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E-learning education. Case: parents in elementary schools during the pandemic

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Abstract

Since the emergence of COVID-19, education has witnessed unprecedented transformations at different levels. Online education, which entails e-learning, has markedly affected students; however, there is a dearth of studies concerning its effect on parents. This study was conducted with the objective to determine the effect of online education on parents of primary level students with e-learning methods. This study employed descriptive and quantitative methods and is non-experimental and cross-sectional, with the participation of 162 parents of an educational institution of the primary level. The survey was conducted online on a voluntary basis and anonymously. The findings of this study revealed that the effect of online education on students is highly significant in the latter three dimensions, while the effect on the technical issues is moderate.

Keywords: e-learning, primary education, parents, COVID-19.

Introduction

One of the consequences of the COVID-19 pandemic is the imposition of telecommuting around the world (Morilla-Luchena et al., 2021), which has affected the emotional state of the majority of the global population. The primary purpose behind facilitating telework was to continue with official work and not affect the household economy. Like other working professionals, teachers had to adapt to the new style of telework. Their work in online mode involves e-teaching and e-learning, using different virtual environments to reach the student in the best way (Zamora-Antuñano et al., 2021). Also, most educational institutions were implemented with information and communication technologies (ICTs) to develop the process of teaching–learning; however, this process could be fully realized not only with the efforts of teachers but also from the parents (Ramírez-Rueda et al., 2021). Parents were either isolated at or worked from home and thus played a vital role in this process as they watched over their children's education with ICT, where parents and children broke the digital gap despite the negative effects of COVID-19 (Montenegro et al., 2020).

A group of students decided not to miss another day of school, because they have no access to internet or radio coverage because they are far from the city. So they were unleashing their teaching skills and imparting their knowledge of physics where they learned about autonomy, engagement, participation and motivation. These school children were positively affected in their learning as they saw a healthy digital competence of greater collaboration among them, which motivated the experts to share their experience with the beginners to prepare educators and families in the use of technologies to support their children. The main objective was that the school, the family, the education of the students and the whole community would move forward without

being harmed. (Manca et al., 2021). Consequently, teachers transfer responsibilities to parents so that they can face the challenge of teaching, with the sole purpose of parents ensuring the delivery of homework to their youngest children, the online learning of students managed to achieve a positive relationship between school, teacher and family, this due to the analysis and consequent effect of virtual student monitoring. (Hortigüela-Alcalá et al., 2020). However, families with difficulties, such as having a child with special abilities that were not adequately controlled, were negatively affected, which affected the whole family with depression, feeling of burden and questioning their competence to care for their child. Interventions were accompanied by psychological counseling (Etxeberria et al., 2021). The presence of COVID-19 had greatly affected millions of children, limiting several of their recreational and educational activities, confining them only to the use of technological devices. This also affected parents who experienced, for example, fatigue, loss of energy, concern over children's tiredness, and stress (Zagalaz-Sánchez et al., 2021), due to effects of technology use and direct relationship with the digital divide (Sáiz-Manzanares et al., 2021). People who lacked internet access joined a project entitled "Books that unite people" to continue their education, and family participation in accompanying their loved ones was a success. This initiative improved the quality of life of the students, once the children were very interested in reading, which caused motivation, interest, and involvement (Elboj-Saso et al., 2021).

The teacher was concerned about the performance of the students due to digital deficiencies encountered despite having been trained, generating a greater burden and emotional stress during the confinement because of COVID-19 (Portillo et al., 2020). However, the prioritization of a social welfare care system to the entire primary level community is urgent for both teachers and parents because they suffer from stress and exhaustion from the use of ICT (Pozo-Rico, 2020). Both teachers and parents are aware of the technological tools that children become familiar with due to their teaching and learning processes (Navarro et al., 2021). One of these successful methodologies, the "project-based learning" project, was applied in rural areas with the participation of parents in outdoor educational meetings and recreational activities, where the family was committed to the unconditional support of the students at the primary level. The results were innovative and highly positive (Santamaría-Cárdaba, 2020).

This research is important due to the advancement of ICT observed as a consequence of the investments in the educational sector. These technologies must be implemented inside a classroom, and currently also be inside the home of the students. Therefore, the Internet cannot be missing because it is a need of utmost importance since teachers transmit their knowledge to students through online activities, and then parents intervene in teaching their homework (Shoraevna et al., 2021). In addition, primary level students must resort to their perception, use digital skills (Romero-Tena et al., 2021), and their mathematical skills, which will help them solve calculation and computational problems (Cacha-Nunez et al.,2021). Reading comprehension is also of utmost importance for primary school students, and small changes (30%) are observed in the level of comprehension with the help of technology, according to their ages (Mohamedi-Amaruch & Rico-Martín, 2020). These differences in comprehension arise due to the personal difference of each child in understanding. Some institutions use interactive whiteboards to improve learning. In addition, technologies were observed to significantly affect teaching-learning, especially in less metacognitive children (Cadamuro et al., 2020). Many software that are fun for children and are based on content, presentation, pedagogy, usability, and functionality of the software, are used nowadays (Barbosa et al., 2021).

This study aims to contribute in a practical way to the technological tools used in schools and show how educational games can be used to obtain feedback and assess the level children, strengthening memory, logic, and concentration (Esquicha-Tejada et al., 2020). However, the greatest difficulty of teachers is still grasping the attention and interest of students, despite the technological tools available. The Escape Room software was analyzed and was perceived as motivating for students of the primary level as it strengthened and included everyone, in addition to being very easy to implement in classrooms upon their return to presential classes (Moreno-Fernández et al., 2020). With the presence of

COVID-19, teachers and students, whose teaching-learning environment had an unexpected turn, are working with digital skills (Mercader& Gairin, 2021). The quality of the psychometric properties of an assessment can measure the cognitive reactions and stimuli of technology (Sandoval-Henríquez & Badilla-Quintana, 2021). Both the e-learning methodology and other virtual environments, and the traditional and virtual teaching can be combined based on the characteristics of students at the primary level, where intrinsic motivation has a greater effect than extrinsic motivation (Pozo-Sánchez et al.,2021).

Each child faces difficulties depending on the situation, with triumphs and failures. During COVID-19 pandemic, they face larger issues and several failures leading to social and school stress for the families and coping styles of "maladaptive and adaptive" children, causing stress and anxiety in parents (Gómez-Maqueo & Monjarás Rodríguez, 2020). Studies have claimed that stress arises directly from workload, work pace, and work organization, in addition to the family burden (Valdivieso-León et al.,2020). The special relevance of the affective-motivational factor, which is directly related to the parents, is the main factor to positively or negatively affect the learning of students at the primary level, reflecting on the academic performance presented at the end of each unit of study. Therefore, intervention is needed in stressful situations for children and parents during COVID-19 pandemic to improve learning strategies and mental health (Martínez-Vicente et al.,2019).

Teachers, after having experienced e-learning education, still believe that the use of ICT in quality learning teaching is not new, given that it has been used with WhatsApp, which is used daily and frequently by parents (Contador & Esteban, 2020). The technological boom has changed people's daily lives, bringing great changes, especially in education (Saladino et al., 2020), and along with it, an increased incidence of mental health diseases among family members. Several model tests were performed for primary education teachers to understand their technological training. These tests showed that males have a greater perception of the use of ICT, and females are better at selecting approaches to apply their teaching-learning process (Ortiz-Colón et al., 2020). However, the methods involved in the new experiences in the digital environment were compared, and results showed that e-learning education has positive effects on traditional learning (López-Belmonte et al., 2020) and a negative effect on mental health. Thanks to the parenting school, it was possible to measure the parental stress index (PSI) during three months in which stress was reduced from a high to a medium level, and changes in interpersonal relationships among family members were also observed (Martins dos Santos et al., 2020).

Justification and Objectives of the Study

During COVID-19 pandemic, going out has been a stronger need. The requirement of going outside for fresh air is considered an urgent need. At home, from Monday to Friday, we observed that the classes attended by younger children are of good quality, providing a good education for the second consecutive year. Thus, symptoms of mental health and effects of parents learning technologies without proper training are also observed. The effect caused by e-learning in education is very eminent. The study has the following objectives:

- To determine the expectations of e-learning and its effects on the parents of primary level students in Peru during the COVID-19 pandemic.

- To descriptively analyze the sociodemographic characteristics.

- To analyze the effects of each dimension on parents of primary level students during the COVID-19 pandemic.

Methods

Research Design

This research has a descriptive, correlational, non-experimental and cross-sectional design (Hernández et al., 2016).

Study Sample

The study sample consisted of 162 parents of students attending an educational institution in the district of Talavera, province of Andahuaylas, Peru. Parents who were able to participate in the study are primarily responsible for monitoring and being attentive to the virtual classes that their underage children attend via

the Internet, and consist of parents of primary school (first to sixth-grade) students. A total of 77.8% of the parents are female, and 22.2% are male. Most parents (85.2%) are aged from 25 to 45 years. Due to the accessibility of the researchers, the educational institution was chosen from the seven existing primary level educational institutions in the urban area of the district of Talavera.

Measurement Instrument

The measurement instrument used in this work an adaptation of Rehna & Manoharan (2021) for the Peruvian context. The measurement instrument consists of 28 questions with the following four dimensions: technical issues (CT1: The device on which your youngest child listens to lessons crashes/shuts down; CT2: You have difficulty organizing your child's device; CT3: You are unaware of the monitoring tools your child's teacher uses; CT4: You have internet accessibility; CT5: You have network problems in the recharges you make; CT6: You are not able to find suitable online learning material for your child; and CT7: You are unfamiliar or unaware of the latest technologies that your child uses; CT8: You are not able to find suitable online learning material for your child; CT9: You are not able to find suitable online learning material for your child), Stress (E1: You have deep concerns about mental development and physical activities; E2: You are exposed to unsolicited content; E3: You believe that your child's academic performance will be lower with this type of education; E4: You believe that you miss goals due to online classes as they increased the pressure; E5: You experience role conflict. (You do not know whether to act as a parent or a teacher); E6: You believe that your privacy is being affected; and E7: You believe that this way of studying creates a financial burden for you), time management problems (PGT1: No time to care for family members; PGT2: Family schedule was affected; PGT3: No time for relaxation; PGT4: No time to care for children; PGT5: Difficulty managing children; PGT6: No time to do household chores and PGT7: Suffer from reduced sleep time), and children-related issues (CRN1: Your child has problems in character development; CRN2: A facile attitude towards the child has formed; CRN3: The child's daily routine is hindered; CRN4: Misuse of electronic devices has increased; CRN5: Complaints about teaching have increased; CRN6: Your child has had frequent health problems; and CRN7: Your child has become more anxious). Each dimension consists of seven 5-point Likert-type questions (1 is more negative and 5 is more positive).

This validation instrument achieved adequate ratings compared to its original validation. The results of the validation process in the Peruvian context (district of Talavera, province of Andahuaylas) are shown in Table 1.

Table 1 *Cronbach's Alpha Scores for Each Dimension*

	Cronbach's alpha	Cronbach's alpha based on standardized items	Reliability level
Technical issues	.690	.709	Moderate
Stress	.816	.815	High
Time management issues	.873	.873	High
Child-related issues	.841	.841	High

Several tests were performed, such as Bartlett's Sphericity test, the Kaiser-Meyer-Olkin test, and the goodness-of-fit test using the Chi-square. The Kaiser-Meyer-Olkin test was .894, indicating adequate sampling, and the Chi-square test showed a p-value of .002, which is optimal and indicates that the research can be continued.

Procedures and Data Analysis

This research was conducted in June 2021, covering one of the seven primary level

educational institutions of the district of Talavera (province of Andahuaylas). The sample was intentionally selected and followed the ethical principles of the Declaration of Helsinki. The purpose of participating in the online survey through Google Forms was explained to each parent. Permissions and consent were obtained from each parent to analyze and publish their answers.

Once enough responses were reached, we started to analyze the responses, obtaining the relevant answers that would meet the study objectives we set at the beginning of the research. The statistical analysis was performed using the SPSS 25 software. The linearity, normality, independence, residual analysis, and non-collinearity tests were performed to determine the validity of the application of the statistical model.

First, for the descriptive analysis, some statistical methods such as mean (M), standard deviation (SD), standard error (SEM), kurtosis (Kme), and skewness (Skw) were performed. Then, an exploratory factor analysis method was used.

Results

A total of 162 questionnaires were answered in the online survey. Table 2 shows the demographic information of the parents. According to the descriptive analysis results, 45.7% of the parents are between the ages of 25 and 35, followed by parents whose ages are between 36 and 45 (39.5%). Nineteen parents (11.7%) are in the 46 to 55 age group. Only five parents (3.1%) are over 56 years old. The mean age of the participants was 1.72, the variance was 0.624, and kurtosis was 0.348.

A total of 38.9% of the parents have secondary education while only 6.8% of them have postgraduate degrees (Table 3). Only 6% of the parents are dedicated to livestock, while 41.4% are housewives. That means mothers are the only ones supporting their young children when they receive online classes.

Table 2 *Representation of the Ages of the Parents*

Ages (years)	Frequency	Percentage	Valid percentage	Cumulative percentage
25–35	74	45.7	45.7	45.7
36–45	64	39.5	39.5	85.2
46–55	19	11.7	11.7	96.9
over 56	5	3.1	3.1	100.0
Total	162	100.0	100.0	

Table 3 *Parents' Education Levels*

Education level	Frequency	Percentage	Valid Percentage	Cumulative percentage
Primary	32	19.8	19.8	19.8
Secondary	63	38.9	38.9	58.7
Technical productive	19	11.7	11.7	70.4
Undergraduate	37	22.8	22.8	93.2

Postgraduate	11	6.8	6.8	100.00
Total	162	100.0	100.0	

Table 4 *Occupation of the Parents Most of Their Time, Even When Supporting Their Children During Class Hours*

Occupation	Frequency	Percentage	Valid Percentage	Cumulative percentage
Farmer	10	6.2	6.2	6.2
Housewife	67	41.4	41.4	47.5
Merchant	30	18.5	18.5	66.0
Exercises another	54	33.3	33.3	99.4
Livestock farmer	1	0.6	0.6	100.0
Total	162	100.0	100.0	

A total of 13.6% of the parents go to work, as usual. In other words, they leave their young children under the care of their mothers. In addition, 31.5% of the parents do not have a job, and therefore sometimes stay at home and sometimes they leave looking for a job. About a quarter of the parents (23.5%) leave home to work as freelancers, while 20.4% of them work from home and help their children when they attend online classes. A small percentage of the parents (11.1%) work at home, meaning that they support their children during their online classes.

Table 5 *Parents' Work Situation During the COVID-19 Pandemic*

Work situation	Frequency	Percentage	Valid Percentage	Cumulative percentage
Goes to work as usual	22	13.6	13.6	13.6
Does not have a job	51	31.5	31.5	45.1
Leaves home to work as a freelancer	38	23.5	23.5	68.5
Works from home in a remote job	33	20.4	20.4	88.9
Works at home (tradesman)	18	11.1	11.1	100.0
Total	162	100.0	100.0	

The technical issues reported with the highest mean are associated with Internet stability (score of 3.58 from 1 to 5 points), while the lowest mean concerned the tools used by the teacher to

teach their youngest child (score of 2.15 from 1 to 5 points). In the stress dimension, a mean score of 3.25 was obtained for stress because parents are concerned about the mental development and physical activities of their under-aged children. The lowest mean score refers to the exposure to unsolicited content. The highest mean obtained in reference to time management problems was 2.98 regarding the effect on the family agenda. The lowest mean was found for the question of whether a reduction of sleep time was observed. The last dimension studied concerned the issues related to the children. The highest mean of 3.15 was recorded for the increased misuse of electronic devices and the lowest mean of 2.23 concerned the incidence of frequent health problems during the times he/she had online classes.

The studies conducted with four dimensions resulted in a very high level of reliability, with a Cronbach's Alpha score of 0.921, which is higher than that of the original study (Rehna & Manoharan, 2021).

Table 6 shows the statistics of the total number of items, and the Cronbach's Alpha if the item was deleted, a result of presenting values higher than 0.916, concluding that if any item is eliminated the Cronbach's alpha will always be highly reliable.

Table 6 *Statistics of the Items and Cronbach's Alpha Scores If the Item Has Been Deleted*

	Scaling average if the element was suppressed	Scale variance if the element was suppressed	Total correlation of corrected elements	Cronbach's alpha scores if the item was deleted
CT1	73.02	369.726	.334	.921
CT2	73.39	360.053	.551	.918
CT3	73.59	365.896	.343	.921
CT4	72.16	379.440	.039	.926
CT5	73.22	359.028	.525	.919
CT6	73.35	365.869	.364	.921
CT7	73.23	370.777	.206	.924
E1	72.49	354.326	.517	.919
E2	73.77	363.274	.464	.919
E3	72.84	356.272	.508	.919
E4	72.74	351.050	.641	.917
E5	72.74	350.044	.632	.917
E6	73.44	352.062	.609	.917
E7	72.86	349.000	.584	.918
PGT1	73.01	355.739	.607	.917

PGT2	72.76	346.122	.749	.915
PGT3	72.93	361.467	.474	.919
PGT4	72.98	358.422	.507	.919
PGT5	73.04	350.992	.666	.916
PGT6	72.96	354.936	.575	.918
PGT7	73.07	346.131	.723	.915
CRN1	73.38	351.553	.688	.916
CRN2	72.82	369.477	.269	.922
CRN3	73.09	351.955	.613	.917
CRN4	72.59	350.157	.621	.917
CRN5	73.10	348.350	.693	.916
CRN6	73.51	359.183	.557	.918
CRN7	72.93	354.665	.567	.918

Figure 1 shows the results of the technical issues that parents have to deal with when their children are in class, whose highest mean is CT4 with 3.58, which means that families have access to the Internet and not in its totality only in a reasonable percentage, because the rest of the families suffer from Internet access, and the lowest mean is CT3 with 2.15, which means that parents do not know what programs their teachers use to teach their children.

Figure 1. *Histogram of the Technical Issues that Parents Face*

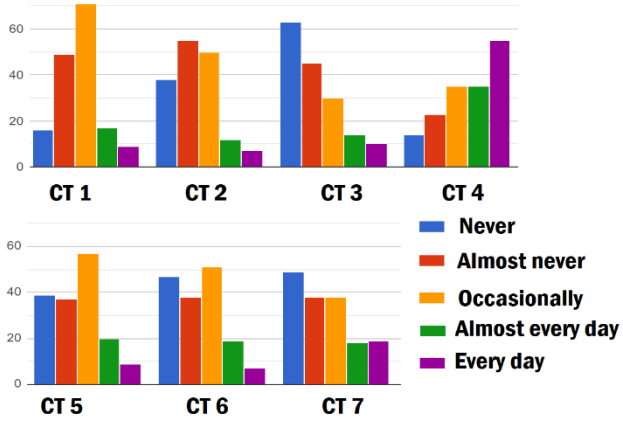


Figure 2 shows the results of stress suffered by parents when their children have academic work at home; with a high mean of E1 with 3.25, meaning that the parent has a deep concern for the mental development and physical activities of their youngest child because when it is done virtually it seems to them that they are not developing their skills as they did in person, and the lowest mean is E2 WITH 1. 97; that is to say that parents are not exposing themselves to unsolicited content because they try to be careful with these topics due to their fear and lack of security and/or lack of knowledge.

Figure 2. *Histogram of Stress among Parents*

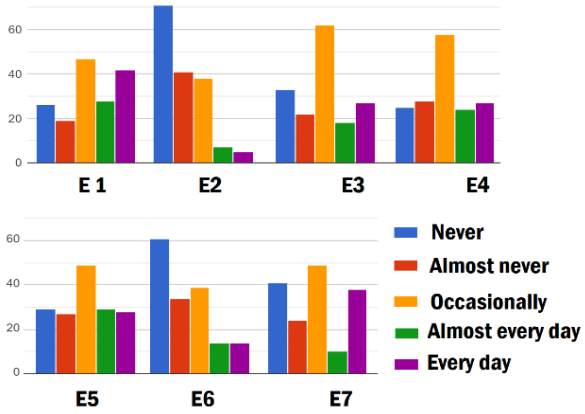


Figure 3 shows the results of time management problems that parents have to face with their family, achieving a high mean in PGT 2 with 2.98; that is to say that the family agenda was affected by the presence of Covid-19 and this point influenced parents negatively and with the lowest mean in PGT 7 with 2.66; that is to say that the parent suffers from the reduction of sleep time compared to now, since they have to deal with their children due to academic situations until late at night.

Figure 3. *Histogram of Time Management Problems of the Parents*

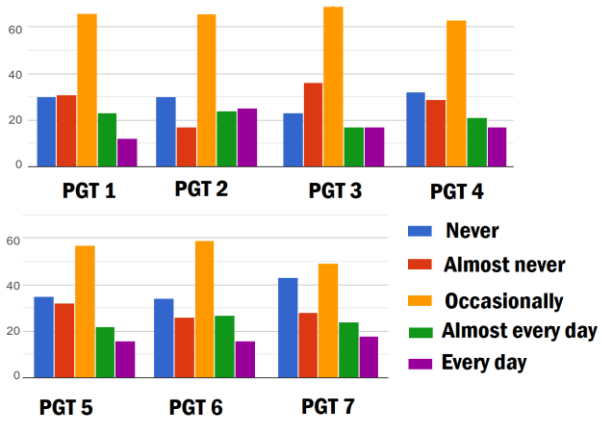
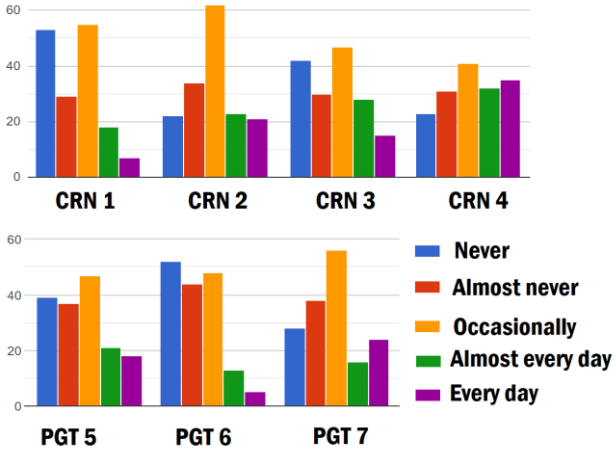


Figure 4 shows the results of the questions related to the children during their academic work, achieving a high mean in CRN 4 with 3.15; that is to say that the children make improper use of the electronic devices, so the use increased enormously, because for all types of academic activity their use is fundamental; and with a low mean in CRN 6 with 2.22; that is to say that the youngest child has not presented health problems during the online classes, which did exist in times of face-to-face classes.

Figure 4. *Histogram of Child-Related Issues*



Conclusion

The findings of the study revealed that the effect of e-learning education on parents of primary level students during COVID-19 pandemic had a moderate effect in relation to technical issues. In turn, the effect of e-learning education on parents of primary level students during COVID-19 pandemic in relation to stress, time management problems and issues related to children was significant.

Most parents are in 25 to 45 age group, the age at which parents enjoy their children.

According to the study findings, parents who have completed their secondary education and are able to solve any issue in the classes that their children attend online through the e-learning method prevailed.

It turned out that parents without a job prevailed, and this factor would increase the parents' level of stress.

Housewives (mothers) accompany their youngest children in their classes to give them some support during their online classes, and they represent over 40% of the total respondents.

The device through which they attend classes occasionally goes offline and/or turns off, so the mothers must try finding a better signal. Parents state that they are unaware of the technological tools used by teachers, which makes it difficult for them to explain the tasks they leave for their children. It is noteworthy that the Internet is currently part of the family as a preponderant need. The problem faced by parents is to help

children to find information required to deliver the tasks, because they occasionally do not know how to search for adequate information. Therefore, parents know about these technologies without proper training.

The concern of parents regarding the education they receive negatively affects mental health, causing symptoms of stress. Parents avoid accessing unsolicited educational content fearing that it might damage the technological equipment. Parents are concerned that the academic level and performance of their children are lower than the expected and think that in e-learning teaching the objectives established for each study year are lost.

The families, despite being inside the home, do not have time available to take care of the family members, which increases the pressure associated with their daily tasks. In addition to the restrictions and changes that are dictated monthly by the Peruvian Government affected meetings, outings and among others of family type. Therefore, parents do not have time to relax, distract themselves with the effect of increasing the difficulty in their personal attention and care, because they are focused on household chores. However, it will not be possible to carry it out due to the limited time available.

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