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Challenges and opportunities of research in the COVID-19 pandemic: the lived experience of students of Ferdowsi University of Mashhad

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Abstract

Objective: The efficiency and quality of higher education, which has the serious responsibility of developing human resources and developing society, can affected by many factors, including the social and economic conditions of the society. The outbreak of COVID-19 in December 2019 affected various aspects of human life, including the quantity and quality of higher education. Based on this, the purpose of this research is to study and understand the lived research experience of students of Ferdowsi University of Mashhad during the COVID-19 pandemic.

Materials and methods: The research method is the qualitative and descriptive phenomenological approach. To conduct research from Ferdowsi University of Mashhad, as the field of research, 16 people were selected purposefully and based on the snowball method. The findings of the research were collected using structured interviews and analyzed with Colaizzi's (1973) method. The reliability of the findings (credibility, transferability, reliability, and verifiability) was verified through the description by peers, review by members, the use of thoughtful notes, and a rich and detailed description of the research process.

Result & Discussion: The higher education system in the present era is affected by technological progress, and economic, cultural, and social changes in society, as COVID-19 in December 2019 affected different dimensions of higher education, including research. The findings of this study were presented in two areas of research challenges of students during the COVID-19 period in the form of 4 themes 'Physical and mental problems', 'Non-cooperation of some professors, university, subjects and researchers', 'Weak informational, network and scientific infrastructures' and 'Creating a negative attitude while not mastering the research' most important opportunities in the form of 4 themes 'facilitating library and office facilities', 'virtual communication equivalent to face-to-face', 'saving Time and money and convenience of virtual communication' and 'Strengthening writing, analytical, knowledge and communication skills'. Undoubtedly, strengthening educational, technological, and research infrastructures, developing ethics standards and mutual duties of supervisors and advisors-students, reviewing the curriculum of research- based units, and establishing an electronic library are among the most important strategies to reduce challenges and strengthening research opportunities in the COVID-19 pandemic and even after it.

Keywords: *Research, Research lived experience, Challenge and Opportunities, COVID-19, Higher Education.*

Introduction

Higher education is the most important institution of human resources training and development of society, in achieving sustainable development and

new sciences, their revival and application play a fundamental role (Malmir, Salehi, Moghadamzadeh and Dehghani, 1400). The most important areas in higher education are four areas: 1- Education, 2- Research, 3- Social mission, and 4- Specialized services, which are the courses of supplementary education, theses and theses of the students of these courses, are among the most important categories of research in higher education. Complementary education, which plays an important role in the development and solution of economic, cultural, and social challenges, is the meeting place of education and research at its highest level. In these courses, while developing the innate characteristics of a researcher by combining science and practice, students bring their experiences and learnings to the fore in the form of research (dissertations, dissertations, articles, etc.) They become producers of science (Mirzaei, 2019).

Writing a thesis or dissertation under the guidance of a research team, while creating interactive learning in students will improve the quality of research, write a scientific article, and gain experience and research competence, in realizing this desire, the supervisor is the most important member of the research team. It can play a great role (Yamani Dozi Sorkhabi and Amin Mozafari, 2016). research experience; It is the research activity, search, review, and work experience of researchers including students of supplementary education courses that helps to develop values and attitudes, knowledge, and skills for conducting scientific research (Halstead, 1997; quoted by Ismaili, 2012). Considering the importance of research experience, the studies of Hakak, Marwati, Hazni, and Akhlaghi (2017) and Hanson (1992) showed that financial, health, library, and family problems and problems of the research process could create disturbances in obtaining the desired research experience. (Dominguez, 2006).

In the field of health, the spread of COVID-19 in December 2019 in China, affected various aspects of human life in terms of economic issues, international relations, social, health, commercial, psychological, cultural, and educational, etc., among various fields of education (Hua and Shaw, 2020: 1 and 2). In response to COVID-19, while changing the form and type of personal-social relationships (Hamidizadeh, 1400), higher education institutions across the country changed the guidelines of face-to-face education to emergency distance education (Hart, Hill, Kho, and Alonso, 2021: 42); As a result, all training activities and interactions were transferred to online communication and learning platforms such as Zoom, Vroom, email, online conference, etc. (Ruoslashti, 2020). Also in the field of research, COVID-19 19 all national and international scientific research activities and programs of higher education, including seminars, conferences, study trips, theses, and, teacher-student interaction programs, and especially the quality of It affected the relationship during the guidance of theses and treatises and the like (Mirzaei, 2019). As a result, in their research process, students were temporarily limited in their access to supervisors, required resources, research and subjects, and their attendance at the university, and were forced to adapt themselves to new strategies or revise their approaches to research. (Howlett, 2021). While these conditions continued, many groups engaged in remote research, a limited number worked in laboratories or research institutes, and some people who did clinical research faced serious disorders. Many university professors also faced challenges in teaching and directing students' research; As a result, while accepting the university rules during the COVID-19 pandemic, they tried to choose the most effective method for the proper education and guidance of their students (Elmer and Durocher, 2020). Also, with the creation of limitations in non-clinical and clinical research, the researchers needed to follow the state local, and institutional policies related to the protocols to restart them (Taylor-Cousar, Maiere, and Downeyt, 2020); As a result, the interactions of researchers with subjects and researched subjects, instructors and universities were reduced, and were carried out through information and communication technology in online and pre-planned spaces (Ruoslashti, 2020). Information and communication technology, which was already acting as a side tool for social interactions, the epidemic of COVID-19 caused it to be used as a very important tool in academic education and research.

Although research through information and communication technology is not a new phenomenon, researchers have used many examples of “ethnography” or ethnographies, content analysis, and online polls using messenger software for years in this type of research. Usually, the process of gathering findings was done using information and communication technology. However, the COVID-19 pandemic affected all aspects of research, from communication with supervisors to the publication of research results (Howlett, 2021). This type of research will undoubtedly come with challenges and opportunities. As the research of Levine, Nasir, and Rios-Aguilar (2021), Taghizadeh, Haji, and

Mohammadi Mehr (2019) showed that the most important research challenges for students are "delay and departure of research from its path, absence of a mentor to guide the research, failure to enter the research field, risk suffering from COVID-19 disease, lack of face-to-face communication with classmates, lack of access to needed resources and software, lack of motivation and anxiety" and the most important opportunities "creating free time for working and married students, forming pure research ideas, creating a perspective It is new to the process of conducting dissertations and theses and facilitating research, conducting interviews, tests, and questionnaires, holding various non-attendance conferences, forming research teams in the online space and cooperation and better support of professors and students.

In each of the mentioned studies, researchers have researched the challenges and opportunities of virtual education during the COVID-19 pandemic, and the researchers have mentioned the effectiveness of their research process in some topics. Considering the importance of research in higher education as one of the most important and broadest areas of economic, industrial, social, etc. progress and development, and the effect of COVID-19 on this area, especially the research of students of supplementary education, such as the limitations of teacher-student interactions, Lack of access to resources and subjects, etc., Therefore, it is necessary to conduct a deep study to examine the dimensions and achievements of this field in the COVID-19 pandemic. While conducting this study, we can get answers to our questions what problems and difficulties do graduate students face in writing theses and dissertations during the COVID-19 pandemic? During the process of conducting their research, from choosing the topic to publishing the report, what concerns do they have regarding their relationship with their supervisors and receiving the necessary guidance? What will be the dimensions, expectations, and achievements of thesis and

dissertation guidance? Finally, what challenges and opportunities will writing research in the COVID-19 pandemic bring for students, professors, universities, and society?

Considering that Ferdowsi University of Mashhad, with more than 13 schools, 8 research schools, and 25,000 domestic and international students, is considered one of the largest universities in Iran and the scientific hub of eastern Iran, It was necessary to examine the effects of the COVID-19 pandemic specifically in this university; As a result, the lived research experience of Ferdowsi University graduate students was studied and after identifying the dimensions, expectations, challenges and opportunities, suggestions were made to improve the educational and research situation of higher education, reduce challenges and strengthen research opportunities.

Theoretical foundations and background of research

Research in a certain culture means studying, examining, reaching, and correcting, reality and truth, and according to John Dewey, "the controlled change of an uncertain or unstable situation to a situation that is completely fixed and definite in terms of relationships and characteristics and is in a situation It means that the elements of the main situation have changed in the form of a unified whole" (Delavar, 2014: 30). Research in a special sense is a systematic or systematic process of collecting, analyzing, analyzing and interpreting information to reach an understanding of the universe or the desired phenomenon by finding answers to research questions (Leady and Ormord, 2010: 2). The second field of higher education that has a wide role in research and science production is research. Higher education is a research-oriented educational system that, along with the teaching process, teaches students the knowledge, skills, and attitudes needed for research (Heidari, 2016: 4). Research experience is an emotional, financial, and intellectual commitment that students gain experience during their research activities with the help and cooperation of the supervisor and advisor in a joint research work together (Park et al., 2007, quoted by Asadollahi, Shams and Rezaei, 2013: 59, Santhanam, 2001) which is in the form of internships and research assistantships, research-based courses, classroom research assignments, and supervised study courses. One of the important and common courses of research experience is the study courses under the guidance of the academic faculty (independent/individual study courses, guided reading courses, final year project, or doing a thesis and dissertation) which are considered as courses of a Or a two-term course is defined as including one-on-one training with a faculty mentor (supervisor) and focusing on independent research by students (Moor, Hvenegaard & Wesselius, 2018).

Traditional teaching and research procedures in higher education have been affected by the advancement of information and communication technology in today's digital world, in such a way that the traditional structures of the classroom to the

library are being changed by these technologies. Along with the expansion of information and communication technology in higher education since the 18th century, opportunities such as communication through email, online channels, electronic libraries, etc. were created (Amoli, 2008). The growth of these activities gradually led to the emergence of some terms such as electronic university, virtual university, virtual education, distance education, and web-based education. The concept of an electronic or virtual university was proposed for the first time under the title of Open University in England, but Americans developed it. Iran's first electronic education center was the Iran University of Science

and Technology. In addition, in 1383-1384, the School of Hadith Sciences managed to start its electronic education by attracting students (Mohammadi, Salimi, and Safari, 1400: 282 and 283).

The field of research was also affected by the creation and development of electronic or virtual universities, and concepts such as electronic research, virtual research, web-based research, internet research, and online research appeared. Although virtual research has a long history, it took a professional form with the distribution of postal questionnaires in 1970, and sometime after the appearance and use of the first Internet search engines such as NCSA in 1992 and Netscape Navigator in 1994, the distribution of articles On the web in 1996, researchers noticed a phenomenon called internet research (Amoli, 2018: 24 and 25). This type of research is a type of transition from the traditional and developed methods of data collection on-site, in person, and in real-time, such as face-to-face interviews, surveys, and paper and postal questionnaires, to observations, interviews, and online surveys and data collection in spaces Such as blogs, websites, chat rooms, sites, media, and social spaces, etc. Kitchen (2007) divided internet research into two main categories, web-based research and online research. Web-based research is divided into non- interventional and interventional research. Non-interventional web-based research refers to the collection and analysis of data available on the web. This type of research does not interact with the subject or the researched, and the researcher, as an observer does not influence the creation of data. On the other hand, in web-based research, the researcher acts as an observer and interacts with the subjects and research. Online research refers to situations in which the researcher places himself in the research framework and becomes an active participant-observer in the online environment, and data collection includes significant interaction between the researcher and the participants (Warrel and Jacobsen, 2014: 23-25). This type of research, which is generally known as virtual research, became more common since the 18th century with the advancement of information and communication technology and since the 21st century with the spread of the COVID-19 pandemic. In this era, experts have found it more appropriate to carry out some research methods (such as literature review, meta-analysis, focused texts, etc.) in a virtual way than laboratory or field research which face more limitations, each of which may have challenges and Or have benefits.

For example, in their research, Elmer and Durocher (2020) have described some research strategies to advance student research during the COVID-19 pandemic as follows:

1- Systematic review and meta-analysis: In this type of study, the analysis of a set of results (searching the existing literature) is done to integrate the findings and present the results at a higher level.

2- Focused literature review: students prepare a summary of a new research topic and send it to relevant journals.

3- Innovative method or technical note: In this method, students can describe and explain how new research methods can help in recording and measuring data and better understanding.

4- Mathematical modeling and computer simulation: using available data to develop mathematical models and computer simulation to describe and predict different aspects of the study area.

5- Data mining: referring to the online database and discovering new patterns by studying the data.

6- Limit remote research on humans. 7- Scholarship

8- Education-oriented research.

Amoli (1388) and Shariatmadar (1397) in their studies identified the most important advantages of virtual research as "economy, ease of communication and reduction of time, flexibility and the existence of virtual assistance facilities, increasing metacognitive abilities and increasing access to resources and professors and finally reducing prejudgment and surfer when collecting the findings. They also believe that in addition to the advantages, this type of research has challenges such as "lack of access to computers and the Internet or unfamiliarity with the virtual environment for groups with low income and technology literacy levels, reducing the credibility or reliability of research due to access to people who

have the opportunity to communicate online or respond decrease in the quality of answers in researches with a high number of questions, the existence of unpredictable technical problems in the process of conducting research, information storage, etc., problems related to recording and documenting findings, the possibility of disclosure of information about findings, lack of control power and planning due to change of time, software, etc., subject drop due to software and hardware problems, lack of extra-linguistic signs, difficulty in emotional communication, deception of the researcher by not providing honest information, lack of concentration of the researcher on appearance, language The body, emotions and activities that the researched or researchers may be carrying out along with the communication such as attending the class.

In similar results, Levin et al (2021) in their research described some of the effects of the COVID- 19 pandemic on research as "disruptions and delays, research leaving its original path, delay in conducting research, absence of institutional and scientific mentors to help in the direction Research activity and failure to enter the research field to continue research, loss of communication and reduced access to academic resources.

In contrast to the studies of Levin et al (2021), the studies of Spear, Lyon & and Johnson (2021) showed that while ranking virtual communication after face-to-face communication, after some time has passed since the COVID-19 pandemic, researchers can coordinate and adapt to They became virtual research and believe that the continuation of research in the time of COVID-19 has brought them continuity, structure, feeling of productivity and gaining a complete insight into the professional and scientific work environment. Although some trainers could not guide their students sufficiently at this time and in some cases were forced to change their goals to activities such as literature review and data analysis; however, in virtual communication, trainers had more time to devote to training and developing their relationships with students and helping other educational programs.

Research method

Considering the purpose of this study, a qualitative method has been used to deeply understand the lived research experience of Ferdowsi University of Mashhad during the COVID-19 pandemic.

According to Creswell (2007), qualitative research can be used whenever there is a need to know the variables of the phenomenon, to study a group of people, to share their experiences, and to have a deep understanding of the issue. Descriptive phenomenology was chosen among the qualitative research approaches to answer the research questions. Phenomenology, which means studying and knowing the essence of phenomena; examines phenomena and conscious experience from the subjective point of view or the first person of the subject (Smith, 2014). Descriptive phenomenology, considering the structure of experience, believes in the existence of a common essence in the phenomenon, and one of the ways to reach the essence of the phenomenon is to examine the common experience of the researcher (Jackson, Vaughan & Brown, 2018).

Generalizing the research to a population is not the goal of qualitative research; Rather, its purpose is to explore and deeply understand the phenomenon in question, so the researches are selected in a way that helps the researcher to understand the phenomenon in the best way (Creswell, 2007); Based on this, using targeted sampling and making sure that the student in question is preparing his research (proposal, dissertation and thesis) in the COVID-19 pandemic, from among the students of supplementary studies of the Faculty of Educational Sciences and Psychology of Ferdowsi University of Mashhad. In the field of research, the study subjects were selected and while identifying the first people, they were asked to introduce other talented and informed students using the snowball sampling method (Etikan & Bala, 2017).

Considering the objective of qualitative research, a deep understanding of the phenomenon under study, in this type of research, the sample size is usually small and is not selected in advance (Rahbardar and Dayani, 2011). In addition, according to Patton (1991), in qualitative research, sampling continues until reaching theoretical saturation (the case after which information will be repeated) (Gall, Borg, and Gall, 2014); Based on this, the researchers interviewed 16 of the students to investigate the lived research experience of the students. Although the research reached theoretical saturation in the 14th interview, two more interviews were also conducted to ensure saturation and validation of the research findings. The demographic information of the students participating in the research is given in the table below (Table No. 1).

Table 1: Demographic characteristics of the studied subjects

0	trend	section	Number (bygender)
Educationa lsciences	Philosophy of education	Ph.D.	3 people (female)
	Education Management	Ph.D.	3 people (Mr.)
		Master of Science	2people (female)
	Curriculum planning	Ph.D.	1 people (female)
		Master of Science	2people (female)
	Training andimprovement	Master of Science	1 people (female)
	Education research	Master of Science	4 people (female)

The method of collecting and analyzing the findings:

Considering that, the main method of collecting findings in phenomenological research is an interview (Abedi, 2019); in this study, unstructured interviews were used to deeply understand the lived experiences of the researched. The interviews, which lasted for about 60 to 120 minutes, started with preliminary questions (educational and research history) and led to the main questions. In addition to the principles of points before and during the interview, after collecting the findings, the interviews were implemented in a text file, and after ensuring the correctness of transferring the full details of the audio file, it was entered into the MAXQUDA20 software to analyze the findings.

In the analysis of qualitative findings, a researcher based on reason and logic should discover facts and realities from the study and analysis of documents and information (Hafez Nia, 2016); In this regard, Colaizzi (1973) believes that the experimental method cannot be used in the objective research of human experiences and there is a need for a method that can achieve a deep understanding of the researched experience; Therefore, he developed a method for qualitative phenomenological data analysis (Abalos, Locsin & Schoenhofer, 2016). Colaizzi's seven-step method is as follows:

1- Epokheh or commentary: putting in parentheses the lived experience of research by the researcher and analysis without prejudgment.

2- Transcription of all people's descriptions: type of recorded interviews and its complete transfer to the MAXQDA20 software environment.

3- Extraction of important sentences: reading and coding the findings using the three-stage theoretical coding method of Glaser and Strauss (1967) (three stages of open, central, and selective coding). Is. In the first stage of open coding, 612 concepts were extracted.

4- Creating compiled meanings: using axial coding (refinement and separation of concepts in the form of categories). In this step, 44 categories were extracted.

5- Organizing the compiled meanings in clusters of themes: using selective coding (examining and moving the categories obtained from the previous stage and classifying related categories in the form of more abstract codes under the title of the theme). At this stage, eight themes were obtained.

6- Integration of the findings in a comprehensive description (description of the basic structure of the phenomenon): providing a comprehensive description through the integration of all clusters of themes and meanings compiled based on the experiences of the researched.

7- Validation of the findings: Returning to the studies to confirm the findings of the study using a "member survey" to validate the findings (Praveena & Sasikumar, 2021; Edward, 2011 Bohm, 2004).

In addition, to validate the findings, the reliability criteria of Lincoln and Guba (1989) were used, whose components are credibility, transferability, reliability, and verifiability (Hariri, 2015). How to use the four criteria and related measures is shown in Table No. 2

Table No. 2*: Validation methods of research findings*

Criterion	goal	Actions
Credibility	The authenticity and validity of research findings	Description by peers (second coder), exchange of opinions withpeers
transferability	Transferring research results toother fields and environments	A rich and detailed description of the research, environment, researchprocess, and research findings
Reliability	Reaching similar results atother times or by other researchers	A rich and detailed description of the research process, control of thefindings by the researchers and thesupervisor
Verifiability	Protecting the research findingsfrom the researcher's interests, motivations, and views	Control of the findings by theresearchers, the second coder,thoughtful notes

Findings

The raw findings of the research were analyzed with the method of Colaizzi analysis (1973) and the theoretical coding of Glaser and Strauss (1967). The process of collecting and analyzing the findings took place simultaneously. In the first stage of coding, i.e. open coding, the researchers read the interviews line by line while clarifying their mentalities, and coded sentences under the title of concept. In the central coding stage, categories were obtained from the study, displacement, semantic sharing, and elimination between concepts, and in the third stage of coding, topics were extracted from the semantic sharing of categories, finally, to understand the students' lived research experience, the findings were presented in the form of 612 concepts, 44 categories, and 8 themes were extracted and classified in the two axes of challenges (Table 3) and opportunities (Table 4). Finally, the topics obtained are shown in the form of a conceptual diagram.

A- Research challenges of higher education in the COVID-19 pandemic

According to the statements of the researchers, from which 328 concepts, 23 categories, and 4 themes were extracted, the most important research challenges faced by students in the covid-19 pandemic are: "physical and mental problems", "non-cooperation of some professors, universities, researches and subjects", "weak information, network, and scientific infrastructures" and "creating a negative attitude while not mastering the research" which is presented in table number 3.

Table 3: Higher education research challenges in the COVID-19 pandemic

theme	category
Physical and mentalproblems	1. Limitations in the research process 2. Mental-psychological and physical problems of the student 3. Inability to defend in person after the end of Covid-19 4. Lack of support and cooperation among students
Non-cooperation of some professors, universities, researchers, and subjects	5. Decreased communication with advisors and counselors 6. Inappropriate response of supervisors and advisors 7. Lack of responsiveness and proper cooperation of the university 8. The stress of research and subjects in face-to-face meetings 9. Lack of access and responsiveness to the researched and subjects
Weak information, network, and scientific infrastructures	10. Unpreparedness of the university in facing the Covid 19pandemic 11. Technical problems of virtual education 12. Unfair virtual exams 13. Unfair and dry virtual defense environment 14. Non-interactive and vagueness of virtual guidance sessions 15. Lack of concentration, theory, and time-consuming virtualclasses 16. Limiting access to resources while closing the universitylibrary 17. Lack of information about online seminars, conferences, and workshops 18. Away from the academic space of the university
Creating a negative attitude while not mastering the research	19. Lack of mastery in research writing 20. Feeling of despair and hatred for research 21. The necessity of practical training in the research process 22. The need to teach research methods and software

Below is a brief description of the themes and categories related to the challenges of higher education in the COVID-19 pandemic.

Physical and mental problems

With the involvement of all aspects of human life along with the spread of COVID-19, many jobs and training have become virtual and brought a kind of communication isolation for people. Some of the researchers stated that in addition to causing physical problems caused by family members or themselves being infected with COVID-19, quarantine and social distancing, and limited communication and access to resources and professors, the natural process of their research faced disturbances. In addition, while continuing virtual education, they lost the cooperation and support of their friends in face-to-face classes and their defense sessions were accompanied by stress and internet disconnection. In this connection, the researchers expressed concern and stated that they are used to the virtual method, some of their skills have decreased, and with the reduction of the COVID-19 pandemic and the in-person defense sessions, they are stressed and think that they will not be able to have a good face-to-face defense.

Interviewee number nine stated in this connection:

"During this time, due to my coronavirus and physical

weakness, the stresses and pressures of the quarantine caused our mental conditions to collapse as well. Also, my mother was infected with Corona and I took care of her; Therefore, my research was abandoned for about a month."

Non-cooperation of some professors, universities, researchers, and subjects

The researchers considered the non-cooperation of some professors, universities, researchers, and subjects as a limitation to disrupt their research process. For professors in virtual education, new workloads were defined, which caused them to be less responsive to students in virtual communication, and as a result, students were not able to benefit from the scientific guidance of

supervisors and advisors in this era, to reject or correct their research. The university also did not cooperate much in administrative processes. With the closure of universities and the reduction of people's communication and knowledge of each other, the subjects and the researchers had less desire to cooperate. Interviewee number 8 stated:

"Professors are busy due to busy work and give late feedback to files and messages and sometimes they don't respond at all because virtual classes are time-consuming on the other hand, professors are not very interested in a virtual response, which are all due to the effects of COVID-19 and Virtual education.

Interviewee 3 also tells about the lack of access to subjects and researched subjects that:

"If the classes were face-to-face, I would attend the college and find a student, or at least one student who has more experience than me, and I would ask them to introduce someone. I could not communicate with the students. They do not answer me now, even though they are students, for example, they say we have work and they do not answer. If they were present, I think if they had seen us and realized how much we needed their help, at least they would have tried to help us in some way. At least they introduced someone to whom we could go and talk to, to satisfy him, but they didn't answer."

Weak information, network, and scientific infrastructures

Iran's universities, like the rest of the world, were in an unknown situation with the spread of COVID-19. At first, universities were closed for 2 weeks in the hope that the disease would end, but with the continuation of the situation, distance education was inevitably established. In a short period, higher education has succeeded to some extent in creating virtual education infrastructures; However, in the first virtual semester, there were problems that various experts considered to be the weakness of the infrastructure, and this weakness of the infrastructure caused some students to delete the semester in the first virtual semester of writing their research, so that they could concentrate better while reducing the limitations in the future semesters have on their research. Interviewee number 15 stated the weakness of infrastructure in the field of resources as follows:

"At the beginning of the spread of COVID-19, by closing the university library and cutting off face-to-face access to resources, as well as not providing a suitable solution on how to access resources, it confused and wasted time for many of us students."

Interviewee 12 also described the lack of access to resources in writing her proposal as follows:

"In writing my proposal, access to study resources was limited, and this made me take a leave of absence. I did not have access to library study resources and I could get very limited articles at that time. Therefore, I faced a serious challenge in my work and decided to take a semester off".

Creating a negative attitude while not mastering the research

Although the researchers stated that in the classes, communication with professors and friends, defense meetings, going back and forth to do administrative work, research guidance from supervisors and advisors, and research collaborations with various organizations and institutions, whether during face-to-face or virtual training of some knowledge and They acquired skills such

as communication skills, writing skills, analysis skills, etc.; But about research skills, they admitted that they did not acquire these skills as they should, and they had a weakness in this field, which showed their research failure and despair in the backwardness of research. Interviewee number 6 described as follows:

"We didn't learn how to write research in virtual education and now we don't know, that's why I think I don't have confidence because the professor talks in such a way that I say to myself, I just don't know, and when I talk to my friends, I see that we all have weaknesses in this field.

B- Higher education research opportunities in the COVID-19 pandemic

According to the statements of the researchers, from which 284 concepts, 22 categories, and 4 themes were extracted, the most important research challenges faced by students in the Covid-19

pandemic are: "facilitating library and administrative facilities", "virtual communication equivalent to face-to-face", "cost, time and convenience of virtual communication", "Strengthening writing, analytical, knowledge and communication skills" which is presented in table number 4.

Table 4: Higher education research opportunities in the COVID-19 pandemic

theme	category
Facilitating library and administrative facilities	1. Website design and virtual library 2. Posting and extending books 3. Use of electronic resources 4. Download resources from PAD, GOOGLE SCHOLAR, ENSANI, CIVILICA, ELMNET, RIX, IRANDOC, ERIC, MAGIRAN, NOORMAGS, 5. Reduction of job problems 6. Unannounced leave due to the spread of covid-19
Virtual communication is equivalent to face-to-face	7. Communication with professors through virtual platforms 8. Virtual class and defense 9. Designing an electronic questionnaire 10. Correspondence of laws and frameworks of virtual and in-person defense
Saving money and time and convenience of virtual communication	11. Ease of online communication with professors 12. Saving time and money and convenience of virtual interviews 13. Easy regulation of time and stress reduction in virtual defense 14. Easy and fast communication with universities, workshops,and professors 15. Time flexibility of virtual education 16. Reducing distance and distances
Strengthening writing, analytical, knowledge, and communication skills	17. Learning research knowledge 18. Development of the power of thinking and analysis 19. Learning how to access and search resources 20. Development of writing skills 21. Development of communication skills 22. Development of analysis skills

Below is a brief description of themes and categories related to higher education opportunities during the COVID-19 Pandemic.

1- Facilitating library and administrative facilities

The researchers acknowledged that while the conditions of the COVID-19 pandemic continued, the university created facilities such as the design of a virtual education site, the creation of a university email for unlimited download of resources, and a virtual library to facilitate distance education and research. In this case, the interviewee number 15 stated:

"One of these facilities was the sites introduced by the central library of the university itself. For example, I was not at all familiar with some sites. In a section that I was studying on the website of the Central Virtual Library, this site was introduced and it was written that this is a site where you can download all kinds of articles, dissertations, and English books from here, and there is no need to go to the Central Library. Have a reference. Well, this was very good."

2- Virtual communication equivalent to face-to-face

While pointing out the weaknesses of virtual education, with the strengthening of infrastructures, the researchers considered virtual classes, as defense equivalent to face-to-face, and stated that many of the rules and frameworks of presence in virtual are observed. They acknowledged that the university, college, and professors are trying to transfer face-to-face education to virtual platforms with good quality and they have been successful largely, regardless of technical problems. In the research process, despite the limitations, the researchers used similar methods such as virtual interviews, tests, and electronic questionnaires to collect findings. Interviewee No. 2 described how to hold virtual classes as follows:

"Most of the classes were virtual, the students were mostly present in the class through audio communication and the professors had both audio and video. In the chat section, we had a conversation with the others, and if necessary, in some classes, such as internships, we showed our pictures. In general, our virtual classes have both audio and video formats, as well as the ability to chat and upload files both offline and online.

3- Saving money and time and convenience of virtual communication

The researchers consider virtual communication more appropriate due to "time and place flexibility,

easier communication, less stress, saving time and money"; In this regard, interviewee number 15 stated:

"In a virtual interview, the cost and time of the student is saved because there is no commuting, but the face-to-face interview was time-consuming and annoying for the student because of the commuting."

In addition, interviewee 12 related to the convenience of this type of communication states that:

"The good thing about virtual communication is that access is done faster. When you want to see it in person, it is much more difficult to coordinate, but finally, you ask questions online, you send

an email or you can ask the communication methods that the professors themselves determine, and they will be answered at the right time and in less time.

4- Strengthening writing, analytical, knowledge, and communication skills

Although the researchers admitted that due to the limitations of virtual communication, they could not master the research writing process well during the Covid-19 pandemic, they believed that in classes, conferences, workshops, administrative visits, communication with supervisors and advisors In person or virtually and generally during the research process, some skills were strengthened in writing, analysis, knowledge, and communication. Interviewee number eight stated in this connection:

"In the classrooms, while teaching the theory of theories and methods, class tasks such as studying and reviewing various types of research were given by the professors. By examining the research, we got to know the work routine, what parts research is made of, and while getting to know our research interests, our ability to analyze increased."

By examining the subjects extracted from the lived research experience of Ferdowsi University of Mashhad during the COVID-19 pandemic, the final model was compiled in the form of Figure 1.

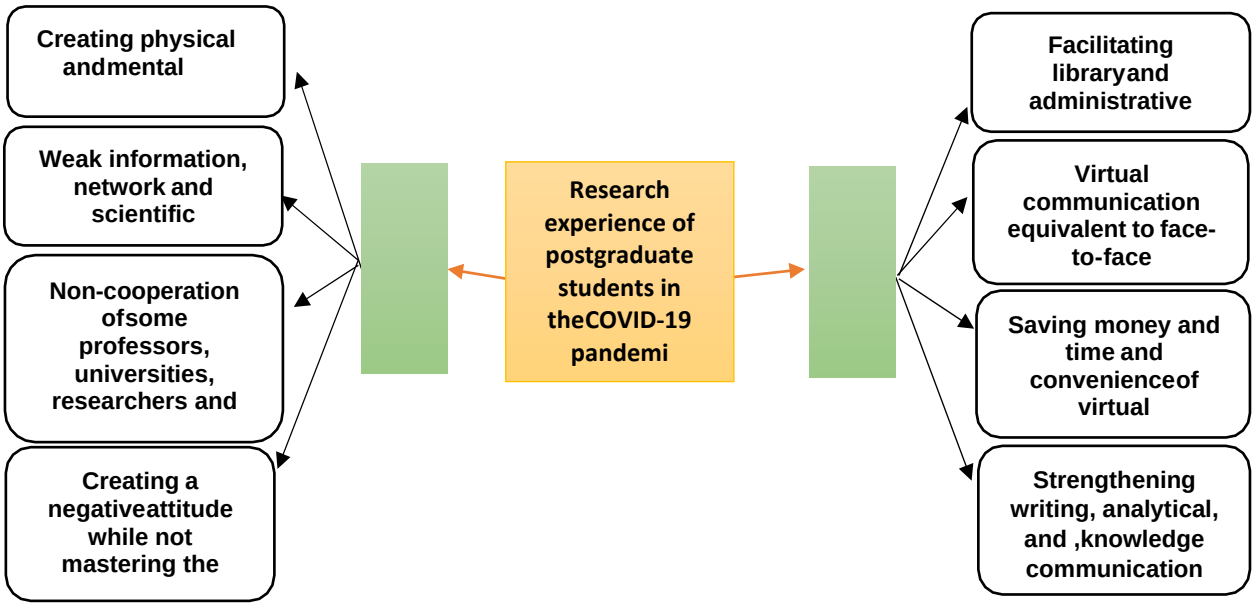

Fig 1: The lived research experience of Ferdowsi University of Mashhad graduate students during the Covid-19 pandemic.

Discussion

The epidemic of COVID-19 has affected all sections of society; the higher education sector is no exception to this rule. Since March 2020, equivalent to March 2018, the World Health Organization declared COVID-19 as an epidemic disease; Quarantine, social distancing, online education, and research from home have become a part of life.

In online education, information and communication technologies, which have been used in higher education for years, have become the only means of education because of the COVID-19 pandemic. The second mission of higher education, i.e. research, was pursued remotely and from the home environment. Research in higher education is very important for several reasons, including the desire to improve the quality of education, as well as the need to produce and expand knowledge to train specialists who can produce it from a scientific and humanitarian perspective. Due to the importance of research in higher education, it is necessary to examine the dimensions and angles of research from home during the COVID-19 pandemic. Therefore, questions arose in the researcher's mind what will be the dimensions, expectations, and achievements of writing a

thesis/dissertation in the COVID-19 pandemic? In addition, what challenges and opportunities will writing research in the COVID-19 pandemic bring for students, professors, universities, and society?

To answer the questions, the researcher designed his research to know and understand the lived research experiences of post-secondary education students during the COVID-19 pandemic, and while collecting and analyzing information, he found the students of the Faculty of Educational Sciences and Psychology of Ferdowsi University of Mashhad as the field of research. in the form of challenges in 4 themes: "Physical and mental problems", "Non-cooperation of some professors, universities, researchers, and subjects", "Weak information, network, and scientific infrastructures" and "Creation of negative attitude while not mastering research" And the opportunities were also extracted in 4 themes: "facilitating library and administrative facilities", "virtual communication equivalent to face-to-face", "saving money and time and convenience of virtual communication" and "strengthening writing, analytical, knowledge and communication skills". About the themes of students' lived research experiences during the COVID-19 pandemic, researchers such as Levin et al (2021), Spear, Lyon, and Johnson (2021), Nenko, Kybalnae and Snisarenkot (2020), Busttil, Zahra, Gatt and Agius (2020), Radu, Schnakovszy and Herghelegiu, (2020), Naik, Deshpande and Shivananda (2021), Noor, Mazhar (2020) and Esici, Ayaz, and Yetim (2021) also acknowledged in their research that their research results are more related to The complement of topics were extracted, and the most topics mentioned in the results were related to the topics of "weak information, network, and scientific infrastructures", "physical and mental problems" and "non-cooperation of some professors, universities, researchers and subjects" which needs more attention in these areas.

With the spread of COVID-19 and its impact on various aspects of human life, including education, higher education institutions across the country changed their education to distance education. The limitations of educational methods did not allow the wide application of virtual education in all fields, including the field of research, and required special arrangements and considerations. In addition to the spread of COVID-19 and the lack of prior planning, the network, information, and scientific infrastructures of the university as one of the most important arrangements for virtual education and one of the factors affecting the research experience (Gentile, Brener, and Stephnes 2017; Trigwel and Goddet, 2017; Behzadi, 2007) was associated with weaknesses that caused dissatisfaction of the researchers with dry, unfair and theory-oriented classes, exams and virtual defense. Nenko et al. (2020), Naik et al. (2021), Noor et al. (2020), and Esici et al. (2021) considered the lack of information and communication technology knowledge and technological

equipment and low internet speed as the most important obstacles to conducting virtual education. This weak infrastructure caused the researchers to face limitations in accessing professors, society and research samples, resources, and the university. In confirmation of this matter, researchers such as Levin et al (2021) and Radu et al (2020) have considered the reduction and disconnection of teacher-student communication and the absence of an instructor to guide the research as the most important disadvantages of this type of communication. In addition, with the increase in the death rate and the limitation of gatherings, the researched and the subjects did not have the desire to meet in person, and due to the lack of familiarity with the researcher in virtual communication, they did not see any reason to cooperate in the research. As a result, the researchers faced a challenge in collecting the findings. In addition to the mentioned limitations, the university did not have the necessary cooperation in the process of administrative activities, which caused more dissatisfaction among the researchers.

In addition to the problems of the research process, in line with the study of Busttil et al (2020), who considered the loss of family members, the reduction of communication, and the change of lifestyle to immobility because of COVID-19 as the most important factors in the deterioration of the physical and mental health of students. The researchers also stated that the physical and mental problems caused by COVID-19, the unfortunate news of the death of loved ones, communication isolation, etc., along with the weakness of the infrastructure, caused them to abandon their research for a while, as a result of the quality and level of their research. It was degraded. In such conditions, Elmer and Durocher (2020) have found it appropriate to conduct research such as secondary data analysis, literature review, and survey, but there is a need to strengthen the infrastructure and provide conditions where students can choose the most suitable topic and their interests and field of activity. Choose the research method.

According to what was stated about the research problems, physical and mental-psychological, which led to the change of research procedures and even

the elimination of the academic semester by the students, but after some time, the university strengthened the infrastructures, provided facilities such as the design of the educational site and the virtual library, created a university e- mail for unlimited access to resources lifting the sanctions of some resources, book posts, and allocating a semester of leave without years so that students can carry out their research in a safe space without worries. While creating these conditions, opportunities for virtual education and research showed themselves; among them, the spread of communication in such a way that by reducing the distances in virtual communication, researchers were able to easily communicate with professors, workshops, and students, even in other universities, gain research skills in different fields and save time and express satisfaction with the cost and flexibility of this type of communication. The expansion of communication with universities, workshops, and professors around the world is one of the most important advantages of virtual education that can create a transformation in international higher education. The confirmation of this issue can be seen in the studies of Ameli (2018), Shariatmadari (2017), and Nenko et al (2020) that economic efficiency, flexibility and ease of communication, flexible virtual facilities, the development of metacognitive abilities such as the ease of self-disclosure for people with inhibitions, the possibility Performing several tasks in the research process, the extent of communication and self-learning have been considered as the most important advantages of virtual education Despite these advantages, the

researchers found physical presence at the university more desirable and believed that they had acquired many of their research skills in face-to-face education and they could not acquire these skills in virtual education as they should; As a result of postponing and abandoning the research, in addition to the poor research performance, it brought a feeling of hopelessness, hatred and overall negative attitude towards higher education and research.

While examining and analyzing the topics and research background, it is necessary to mention a point about the most frequent topic, i.e. "weak information, network and scientific infrastructures"; In the research of Elmer and Durocher (2020) and the studies of Popovska and Latkovikj (2019) as a solution, they encouraged students to conduct a literature review, secondary data analysis and survey research, but it should be noted that by creating infrastructures It is necessary to provide facilities so that students can choose the best and most appropriate method based on their field, topic and interests, enter the field and collect first-hand data.

According to what has been said, without a doubt, any event, especially if it happens suddenly and without planning, will be accompanied by challenges at the beginning. Efforts to create infrastructure while solving challenges require time and cooperation of people; Therefore, in such a situation, it is necessary for the university and the students to increase their cooperation and overcome the challenges and problems together, and to create motivation in the students to grow and obtain higher degrees and continue on the way, as well as the opportunities created to increase the quality Get a great education.

- Establishing research meetings with the presence of professors and students to resolve the ambiguities of research activities and benefit from the thoughts and experiences of other professors and students.
- Providing wide information about the activities of the university during the COVID-19 pandemic (notifying about workshops or seminars, how to proceed with administrative procedures, introducing sites and how to download resources from these sites, etc.).
- Organization of motivational, research workshops and seminars for postgraduate students (revival and organization of motivational, research workshops for postgraduate students and seminars for doctoral students)
- Requirement to hold online guidance sessions and establish the rules and obligations of the supervisor to the student and vice versa.
- The need to widely inform the activities of the university during the COVID-19 pandemic
- The necessity of allocating two permitted academic semesters for quantitative and qualitative research
- The need to teach essay writing, proposal, and research writing, such as placing an optional essay-writing unit in the summer.

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