Research Article

Verena Letzel*, Marcela Pozas, Christoph Schneider

Energetic Students, Stressed Parents, and Nervous Teachers: A Comprehensive Exploration of Inclusive Homeschooling During the COVID-19 Crisis

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Abstract: March 2020 will be reminded as the time when schools around the world came to a shutdown. This resulted in a necessary and immediate redesign of teaching and learning. School-based instruction had to be replaced by a home-based instruction format. This required students, parents and teachers to adapt their daily routines to a new and unknown educational reality. Given this unprecedented situation, research into the impact of homeschooling during the COVID-19 crisis became urgent. This brief report introduces a nation-wide research project in Germany. Following a mixed-methods design, the SCHELLE project titled Student-Parents-Teachers in Homeschooling (abbreviated as SCHELLE following its German name **S**chüler-**E**ltern-**L**ehrer) was developed in order to comprehensively explore students', parents', and teachers' experiences during homeschooling. Overall, the studies focused on collecting quantitative and qualitative data on how homeschooling was implemented, whether inclusive education was considered, and the well-being of all three perspectives. The main findings of the SCHELLE project revealed that the impact of homeschooling expanded not only into the educational domain, but as well into the social (e.g. social distancing), psychological (positive and negative activation), and educational equality matters (implementation of inclusive education).

Keywords: inclusive homeschooling; mixed methods design; coronavirus; emergency remote education.

1 Introduction

The Coronavirus (COVID-19) has caused worldwide unprecedented educational crisis (Education International, 2020): schools have been forced to close, teachers and parents had little time to prepare, and students must learn from home. With schools under lockdown, emergency remote education (ERE) became a temporary solution (Bozkurt & Sharma, 2020; Flores & Gago, 2020). ERE “is about surviving in a time of crisis with all resources available, including offline and/or online” (Bozkurt et al., 2020). In this line, Bozkurt et al. (2020) argue that ERE is a branch of online learning and homeschooling.

Homeschooling, in the form of ERE during the COVID-19 crisis, requires that students adjust to learn from home with the available resources and limited contact to school classmates and teachers, while parents take up the roles of teachers (Bozkurt et al., 2020; Dempsey & Burke, 2020), and teachers set up online instruction using the resources at hand. With this background, homeschooling has brought important consequences into the educational landscape. Initial reports have revealed that there are substantial challenges that students, parents, and teachers are facing during home-based education. Flack et al. (2020) have raised concerns of the potential impact of homeschooling on students, such as social isolation and the decrease of their well-being, in particularly of those in primary school. Parents, on the other hand, have to balance their new role as teachers with, for example, their paid jobs or financial concerns due to the current situation (Fischer et al., 2020). Preliminary reports also indicate that teachers are struggling to adapt their instructional methods within a digital environment, as well as having an increase of demands that consequently raised their workload (Flack et al., 2020). Besides these struggles among students, parents, and teachers, educational researchers have expressed great concern that the current situation may aggravate existing social inequalities and

*Corresponding author: Verena Letzel, Section for Teacher Education and Research, Universität Trier, Universitätsring 15, 54296 Trier, Germany, E-mail: letzel@uni-trier.de

Marcela Pozas, Christoph Schneider, Section for Teacher Education and Research, Universität Trier, Universitätsring 15, 54296 Trier, Germany

widen the educational gap (Forsa, 2020; van Ackeren, Endberg, & Locker-Grütjen, 2020).

Although there are initial reports describing stakeholders' struggles and challenges, the full impact of COVID-19 on the educational field is still unclear (Fischer et al., 2020). Thus, against this background and with an urgent need for in-depth research, a multi-perspective mixed-methods research project titled *Student-Parents-Teachers* in Homeschooling (abbreviated as SCHELLE following its German name *Schüler-Eltern-Lehrer*) was designed and conducted nation-wide in Germany. Given its mixed-methods research design, the project has collected both quantitative as well as qualitative data on each of the three perspectives: students, parents, and teachers. The goal of the project was threefold. First to explore how teaching and learning during homeschooling is carried on. Second, to investigate whether and how inclusive education is implemented during home-based education, and third, to examine how students, parents, and teachers are experiencing and perceiving homeschooling.

This brief report has the primary goal of presenting and describing the key findings obtained from the SCHELLE project. The following sections will introduce the methodology followed in this project, and then present the key findings for each of the three perspectives. Lastly, the brief report will bring together the findings and discuss their implications.

2 Method

The SCHELLE project implemented a mixed-methods concurrent single-phase design, where both quantitative and qualitative data were simultaneously collected (Creswell & Zhang, 2009). Both types of data were analysed separately, while the findings were merged together in the results and discussion section. Thus, both forms of data are given equal emphasis throughout this study. Within the context of the SCHELLE project, the qualitative data will allow us to identify particular trends across the sample, while the more detailed quotes from the interviews will serve to corroborate or contradict the evidence (Creswell & Zahng, 2009). Data collection was carried out following convenient and snowball sampling from April 27, 2020 to June 13, 2020 (Robinson, 2014). Concerning quantitative data, three separate online surveys were built for each sample perspective. The online links to each survey were then shared. Participation was voluntary, and thus, needed to be approved with the participant's consent in order to proceed with the questionnaire. Underage participants

required their parents' or tutors' consent before accessing the online survey. Table 1 shows the instruments used for each of the three questionnaires. Questions were adapted to fit the participants' perspective correspondingly. For overall sociodemographic information on each of the quantitative samples, please refer to table 2.

Qualitative data was collected through semi-structured interviews that included different thematic sections such as (a) how homeschooling was implemented, (b) use of inclusive practices within homeschooling, and (c) general experiences during homeschooling. Interviews were recorded, transcribed, and analysed using MAXQDA and following qualitative content analysis according to Mayring (2014).

3 Results

3.1 Students' perspective

The student quantitative sample consisted of 150 students (62% female) with a mean age of 15.27 years, while the qualitative student sample was composed of 20 students. Descriptive results indicate that in general, students spend approximately 4 hours a day on their home-based instruction ($M = 3.95$; $SD = 2.13$). With regards as to how homeschooling is implemented, figure 1 shows that the majority of students consider that during homeschooling they spend far less time on school-related material than in regular school face-to-face class. Additionally, students reported feeling well supported by their family members, but would like to have more assistance from their teachers during homeschooling. Concerning the implementation of inclusive education within homeschooling, students rarely experienced working with differentiated instructional practices (Figure 2). In relation to whether teachers differentiate their instruction during homeschooling, Student A states:

"The tasks were uploaded by the teachers and every student has to work on the tasks until a specific date. No difference is made."

Furthermore, student A reports that the teachers do not qualitatively (e.g. complexity of the task) or quantitatively (e.g. provide more time to work on the assignments) tier the assignments in order to meet different ability levels. However, other students who actually reported experiencing some type of differentiated practices mostly indicated that they received tiered assignments.

Table 1: Description of the questionnaire instruments.

Concepts	Brief description	Example item
Homeschooling implementation	This section included questions that tapped into how homeschooling was implemented, it considered the time invested to prepare and learn during homeschooling, the technical resources at hand, as well as information regarding the demands, assessment, and quantity of school tasks developed during the homeschooling period. Furthermore, student, parent, and teacher communication and feedback was also included within the questionnaire.	<p><i>Example item for the student perspective:</i> “The tasks I have to deal with in homeschooling are too difficult for me.”</p> <p><i>Example item for the parent perspective:</i> “The teachers consider students with special education needs adequately during homeschooling.”</p> <p><i>Example item for the teacher perspective:</i> “In homeschooling, the equality of opportunities / educational equality cannot be maintained.”</p> <p>Each item was measured in a 4-point Likert scale ranging from 1 = <i>I do not agree at all</i> to 4 = <i>I do fully agree</i>.</p>
Inclusive homeschooling	<p>To measure the students’, parents’, and teachers’ (themselves) actual differentiated practices during homeschooling, a questionnaire was developed based on the taxonomy by Pozas and Schneider (2019). This taxonomy categorizes the different inclusive practices that teachers can implement to address meaningfully learner variance. Such practices are tiered assignments, intentional composition of student groups, tutoring systems, staggered nonverbal learning aids, mastery learning, and open education.</p> <p>A student, parent, and teacher version was created in order to adapt the questionnaires to each of the three perspectives under study.</p>	<p><i>Example of tiered assignments:</i> “Some students receive more tasks than others do.”</p> <p><i>Example of intentional composition of student groups:</i> “Learning groups with group members that show different levels of ability in school.”</p> <p><i>Example of mastery learning:</i> “The teacher waits until every student got through the topic, before starting a new one.”</p> <p><i>Example of open education:</i> “Students are allowed to decide on their own e.g. which tasks they want to work on in terms of open education.”</p> <p>Each item was measured in a 6-point Likert scale ranging from 1 = <i>never</i> to 6 = <i>very frequently</i>.</p>
Positive and negative activation (PA/NA)	<p>The PANAVA instrument measures participants’ positive (PA) and negative (NA) (e.g. distressed) activation systems of affect. According to Schreiber and Jenny (2020), PA and NA represent the two unipolar states of activation: high PA relates to positively valued states (e.g. enthusiastic); conversely, higher NA is characterized at the low end indicating negative valued states.</p> <p>The present study assessed participants PA and NA using Schallberger’s (2005) the PANAVA short-form scale.</p>	<p><i>During Homeschooling:</i> “How do you experience your day-to-day work since homeschooling started because of COVID-19? Since homeschooling I feel...”</p> <p><i>Before Homeschooling:</i> “How did you experience your everyday work in general before homeschooling? In my every day work I generally felt...”</p> <p>Full of energy – no energy (scale 1 to 6)</p> <p>Worried – free of worry (scale 1 to 6)</p> <p>Reliability for student sample: PA during homeschooling $\alpha = .81$; NA during homeschooling $\alpha = .78$; PA before homeschooling $\alpha = .77$; NA before homeschooling $\alpha = .81$.</p> <p>Reliability for parent sample: PA during homeschooling $\alpha = .79$; NA during homeschooling $\alpha = .81$; PA before homeschooling $\alpha = .75$; NA before homeschooling $\alpha = .73$.</p> <p>Reliability for teacher sample: PA during homeschooling $\alpha = .76$; NA during homeschooling $\alpha = .65$; PA before homeschooling $\alpha = .80$; NA before homeschooling $\alpha = .73$.</p>

Table 2: Sociodemographic information on the student, parent, and teacher quantitative samples.

Sample	Sample Size	Gender	Age	Teaching Experience
Students	$n = 150$	57 male 97 female 1 missing	$M = 15.27$ years	-
Parents	$n = 247$	22 male 223 female 2 missing	$M = 42.70$ years	-
Teachers	$n = 124$	27 male 97 female	$M = 38.02$ years	$M = 10.81$ years

Figure 1: Student perspective on the implementation of homeschooling.

With relation to students' positive and negative activation, t-tests analyses at the level of the scale values indicated no significant differences between the situation prior to homeschooling or during homeschooling with regards to students' NA, ($t(123) = -1.13$, n.s.), however, their PA before homeschooling ($M = 3.44$; $SD = 1.07$) and during homeschooling ($M = 3.04$; $SD = 1.08$) decreased significantly, ($t(129) = 2.56$, $p < .05$). Thus, it can be assumed that students' well-being (both PA and NA) was not affected by homeschooling. However, when examining students' PA and NA on the item level, some significant differences were revealed (see figure 3). Overall, students reported feeling listless, bored, and more worried. However, they also indicated feeling more energetic and awake in homeschooling than in normal face-to-face school instruction. Results from the qualitative data provide further

understanding for these results. For example, Student B values the flexibility that homeschooling brought:

"I liked homeschooling better than working in school because the tasks were sent to us via email and we could structure our schedule individually. So I got up at 8 am, had breakfast, relaxed and around 9:30 am, I started to work until 3 or 4 pm. Thereafter, I could do whatever I wanted."

Besides the freedom of structuring the day according to the individual's needs, student B also recognizes that in homeschooling, there seems to be a lot of free time. When examining parents' perspectives, their interview responses confirm what students commented on their daily homeschooling schedules:

"[The schedule] starts at 9:30. I wake up the kids. Then, they have breakfast and then they smoothly start to work." (Parent A)

Figure 2: Student perceptions of inclusive practices.

3.2 Parents' perspective

The parent quantitative sample consisted of 247 persons (90.28% female) with a mean age of 47.70 years, while the qualitative parent sample was composed of 17 parents. Descriptive results indicate that parents consider that their children spend approximately 4 hours a day on their home-based instruction ($M = 4.05$; $SD = 2.81$). Parents reported that the technical equipment that their children have at home is adequate to carry out homeschooling. However, they highlighted that within the current homeschooling situation, equal opportunities for all students are not being guaranteed. As shown in figure 4, parents discuss that teachers do not take into account their students' home situation, and thus, do not assist students who are not supported adequately at home or who come from lower-income households that may not count with the appropriate technical and digital resources for homeschooling.

Additionally, in the parents' view, teachers are not addressing the learning demands of special education needs students. When examining figure 5, it can be observed that the vast majority of the parents hardly perceive that teachers make use of inclusive practices during homeschooling. Nonetheless, it appears that if teachers do in fact implement some type of inclusive practice, it is most likely to be in the form of open education:

"No, everyone gets the same tasks. The only difference is that in the maths book – that is a book for comprehensive schools – there are orange and green tasks, easier and difficult, and it is on the kids to choose six of them. I insist that she chooses the difficult ones, as I did it in classroom schooling. The other subjects do not differentiate at all." (Parent B)

Furthermore, this parent states that teachers only differentiate their instruction during homeschooling for the school subject of mathematics. However, this is

Figure 3: Student perspective: positive and negative activation. Note: * $p < .05$; ** $p < .01$.

Figure 4: Parent perspective on the implementation of homeschooling.

because the mathematics textbook is the only one that offers differentiated tasks. Another parent confirms this report:

“I hoped that there is more differentiation. Every teacher promised to differentiate his or her instruction. Now, there is only differentiated instruction in mathematics. In other subjects, there is no differentiation at all. I do not know, whether they differentiate in classroom schooling. Maybe, they [the teachers] do not differentiate their instruction and are just saying so. I have no idea!” (Parent C)

This parent clearly points out that teachers assured that they would provide differentiated instruction; yet, they did not differentiate their instruction during homeschooling. Consequently, this parent doubts whether any

differentiation might also occur at all in normal classroom schooling. Thus, this statement indicates that parents are far more involved in their children's school issues during homeschooling, compared to classroom schooling.

With respect to parents' positive and negative affective activation, the paired sampled t-tests at both scale and item level indicated significant differences before and during homeschooling. Of note is that when comparing parents' PA before homeschooling ($M = 4.07$; $SD = .84$) and during homeschooling ($M = 3.18$; $SD = 1.02$), t-tests indicate that the values drastically decreased, ($t(244) = 9.57$, $p < .01$), whereas their negative activation before homeschooling ($M = 3.07$; $SD = .91$) and during homeschooling ($M = 4.04$; $SD = 1.15$) significantly increased, ($t(245) = -9.21$, $p < .01$). In detail, as shown in figure 6, item-level analyses reveal

Figure 5: Parent perceptions of inclusive practices.

that during homeschooling, parents are feeling far less energetic, more stressed, tired, angry, listless, nervous, bored, and quite worried in comparison to normal school-based instruction.

For instance, this parent explains how she was feeling when she heard that the schools would be closed:

“Oh my god! I thought we just would have yelling at home. Just arguments, because normally, I am very bad in explaining things, because they [the kids] do not even try to follow my explanations, because they differ from their teachers’ explanations. Therefore, we started on that Monday [when the schools were closed] with a family meeting on how we wanted to manage the situation. From then on, everybody follows the rules.” (Parent D)

This parent points at the difficulties parents face when they take the role of the teacher, and further states the consequences in such situations: arguments inherently lead to stress, which explains the results of the increasing negative activation during homeschooling. Another

parent also struggles with giving explanations to the child and indicates the main challenges for parents that have to teach their children:

“I realize my boundaries, when I try to explain new issues and she has a thinking barrier and I do not understand where her thinking mistake is. In that moment, I realize the lack of pedagogical knowledge. I notice that she struggles, but I do not see what it is that she does not understand. [...] The biggest challenge for the child is to stay focused, to keep the motivation”. (Parent E)

It is not only stressful for parents to explain new topics to their children, but also to motivate them to keep working to their school tasks as well as to be willing to learn. Homeschooling led parents to experience more stress, because to not only were they forced to take over the role of a teachers, but also, the everyday teaching responsibilities and tasks that naturally comes with a broad range of challenges. The inexperience of actual

Figure 6: Parent perspective: positive and negative activation. Note: * $p < .05$; ** $p < .01$.

teaching, the lack of pedagogical content knowledge, as well as the unfamiliarity of didactics together with the need to balance a family and household under a crisis situation can only result in parents experiencing more negative affective activation.

3.3 Teachers' perspective

The teacher quantitative sample consisted of 124 persons (78.2% female) with a mean age of 38.02 years and a mean teaching experience of 10.81 years, while the qualitative teacher sample was composed of 19 parents. Overall, descriptive results reveal that although teachers consider their students' private home situation, they do not believe that they can guarantee equal opportunities for all students. However, as seen from figure 7, during homeschooling they do try to support students from lower-income homes, whereas they do not address special education needs students. In relation to inclusive education during homeschooling, teachers tend to differentiate mainly their instruction by means of tiered assignments (figure 8). Other inclusive practices such as student groups, tutoring systems, staggered learning aids, and mastery learning are rarely implemented. Moreover, teachers reported that tiered assignments and open education require higher levels of lesson planning (figure 9).

Finally, with regard to teachers' positive and negative affective activation (Schallberger, 2005), the paired sampled t-tests at both scale and item level indicated significant differences before and during homeschooling (see figure 10). When comparing teachers' PA before homeschooling ($M = 4.16$; $SD = .83$) and during homeschooling ($M = 3.63$; $SD = .94$), teachers' PA appeared

to decrease, ($t(120) = 4.982$, $p < .01$), while their negative activation before homeschooling ($M = 3.21$; $SD = .86$) and during homeschooling ($M = 3.60$; $SD = .96$) significantly increases, ($t(119) = -3.48$, $p < .01$). In particular, teachers reported to feel more angry and nervous, as well as bored and worried during homeschooling than in normal school instruction (see figure 10).

In fact, some teachers stated that they missed their students during homeschooling. Additionally, they also reported that in the beginning of the school lockdown, they consider this issue as an extremely difficult situation. Overall, it appears that teachers also struggled from the lack of contact with their students.

"You get used to it. In the beginning, it was a hard changeover. I missed my students. I still miss them. I am really looking forward to next Monday, when I see three of my learning groups again." (Teacher A)

Finally, Teacher B further reports that there was less contact and feedback given to the students. This indicated that during homeschooling, teachers tend to make more use of asynchrony teaching formats.

"I did not provide individual feedback frequently. I called some students or wrote an email when they had specific questions or problems. However, not many made use of that. I have some corrections here, which I will hand out next week in school. But I did not scan and send the corrections to them." (Teacher B)

4 Discussion

The present brief report had the primary goal to introduce the SCHELLE project and its key findings. Given that, the

Figure 7: Teacher perspective on the implementation of homeschooling.

Figure 8: Teacher perceptions of inclusive practices.

Figure 9: Teacher perceptions of the effort invested to plan and implement inclusive practices during homeschooling.

Figure 10: Teacher perspective: positive and negative activation. Note: *p < .05; **p < .01.

SCHELLE project followed a mixed methods concurrent single-phase design, the qualitative data collected across Germany allowed identifying critical issues surrounding the homeschooling situation. The qualitative data collected then helped to corroborate and provide in-depth understanding of the quantitative evidence. After presenting each perspectives' key findings, the present section will attempt to bring each of these independent sample results together.

Quantitative and qualitative data indicates that students' responses concerning the time they spent each day on home-based instruction was also corroborated by the parent sample. Both samples reported that, on average, students spent around 4 hours a day on school tasks and assignments. Overall, this amount of time is significantly less than the normal face-to-face school instruction. This raises the question of whether homeschooling brings potential disadvantages to students learning and development, in particular, for students that are either about to graduate or will graduate in the coming school year. Another question that can be raised from this result is whether actual meaningful learning experiences and processes are taking place during these 4 hours. The issue is not about the quantity of learning, but rather on the quality of the learning experience.

In relation to inclusive practices during homeschooling, students, parents, and teachers responses indicate that hardly any differentiation was implemented to address not only special education needs students, but all learners' needs. This inherently leads to both parents and teachers conclusions that educational equality during this critical situation could not be guaranteed. These results go in line with discussions from van Ackeren, Endberg, and Locker-Grütjen (2020), which argue that the COVID-19 crisis has aggravated existing social inequality. Thus, it is of extreme urgency that the issue of providing educational equality becomes a focus point for further home-based and school-based instruction.

An additional important finding obtained from this project is that approximately the 50% of students reported wanting more support and feedback from their teachers. On the other hand, teachers as well expressed that there was little contact to their students. This indicates that there is also a need to implement more use of synchrony teaching elements where the contact between teachers and students is continuous. For instance, teachers can offer specific and/or flexible schedules for online consultation hours in which students can approach teachers for questions or issues. Furthermore, this finding points out at the need to establish new channels of communication with teachers, where not only emails are employed, but

also videoconferences that provide a more personal and approachable connection between teachers and students.

To finalize, a main finding from the project relates to the well-being of the three participating samples. Even though students' negative activation did not significantly differ before and during homeschooling, students' positive activation did indeed lower. Additionally, differences at the item level indicate that students on the one hand are more energetic during homeschooling because there is no daily pressure in form of grading or waking up quite early. However, on the other hand they are listless and bored. This reveals that some facets of their daily school routine are lacking during homeschooling, such as social contacts with classmates or teachers, as well as curiosity about new topics, projects or interaction within the school community. Even more critical is the significant increase of negative activation in both, the parent and the teacher sample. Overall, the negative valence dimensions such as nervousness, anger, and worriedness characterize the two samples' experiences during homeschooling. In particular, parents were drastically affected by the need to take over the role of teachers. As discussed by Devercelli (2020), the COVID-19 pandemic has placed parents as the main responders for children's learning, which naturally gives them the new role of teachers (Bozkurt et al., 2020). However, although this dual role of parents and teachers, the situation has also offered the opportunity for parents to develop closer bonds with their children (Ndhine, 2020). In relation to teachers' nervousness, the increase of negative activation could be derived from the uncertainty of the situation and the lack of preparedness to face the challenges brought by the school closure.

The present project is not without limitations. Given that both the quantitative and qualitative study uses participants self-reports, such responses can inherently be sensitive to overestimation, underestimation, or socially desired answers. Furthermore, this project has three independent samples that do not hold a relationship among each other (e.g. family membership). Further research should attempt to explore each of the three perspectives directly related to one another.

The main findings of the SCHELLE project show how profound the effects of homeschooling have influenced various areas such as the educational (e.g. didactical, methodological domains), social and psychological factors, and matters of inclusion and equality in the educational field. Because of the multiple effects of homeschooling and school closure has had in a wide range of fields, this brief report highlights the necessity and urgency for research. The full impact of homeschooling is still not fully examined.

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