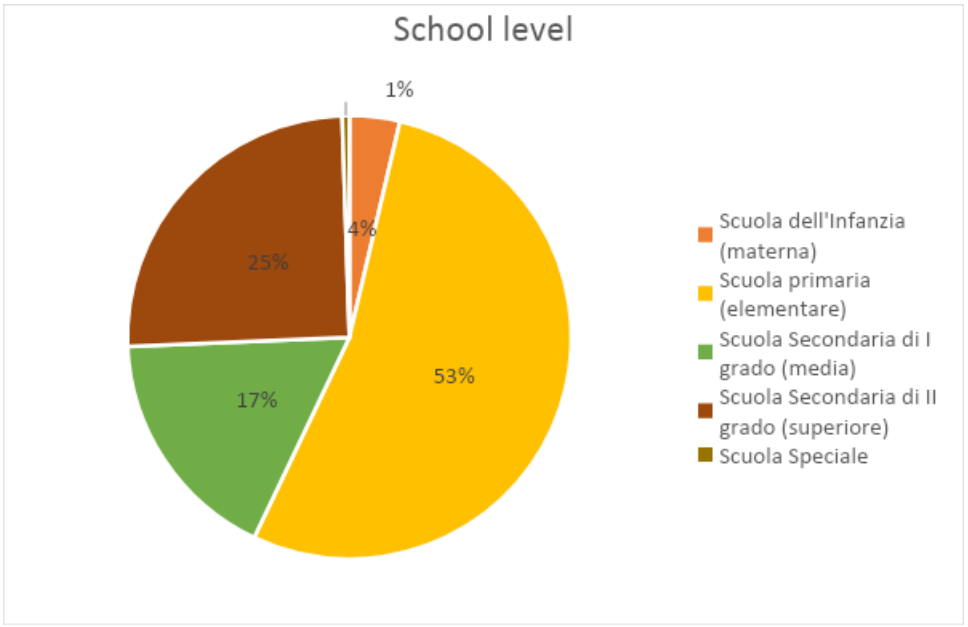


Figure 11: a1c. Age of the student

Among the respondents the 25% of caregivers had children who attended high schools: the data is quite different from the teachers' category. It can be seen as teachers in elementary and middle schools are more sensitive to this kind of research.



a2c. School level

The data above is interesting when related to the question about the number of children who needed to be helped. More than 33% of all caregivers said that they had to support more than 2 children.

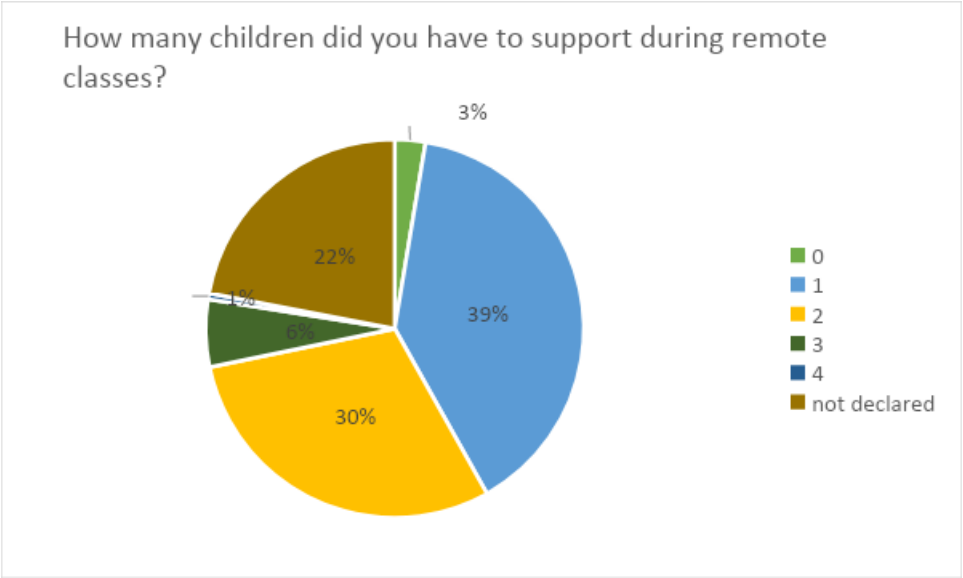


Figure 2: a10c. How many children did you have to support during remote classes?

Most caregivers declared that their children could not attend lessons during the lockdown. It is an interesting data because it clearly shows that more than 60% of the children could not attend online classes during the lockdown.

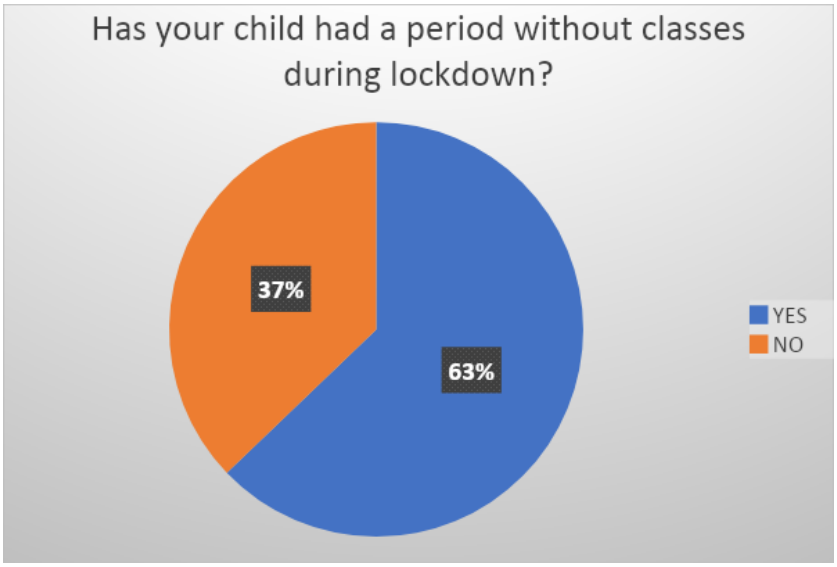


Figure 12: a13c. Has your child had a period without classes during lockdown (not including school holiday)?

The role of the caregivers was decisive: they had to support their children during the online lessons as shown in figure 13.

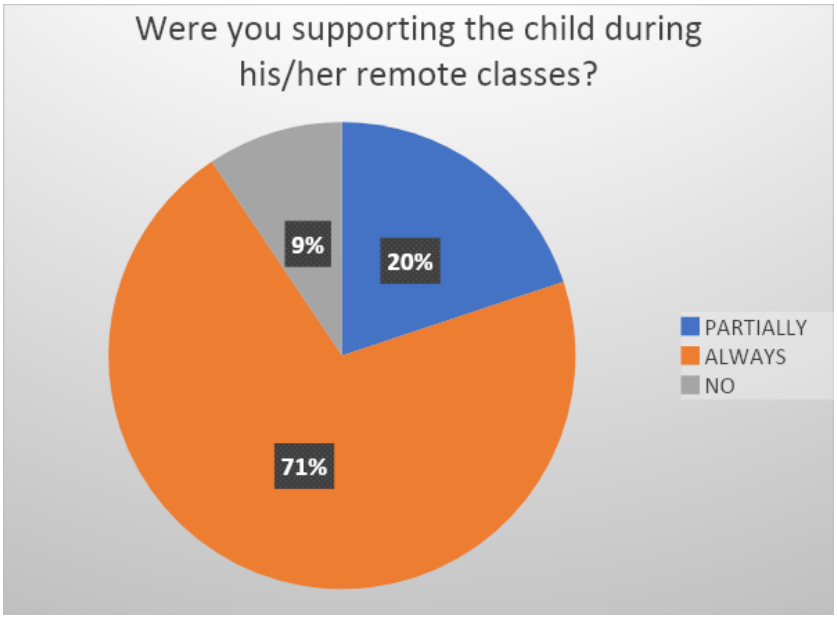


Figure 13: a16c. Were you supporting the child during his/her remote classes?

36% of the caregivers declare that their children attended less than 40% of the classes, a worrying data.

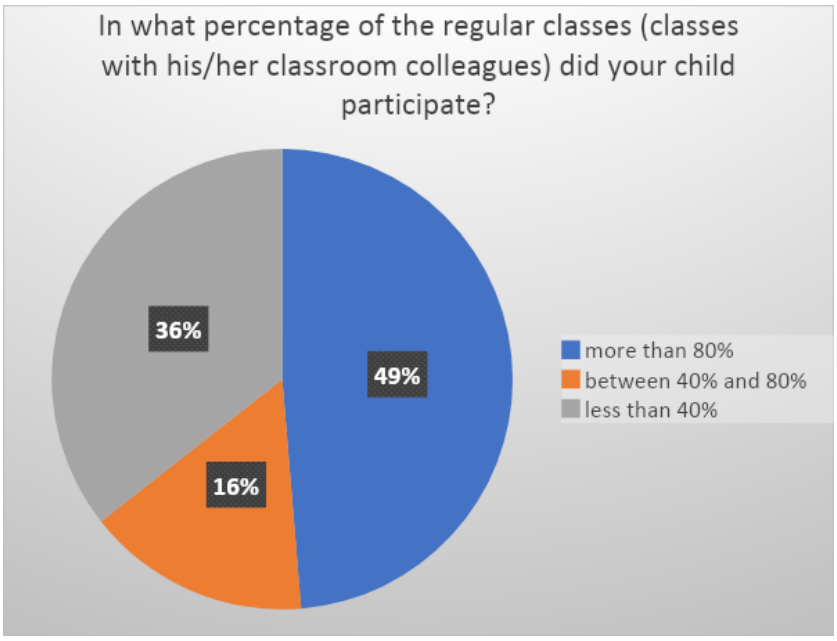


Figure 14: a17c. In what percentage of the regular classes (classes with his/her classroom colleagues) did your child participate?

In comparison to the availability of the therapists who were easy to contact during the lockdown, caregivers felt the teachers were not so collaborative: not all of them exchanged their contacts to make it easier to communicate during the online lessons.

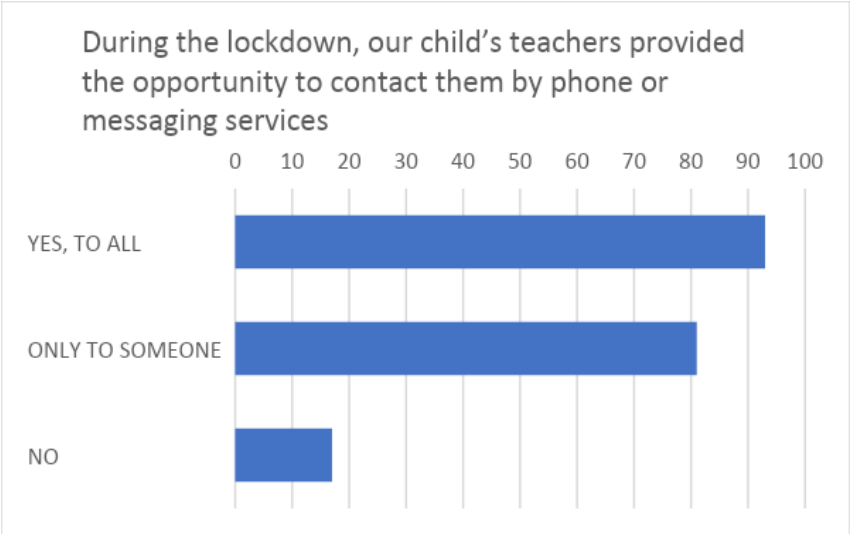


Figure 14: c4c. During the lockdown, our child's teachers provided the opportunity to contact them by phone or messaging services

It is good to observe that most of the caregivers had enough time to help their children.

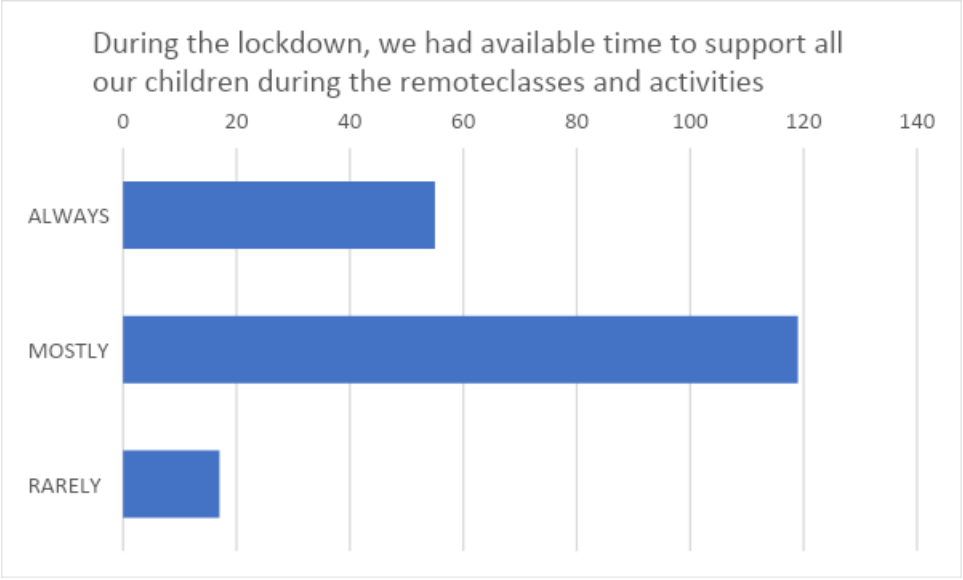


Figure 16: c5c. During the lockdown, we had available time to support all our children during the remote classes and activities.

The most disturbing data is the denouncement from caregivers that their children had less learning opportunity in comparison to their peers.

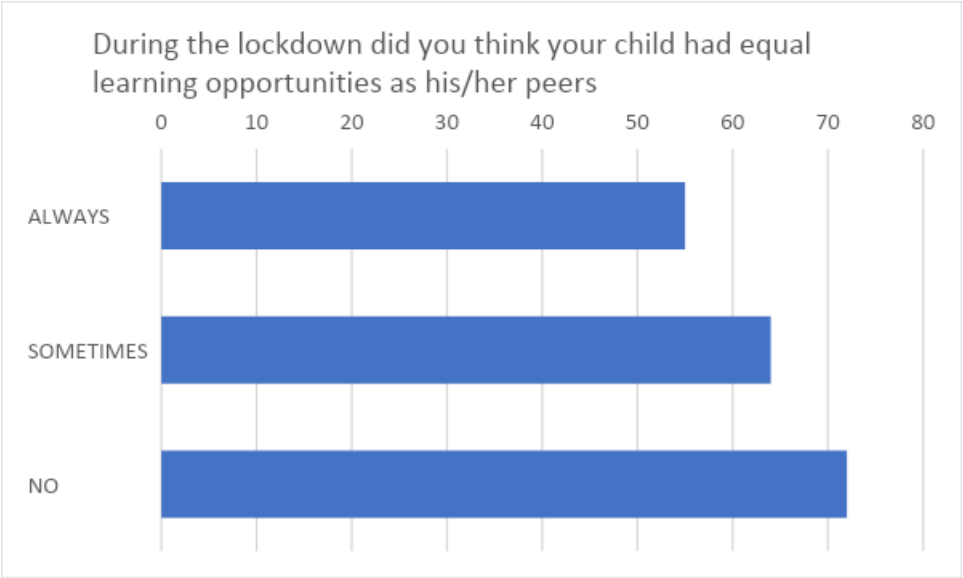


Figure 16: c6c. During the lockdown did you think your child had equal learning opportunities as his/her peers

Finally, it is important to stress that almost no caregivers (and children) had experience of blended learning: it means that using computers or any TLC tools was completely new for all of them.

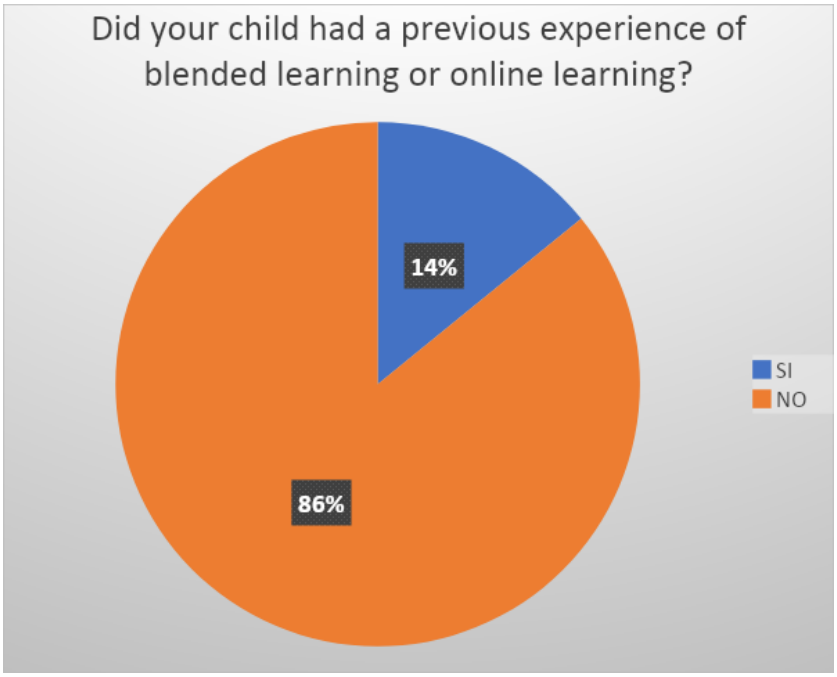
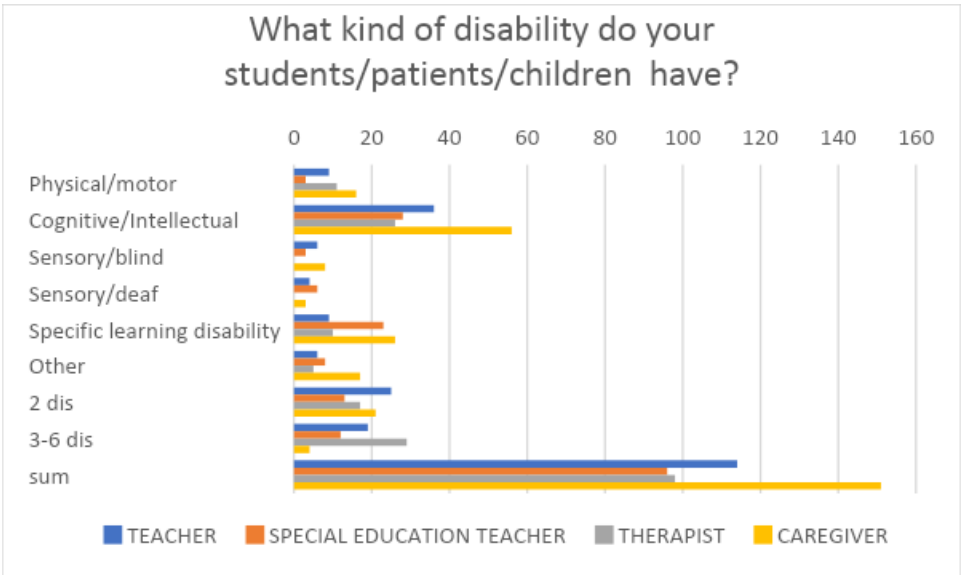


Figure 17: c7c. Did your child have a previous experience of blended learning or online learning?

4 Comparisons

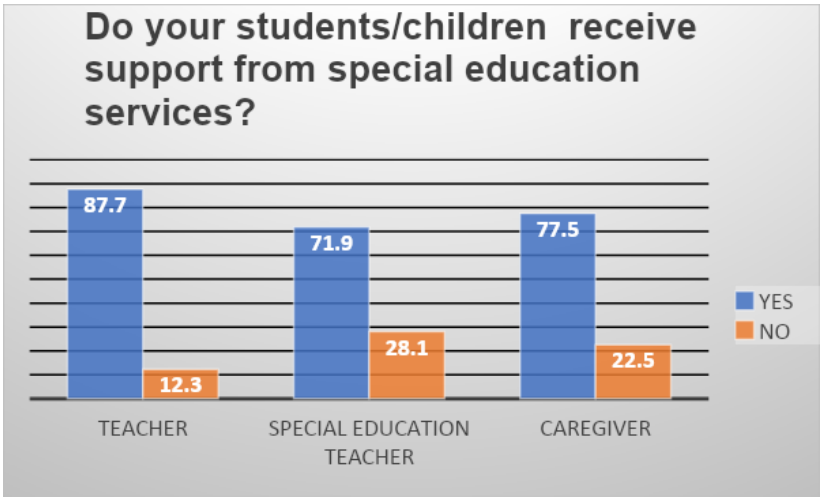
4.1 Socio-Demographic comparison between the categories

What kind of disability do your students/patients/children have?



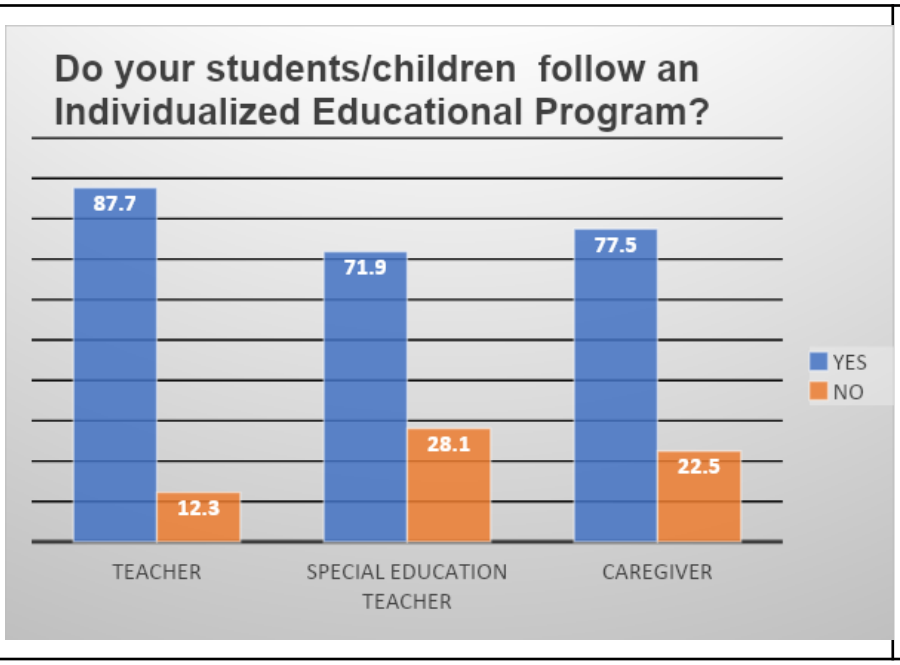
COMMENT:

Do your students/children receive support from special education services?



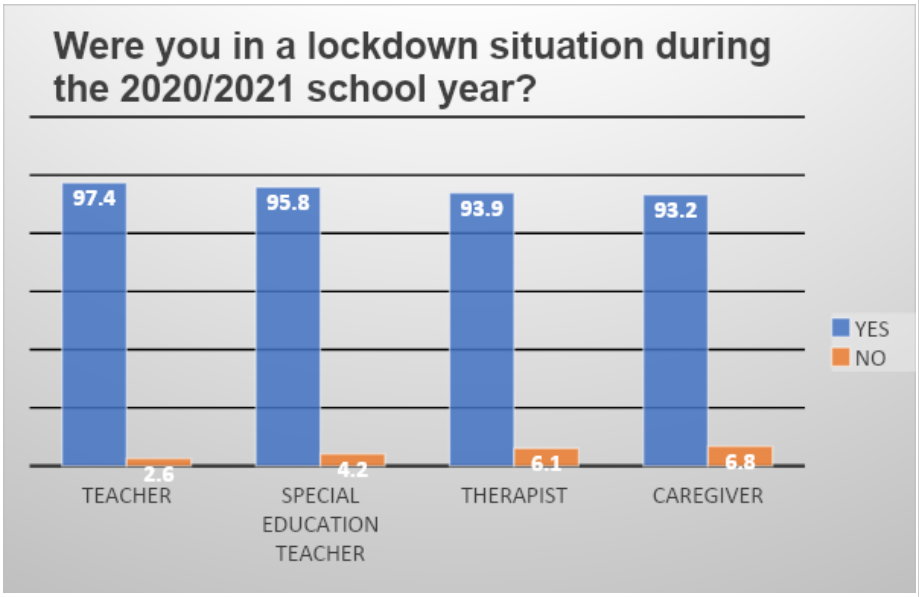
COMMENT:

Do your students/children follow an Individualized Educational Program?



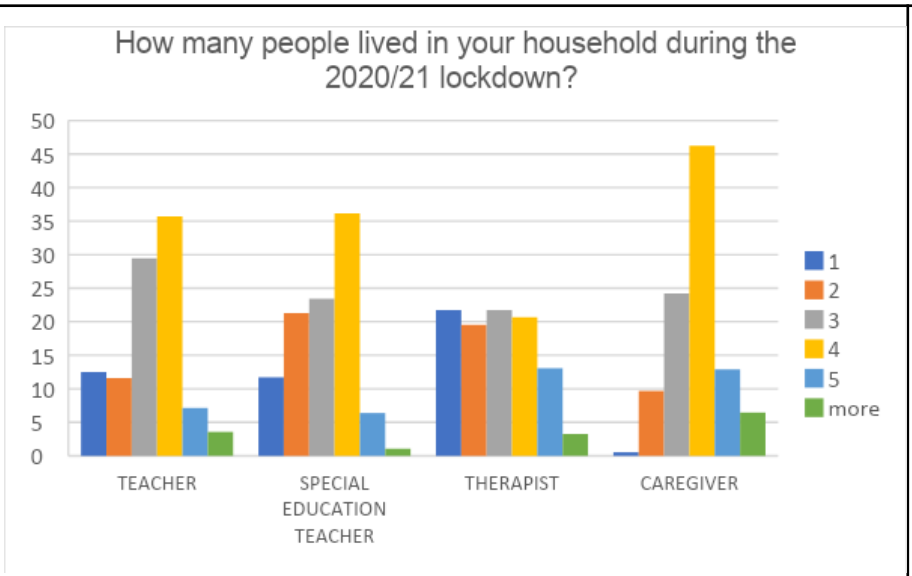
COMMENT:

Were you in a lockdown situation during the 2020/2021 school year?



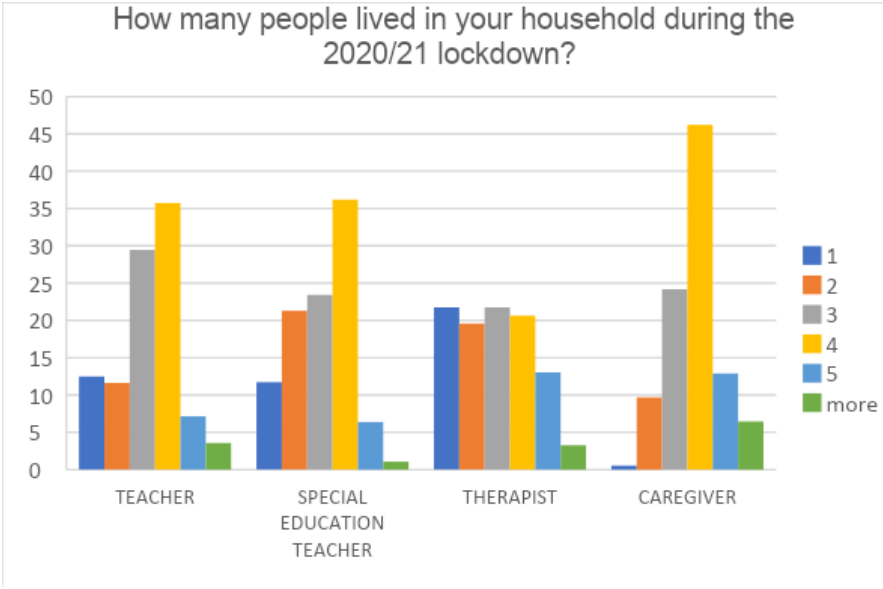
COMMENT:

How many people lived in your household during the 2020/21 lockdown?



COMMENT:

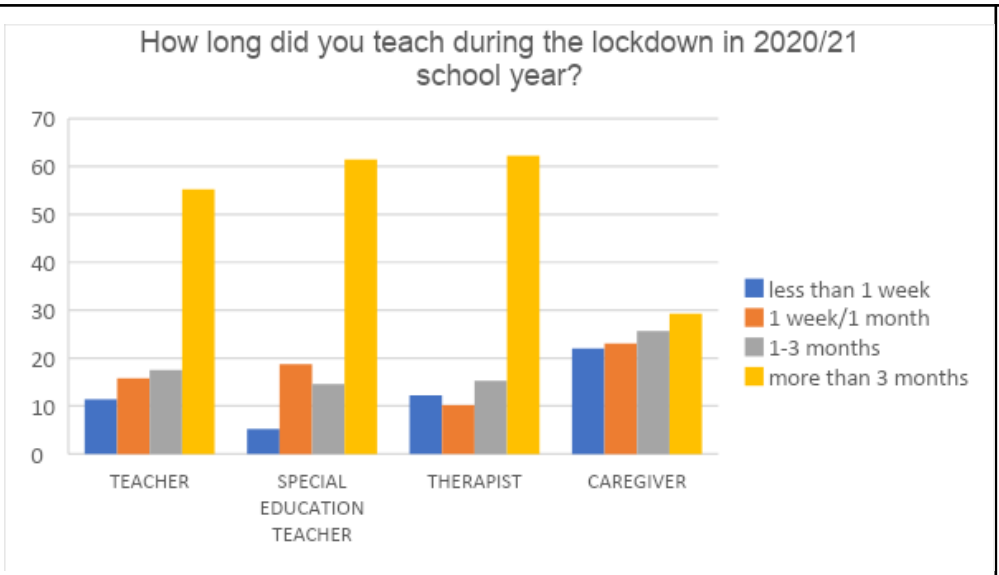
How many people usually worked/studied at the same time from home during the 2020/21 lockdown?



COMMENT:

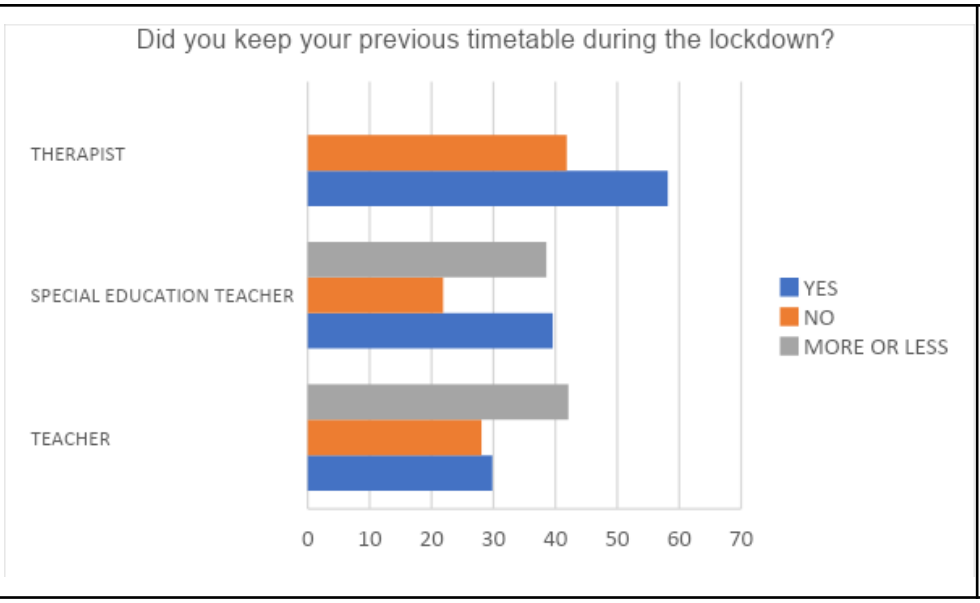
4.2 School life during the lockdown

How long did you teach during the lockdown in the 2020/21 school year?



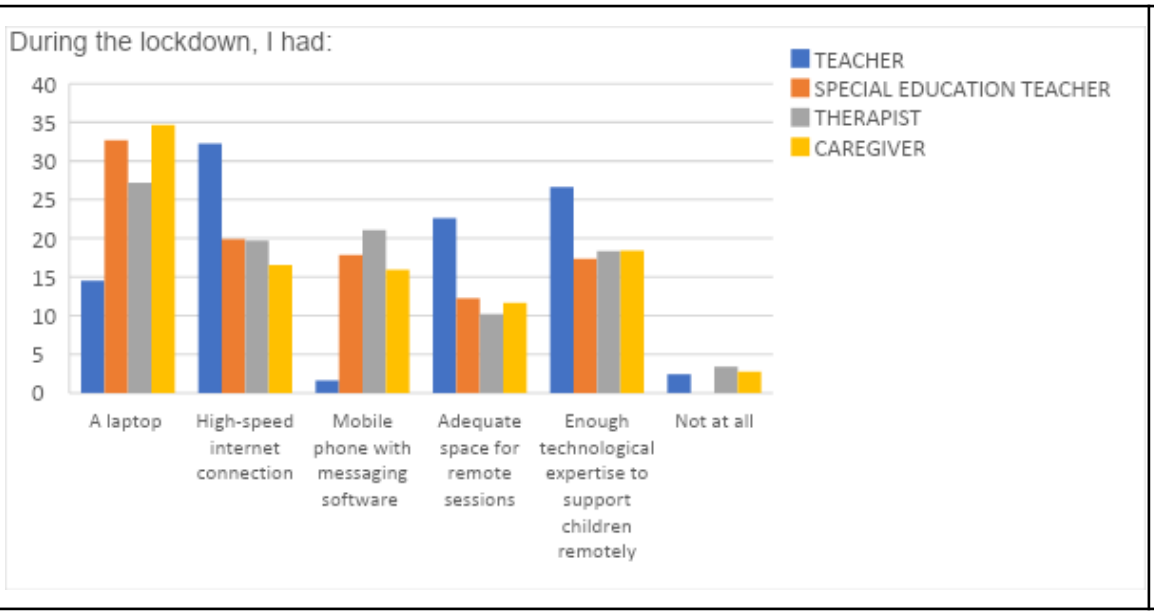
COMMENT:

Did you keep your previous timetable during the lockdown?



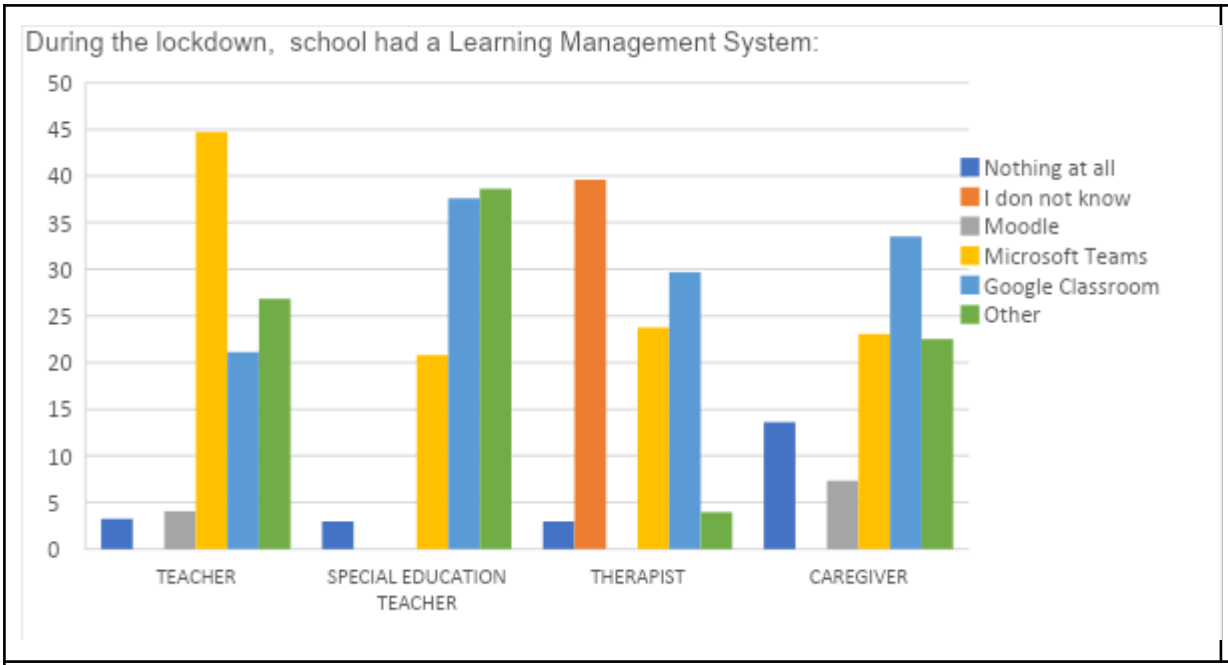
COMMENT:

During the lockdown, I had:


During the lockdown, I had:
40
35
30
25
20
15
10
5
0
A laptop
High-speed internet connection
Mobile phone with messaging software
Adequate space for remote sessions
Enough technological expertise to support children remotely
Not at all
TEACHER
SPECIAL EDUCATION TEACHER
THERAPIST
CAREGIVER

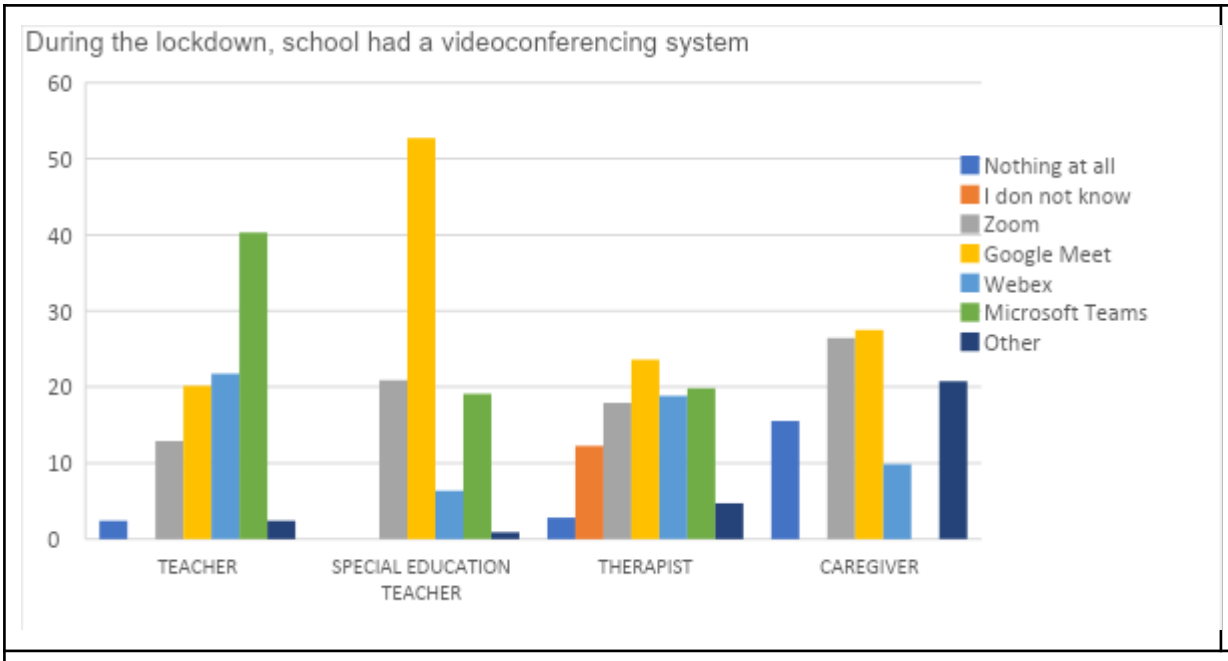
COMMENT:

During the lockdown, school had a Learning Management System

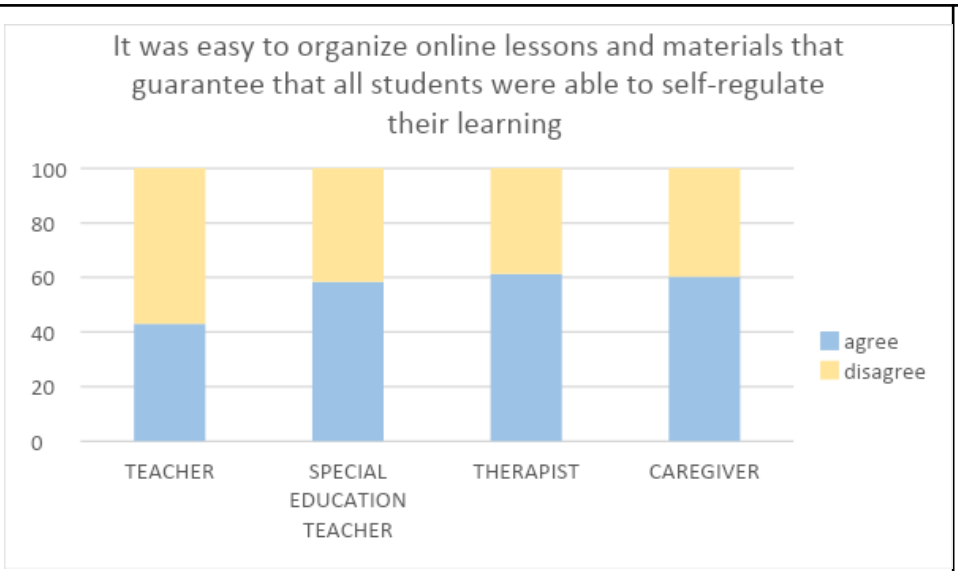


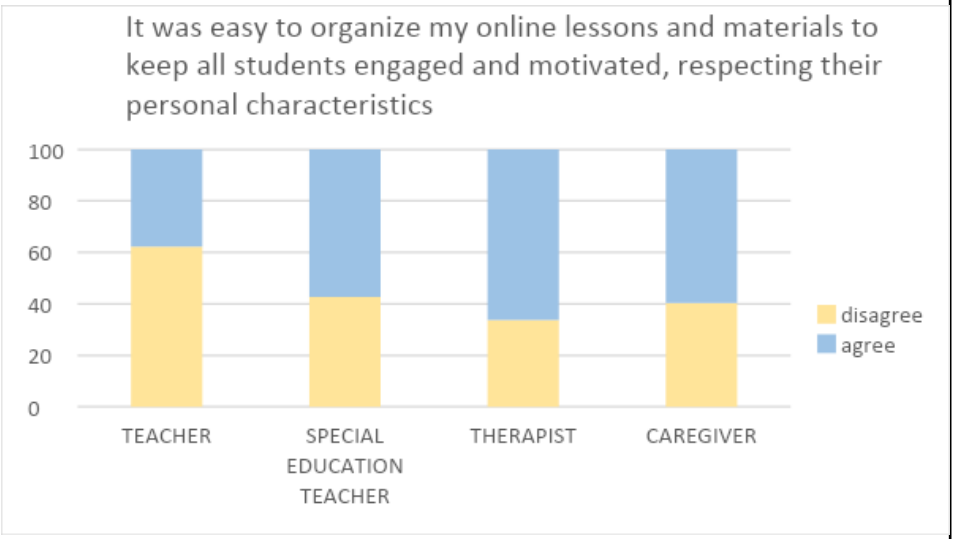
COMMENT:

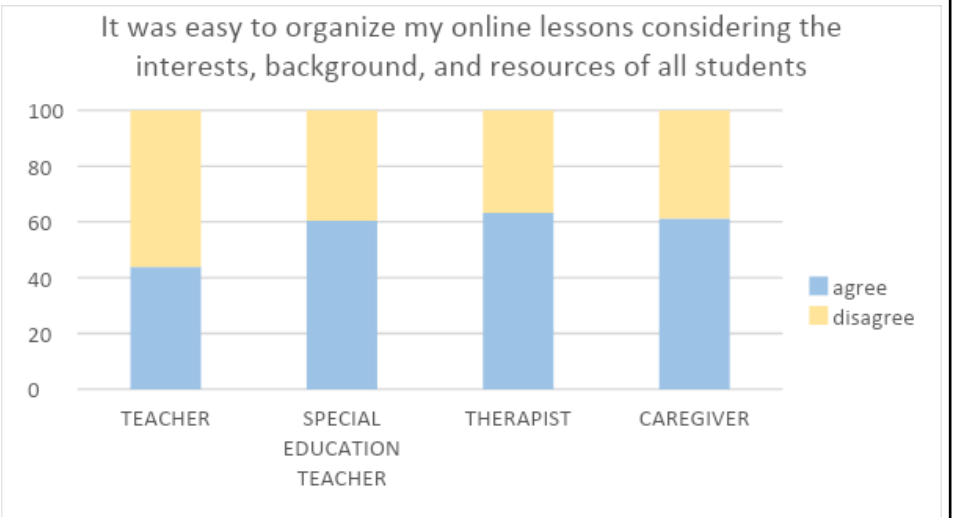
During the lockdown, school had a videoconferencing system

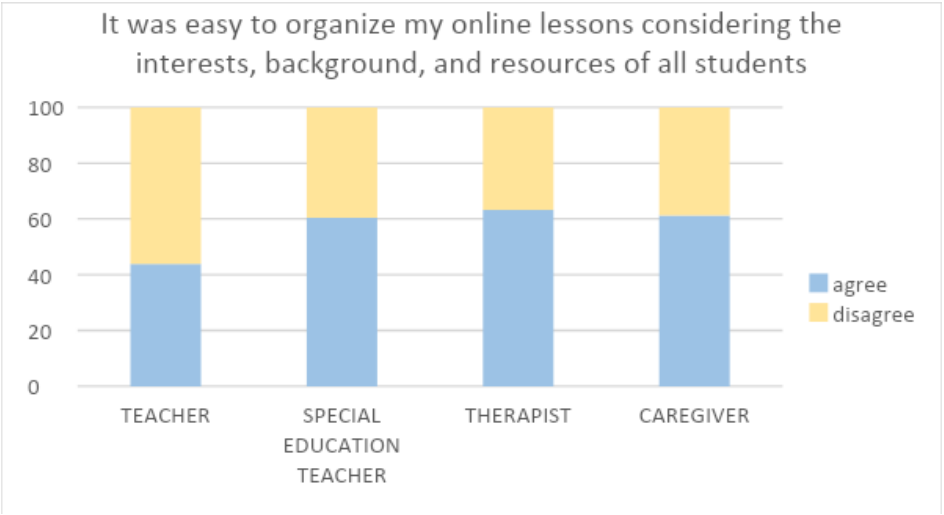


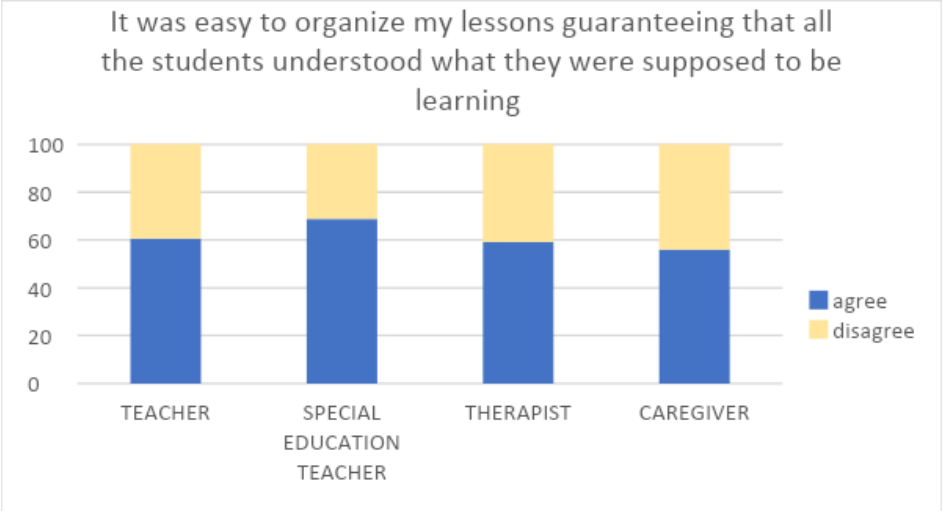
COMMENT:

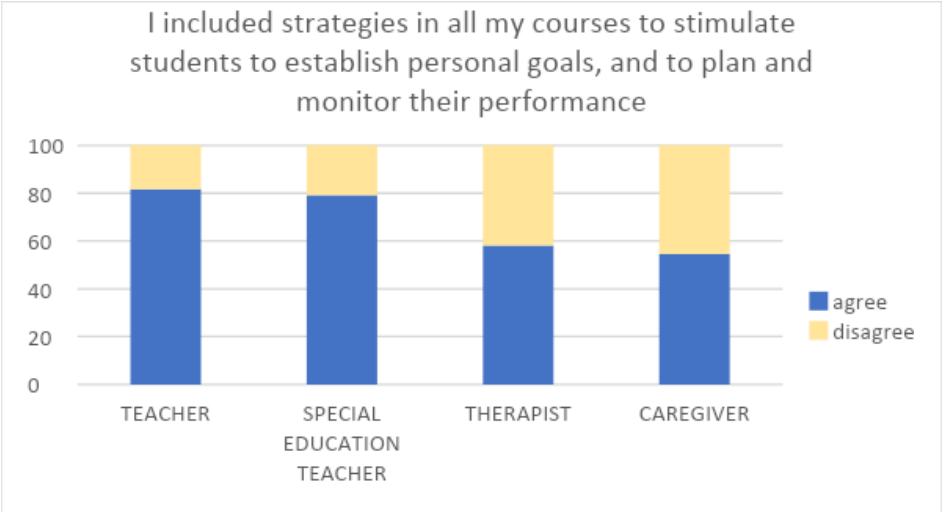

It was easy to organize online lessons and materials that guarantee that all students were able to self-regulate their learning
100
80
60
40
20
0
TEACHER
SPECIAL EDUCATION TEACHER
THERAPIST
CAREGIVER
agree
disagree

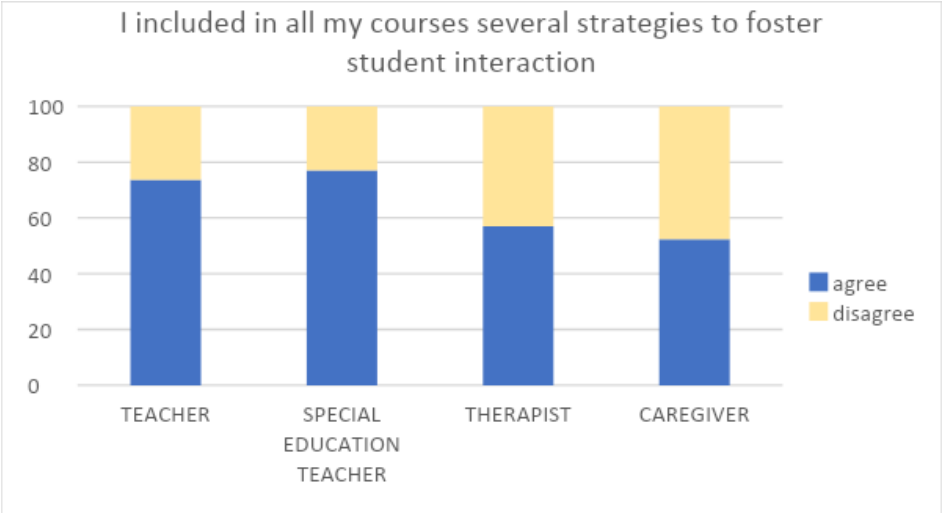

It was easy to organize my online lessons and materials to keep all students engaged and motivated, respecting their personal characteristics
100
80
60
40
20
0
TEACHER
SPECIAL EDUCATION TEACHER
THERAPIST
CAREGIVER
disagree
agree

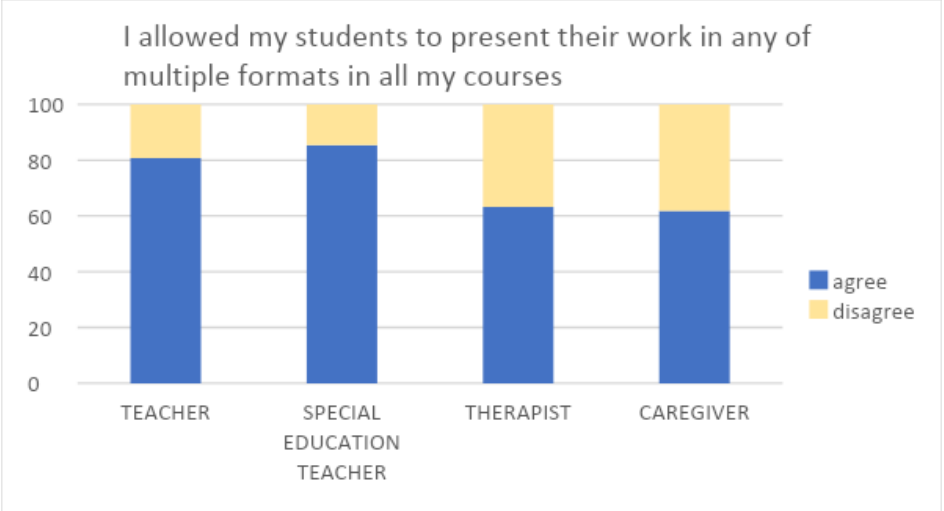

It was easy to organize my online lessons considering the interests, background, and resources of all students
100
80
60
40
20
0
TEACHER
SPECIAL EDUCATION TEACHER
THERAPIST
CAREGIVER
agree
disagree

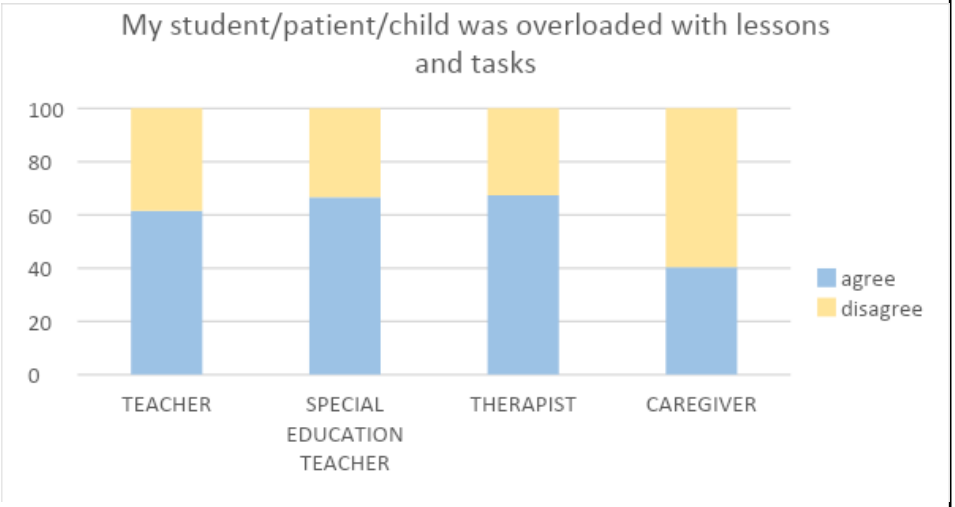

It was easy to organize my online lessons considering the interests, background, and resources of all students
100
80
60
40
20
0
TEACHER
SPECIAL EDUCATION TEACHER
THERAPIST
CAREGIVER
agree
disagree

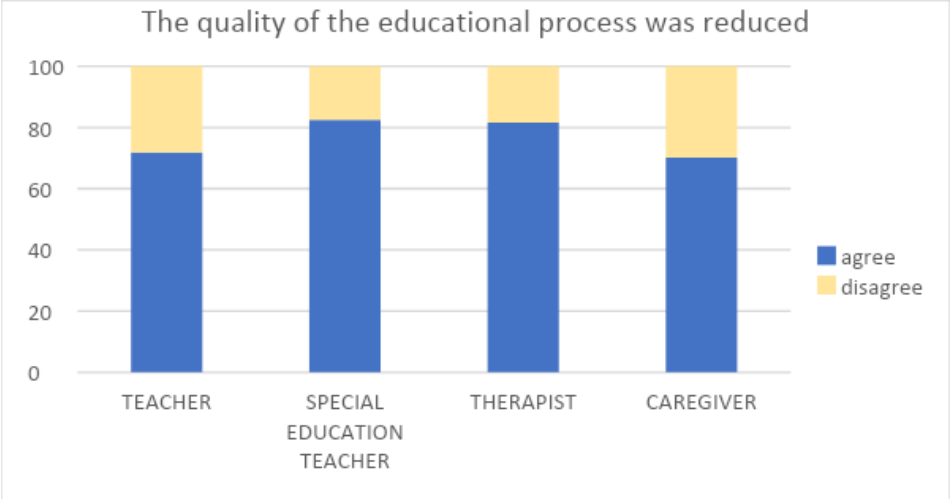

It was easy to organize my lessons guaranteeing that all the students understood what they were supposed to be learning
100
80
60
40
20
0
TEACHER
SPECIAL EDUCATION TEACHER
THERAPIST
CAREGIVER
agree
disagree

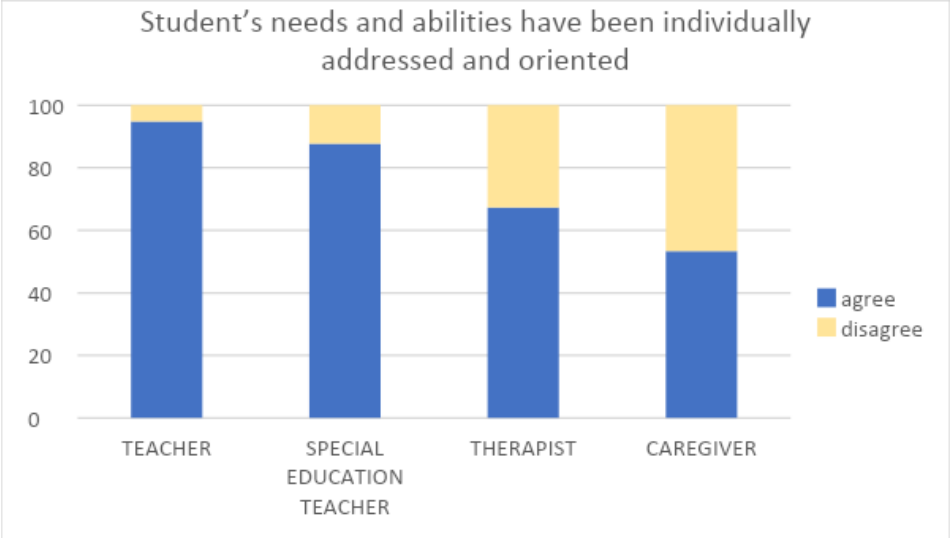

I included strategies in all my courses to stimulate students to establish personal goals, and to plan and monitor their performance
100
80
60
40
20
0
TEACHER
SPECIAL EDUCATION TEACHER
THERAPIST
CAREGIVER
agree
disagree

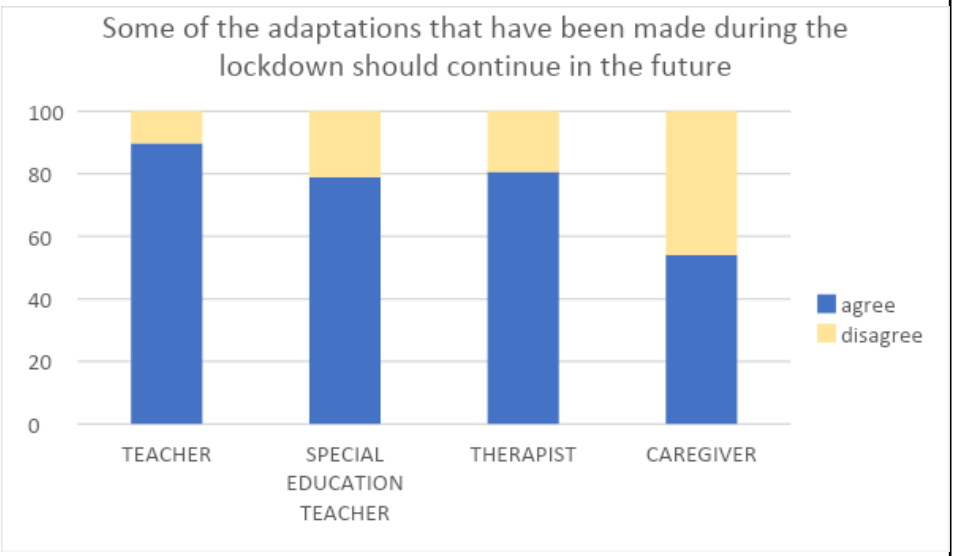

I included in all my courses several strategies to foster student interaction
100
80
60
40
20
0
TEACHER
SPECIAL EDUCATION TEACHER
THERAPIST
CAREGIVER
agree
disagree

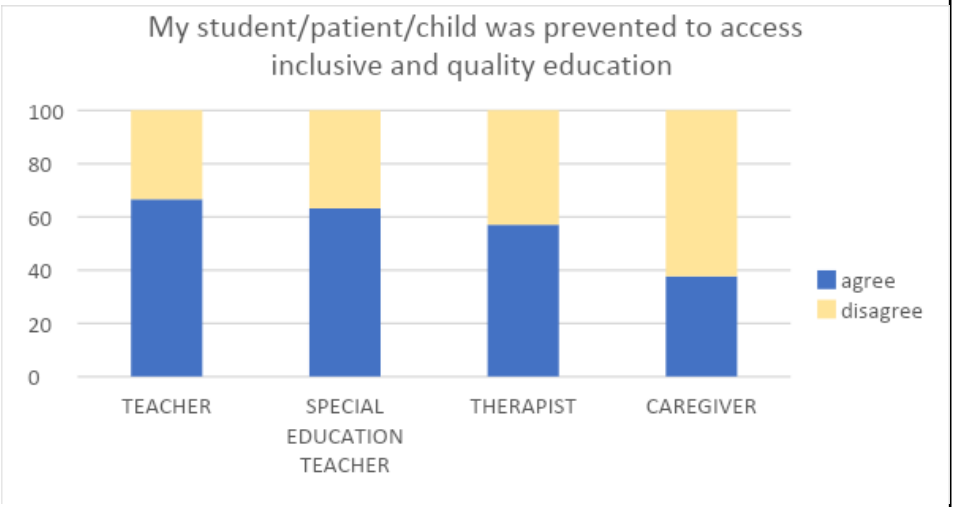

I allowed my students to present their work in any of multiple formats in all my courses
100
80
60
40
20
0
TEACHER
SPECIAL EDUCATION TEACHER
THERAPIST
CAREGIVER
agree
disagree

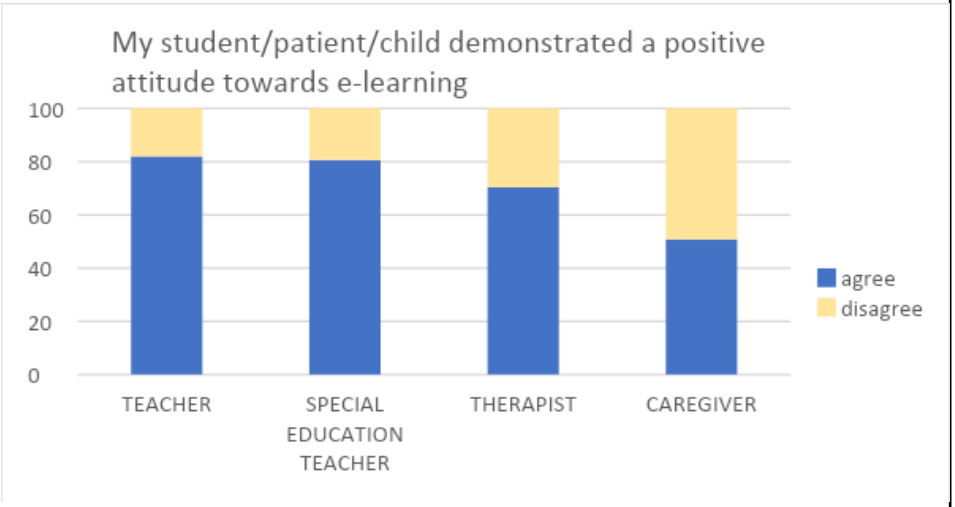

My student/patient/child was overloaded with lessons and tasks
100
80
60
40
20
0
TEACHER
SPECIAL EDUCATION TEACHER
THERAPIST
CAREGIVER
agree
disagree

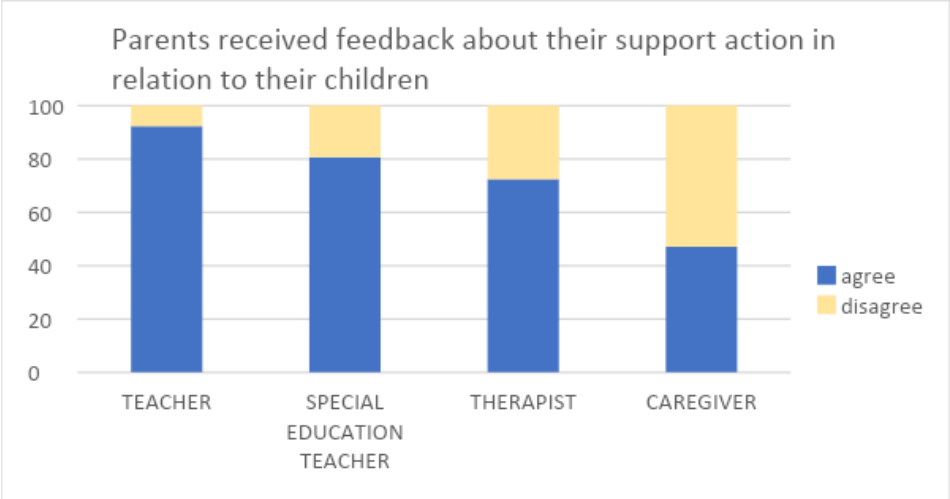

The quality of the educational process was reduced
100
80
60
40
20
0
TEACHER
SPECIAL EDUCATION TEACHER
THERAPIST
CAREGIVER
agree
disagree

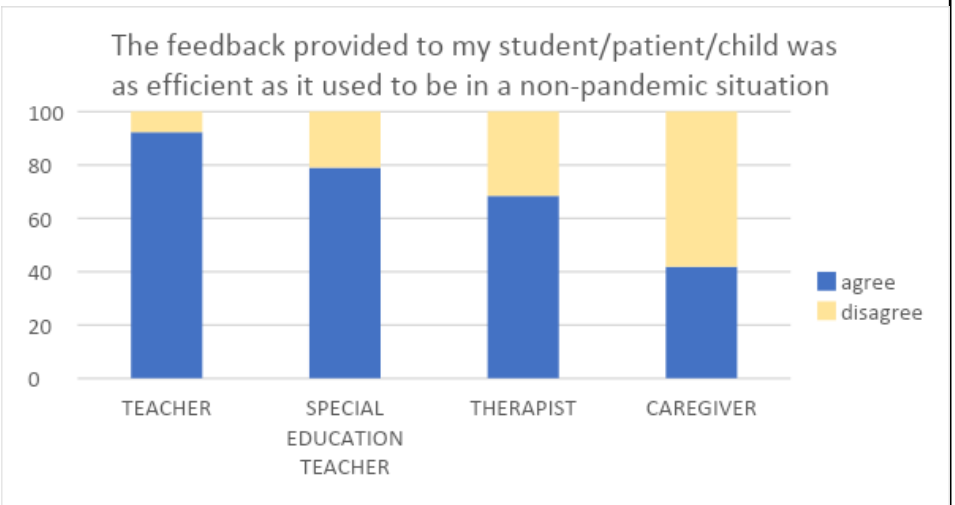

Student's needs and abilities have been individually addressed and oriented
100
80
60
40
20
0
TEACHER
SPECIAL EDUCATION TEACHER
THERAPIST
CAREGIVER
agree
disagree

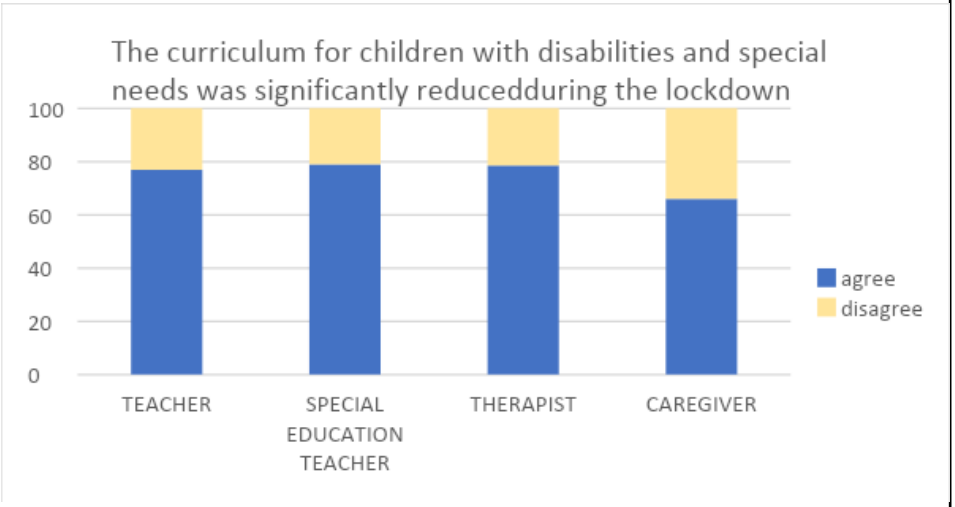

Some of the adaptations that have been made during the lockdown should continue in the future
100
80
60
40
20
0
TEACHER
SPECIAL EDUCATION TEACHER
THERAPIST
CAREGIVER
agree
disagree

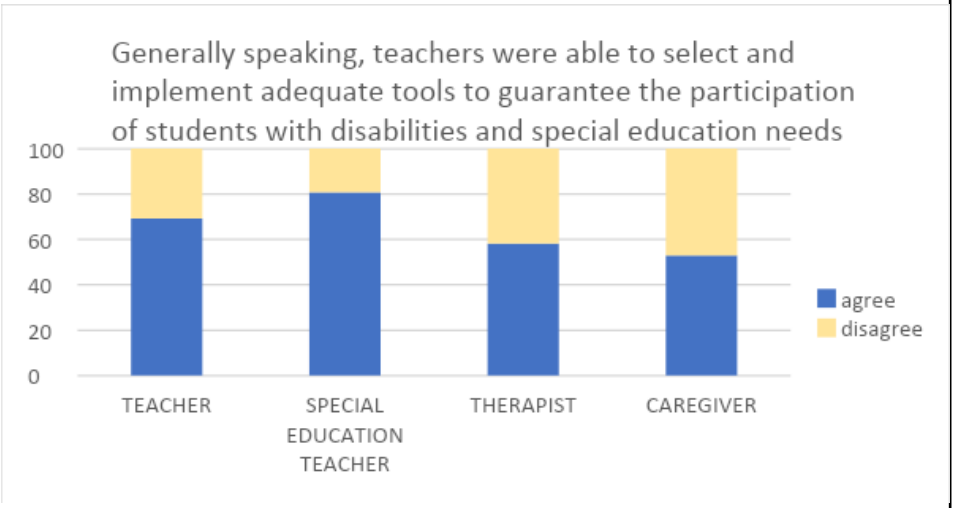

My student/patient/child was prevented to access inclusive and quality education
100
80
60
40
20
0
TEACHER
SPECIAL EDUCATION TEACHER
THERAPIST
CAREGIVER
agree
disagree

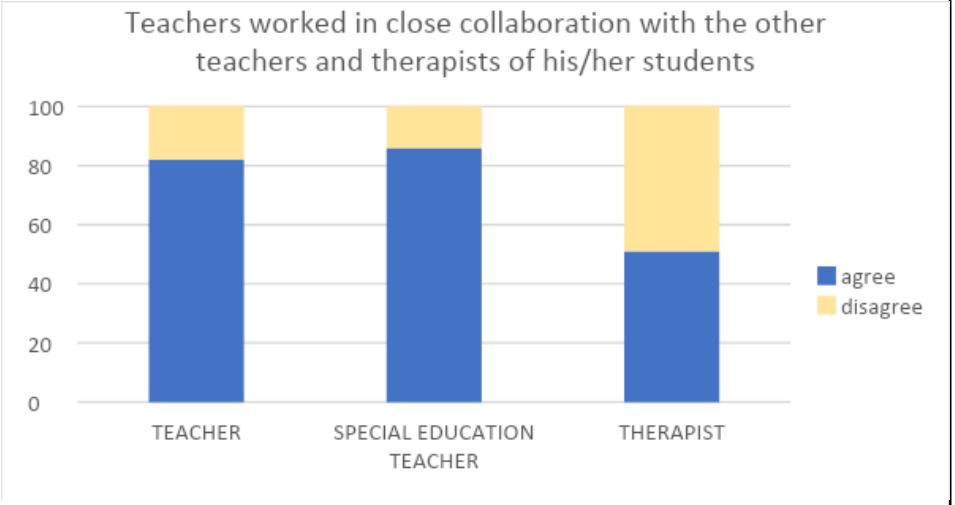

My student/patient/child demonstrated a positive attitude towards e-learning
100
80
60
40
20
0
TEACHER
SPECIAL EDUCATION TEACHER
THERAPIST
CAREGIVER
agree
disagree


Parents received feedback about their support action in relation to their children
100
80
60
40
20
0
TEACHER
SPECIAL EDUCATION TEACHER
THERAPIST
CAREGIVER
agree
disagree


The feedback provided to my student/patient/child was as efficient as it used to be in a non-pandemic situation
100
80
60
40
20
0
TEACHER
SPECIAL EDUCATION TEACHER
THERAPIST
CAREGIVER
agree
disagree


The curriculum for children with disabilities and special needs was significantly reducedduring the lockdown
100
80
60
40
20
0
TEACHER
SPECIAL EDUCATION TEACHER
THERAPIST
CAREGIVER
agree
disagree


Generally speaking, teachers were able to select and implement adequate tools to guarantee the participation of students with disabilities and special education needs
100
80
60
40
20
0
TEACHER
SPECIAL EDUCATION TEACHER
THERAPIST
CAREGIVER
agree
disagree


Teachers worked in close collaboration with the other teachers and therapists of his/her students
100
80
60
40
20
0
TEACHER
SPECIAL EDUCATION TEACHER
THERAPIST
agree
disagree

5 Analysis

5.1 What comparisons suggest for the next steps

Comparisons show critical distance among what teachers think about their work and what caregivers and therapists do. They suggest adopting an approach that can be inclusive in adopting more tools than just video, for example. UDL can be a key to introducing an approach that is new and compatible with ITC technologies.
About technology there are two points with a significant impact on the project:

- Most respondents do not know at all what MOODLE is, especially among caregivers.
- There is a difference among the respondents in terms of know-how about using online tools and in terms of adopting the same technologies, for example, for videoconferences.

We suggest providing online material to help users to learn more about Moodle and the way to use it.
About the other point, the project should provide all needed technologies in one virtual point that can be easily reached by users,

5.2 Descriptive analysis of the items of the second part of the survey

The first step of the analysis of the second part of the survey is to provide a descriptive analysis of the items followed by a Kolgomorov-Smirnov test of normalcy to understand whether the distribution of the answers follows a normal curve. Since the topic of each item is the same for the several subgroups of respondents (teachers, therapists, and caregivers, we are going to provide all the data in one table.

Item	Teachers (N=262)	Therapists (n= 98)	Caregivers (N=191)	Kruskal-Wallis (N=551)
Strategies to self-regulate learning	M= 5.15 [a] SD= 2.37	M= 6.04 [a] SD= 2.29	M= 6.12 [a] SD= 3.00	H(2)= 18.306 P<.001
Strategies to engage and motivate	M=5.07 [a] SD= 2.36	M= 6.09 [a] SD= 2.22	M= 6.07 [a] SD= 3.05	H(2)= 20.745 P<.001
Strategies to consider interests, background, and resources	M= 5.19 [a] SD= 2.30	M= 6.18 [a] SD= 2.36	M= 6.29 [a] SD= 3.09	H(2)= 24.484 P<.001

Strategies to present information in multiple formats	M=8.24 [a] SD= 1.84	M= 6.40 [a] SD= 2.20	M= 6.68 [a] SD= 3.02	H(2)= 58.787 p<.001
Strategies to make all information understandable by all students	M=7.79 [a] SD= 1.91	M= 6.10 [a] SD= 2.26	M= 6.45 [a] SD= 3.13	H(2)= 40.316 P<.001
Strategies to guarantee that all students understood what they were supposed to be learning	M= 5.90 [a] SD= 2.34	M= 5.94 [a] SD= 2.18	M= 6.00 [a] SD=3.05	H(2)= .874 P=.646
Strategies to stimulate the establishment of personal goals, and to plan and monitor performance	M=7.29 [a] SD= 1.91	M= 5.93 [a] SD= 2.47	M= 5.74 [a] SD= 3.03	H(2)=36.505 P<.001
Strategies to offer options to self-expression	M=7.17 [a] SD= 2.23	M= 6.00 [a] SD= 2.55	M= 5.67 [a] SD= 2.99	H(2)=32.809 p<.001
Strategies to allow the presentation of work in different formats	M=7.19 [a] SD= 2.09	M= 6.18 [a] SD= 2.51	M= 6.37 [a] SD= 2.98	H(2)=40.164 p< .001

[a] $p < .001$ for Kolgomorov-Smirnov test of normalcy.

As we can see, in all items and subgroups, the average score is above the medium point of the scale. In the first three items, teachers' answers, on average, get a lower score than the answers of caregivers and therapists. On the other hand, in the other six items, teachers' answers are, on average, higher than those of the two other subgroups. The Kolgomorov-Smirnov test of normality shows that the distribution is significantly different from a normal distribution, in all items, recommending the use of non-parametric statistics.

When comparing the results between the three subgroups in each item, the results of the Kruskal-Wallis test show that there are significant differences between the three groups in all items, except the item "Strategies to guarantee that all students understood what they were supposed to be learning".

As the nine items were constructed taking into consideration the three dimensions of the UDL framework (Engagement, Representation, and Action and Expression), a reliability analysis was conducted to understand if the results showed internal consistency within the three dimensions and in total.

Dimension	Teachers	Therapists	Caregivers	Total
Engagement	.951	.929	.954	.951
Representation	.598	.893	.954	.856
Action and Expression	.796	.900	.904	.883
Total	.832	.953	.972	.929

In all cases, except the subscale Representation, for teachers, the results are above .80, which, according to George and Mallery (2003) rule of thumb, can be considered good or excellent. The value of alpha for the scale representation, in the teacher's subgroup, considering the reduced number of items, can be considered acceptable. According to these results, the following analysis will focus on the three subdimensions and not in the individual items.

The three dimension show significant correlations between them:

	Engagement	Representation	Action & Expression
Engagement		.683** N=551	.479** N=546
Representation	.683** N=551		.740** N=546
Action & Expression	.479** N=546	.740** N=546	

** Correlation is significant for p<.001 (two-tailed)

Comparing the results obtained by the three subgroups (teachers, therapists, and caregivers), in the three dimensions, we determined significant differences in the three subscales, very significant in the Representation and Action & Expression subscales (p<.001) and slightly significant for the Engagement subscale (p=.01). Analyzing the pairwise comparisons for the three subscales, we conclude that there are significant differences between teachers and therapists and between teachers and caregivers. Average scores are higher for teachers than for the other two subgroups of respondents (according to the adjusted significance using Bonferroni correction).

This might be interpreted as demonstrative of a lower satisfaction with the educational practices within the three dimensions from therapists and caregivers, opposite to teachers.

When we compare the answers to the three dimensions of the scale as well as the full scale, according to the level of support needed by the student (characterized in four levels, from none to permanent), we found significant differences in the subscale Engagement (p<.001); Representation (p<.01); and total scale (p<.001). There are no significant differences in the Action and Expressions subscale between the different levels of required support.

Correlations between the scale of pedagogical adaptations and the three subscales and the satisfaction items

Item	Engagement	Representation	Action and Expression	Full Scale
d1. My student was overloaded with lessons and tasks.	.169** N=437	.125** N=437	.131** N=432	.150** N=432
d2. The quality of the educational process was reduced.	-.180** N=437	-.150** N=437	-.194** N=432	-.186** N=432

d3. My student's needs and abilities have been individually addressed and oriented	.417** N=437	.598** N=437	.632** N=432	.585** N=432
d4. Some of the adaptations that have been made during the lockdown should continue in the future	.256** N=437	.356** N=437	.328** N=432	.340** N=432
d5. My student was prevented to access inclusive and quality education due to the lack of accessibility of the information and communication technologies used	.071 N=437	.067 N=437	.172** N=432	.114* N=432
d6. My student demonstrated a positive attitude towards e-learning	.263** N=437	.227** N=437	.245** N=432	.280** N=432
d7. Parents received feedback about their support action in relation to their children	.369** N=437	.469** N=437	.530** N=432	.498** N=432
d8. The feedback provided to my student was as efficient as it used to be in a non-pandemic situation	.414** N=437	.393** N=437	.405** N=432	.450** N=432

d9. The curriculum for children with disabilities and special needs was significantly reduced during the lockdown.	-.159** N=437	-.147** N=437	-.156** N=432	-.146** N=432
d10. Generally speaking, teachers were able to select and implement adequate tools to guarantee the participation of students with disabilities and special education needs.	.528** N=437	.556** N=437	.593** N=432	.616** N=432
d11. I worked in close collaboration with the other teachers and therapists of my students.	.081 N=246	.364** N=246	.403** N=241	.295** N=241

* p<.01; ** p<-,001

In general, we see a strong correlation between all the evaluation items and the results of the three subscales of the pedagogical adaptations, as well as with the full scale. This clearly demonstrates that the level of adaptations the respondents consider existing in the online classes is closely connected with their evaluation of the pedagogical process.