

Analyzing Dimensions and Quality of Teaching-Learning Interactions by Elementary Teachers during the Covid-19 Pandemic

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Purpose: the aim of the present study was to investigate the dimensions and quality of teaching-learning interactions by elementary teachers during the Covid-19 pandemic.

Methodology: this was a qualitative study carried out using a phenomenological approach. The study population included all elementary school teachers in Abhar City (Iran). From this population, 12 individuals were selected as participants in the study using purposive sampling (chain sampling) who were engaged in online teaching from the onset of the Covid-19 pandemic. Data collection instrument included semi-structured or in-depth interviews performed in the Google meet interactive platform. The interviews continued until reaching data saturation. Data analysis was also carried out using thematic analysis and theme network formation. Validity was also assessed using peer review and member checking and reliability was assessed by text coding of three interviews by anonymous people outside the research.

Findings: the results reflect the dimensions and quality of teaching/learning interactions by elementary teachers during the Covid-19 pandemic in the form of 226 basic themes, 21 organizing themes and 4 global themes.

Conclusion: the results showed that elementary teachers had relatively acceptable interactions with themselves, students and parents during this process. However, there were no acceptable interactions between teachers and their colleagues.

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1. Introduction

Since November 2019, the world has been facing a crisis called Covid-19, which has created an emergency for different countries, especially for their education system. Covid-19 Pandemic has disrupted the education systems of most countries. Social distancing, the school closure or the reduction in the frequency of face-to-face teaching, and the expansion of online teaching have posed challenges for teachers. One of these challenges is elementary teachers' dimensions and quality of teaching-learning interactions during the Covid-19 pandemic.

School is a situation in which the students receive supports to achieve effective and meaningful learning (Baker, Grant & Morlock, 2008). Teachers are one of the main sources of support for students, especially students who face challenges under such an important situation (Capp et al., 2016). According to Bronfenbrenner's ecological approach, growth is the result of dynamic processes derived from multifaceted interactions between the individual and the context in which he or she lives (Shelton, 2018). The interaction as a two-way relationship is an important component of a learning experience (Diehl, 2013; Vygotsky, 1978). One of the important problems associated with online teaching is the feeling of isolation among students and their distance from the teacher, school, and classmates (Johnson & Jahnson, 2008). So teachers, as the main element of the teaching process should be able to prepare the appropriate conditions for effective interactions with students, parents and colleagues through their personal and professional development, as well as through adjusting their self-awareness, self-assessment, self-management, and self-direction (Moraru & Cristea, 2013; Postholm, 2012; Spratt, 2019). Considering the gap in the social relations between teaching and learning partners and also the importance of compensating for this shortcoming during the Covid-19 pandemic, addressing the dimensions and quality of online teaching interactions becomes more important than ever.

Teacher-student online interactions are especially important during Covid-19. In this regard, Huang et al., (2020) concluded that teachers should identify different needs and characteristics of students by designing different programs to better interact with students during online teaching. The form of content presentation and teaching has a significant effect on the quality of teacher-student interaction. In this regard, the results of a study show that when the contents are taught and presented via live online teaching, it is much better than when the pre-prepared content is sent to the students (Yao, Rao, Jiang & Xiong, 2020). When teacher-student interactions are healthy and supportive, Classroom and school climate will be productive (Den Brok-Brekelmans & Wubbeles, 2004; Henderson, Fisher & Fraser, 2000).

Teacher-parent interactions are another variable affecting the quality of teaching and learning. To strengthen teacher-parent teamwork, families need to clearly know about educational rules, and their concerns should be understood and eliminated in some cases, such as comparing their children with other classmates and obtaining a vague outline of the academic and behavioral status of their children from teachers (Banerjee & Duflo, 2006; Islam, 2019; Li et al., 2019; Kremer, Brannen & Glennerster, 2013). In another study, Soltero-Gonzalez & Gillanders (2021) concluded that illiterate or low-income parents have many problems interacting with teachers, and this requires more understanding and support from teachers and the school authorities. Teachers and parents can monitor the quality of interactions in the classroom and at home and facilitate mutual responsibility and respect through their beneficial interactions (Mbiti, 2016).

Teacher-teacher interaction can play an important role to improve their professional development and students' learning status. Communication, cooperation, collaboration, creativity, and convergence of teachers are among other important elements of online teaching in social networks (Friedman, 2013). When teachers collaborate with each other and agree to actively participate in their classroom and discuss each other's teaching methods and strategies, students' academic success and job satisfaction will increase (Thompson, 2007). Some studies have concluded that not only did high-ranking school administrators and school executives provided no adequate support to teachers during the Covid-19 pandemic, but also they didn't receive not satisfactory support from their colleagues as expected (Yao, Rao, Jiang & Xiong, 2020).

In addition to teacher-student, teacher-parent, and teacher-teacher interactions, teacher-self interaction is also important. Teacher-self interaction refers to the teacher's self-knowledge and self-awareness (Gomez &

Ladhuk, 2017; Milner, 2003). Teacher's self-knowledge, self-reflection, self-direction, self-assessment, and self-learning are among the key factors in achieving an effective teaching. In this regard, in a study titled "Teacher self-knowledge and its role in professional development", Moraru & Cristea (2013) emphasized that the development of students and their care, ideation, recognizing the teaching limitations and strengths as well as effective communication with students and parents require the teacher to have deep self-knowledge and be able to interact with her/himself. These researchers point out that teacher self-knowledge requires self-exploration, self-definition, and self-assessment. Besides, the foregoing, self-direction is very important, especially in online teaching. Teachers who have self-direction power control different situations, explore different strategies under different situations, facilitate collaborative learning, create a positive learning atmosphere, and provide appropriate feedback to their students (Buchs, Filippou, Pulfrey & Volpé, 2017). Also König, Jager-Biela & Glutsch (2020) emphasized increasing teachers' technological power and thus updating them during online teaching.

After reflecting on previous studies on learning and teaching interactions, it can be inferred that each of these studies has mainly focused on a specific dimension of teacher interactions and has not addressed or paid very little attention to other dimensions. Besides, regarding the special Covid-19-related conditions, existing studies have not yet sufficiently reflected the subtleties and complexities of teacher interactions, especially in education systems with little online teaching experience. The added value of present study is to comprehensively address all the dimensions and complexities of teaching-learning interactions by elementary teachers during Covid-19 pandemic. The Covid-19 pandemic and the shift from face-to-face to online teaching have created special conditions in the education system of many countries in which the dimensions and quality of teacher interactions have changed. For example, in addition to students' academic achievement, teachers need to focus more carefully on the risk of reduced social relationships, Internet harm, psychological challenges, and other issues. It is very difficult to match teaching and learning in the elementary school to the current emergency situation caused by Covid-19 outbreak, especially in situations without proper infrastructure, and requires special interactions of teachers with themselves, students, parents, and colleagues. Teachers, as the main element of online teaching and learning under the current critical situation, can prove appropriate conditions to ensure effective interactions with parents, colleagues and students via self-interaction and their personal and professional development. According to the foregoing, an attempt was made in the present study to analyze the dimensions and quality of teaching-learning interactions by elementary teachers in the city of Abhar (Iran) during the Covid-19 pandemic via in-depth interviews. In this regard, the following questions were asked:

1. How did elementary school teachers interact with themselves during Covid-19 pandemic online teaching and learning process?
2. How did elementary school teachers interact with their colleagues during Covid-19 pandemic online teaching and learning process?
3. How did elementary school teachers interact with their students during Covid-19 pandemic online teaching and learning process?
4. How did elementary school teachers interact with parents of students during Covid-19 pandemic online teaching and learning process?

The present study identified opportunities and limitations of teaching-learning interactions by elementary teachers during Covid-19 pandemic from different aspects and paved the way for improvement of this process if the current emergency situation persists, or similar conditions are created for administrators. In Figure 1, the basic conceptual model of the research is presented based on what is proposed in the Introduction and Problem Statement Sections.

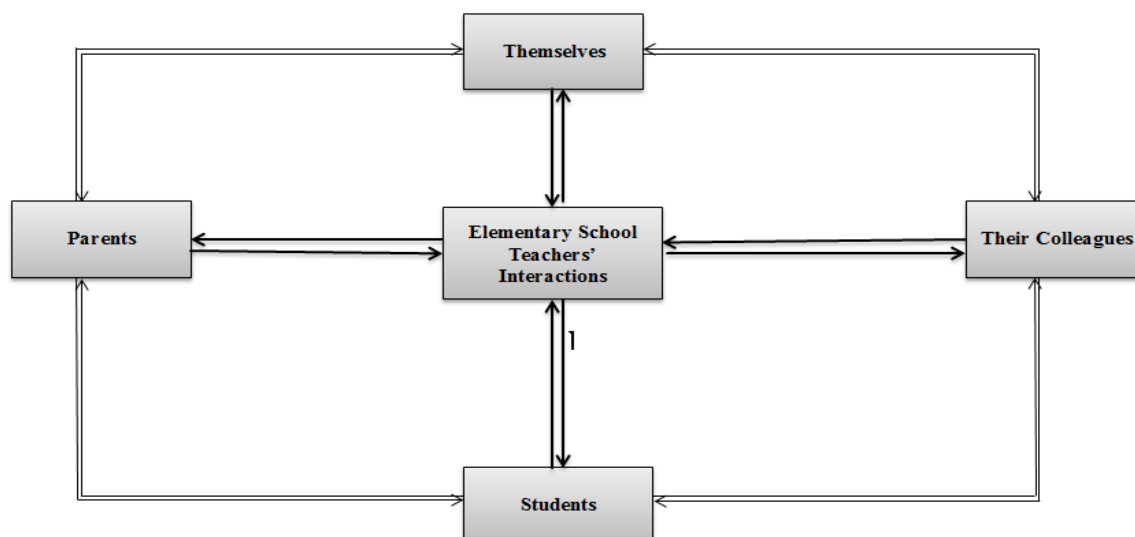


Figure 1: Basic conceptual model: Teacher interactions during Covid-19 pandemic teaching and learning process

2. Methodology

The present qualitative study was carried out using a phenomenological strategy. Semi-structured (in-depth) interviews were used to collect data. The study population included all elementary school teachers in Abhar city (Iran) during 2020-2021 academic year, of whom 12 teachers were selected as informants by purposeful sampling method. The average interview time was about 90 minutes, and the interview process continued until reaching data saturation. The interviews were conducted on Google Meet after making the necessary arrangements and were recorded after obtaining interviewees' permission. Data analysis was carried out using thematic analysis. To perform validity assessment, peer review and member checking methods were used. To perform the peer review method, contacts were made with some individuals with sufficient experience and expertise in qualitative research methods, and their opinions on research design, data collection, and analysis was obtained. Regarding the member checking method, the interview text was coded, and interview analysis results were provided to several of the interviewees to revise them and comment on them. Most of the interviewees expressed satisfaction with the research process. To evaluate the research reliability, the interview text was coded by three anonymous individuals. The result showed 85% agreement between the coders and the relative stability of the responses was confirmed.

3. Findings

The first research question: How did elementary school teachers interact with themselves during the Covid-19 pandemic teaching and learning process?

To answer this question, 150 initial codes were extracted from the answers of elementary teachers, including duplicate codes, and these codes were converted into 91 basic themes, 6 organizing themes, and 1 global theme. Details of each of these themes are given in Table 1.

Table 1. Basic, organizing, and global themes of the first research question

Global theme	Organizing themes	Basic themes
Teacher self-interactions	Self-improvement	Using online network groups, channels, and pages; Use of TV educational programs; Reviewing the recorded teaching; Participating in content production workshops; Participating in

	training workshops and free-discussion workshops; Reviewing teacher's guide for all textbooks; Reviewing lesson plans; Reviewing educational books for strengthening student learning; Filming and reviewing your teaching; net surfing; Consultation with family members; Membership in educational channels; Take notes of class events and review them; Producing educational handicrafts; Reviewing the lesson plan of the top national teachers; Reviewing the successful teacher lesson plan; Using educational software; Using the learning resources available on Shad Platform; Use related educational publications
self-updating	Informal learning; Using parents' capacity ;Engaging with technology; Study of comparative articles; Using cyberspace capacities; Using the creative experiences of colleagues; Utilizing individual creativity in online teaching; Search for up-to-date content on the Internet; Reading books, articles, and other electronic resources; the negative role of multiple secondary designs in self-improvement; the negative role of strict and unnecessary visits and evaluations during self-improvement.
Self-direction	Effective use of technology; creating a positive attitude towards online teaching; Increasing individual effort and perseverance; Double responsibility; Interest in profession and students; Using personal methods of self-motivation (such as music, walking, family, poem reading); Increasing morale for effective student learning; the positive impact of school and parent appreciation; Creating a sense of hope and efficiency in yourself.
Self-assessment	Reviewing your strengths and weaknesses, Reviewing your teaching videos, Assessing how you talk and correspond with students and parents, Assessing the usefulness of assignments, Assessing the quality and quantity of class questions, Reflecting on your lesson plan, Reviewing the archive of exchanged materials in the class group, Taking notes of class events and review them, Reflecting on classroom performance, Reflecting on the impact of educational tools and media used
Self-learning	Improving technology skills through online resources, using available instructional videos, using related software and applications, reading teacher guides, participating in some online meetings and workshops, producing electronic content inspired by available models.

Self-reflection	Reflection on: Students' expectations, How to motivate students, Identify effective teaching methods, Provide appropriate teaching tools, Determine appropriate learning tasks, Effective communication methods, Provide complementary educational content, Prepare lesson plans, Predict students' problems in online teaching (internet disconnection, disciplinary problems, parental expectations), Planning the design of motivational competitions, Using methods to ensure involvement and active participation of students, Time management, Individual differences of students, Creating fun and vitality in the classroom
Self-reflection before teaching	Reflection on: Quality of students' learning, Possible changes in teaching methods, Quality of student assessment process, Time management, Effective and participatory class management, Unforeseen events in the classroom, Continuity of class attractiveness, Taking notes of important class events, Providing feedback during learning, Knowing how to deal with inactive students, Knowing about the goal achievement process, Increasing the quality of communication with students and parents during the teaching process
Self-reflection during teaching	Reflection on: Communication problems with students and parents, Teaching problems, Classroom management problems, Assessment problems, Students' learning problems, Students' inactive participation, Students' emotional problems, Parents' facing problems to cooperate with their children, feedback problems in class, parents' reactions.

The contents of Basic and Organizing Themes Section (Table 1) show the relatively good online teaching interaction during the Covid-19 pandemic. Regarding the first organizing theme, i.e., self-improvement, interviewee No. 7 said: "I am very careful and attentive at my workplace, and I want to promote my professional status by being highly responsible at all times ...". I did always search in Google. However, I did not take notes. Many things were going via my mind, and I plan my work mostly mentally." Regarding the second organizing theme, i.e., self-improvement, interviewee No.9 said: "Online teaching is not comparable to face-to-face teaching, and I could not forget about it at all and become unfamiliar with technology. I did my best to know about it and then updated my knowledge, even though the cumbersome rules of the education department, like numerous and mostly useless directives, prevented me from doing so". Regarding the third organizing theme, i.e., self-direction, the interviewee No. 4 replied: "Oh! The mischievous boys. I had a poor relationship with boys and became even worse in online teaching. I even took soothing pills. But, little by little, I was able to boost my morale and adjust the situation with the support of my husband and my own efforts, i.e. motivating activities such as exercise and listening to music". Interviewee No. 10 said about the fourth organizing theme, i.e. self-assessment: "I was so involved in online teaching that even while cooking, I was reviewing the currents and events of my class, and became aware of some of my problems,

and decided, for example, to change the way I teach or assess". The interviewee No. 12 responded to the fifth organizing theme, i.e. self-learning, as follows: "I used to seek for a solution when I had a problem and solve it by continuously studying online resources and using online workshops. For example, one of my students stuttered, and I did not know much about how to deal with such students. I was able to solve his problem and increase his self-confidence and learning to some extent through extensive self-studying". There were many similar answers to the sixth organizing theme, i.e., self-reflection before, during and after teaching. For example, the interviewee No. 6 said about this theme: "Before the online class, I thought to myself, can I attract the participation of my students, will my class activities attract their attention? What should I do if new conditions arise during teaching, for example, the internet is disconnected during teaching on Shad¹ software platform? "After teaching, I almost always thought about classroom events and the direct and indirect reactions and feedback of my students and their parents to identify my teaching and my students' learning problems".

The second research question: How did the elementary school teachers interact with their colleagues during Covid-19 pandemic teaching and learning process?

To answer this question, a total of 110 initial codes were extracted from the teachers' answers, including duplicate codes. These codes were then converted into 27 basic themes, 4 organizing themes, and 1 global theme. Details of each of these themes are given in Table 2.

Table 2. Basic, organizing and global themes to answer the second research question

Global theme	Organizing themes	Basic themes
Teacher-teacher interaction	Professional dialogue	Insufficient trust in colleagues, lack of effective communication culture among colleagues, having negative assumptions about colleagues, the thought it is unnecessary to talk to school colleagues, having no belief in the effectiveness of talking to colleagues, discussing sub-topics instead of main ones, fear from expressing teaching problems to a colleague, insufficient communication with teachers in other schools, having no dialogue with teachers teaching the same grade about student issues, lack of effective dialogue with the principal and vice principal, showing conservatism while communicating to colleagues.
	Exchange of classroom experiences	Lack of trust in each other for effective exchange of experiences, one-way transfer of experiences, fear of competing with a colleague, exchange of experience only with close colleagues, fear of seeing mistakes in personal experiences, lack of exchange of experiences due to high workload
	Participation in the development of a joint lesson plan	Lack of academic communication with colleagues, lack of motivation to work with colleagues, prevailing individual work culture among colleagues, involvement in compulsory individual plans from the education department, lack of personal interest, feeling no need to participate, lack of request for a partner, absence of a partner teaching the same grade

¹ Platform used in Iran for virtual teaching

Participatory learning opportunities	Attending a group of extracurricular colleagues, attending online elementary school groups at province and national levels, participating in some online meetings and workshops
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The contents of Basic and Organizing Topics Section (Table 2) indicate that teachers do not interact and cooperate with their colleagues due to mutual distrust and the lack of a proper cooperation and participation culture among colleagues during the Covid-19 pandemic. In this regard, regarding the first organizing theme, i.e., professional dialogue, interviewee No.1 said: "In our workplace, and of course, I know in other situations, there is no dialogue and cooperation culture between teachers and they wait to find each other's mistakes and highlight each other's weaknesses. There is usually a negative competition atmosphere among colleagues and they are jealous of each other. Interviewee No. 2 also said: "... I feel I know a lot more than my colleagues and I do not need to cooperate with them or share my experience". Regarding the second organizing theme, i.e., participatory learning opportunities, the interviewee No. 6 said: "In fact, the only participatory opportunity for us as teachers was the same extracurricular same-grade teacher group where few members were usually active. When we became a member of the same grade teachers in online teaching, we did not see much participation. Moreover, experiences were transferred by educational group leaders or one or two active members in most cases. However, there was a program called lesson study, but instead of creating a culture of inclusive collaborative learning among teachers, it was a held just as a formality and a tool for some teachers to earn privileges". Regarding the third organizing theme, the exchange of classroom experiences, the interviewee No.10 answered: "I had no participation and transfer of experience with my colleague because there was no culture of dialogue among us and there was a cold atmosphere among us. I think most colleges are afraid of being judged and do not have enough enthusiasm and motivation. You know what, teachers do not seem to trust each other at all". Regarding participation in the development of a joint lesson plan, the fourth organizing theme, interviewee No.11 said: "Everyone was busy with himself and his/her class, and we were not in the mood to do these things anymore. Honestly, we had no opportunity to write a lesson plan together at all, we somehow did not even think about it at all".

The third research question 3: How did elementary school teachers interact with students during the Covid-19 pandemic teaching and learning process?

To answer this question, a total of 140 initial codes were extracted from the teachers' answers, including duplicate codes, and these codes were then converted into 62 basic themes, 7 organizing themes, and 1 global theme. Details of each of these themes are presented in Table (3).

Table 3. Basic, organizing and global themes to answer the third research question

Global theme	Organizing themes	Basic themes
Teacher-student interaction	Designing participatory learning activities	Using the teacher's assistant, students' participation in designing class assignments, students' participation in designing class questions, students' participation in giving feedback to classmates, students' participation in doing part of the teaching practice

Promoting participatory learning	Reminding the importance of participatory learning, establishing live communication instead of presenting recorded files, paying attention to the opinions of all students, eliminating the fear of making mistakes in the group, student grouping, emphasizing group responsibility, following up the reasons for non-participation, emphasizing group self-confidence, use of participatory teaching methods, use of participatory assessment methods, warm and flexible communication with students, simplification of class participation rules, personal chat or dialogue with students, reminding students of their non-participation, making classroom learning an enjoyable experience, giving on-time feedback, resolving misunderstandings, creating healthy competition, paying attention to the activities of all students, sharing student activities in the group
Good understanding of student's character	Paying attention to students' abilities and limitations, knowing students via their homework and activities, paying attention to the level of involvement and participation of each student, paying attention to students' positive and negative emotions, knowing students through art and composition lessons, gaining information about teachers of previous years, reviewing academic records, listening carefully to students' audio and video files, reviewing students' messages in the group, inquiring about students' interests and needs, asking parents, students' self-expression, paying attention to student profiles
Communication beyond formal teaching time	Answering students' questions during out-of-class hours, following up on homework, following up on extracurricular problems of students during out-of-class hours, supplementary aid to students in need of special assistance, giving feedback on homework that has not been checked during class time
Paying attention to students' emotional states	Holding various celebrations, performing the teaching and learning process using games, giving gifts, Paying attention to the art lesson to cultivate a sense of aesthetics, poem reading and storytelling, showing love and affection to students, helping to strengthen resilience, talking to parents to strengthen the students' morale at home, talking to students on time, showing a sense of humor, motivating students, sharing clips and music, encouraging and strengthening weak students, respecting differences, balancing the homework difficulty level, having no unnecessarily talks on coronavirus

Paying attention to students' individual differences	Attempts to determine the expectations appropriate to the level of students, double follow-up of students in need of special assistance , impossibility to identify all talents and answer their questions online, making some assignments and class questions optional , showing relative attention to student learning styles during the teaching process
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The contents of Basic and Organizing Themes Section (Table 3) show a relatively good interaction between teachers and students during Covid-19 online teaching. In this regard, regarding the first organizing theme, i.e., preparation of participatory learning activities, interviewee No. 1 said: "... In addition to my teaching assistant, other students sometimes collaborated in designing some class questions, spontaneously sending examples of learning-related activities, giving feedback to classmates' activities, and the like". Interviewee No. 4 said regarding the second organizing theme, i.e. promoting participatory learning: "Well, you see, there are a series of children who do not answer because they are afraid that their answer will be wrong and the others will make fun of them, hence, I tried to encourage such students; for example, I would say, 'Well done, for always attending the class on time. I told them that all of your opinions is valuable to me and I would like to hear it". Interviewee No. 12 said about the organizing theme of how to know students online: "Well, I usually knew them and their characteristics by reflecting on the content and the way they talked in their voice calls, their assignments or their answers to the questions, comments, drawings, and even handwriting". Regarding the fourth organizing theme, i.e., Communication beyond formal teaching time, the interviewee No. 6 said: "I practically always had my cellphone in my hand, except at bedtime, and answered the questions raised by parents and children about the lesson content and the intended activities, and so on, so that my family complained that I was all thinking about my students ". Regarding the fifth organizing theme, i.e. paying attention to emotional states, interviewee No. 11, said: "Well, I was attentive about students' likes and learning styles ... To refresh the class and alleviate my students' emotional problems, I used to prepare happy programs for them in the online group, such as birthday parties and star celebrations. For example, every week, under any pretext (school and even non-school), I would take turns announcing one of my students as the star of the class and asking the others to talk about that person's strengths. "In addition to generating energy, it boosted their self-confidence and made them more active in the classroom, and enjoyed the learning process a lot and were refreshed". Regarding the sixth organizing theme, paying attention to individual differences, interviewee No. 8 also said: "Well, it was really difficult to know all the individual differences of the students in the online class, but for example, when I saw one student could not send the question answer in an audio or video format, I would tell him to write and send the answer in text form, or instead of imposing the same homework task on the taught content for all students; for example, I would design two or three types of homework tasks with the same goal so that students should choose one of them according to their characteristics and interests."

The fourth research question: How the elementary school teachers interact with the parents of students during Covid-19 pandemic teaching and learning process?

To answer this question, 98 initial codes were extracted from the teachers' answers, including duplicate codes, and these codes were then converted into 46 basic themes, 4 organizing themes, and 1 global theme. Details of each of these themes are presented in Table 4.

Table 4. Basic, organizing and global themes to answer the fourth research question

Global theme	Organizing theme	Basic theme
Teacher-parents interaction	Collaboration and participation of teachers with parents	Joint review of students' work folder, transfer of concerns and suggestions to each other, continuous cooperation with parents during formal and informal teaching time, trusting parents as a second teacher, holding regular meetings with parents about students' issues, appreciation of parental support, being aware of the effective role of parental involvement, utilizing parental creativity in emergencies, identifying and using special parental abilities, getting help from parents about students' educational backgrounds, getting help from parents about students' needs and characteristics, some parents distrust the teacher at baseline, some parents lack time to cooperate effectively with the teacher.
	Teachers- parents dialogue	Chatting on a private page, telephone dialogue , holding face-to-face or online meetings, creating an online group with parents and discussing it, most parents are reluctant to express their children's psychological and emotional problems, the main focus of the dialogue is on academic problems, some parents have negative mindset regarding the dialogue at baseline, some parents have cultural sensitivities towards dialogue, parents who have several children have very limited opportunity to talk to them, some parents show aggression during dialogue, the negative effect of some parents' livelihood stress on the quality of dialogue, the negative effect of Covid-19-related stress on the quality of dialogue .
	Being aware of mutual expectations	Being aware of parents' expectations via: designing a survey form- phone call, correspondence on the personal page, attending face-to-face and online meetings, reviewing parental messages on the general page of the class group, inquiring from the school principal, asking the parent representative, not being aware of the expectations of some parents to prevent their interference, unclear expectations of some parents Parents' awareness of the teacher's expectations through: inferring from the teacher's words at the beginning and end of teaching, reviewing the conditions for learning activities and assignments, participating in discussion sessions with the teacher, asking questions on the teacher's personal page, asking the parent representative, Some parents show indifference towards the teacher's expectations

Explaining the new responsibility of parents	Explaining the role of mother-teacher, guiding some parents to work with technology, creating a positive attitude towards online teaching in parents, explaining the new educational system to parents due to Covid-19 pandemic, continuous pursuit of parental responsibilities, respecting responsible parents, some parents show poor responsibility due to cultural barriers, lack of attention of some parents to their new role
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According to the contents of Basic and Organizing Themes section (Table 4), there has been often relatively good interaction and cooperation between teachers and parents during Covid-19 pandemic teaching and learning, although there are fundamental limitations and barriers in some cases. Almost all teachers acknowledge that online teaching requires more parental involvement than face-to-face teaching, especially in elementary school. In this regard, some sentences of the participating teachers are important. For example, regarding the first organizing theme, teachers' participation and cooperation with parents, interviewee No.1 said: "I sometimes checked the children's work folder in the presence of their mothers and also received solutions from them on some subjects via telephone and online comments. I had face-to-face and online sessions with the parents, and I kept asking them to let me know about their child's school and non- school problems. Some of them, especially the educated ones, talked especially about school problems but were conservative and did not say anything about non- school problems, especially emotional and psychological problems. You know what, we have a lot of cultural problems. We are generally afraid to be aware of the problems and we think that our children and we will be labeled by doing so. We had a very difficult time communicating with families with low cultural and economic status, and we could not communicate with some of them." Interviewee No. 8 also stated about the third organizing theme, being aware of mutual expectations: "Sometimes I would take a survey in the online group and became aware of the parents' expectations in some way, I would find out some of their expectations by reading their comments in the group and also via face-to-face and online coordination sessions. There was a problem in this regard, that is, parents did not state their expectations clearly and I had to figure out what they were asking me to do. As for my own expectations, I asked them to figure out about my expectations by looking at the classroom teaching process, my explanations and directions of learning activities, and my explanations of classroom questions and answers". Regarding the fourth organizing theme, i.e., explaining the new responsibility of parents, interviewee No.4 said: "At the beginning of school year, I told my parents that I needed their extra support due to the students' absence. You are no longer just a mother, and your role is more important than mine and, in principle, you play the role of a mother-teacher. I even remember that I asked my students to congratulate their mothers on being a real teacher on Teacher's Day".

According to the research findings, the collected themes can be combined as shown in Figure (2) and a network of themes can be formed.

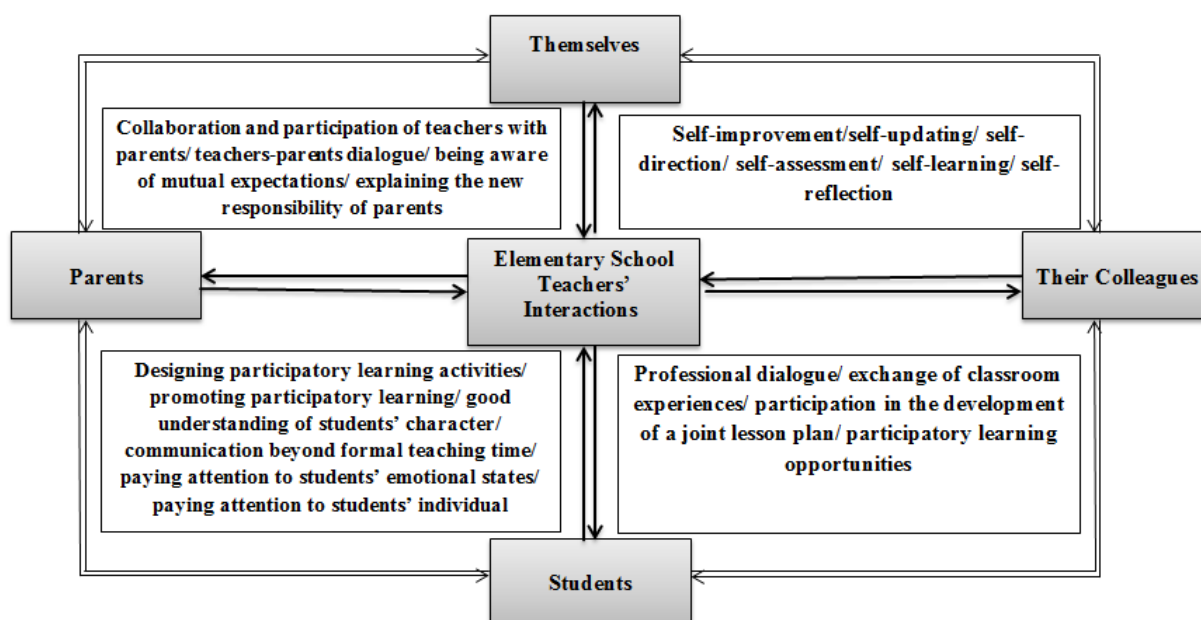


Figure 2: Formation of the theme network based on collected data

4. Conclusion

A shift in the direction of the educational system from face-to-face teaching to online teaching, especially in the current emergency situation, requires interaction and coordination between teaching and learning actors. It is very important to explore the dimensions and quality of these interactions and communication at school, especially in elementary school. In this regard, the research findings focus on four dimensions of teacher interactions: teacher-self, teacher-teacher, teacher- student, and teachers-parents interactions.

In general, the results showed that elementary teachers, despite the hardware and software limitations during the Covid-19 pandemic, finally tried to increase their interactions and communications to affect the quality of teaching and learning. Consistent with the results of a research by Huang et al., (2020), this study's findings showed that teachers were stressed due to new conditions at the beginning of online teaching and couldn't adapt to this type of teaching. They also showed resistance to accept such teaching; however, they gradually became less resistant and relatively adapted to the new conditions as they became more engaged in this type of teaching and gained more knowledge and experience. Among the four types of interaction, teacher-teacher interaction was at a poor level. In this regard, the findings obtained from the first question showed that the beginning of online teaching with the onset of Covid-19 revealed the need to teachers to become familiar with technology, update their information and skills, and apply creative methods. Most teachers acknowledged that they had very limited familiarity with teaching applications, content production, and using different online platforms during face-to-face teaching and did not feel the need to promote such knowledge. Most of them expressed confusion and upset during the first months of online teaching, but they gradually exhibited self-engagement and development in such an environment. Consistent with these findings, Huang et al., (2020) concluded that one of the tools for achieving online learning is teacher engagement and effective communication. Teachers will quickly adapt to new and critical situations and put the teaching-learning process in a better path if they are equipped with self-awareness, self-reflection, and self-learning. According to Linnenbrink & Pintrich (2002), a teacher will have a greater impact on students' academic achievement and increases their adaptability if he/she is equipped with self-assessment, self-efficacy, self-reflection, and self-improvement skills. In this regard, regarding this study's findings, most of the interviewees admitted that they spent a little time studying the learning resources during face-to-face teaching, but they came to the conclusion that they have to be up-to-dated during Covid-19 online teaching. Therefore, they tried to take

advantage of the available learning resources such as resources available on websites, online learning events such as workshops and specialized meetings, online learning channels and groups to ensure their professional development. This is consistent with the findings of a study by König, Jäger-Biela & Glutsch (2020) because he emphasized increasing teachers' technological power and thus updating them during online teaching.

The findings of the second question, teacher-teacher interactions during Covid-19 online teaching, were consistent with the findings of a study by Yao, Rao, Jiang & Xiong (2020). These researchers stated that most teachers have poor interaction with their colleagues. Most of the teachers stated that they did not believe much in the effectiveness of their colleagues in the teaching and learning process, both in face-to-face and in online teaching, believed that he had enough knowledge and skills, were afraid to share their classroom event, and had poor cooperation, which was often limited to give information about the directives of the education department and the routine school affairs. However, some teachers cooperated and exchanged classroom experiences, but their colleague (s) did not have the motivation or knowledge and skills necessary for mutual participation. Most teachers stated that there was no participatory learning culture in their schools. Consistent with the findings of Friedman (2013), the success of online and technology-based teaching is based on communication, collaboration, collaboration, creativity, and convergence between the elements involved in this teaching path. In this regard, teachers' relationship with colleagues and school support staff members is very crucial, which was unfortunately very poor in the present study. Although many teachers regarded it as a cultural issue, some of them complained about the cumbersome directives of the Department of education and the school, and believe that it is very time-consuming to respond to these directives and leave room for interaction with colleagues.

The findings obtained from the third question, i.e., teacher- student interaction during Covid-19 online teaching, showed that most of the teachers experienced some form of participatory learning activities with students and took steps to promote collaborative learning. Moreover, most teachers have gained a relatively good understanding of students and have been in contact with them much longer than the formal teaching time and have paid attention to their emotional state and individual differences more or less. To facilitate communication with students, some teachers have chosen a teacher assistant from among them, and, have sought to reduce the distance between themselves and students during the teaching process and increase class participation. Facilitating students' classroom participation increases their self-confidence and creativity during the learning process and increases the teaching process's effectiveness. In this regard, the findings of a study by Haddon and Lytton (1968) showed that using students' participation in the preparation of classroom activities, increases divergent thinking and flourishes their creativity and latent talents. This seems to be very important during the online teaching process where teachers need to use creative strategies to disseminate the participation culture among their students, and to prevent the teaching and learning process from becoming boring and thus reducing the quality of the classroom. In this regard, teachers used active and creative strategies such as strengthening their resilience and that of their students via hopeful and supportive dialogues, as well as grouping students and appointing active students as group leaders. Besides, teachers use other strategies such as establishing live communications instead of providing recorded files, performing teaching and learning processes using games, continuous monitoring and feedback on students' class activities, examining the reasons for their absence and etc. to make class participation important. According to research by Luckner & Pianta (2011), a teacher who uses active strategies to increase class participation can increase students' motivation for responsible learning. Also, according to the results of studies by Brand et al., (2008), if students' participation in the teaching and learning process encompasses cognitive, behavioral and emotional aspects, it will yield constructive outcomes such as their academic improvement, completion and achievement. Although teachers can increase students' participation during the online teaching and learning process by choosing intelligent strategies, factors such as lack of participatory culture, poor technological literacy and poor economic strength of some parents as supporters of students reduce the quality of teacher-student interaction. Besides the foregoing, the findings of the third question show that most teachers sought to interact and communicate effectively with students by recognizing them effectively and strengthening their

emotional and psychological states. In this regard, they used different methods such as checking their homework, paying attention to the tone of speech in audio files, technical quality and content of video files, self-expression in composition and art lessons, parents' comments and reviewing their academic background. These methods seem to be useful in a period when there is no or limited real face-to-face interaction. Moreover, teachers enhanced students' psychological and emotional well-being, especially during the current crisis using creative methods such as holding various celebrations such as online birthday parties for students, poem reading, storytelling, sending attractive clips and happy songs to the online student group for any occasion, no unnecessary talk about coronavirus, talking to parents to strengthen their children's morale, understanding students' concerns regarding the low Internet speed and subsequent disconnections, and the like. Finally, the third question of the research, i.e. paying attention to the individual differences of students, was the concern of most teachers more or less. In this regard, instead of assigning the same task or learning activity to all students, some teachers designed several tasks for students to choose according to their abilities and interests. Although due to the online teaching limitations, it was not possible to identify all students' talents and respond to them, teachers could identify some special needs and levels of students' abilities and learning activities and design appropriate learning activities by following classroom behaviors and communicating continuously with parents.

Regarding the last question of the research, i.e., teachers-parents interaction, elementary school students were not able to follow up teacher teaching and perform learning activities independently due to their circumstances, mainly during the online teaching. Thus, according to Vygotsky (1980), they needed a strong scaffolding and support called parents, especially mothers. The previous role, that is a mother, no longer met the needs of students and they had to play the role of mother-teacher in the new current situation. Moreover, teachers had to establish more constructive and continuous interactions and communication with parents during the current pandemic and a change in the education system. According to the findings of the fourth question of the research, although teachers had problems interacting with some parents, they participated and talked with parents and explained their new responsibilities during the online teaching more or less. Teachers stated that they communicated with parents mostly via personal chats, phone calls and forming parent-specific groups. They mostly talked to their parents about school issues and stated that most parents refuse to talk about their children's psychological, emotional and behavioral problems, attributing the reason to family culture. Parents were informed of the teacher's expectations, mainly through the teacher's class routine and sometimes by telephone and sending private texts to the teacher online. Teachers also became aware of parents' expectations through surveys, their representatives in face-to-face sessions and online groups, and case follow-ups. Some teachers stated that they used the "mother-teacher" combination to emphasize the role of parents (mothers) in online teaching and to promote their responsibility. Students were even asked to appreciate their mothers on Teacher's Day. These teachers repeatedly reminded parents that they play a more important role in online teaching throughout the school year than even one teacher. As shown in studies of Mloiti (2016), Islam (2019) and Li et al., (2019), such interactions increase the mutual teachers-parents responsibility and thus the student academic achievement.

Considering the foregoing, it should be concluded that to increase the quality of teaching and learning process and outcome, especially under the current complex situation, it will not be sufficient to only take into account the teacher- student interaction, but it is very important to pay attention to other dimensions and aspects of teachers' interaction such as teacher self-, teacher-teacher, and teacher-parents interactions. Each of these dimensions affects each other and is influenced by each other. Furthermore, the quality of teacher-self, teacher-teacher, and teacher-parents, and teacher-students can play a decisive role in the efficiency of online teaching and students' academic and non-academic achievement. Improving such interactions requires cognitive, skill-based, and most importantly, improving the perspective, attitude, and culture of teachers, students, and their parents in establishing a constructive interaction.

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