IDENTIFYING VARIABLES THAT PREDICT STUDENTS' GEOGRAPHICAL INQUIRY SKILLS DURING THE COVID-19 PANDEMIC

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ABSTRACT

The purpose of this study was to observe the predictive power of the practices carried out in distance geography courses conducted during the Covid-19 pandemic in students' self-efficacy in geographical inquiry skills. Fourteen variables were determined for this purpose. In this context, questions covering the individual characteristics of the students, systems followed by the students (synchronous-asynchronous), students' interests in the course and their follow-ups, and their learning experiences were included. "The Self-Assessment Scale for Geographic Inquiry Process Skills" was used to determine the students' self-efficacy levels. The data were collected from 493 students attending 11th and 12th grades in eighteen high schools in the spring semester of the 2021-2022 academic year. The screening model was used in the research and the data were analyzed using multiple hierarchical regression methods. The results of the study showed that nine variables statistically predicted 89% of the total variance. In order of relative importance, grade, school type, and gender are the first and most important predictor variables. Students' asking questions, doing homework, and using supplementary materials come next. Based on this, it is recommended that teachers take on the responsibility of raising their students as individuals who are independent and learned to learn.

Keywords: Geography, distance learning, pandemic, inquiry, skill, self-efficacy.

INTRODUCTION

The Covid-19 pandemic is neither the first nor will it be the last of the pandemics that humankind has been facing since ancient times. Covid 19, which began in the first months of 2020, continues to have an impact on the lives of millions of people around the world, albeit in a weakening way. This pandemic, which has had significant impacts at different scales in different parts of the world, has affected the quality of life of human beings in many areas, especially in health and education. Since March 2020, when the pandemic started to be seen in our country, various measures have been taken at the secondary and higher education levels for face-to-face formal education to continue without interruption. However, since the measures taken did not provide the necessary environment for face-to-face education, distance education was swiftly and unpreparedly introduced. First, in secondary education, courses started to be conducted offline through the Education Information Network (EBA) and television broadcasting on this network, and soon afterwards online or in a hybrid model of both. Afterwards, education and training activities continued using both. This unplanned and instantaneous change was reflected in the studies in the literature, where teachers and administrators, as well as students and parents, faced adaptation problems. In this period, many educators and administrators have directed their entire educational background and skills to online learning platforms without proper planning and often without having the necessary methodological knowledge and skills (Palmentieri, 2022).

Teachers transferred their experiences in the face-to-face learning environment to online and offline platforms in a short period and contributed to the continuation of education and training activities without interruption. Teachers used tests, animations, daily assignments, additional resources, worksheets and questionnaires in online platforms to supplement live distance lectures. Students worked individually using these resources and asked questions about a subject when they had difficulty understanding it. They communicated with students through social networks so that they would not be distracted from the geography courses (Babacan & Ceviz, 2022; Firomumwe, 2022; Kilinc & Karademir, 2021). They assigned homework to the students from auxiliary sources and monitored whether the assignments were completed or not. In order not to disrupt the educational process, they continued to answer all kinds of questions about their field from all students, especially 12th-grade students preparing for the university entrance exams. The distance education and virtual classroom system enabled the diversification of geography teaching materials, and geography teachers did not have much difficulty in explaining new topics in live classes (Ince et al., 2021). Teachers stated that they carried out different activities from their face-to-face practices by using services such as Google Earth (Babacan & Ceviz, 2022). They also used video and pictures instead of fieldwork (Firomumwe, 2022). Teachers continued to use various traditional methods such as lectures, discussion, question-answer, and applied problem- and project-based learning models (Susanthi & Nursa'ban, 2022). During this period, students mostly preferred the study notes, and video and audio lectures that teachers had prepared by themselves, and textbooks (Hasan & Khan, 2020). Students were confined to watching the lessons broadcasted on EBA TV. In live classes, the quality of the class decreased due to the lack of interaction between the teacher and the students (Basaran et al., 2020), and students were negatively affected because they could not touch the materials (globes, maps, etc.) and could not access some resources (Babacan & Ceviz, 2022).

According to Bozkurt (2020), teachers taught in distance education with an experience similar to traditional, face-to-face education as much as possible. Therefore, the educational methods, tools and materials used in distance education were not very different from those used in a face-to-face course. The use of the EBA platform in Turkiye as an alternative to inaccessible online education has been included as a stabilizing factor for access to education and educational materials so that students are not disadvantaged in distance education due to their lack of readiness for this type of learning. EBA's strengths such as its rich content and its suitability for sharing questions made it easier for teachers to teach their classes (Turker & Dundar, 2020).

In addition, the Covid-19 theme as a subject has provided teachers with a basis for effective geography learning and teaching online in such an environment of turmoil, providing a unique context for current events and problem-based learning in geography education. In the geographic inquiry environment, where students are problem solvers, Covid 19 paved the way for students to reconsider the relationships between their daily lives and their education (Ushera & Dolan, 2021). The pandemic has provided opportunities for geography teachers to teach about global, economic, and socio-cultural events and phenomena in everyday life, especially the factors influencing the cause, emergence and spread of Covid 19, using digital resources. Unlike other courses, it has created real learning environments that ensured the active participation of students to develop many skills, especially geographical concepts. During the Covid 19 period, the students' current questions about what happened during this period and their desire to reach the answers to these questions offered teachers the opportunity to gain students a geographical perspective without wasting too much time. Therefore, the fact that geography itself is a natural part of Covid-19 has provided an environment for the use of many methods and resources on the internet in geography education. It is still unknown how the distance education environment, which is full of opportunities on the one hand and limitations on the other, was formed and how it turned into a learning opportunity.

Studies in the literature have raised important questions about the quality of distance education in terms of outcomes. During the pandemic period, most geography teachers focused on academic knowledge (Basaran et al., 2020), and social skills instead of geographical skills and pushed their responsibilities to gain geographical skills to the background. Due to the problems experienced by students, teachers returned to the textbook and reduced the variety of media they used in classes. Moreover, most teachers experienced difficulties in defining the role of Covid-19 in students' lives and linking it to geographical knowledge as

an important field of study or subject matter for geography and geography education (Bagoly-Simo et al., 2020). The pandemic has crystallized the need for qualified geography teachers who teach students to look beyond maps, learn inquisitively and ask critical questions about complex issues in our rapidly changing world (Van der Scheea, 2020). In geography, a course that relies on the visualization of concepts such as movement, processes and systems, teachers have struggled to use the potential of online teaching. Teachers experienced many difficulties in selecting models and methods, mastering technology, communication and availability of infrastructure (Changa, 2020; Turker & Dundar, 2020), and explaining complex and abstract topics (Babacan & Ceviz, 2022). When problems such as students' lack of attendance and low motivation were added to these (Kilinc & Karademir, 2021; Ince et al., 2021; Susanthi & Nursa'ban, 2022), they continued to use the textbook as a reference source (Bagoly-Simo et al., 2020) and conducted most learning activities as online assignments (Susanthi & Nursa'ban, 2022).

During the pandemic, the majority of studies conducted in secondary and higher education to understand how distance geography education is carried out consist of opinions of teachers, opinions of students, experience sharing, and examples of activities. These include examples of activities (Hazen, 2020; Parra et al., 2022), model development, virtual fieldwork (Firomumwe, 2022; Li et al., 2022); evaluating the effectiveness of online learning (Abdi et al., 2021); the effects of Covid-19 on teaching and learning geography (Changa, 2020); the relationship of Covid-19 with students' life experiences (Ushera & Dolan, 2021); students' perspective (Hasan & Khan, 2020; Hastuti et al, 2021; Ince et al., 2021); the role of geography in understanding local and global issues (Van der Scheea, 2020); film as a pedagogical tool (Mullick & Haque, 2022); the current state of geography education in schools and its impact on geography learning and teaching (Bagoly-Simo et al, 2020; Schultz & DeMers, 2020; Susanthi & Nursa'ban, 2020; Day et al, 2021); effective course design (Santoso, 2021); educational experience gained in line with the European Commission's Digital Education Action Plan (2021-2027) (Palmentieri, 2022); students' attitudes towards distance learning (Saribas & Meydan 2020); opinions of teachers and prospective teachers (Babacan & Ceviz, 2022; Kilinc & Karademir, 2021; Ozkaral & Bozyigit, 2020; Turker & Dundar, 2020); the contribution of the pandemic period to students' geographical knowledge (Yigit Ozudogru & Sahin, 2022).

The pandemic period is known to offer students various opportunities to develop problem-solving, organization, listening and providing feedback, writing, time management, note-taking (Li et al., 2022) speaking and self-regulation skills (Hastuti et al., 2021). In this study, the effect of geography courses on students' geographical inquiry skills during the pandemic period was observed. The study was conducted to determine the variables predicting 11th and 12th-grade students' self-efficacy in geographical inquiry skills.

One of the four main sources of information that affect people's beliefs about their competencies is their past lives and experiences. Achievements are an effective way to have a strong sense of competence and to build a firm belief in one's own competence. The stronger the perceived self-efficacy, the higher the goals people set for themselves and the stronger their determination to meet them (Bandura, 2010).

PURPOSE OF THE STUDY

This study aimed to determine the effects of the methods of distance education used by secondary education students in geography classes and the frequency of their follow-ups, some of their demographic and learning-oriented characteristics, their perceptions of having learned and remembering geography classes, and their success in the course compared to the pre-pandemic period on their self-efficacy in geographical inquiry skills during the pandemic period.

The independent variables of the study are the variables defining the students and the school, the structure of the learning-teaching environment, students' self-regulatory characteristics, and students' experiences in the geography courses in the previous year. Students' self-efficacy in geographical inquiry skills is the dependent variable of the study.

In the study, four questions were created to determine whether some variables related to the geography course during the pandemic period predicted students' self-efficacy in geographical inquiry skills.

From this point of view, answers to the following questions were sought as the problem of the research:

1. Do 11th and 12th-grade secondary education students' gender, grade, school, school placement type, and participation in the project significantly predict their self-efficacy in geographical inquiry skills?
2. Do 11th and 12th-grade secondary education students' methods of joining geography classes (Live class or EBA TV) and the frequencies of joining the classes during the pandemic period significantly predict their self-efficacy in geographical inquiry skills?
3. Do 11th and 12th-grade secondary education students' doing their homework, using supplementary resources, and asking questions in the classes during the pandemic period significantly predict their self-efficacy in geographical inquiry skills?
4. Do 11th and 12th-grade secondary education students' learning, remembering, and succeeding in geography classes during the pandemic period significantly predict their self-efficacy in geographical inquiry skills?
5. It is important to understand the practices in distance education and to continue the experiences to improve the quality of education. The results of this study are expected to have an impact on improving the quality of distance geography education.

METHOD

In this study, the retrospective survey model, one of the quantitative methods in which participants are asked questions about the events they experienced in the past, was used (Buyukozturk et al., 2012; Karasar, 2020). The single survey model, which is one of the general survey models, was conducted retrospectively with a cross-sectional approach. In single surveys, it is important to determine the characteristics directly and in accordance with certain standards (Karasar, 2020).

The stratified purposive sampling method was preferred when determining the sample. In the stratification method, the sample is formed by dividing the groups drawn from the population into subgroups, each of which belongs to a stratum and also in such a way that none of the strata representing the population is excluded from the study (Buyukozturk et al., 2012). In this context, eighteen high schools were selected among schools of different quality in Ankara. In these high schools, students' participation in distance education during the pandemic period was effective in determining the branches.

Participants

The study group consisted of eighteen high schools and a total of 493 students. The schools were selected from Golbasi, Cankaya, Yenimahalle, Altindag, and Kecioren districts of Ankara province. These schools were also grouped according to whether they enrolled students with or without an entrance exam. Ten schools in the study group accepted students through the Address Based Population Registration System (ABPRS/ADNKS in Turkish) and eight schools accepted students through the high school entrance exam (HSEE/LGS in Turkish). Religious Vocational (aka Imam Hatip) and Vocational and Technical Anatolian, Anatolian (with and without placement exam), and Science and Social Sciences high schools were included in the study group. Two schools are located in Altindag, seven in Cankaya, six in Golbasi, one in Yenimahalle and two in Kecioren district. Seven of the schools are Anatolian high schools, four are religious vocational (imam hatip) high schools (two single-sex girls', one single-sex boys', and one coed), two are science high schools, two are social sciences high schools, and three are vocational and technical Anatolian high schools.

The data were collected from 11th and 12th-grade students who took elective or compulsory geography courses in the 2021-2022 academic year. The composition of the study group from 11th and 12th-grade students was because of the fact that they participated in geography courses through distance education for at least three semesters during the pandemic.

The study group consisted of 35.7% (n=176) male and 64.3% (n=317) female students, 73.4% (n=363) 11th-grade students and 26.4% (n=130) 12th-grade students. While 42.8% (n=211) of the students attended the schools without entrance exams, 57.2% (n=282) attended the schools that enroll students with an entrance exam. The number of students included in the study group varies according to the environmental characteristics and type of the school.

Data Collection and Analysis

The study was conducted in schools where school administration, parents and students were willing to participate. The data collection tools were administered by the researcher together with the school administrators who permitted the application after obtaining parent-student approval. The questionnaire form and scale were distributed to the students in printed form. The data collection took approximately one month in the spring semester of 2021-2022. SPSS 26 software was used for data analysis. For the purpose of the study, multiple linear hierarchical regression analysis was conducted to determine whether the 14 questions, determined as independent variables, were predictive variables of geographical inquiry skills and their predictive power. For this purpose, dummy variables were created by reducing the number of categories to two in each variable due to the categorical nature of the independent variables. The presence of a linear relationship between the predictor variables and self-efficacy, which is the dependent variable, and whether they show a multivariate normal distribution were analyzed. As a result of this examination, it was accepted that the normality and linearity assumptions of the data were met. The multicollinearity problem among the predictor variables was eliminated by removing some independent variables from the model.

The Scale

A fourteen-question questionnaire prepared by the researcher and the Geographical Inquiry Process Self-Assessment scale, which was developed by Yigit Ozudogru (2021) and includes five dimensions and 22 items, were used in the study. The scale used in the study was preferred because it was prepared for secondary school 9-12th-grade students and has high validity (KMO value 0.914 and chi-square (x^2=3459.765; df=231; sig=000) significant) and reliability (Cr α EFA value 0.926 and CFA value 0.950). While preparing the questionnaire, studies in the literature were examined and factors that may have an impact on students' geographical inquiry skills were identified. The questionnaire was finalized with the information obtained from the interviews with a teacher working at an Anatolian high school designated as a project school and an assistant principal at a vocational high school. The questionnaire included demographic information such as gender, grade, whether they participated in a TUBITAK project during the pandemic, and questions about the learning environment, learning style and learning status. First, in order to ensure cognitive or affective learning, students were expected to follow their lessons as in face-to-face education. To determine this, questions were prepared about whether the students attended the classes, and if so, the system they followed (synchronous-asynchronous) and how often they followed the classes. Even if a student participates in the class, quality learning may not take place. To understand the time he spent learning the course, it was aimed to determine how often he performed behaviors such as using materials, doing homework and asking questions. These behaviors were classified into three categories (never, occasionally, and always).

In addition to these questions, questions about their experiences related to learning were included. These questions were determined as the student's learning, remembering what he/she learned, i.e. retention and course success. The questionnaire was administered to an eleventh-grade student and the total response time was determined. After the questionnaire was reviewed by assessment and language experts, ethical and application approval was obtained.

FINDINGS

First, the students' geographical inquiry process skill scale total mean scores were calculated according to the schools and the results are given in Table 1.

Table 1. Distribution of Students by District, School, and School Type and Their Scale Mean Scores

District	School Name	School Type	N	%	Mean	SD
Altindag	Sabahattin Zaim Social Sciences High School	HSEE/LGS	31	6.3	83.16	2.382
	Ankara Girls' Anatolian Religious Vocational High School	HSEE/LGS	23	4.7	73.74	3.078
Cankaya	Hasan Ali Yucel Social Sciences High School	HSEE/LGS	91	18.5	85.89	1.578
	Cumhuriyet Science High School	HSEE/LGS	20	4.1	73.75	4.083
	Ankara Science High School	HSEE/LGS	30	6.1	80.80	2.180
	Bahcelievler Anatolian High School	ABPRS/ADNKS	23	4.7	87.57	2.838
	Ayhan Sumer Anatolian High School	HSEE/LGS	14	2.8	89.93	4.094
	Ayranci Vocational and Technical Anatolian High School	ABPRS/ADNKS	14	2.8	69.29	4.039
	Dr. Binnaz Ege- Dr. Ridvan Ege Anatolian High School	HSEE/LGS	18	3.7	79.89	3.634
Golbasi	Mehmet Akif Ersoy Boys' Anatolian Religious Vocational High School	ABPRS/ADNKS	16	3.2	78.50	4.283
	Zubeyde Hanim Vocational and Technical Anatolian High School	ABPRS/ADNKS	30	6.1	64.23	2.513
	Erdem Bayazit Anatolian High School	ABPRS/ADNKS	26	5.3	75.04	3.267
	Sehit Sebahattin Kocak Girls' Anatolian Religious Vocational High School	ABPRS/ADNKS	29	5.9	80.00	2.403
	Ahmet Alper Dincer Anatolian High School	ABPRS/ADNKS	41	8.3	80.49	2.646
	Sevgi Anatolian and Science High School	ABPRS/ADNKS	28	4.7	78.89	2.979
Yenimahalle	Tevfik Ileri Anatolian Religious Vocational High School	HSEE/LGS	27	5.5	81.30	3.029
Kecioren	Kâtip Celebi Anatolian High School	ABPRS/ADNKS	26	5.3	86.65	2.425
	Kanuni Vocational and Technical Anatolian High School	ABPRS/ADNKS	6	1.2	77.00	8.466

When the results of the scale total mean scores were analyzed according to the schools (Table 1), Ayhan Sumer Anatolian High School (with a mean score of 89.93) had the highest mean skill scores, followed by Bahcelievler Anatolian High School (with a mean score of 87.57). The schools with the lowest mean skill scores were Zubeyde Hanim (64.23) and Ayranci Vocational and Technical Anatolian High Schools (69.29). According to the school types, the students with the lowest mean total scale scores were in vocational high schools. These schools were followed by Cumhuriyet Science High School (with a total mean skill score of 73.75) and Ankara Girls' Anatolian Religious Vocational High School (with a total mean skill score of 73.74). These results show the significant impact of students' efforts on skills, rather than schools'.

The frequency analysis of the students' responses to the questionnaire items and the results of the scale total mean scores for each category of each variable are presented in Table 2.

Table 2. Descriptive Statistics of Student Responses According to Total Scale Score

Variable	Category	N	%	Total	Mean	SD
Gender	Female	317	64.3	493	79.77	.949
	Male	176	35.7		80.43	1.387
Grade	11	363	73.6	493	79.45	.891
	12	130	26.4		81.54	1.620
School Type	ABPRS/ADNKS	211	42.8	493	77.38	1.257
	HSEE/LGS	282	57.2		81.83	.983
TUBITAK	Yes	98	20.7		87.20	1.707
	No	344	72.6	493	77.96	.908
	Partly	32	6.8		80.15	2.098
	Eba TV	11	2.3		73.91	6.916
How were the geography classes taught?	Live class	381	79.0	482	79.92	.852
	Both	77	16.0		81.70	1.998
	None	13	2.7		77.70	7.196
	Never	248	51.3	483	78.63	1.088
How often did you follow the geography lessons broadcast on EBA TV?	Occasionally	194	40.2		80.12	1.169
	Always	41	8.5		87.43	3.074
How often did you follow live classes given by your geography teacher?	Never	41	8.5	485	77.33	3.216
	Occasionally	198	40.8		75.41	1.170
	Always	246	50.7		83.97	1.037
How often did you do the assignments given in EBA TV or live class?	Never	67	13.6	491	74.57	2.546
	Occasionally	204	41.5		78.43	1.090
	Always	167	34.0		84.46	1.328
	No assignments were given	53	10.8		78.40	2.202
How often did you use supplementary resources?	Never	98	20.0		73.41	1.973
	Occasionally	252	51.5	489	79.51	.979
	Always	139	28.4		85.34	1.436
How often did you ask your teacher questions?	Never	201	40.9		75.97	1.232
	Occasionally	250	50.8	492	81.52	1.014
	Always	41	8.3		90.94	2.831
My geography course success compared to the pre-pandemic period	Better	114	23.4		83.04	1.694
	Same	203	41.7	487	80.86	1.224
	Worse	170	34.9		76.93	1.230
I learned the topics covered in the geography course...	easily	187	38.2		85.68	1.192
	with difficulty	166	33.9	489	79.27	1.212
	I could not learn	136	27.8		73.28	1.514
Regarding what I learned in geography classes,...	I do not remember anything	177	35.9		74.78	1.354
	I remember a little	258	52.3	493	81.81	.965
	I remember	58	11.8		88.08	2.354

Table 2 shows that 79.0% of the students followed live classes and 16.0% of the students followed both live classes and lectures on EBA TV. 50.7% of these students followed all of the live classes. 51.3% of the students have never participated in the lectures given on EBA TV. 23.4% of the students stated that their geography course success was better than it was before the pandemic, 38.2% stated that they learned the subjects taught in the geography course easily and 35.9% stated that they did not remember what they had learned in the geography course.

The total mean scores of skill self-efficacy in Table 2 show that the mean skill scores of boys were slightly higher than girls, those of 12th graders were slightly higher than those of 11th graders, and those of participants in a project were slightly higher than those of non-participants. The difference in mean scores between 11th and 12th graders can be attributed to the fact that 12th graders took courses for two more semesters and that they were older.

However, those who followed the geography courses both on EBA TV and in live classes, who followed the classes without interruption, who did their homework regularly, who used supplementary resources, and who asked questions had higher mean skill scores than the others. Those who had lower achievement in geography courses compared to pre-pandemic levels, those who stated that they had learning difficulties during the distance education period, and those who did not remember what they had learned had lower mean skill scores compared to others.

How a student is placed in a school is also among the factors that increase self-efficacy related to student skills. Students who took the high school entrance exam (HSEE/LGS) and were placed in a school by passing this exam have higher average skill scores than others. It is quite normal for these students to have certain competencies more than others for various reasons. It can be said that both the students' prior competencies and the advantages of the school (quality of teachers and availability of technical infrastructure) have an impact on students' skill development.

Accordingly, the skills of students with developed self-regulation such as participating in projects, following the courses, asking questions about the topics in classes, and doing homework without any interruption are also high. In particular, the fact that the students with the highest mean scores in geographical inquiry self-efficacy were the students who stated that they constantly asked their teachers questions shows that asking questions is important for the development of inquiry skills.

The results of the stepwise multiple linear regression analysis to determine the significant predictors of students' geographical inquiry skills are given in Table 3.

Table 3. Multiple Linear Hierarchical Regression Analysis Results for the Total Scale Score

		Part. Cor.	t	p	B	ß	R	R^2	Adj. R^2	F	p
Model 1							.871	.759	.757	489.872	.000
	Gender	.041	2.786	.006	7.198	.071					
	School Type	.132	8.874	.000	2.571	.200					
	Grade	.053	3.563	.000	10.075	.063					
Model 2							.900	.810	.808	495.880	.000
	EBA TV	.050	3.381	.001	8.722	.074					
Model 3							.941	.886	.884	513.699	.000
	Assignment	.079	5.292	.000	16.361	.174					
	Resource	.093	6.216	.000	20.800	.227					
	Asking questions	.044	2.942	.003	8.101	.076					
Model 4							.948	.898	.896	450.257	.000
	Learning	.097	6.523	.000	19.214	.199					
	Success	.034	2.252	.025	6.596	.039					

Table 3 shows that there are nine important predictors of geographical inquiry skill.

In the regression analysis, the variables of gender, grade, participation in a project, and type of school placement were first added to the equation, explaining 75.7% of the variance in geographical inquiry (R^2 = .757; FReg = (4.445)= 489.872; p< .01). In the model, all variables contributed significantly to the variance. Therefore, all variables were included in the model in the first stage.

In the second stage, variables determining the frequency of following the courses via live classes and lectures broadcast on EBA TV were added under the title of course instruction and course follow-up method, which contributed 5.1% to the explained variance (R^2 =.808; FReg (2.445)= 495.880; p< .01). At this stage, the variables that showed multicollinearity such as course instruction and course follow-up method and the frequency of following live classes were excluded from the analysis. In the second stage, only the variable indicating the frequency of following the course via lectures broadcast on EBA TV was added to the first model.

In the third stage, the variables of doing homework, using supplementary resources and asking teachers questions were added for student self-control, which contributed 7.6% of the variance (R^2 =.884; FReg (3.539)= 513.699; p< .01). The third model, created with the new variables, is also statistically significant. At this stage, the new variables contributed significantly to the model along with all the variables included in the regression equation. Therefore, since no variable was removed from the model in the third stage, the number of variables increased to eight.

In the fourth stage, with a 1.2% contribution to the variance (R^2 =.916; FReg (1.538)= 450.257; p< .01), perception questions such as recall, learning and course success were included. The model at this stage is statistically significant but its contribution to the variance is low. The variables of recall and involvement in a TUBITAK project, which were statistically significant in the previous models, were removed because they did not contribute statistically significantly to this model. In the fourth and final stage, three variables were added and two variables were removed from the model.

Finally, after all variables were entered into the model in the form of a block, nine variables that had an effect on students' geographical inquiry skills and contributed significantly to the variance were identified. This model explains 89.6% of the variance. The variables that did not make a statistically significant contribution to the model were participating in a project and remembering the course. The variables excluded from the model due to multicollinearity are following the lessons live and always attending the live classes. The results of the test for the significance of the regression coefficients show that all variables included in the model are significant predictors of geographical inquiry skills. The signs of the regression coefficients indicate that the relationship between all variables and geographical inquiry skills is positive.

According to the standardized regression coefficient (ß), the relative order of importance of the predictor variables that contribute the most to this model on inquiry skills are; using supplementary resources, school type, having no problems in learning the course, doing homework completely, being able to ask questions and always watching the broadcasts on EBA TV without missing them, gender, being in the 12th grade, and the success in geography course during the pandemic.

When all the variables predicting the model are evaluated together, it is understood that the most important predictor is the determination of the student to participate in the class and fulfil his/her responsibilities. These students followed the live classes without any interruption, stayed in full communication with their teachers and followed the instructions they were given carefully. Another important contributing variable is school type. Accordingly, the geographical inquiry skills of students who were placed in a school through an exam are higher than those of students who were placed in a school through ABPRS/ADNKS. Students' use of supplementary sources is as effective as the type of school on skills. Students who follow their courses and continue to work with supplementary sources have improved their skills. Another important contributor to the model is the grade in which the student continues his/her education. 12th-grade students have higher skills than 11th-grade students. Based on its average and positive predictive power, it is possible to say that the effect of age is also observed indirectly. Here, the contribution of courses that students take in one more academic year should not be overlooked. Doing homework regularly also significantly predicted the skill. Following the lectures on EBA TV and communicating with the teacher, asking questions and getting feedback on their questions are among the other skill-building variables. This reveals that when synchronous courses and asynchronous courses are used together in distance education, they are as effective as in face-to-face learning. It is understood that both knowledge and skills are gained in asynchronous lessons where there is no interaction at all. These results put students who make an effort to learn ahead of others.

Whether the learning tools used by the students to follow the geography course were synchronous or asynchronous, remembering what they learned from the previous year and participating in a project, always following the live classes did not significantly predict self-efficacy in geographical inquiry skills. These variables

are activities that are regularly carried out voluntarily by all students who have already taken responsibility for their learning. As can be understood when the significant predictors are examined, students who do not follow the course are not expected to do homework, use resources, ask questions, succeed in the course and learn.

DISCUSSIONS AND CONCLUSION

Although it is a global pandemic, the effects of Covid 19 were felt more at the local level, so measures were also taken at the local level. As health officials worked in laboratories to find a medical solution to the pandemic, economists looked for ways to manage its impact on national economies. Social policymakers have sought to identify and take measures to address the social and economic damage caused by Covid 19 to disadvantaged groups and the barriers to equal access to health and education. Geographers and geography educators have also taken on the task of helping to observe, understand and make sense of geographical events and phenomena stemming from Covid 19. Educators endeavored to understand what happens in the learning environment for a higher quality education (Sintema, 2020). This unexpected situation forced educators to adopt different learning theories that they had been largely unaware of (Schultz & DeMers, 2020).

Many studies have been carried out to identify the developments in education with Covid 19, to understand the applications in the learning environment, and to increase the quality of distance education. This study was conducted to determine the variables predicting students' self-efficacy in geographical inquiry skills in distance education. At the end of the study, it was found that nine of the fourteen variables significantly predicted students' self-efficacy in geographical inquiry skills.

First, gender, grade, and school placement type were found to be significant predictors in explaining students' self-efficacy in geographical inquiry skills. The self-efficacies of male students were higher and more significant than those of female students. The grade variable had a positive and significant predictive power in predicting students' perceptions of self-efficacy in geographical inquiry skills. 12th graders had a higher average score than 11th graders. The mean skill scores of students from all types of schools that enrol students through HSEE/LGS were higher than those of vocational high schools and Anatolian high schools that enrol students without an entrance exam, i.e., HSEE/LGS, and school type was a significant predictor. These results support the findings of Babacan and Ceviz (2022) that public school students with higher entrance exam scores are more likely to attend geography courses than those with lower entrance exam scores; Valentina (2002) that more mature students are most likely to achieve success through distance education; and Day (2015) that boys have higher test scores than girls (as cited in Day, et al., 2021).

Based on the results, it can be said that the differences observed between 11th and 12th grade students may be due to two reasons. The first one is the ages of the students, while the other is the setting learning objectives appropriate to the grades of the students with the Geography Course Curriculum (CDOP, 2018). In the CDOP, the recommended outcomes for the development of students' geographic inquiry skills continue to increase gradually from 9th grade to 12th grade (MEB, 2018). In addition, these outcomes, which are recommended for students to gain geographic inquiry skills, become increasingly complex towards 12th grade, focusing on themes that require cognitively higher level thinking. Therefore, the fact that 12th graders' self-efficacies in geographic inquiry are higher than that of 11th graders can be attributed to the fact that these students have taken two more semesters of geography courses in line with the CDOP.

The fact that the school type is a significant predictor depending on the placement score may be attributed to the fact that the students of Anatolian and Science high schools, which enrol students with high scores, have fewer deficits in their learning backgrounds and higher readiness levels. In addition, the high levels of teacher competencies and school infrastructure and equipment may also have an impact on these students. In the case of vocational high school students, the opposite situation may reduce their motivation and prevent them from having a better learning experience. Therefore, it can be said that these deficiencies and the cognitive difficulties experienced by students in the past learning periods were reflected in their self-efficacy.

Students' placement scores to enrol in a school have a relationship with the educational level and socioeconomic status of their families (MEB, 2019). High-poverty students' access to higher-quality education has become more difficult during the pandemic and they have not been fully provided with adequate conditions to overcome their academic underachievement. Many students attending vocational high schools in Turkiye are from low-income families. It is known that the pandemic period has increased the vulnerability of this

lower-income group in education (Ozer et al., 2020). Girls in these families face a more disadvantageous situation than boys by having to take on responsibilities such as helping with domestic chores and taking on baby care (Ceran & Ergul, 2022). It is seen that the disadvantaged status of girls and students of schools that enrol without exams, such as vocational high schools, which continued before the pandemic, increased their vulnerability in skill development with the pandemic. In the literature, there are findings that the geographical characteristics of the place where students live have a significant impact on learning deficits and that children from families living in rural areas are more disadvantaged than those living in cities (Baz, 2021). In this study, since all students resided in the metropolitan districts of Ankara, the capital of Turkiye, a problem related to internet access was not identified as a variable to be used to interpret the results of the study. However, although students attending open-enrollment schools such as vocational high schools do not have problems with internet access, crowded families and the presence of more than one school-age child in the family hinder adequate access to technological devices such as computers and televisions. As a result, it becomes possible for more than one student in a house to participate in a class at the same time. It can be said that this situation reflects negatively on the development of students' self-efficacies in geographic inquiry process skills whose families have low educational and socio-economic levels.

Families' close monitoring of the distance education process, their motivation and support for attending classes and doing homework directly affect students' participation in distance education processes and their learning levels (Ozer et al., 2020). Students in schools with entrance exams generally come from families with high levels of education and socio-economic status. The fact that the follow-up and support of the families of successful students who enrolled in a school with the placement exam score continued during the pandemic caused their self-efficacies in geographic inquiry skills to increase compared to other students.

Second, it was found that students' self-regulatory behaviors such as asking questions, doing homework, and making use of supplementary resources both increased their mean self-efficacy scores and were significant predictors following the personal variables. In particular, the fact that the students who insisted on asking the teachers questions had the highest mean scores of self-efficacy in geographical inquiry skills compared to other variables shows that the role of questions in the development of inquiry skills is important.

The mean scores of the students who asked questions support the theoretical knowledge and conceptual framework suggesting that a good inquiry should start with questions. Basar et al. (2019)'s finding that there is a direct correlation between attitudes towards distance education and caring, attention, course efficiency and success; Reimers and Schleicher (2020)'s finding that time spent on learning is a reliable predictor of learning opportunity; Yates et al. (2021)'s findings that the time allocated to school and school assignments affects students' sense of learning, students who spend less time studying at home than others have a lower sense of learning than students who spend more time studying; Babacan and Ceviz (2022)'s findings that students who participate in class learn more because they ask more questions and want to answer them more than others; Sintema (2020)'s findings that the time students spend in communication with their teachers and their ability to consult them when they encounter difficulties in learning/comprehension are effective on the level of academic performance; Day et al. (2021)'s finding that teachers' accessibility, quick feedback and clear instructions lead to progress in students; and Orhan et al. (2021)'s findings and opinions that learning perceptions make significant differences according to participation in classes and that the learning rates of students who do not participate in classes decrease are in line with the results of this study.

As the above research results show, class participation and the structure of the learning environment is a factor that increases the learning rate and encourages students to ask and answer questions. The atmosphere created for easy access to the teacher in the learning environment improved the geographic inquiry skill self-efficacies of the students who attended the class, asked questions and received answers to the questions they asked, and were supported with various methods when necessary to reach the answer.

According to the CDOP (2018), it is not enough to talk about a single type of assessment and evaluation method and to make cognitive measurements only. To this end, students are asked to develop their skills through various types of homework assignments as well as in-school activities. When students are given homework assignments that involve thinking, understanding, questioning, research and problem solving, these assignments improve their skills, help them structure information in their minds and increase the retention of learning. Research suggests that the reason why Korean and Japanese children are more successful than others in exams such as PISA, PIRLS and TIMMS is because they do homework (Gunes, 2014). During

the Covid 19 period, teachers, students and parents agreed that homework has an important role for students' development (Altan & Karalar, 2022, Basaran & Vural, 2022; Pekcan & Toraman, 2022). The conditions experienced during the pandemic directed teachers and students to homework, and students who fulfilled their responsibilities by doing their homework received positive results. Homework assignments given for various purposes such as preparation, reinforcement, drawing attention and repetition within the scope of the geography course increased students' self-efficacy in geographic inquiry skills. Doing homework by using various resources and asking questions to the teacher when necessary, students taking responsibility for their own learning, and the correct design of the learning environment by the teacher as open to communication supported skill development in distance education.

Third, it was found that regularly following the classes from asynchronous sources such as EBA TV increased the students' mean scores of self-efficacy in geographical inquiry skill and predicted them significantly.

Turk et al. (2021) reported that asynchronous method is more effective than synchronous method and Ince et al. (2021) mentioned that EBA TV contributes less to distance education practice. In the emergence of this result, which overlaps with both studies, the effects of the content of the course carried out synchronously via the EBA platform, the materials used, and the design of the learning and teaching environment can be mentioned. It can be said that the way of conducting live classes in the distance education period and the purpose of using EBA TV are effective on the results. EBA has different learning tools for all ages and levels, including lecture videos, interactive materials, interactive games, tests, lecture notes and other resources. On the EBA platform, teachers can communicate with students, assign homework, provide feedback and encourage student engagement through online discussion forums. It allows students to manage their time effectively and acquire knowledge and skills in accordance with their own learning pace and style. However, EBA has some limitations in that the classes are one-way, there is no opportunity to ask questions to the teachers, and students cannot satisfy their curiosity at that moment. Therefore, students prefer interactive lessons because they can communicate more easily with the teacher and ask questions (Aydin, 2020). However, students tried to overcome their deficits on the EBA platform because they had problems with attendance, active participation and focusing in live classes during the distance education period (Ceran & Ergul, 2022). EBA was used by students as a supplementary platform to overcome difficulties they encountered in synchronous lessons or to learn topics they had difficulty understanding. The time students spend on a particular course tool to learn the course is an indicator of their effort and diligence towards the course. Therefore, the determined and eager behavior of the students who followed EBA TV in attending the class made them stand out in skill acquisition compared to the students who followed the live classes compulsorily and reluctantly. The results of this study show that students' active participation in live classes and supporting their learning with EBA provided positive development. The results of this study show that students' active participation in live classes and supporting their learning with EBA provided positive development. Therefore, in order to close the gap in students, it is expected that using both methods together instead of using only synchronous or asynchronous methods in course follow-up will be a solution for more permanent learning and skill development. For this, the EBA platform should be enriched by adding skill-based applications and materials.

Fourth, having no difficulty in learning the geography course and indirectly the success in the course was reflected in the student's geographical inquiry skill self-efficacy mean score and predicted the model significantly. As a result, having been able to learn geography classes supports students' skill development. The pandemic period has provided many opportunities for geography teachers to conduct their classes more actively and ensure permanent learning. In addition, what happened during the pandemic period provided up-to-date content for geography courses. Geography teachers used many materials related to the subject, especially digital maps and globes, in their classes (Macit & Coban, 2021). The use of these materials in the classes facilitated students' learning of the lesson and contributed to skill development. In a study conducted by Santoso (2021) using the inquiry method during the distance education period, he found that students were more successful than face-to-face education. (Ozcan & Gucum, 2022) concluded in a similar study that students' achievement in science courses increased. According to Ceran & Ergul (2022), during the pandemic period, teachers' use of traditional and student-centered methods together is an important process for students to gain skills. Therefore, it is possible to say that skill development took place in the courses conducted by teachers using methods, approaches and materials appropriate to the characteristics of students during the pandemic period. According to these results, the responsibility of teachers to prepare

learning environments appropriate to the level of students and the necessity of conducting classes with different approaches and using materials appropriate to the content of the course in distance education have become evident. It was concluded that students' skill development would increase if teachers move away from monotonous lectures, plan inquisitive classes and conduct these classes with the active participation of students and by utilizing tools such as maps, globes, Google Earth and GIS.

Students' participation in classes, listening actively, repeating through homework assignments, and trying to overcome their deficits by following asynchronous broadcasts, in other words, taking their responsibilities on their own and staying in communication with their teachers positively affected the development of their self-efficacies in geographic inquiry skills. Therefore, in distance education, students need to have the skills to control, manage and plan their own learning compared to face-to-face education (Ally, 2004). In distance education, just as in face-to-face classroom education, students' characteristics and willingness affect skill self-efficacy. From this point of view, it is possible to say that skill development is directly affected by a student's sense of responsibility, interest in the course, attitude and motivation. The results showed that students who actively participated in classes and were able to fulfill their responsibilities had higher levels of skill self-efficacy. Depending on a student's effort and success in learning a lesson, his/her skill development also increased. In distance education, self-regulated learning skills increased success (Duzgun & Unal, 2022) and supported the development of students' skills and abilities (Samortin et al., 2022) and inquiry skills (Teke, 2020), as well as geographic inquiry skill self-efficacy. It was concluded that students' self-efficacies in geographic inquiry skills develop in distance education if the learning environment in face-to-face education is created and students have the opportunity to fulfill their responsibilities.

Based on the results of the study, it is recommended that;

- the responsibility for learning be given to students (Demir et al., 2022),
- environments, materials and perspectives that support a culture of inquiry-based learning be created,
- students be encouraged to ask questions,
- materials be designed in a multidimensional form on the EBA platform so that they will be live and can be used in distance education,
- assignments that are accessible and suitable for individual work be given,
- synchronous and asynchronous methods be used together.

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