IJPES
www.ijpes.com
International Journal of Psychology and Educational Studies
ISSN: 2148-9378

Why Do Pre-Service Teachers Prefer Face to Face, Online or Hybrid Education?*

Suat KAYA[1],

[1] *Faculty of Education, Ağrı İbrahim Çeçen University, Ağrı, Türkiye* *0000-0001-6593-3205*

ARTICLE INFO

Article History
Received 14.09.2022
Received in revised form 23.01.2023
Accepted 10.02.2023
Article Type: Research Article

ABSTRACT

In this cross-sectional survey, it was aimed to analyze pre-service teachers' comparative perceptions about face-to-face (F2F) and online courses. It was also intended to discover the predictors influencing their choice of educational modes. The sample consisted of 338 pre-service teachers, selected with the cluster random sampling method, studying at two universities in Turkey. Data were collected using a questionnaire developed by the researcher. Data regarding the sample's comparative perceptions of online and F2F courses were analyzed with descriptive statistics, while Multinomial Logistic Regression was used to analyze the predictors influencing the sample's education preference, which had three categories: online, F2F and hybrid education. Preliminary findings revealed that the sample preferred hybrid education more than online or F2F education. Further findings revealed that as participants' satisfaction with online courses increased, as did their autonomy and the instructional effectiveness of the online courses, students' proclivity to prefer online education over F2F education increased. Additionally, gender and university type influenced this sample's preferences between F2F and hybrid education significantly.

Keywords:
Face-to-face education, hybrid education, online education, multinomial logistic regression

1. Introduction

The COVID-19 pandemic has touched our lives in all aspects, including the provision of education all around the world. When the pandemic started in late 2019, all education institutions were obliged to transform their mode of education delivery from F2F to distance education (DE). Since then, all education institutions from early childhood education to universities have started to provide education through distance education opportunities. It was the distance education opportunities that allowed these institutions to reach the students who otherwise could not have the chance to attend their classes in order to get a degree or gain knowledge in general. This fact has turned DE, online learning (OL), online courses and the concepts and theories regarding DE into the most researched subject of study throughout the world since the pandemic.

The pandemic has not finished completely yet and it still continues to risk lives, so educational institutions still seek ways to decrease this risk while delivering education simultaneously. The Turkish Council of Higher Education decided upon hybrid education in the 2021/2022 education period which made it possible to offer both online and F2F courses at the same time. In this respect, this decision made it possible for higher education institutions and instructors to choose between online and F2F course offerings.

It is essential to get a clearer understanding of DE, as it seems to be on its way to becoming an indispensable component of education. The hybrid education opportunity allowed the researchers to directly compare these

*Part of this study was presented as an oral presentation at TRB2 International Congress on Educational Sciences held on June 24 -26, 2022.

[1]Corresponding author's address: Ağrı İbrahim Çeçen University, Faculty of Education, Ağrı /Türkiye
e-mail: kayasuat2002@gmail.com

Citation: Kaya, S. (2023). Why do pre-service teachers prefer face to face, online or hybrid education?. *International Journal of Psychology and Educational Studies*, *10*(2), 379-392. https://dx.doi.org/10.52380/ijpes.2023.10.2.1024

course offerings. In this respect, the purpose of this research study, was to analyze pre-service teachers' comparative perceptions about F2F and online courses. It was also intended to discover the predictors influencing their choice of education mode. The following research questions were developed to achieve this goal:

- What are pre-service teachers' comparative perceptions of F2F and online courses?
- What are the predictors influencing pre-service teachers' preferences for online, F2F, and hybrid education?

The research studies conducted since the pandemic and previous literature have managed to answer many questions regarding DE. These questions have included effectiveness of DE in terms of learning (Johnson & Palmer, 2015); students' views and perceptions about it (Bristow et al., 2011); the problems encountered during DE (Kaya, 2020; Kaya, 2021a); students' satisfaction with DE/online learning (Tratnik, Urh & Jereb, 2019); and students' engagement in online courses (Kaya, 2021a); however, what makes this research unique is its attempt to answer more of these questions in a single study more directly. What is more, the reasons behind their course preferences and education mode are searched for, which might result in important findings with respect to course offerings.

2. Theoretical Framework and Literature Review

2.1. Online vs. F2F Learning

OL can be described as "the use of the Internet to access learning materials; to interact with the content, instructor, and other learners; and to obtain support during the learning process in order to acquire knowledge, construct personal meaning, and grow from the learning experience" (Ally, 2008, p. 17). Apart from the place of instruction that separates learners and teachers, OL is quite similar to F2F learning. As stated by Paul and Jefferson (2019), OL and F2F education have many shared qualities: "Students are still required to attend class, learn the material, submit assignments, and complete group projects. While teachers still have to design curriculums, maximize instructional quality, answer class questions, motivate students to learn, and grade assignments" (Paul & Jefferson, 2019, p. 2). Below are some studies comparing OL and F2F learning in terms of some concepts and constructs.

2.1.1. Learning Outcomes in Online vs. F2F Courses

F2F or online, all educators' main purpose is to teach and help students learn and the question has been "which delivery medium generates higher and better student performance" (Paul & Jefferson, 2019, p. 2). Previous research comparing the two teaching modes highlight that students learning online can be as successful as the ones having F2F education (Aly, 2013, 2016; Arbaugh et al., 2009; Smith et al., 2015). The studies conducted by Basile and D'Aquila (2002); Warren and Holloman (2005); Shifflett and Sibley (2006); Chen and Jones (2007); Fortune, Herman and Banister (2007); Keller, Hassell, Webber and Johnson (2009) and Dell, Low and Wilker (2010) concluded that DE is as successful as F2F education regarding students' learning and their final grades. Some studies further suggest that the students learning online get higher marks than students having F2F education (Dendir 2016; Enriquez, 2010; Shachar & Neumann, 2003).

In contrast to the studies above, the studies conducted by Dereshiwsky and Rich (2011); Nemetz et al. (2017); Paul and Jefferson (2019); Wagner, Garippo and Lovaas (2011) did not find any significant differences between F2F and online courses in terms of final grades, while some studies concluded that online students underperformed their F2F counterparts in terms of their overall performance and final grades (Arias, Swinton & Anderson, 2018; Chen, Jones & Moreland, 2010; Dendir, 2019; Johnson & Palmer, 2015; Morgan, 2015; Parsons-Pollard et al., 2008).

2.1.2. Interaction in Online vs. F2F Courses

Interaction, which can be defined as the interplays between learners and relevant educational elements, is categorized by Moore (1989) as "learner-learner interaction," "learner-content interaction," and "learner-instructor interaction." Previous studies conducted before the COVID-19 pandemic have demonstrated the positive influence of interaction on learners' satisfaction (e.g., Alqurashi, 2019; Kuo et al., 2014; Paul et al., 2015; Swart et al., 2014), engagement (e.g., Bolliger & Halupa, 2018), and academic performance (e.g., Ekwunife-Orakwue & Teng, 2014).

During the COVID-19 pandemic, research studies clearly demonstrated the importance of interaction. In the study of Meehan and Howard (2020), students noted "how they keenly missed the easy interactions with peers and lecturers that they enjoyed pre-Covid, and the negative impact this absence had on their learning" (p.24), which coincided with Mullen et al.'s (2021) study, in which students "admitted to being unaware, until COVID-19, of what was gained from their peers on campus in terms of the implicit or "accidental" learning that happens in this environment" (p. 21). Mullen et al. (2021) concluded their research by highlighting the shared desire for communication and connection among students and staff. According to Adnan and Anwar (2020), students have made it clear that they feel as if they would not be able to interact as well with their classmates and teachers in an online learning mode compared to a F2F class. Likewise, Otter et al. (2013) highlighted that students felt more disconnected when studying alone; Nartiningrum and Nugroho (2020) complained about less direct interactions; and Kanik (2021) found that students had negative perceptions about OL, and some of the reasons were reported to be disconnection from peers and teachers, a lack of help from their peers, and a lack of immediate feedback.

Some studies compared online courses with F2F courses. Johnson and Palmer (2015), for example, examined tthe F2F and online versions of a course. The students in F2F courses were found to earn a higher GPA. As a result, those students preferred to take more F2F courses. Interaction was discovered to be necessary for success in face-to-face (F2F) courses. The convenience of online courses was highlighted as a factor influencing students' decisions to take them. Jaggars (2014) investigated students' experiences of F2F and OL as well as the reasons behind their preference for online courses over F2F courses. Findings revealed that students did not prefer to take difficult courses online as there was less interaction in online courses. Quite similarly, Platt, Raile, and Yu (2014) concluded that online courses offered fewer opportunities for interaction.

2.1.3. Satisfaction in Online vs. F2F Courses

Thong, Hong, and Tam (2006) define satisfaction, a construct derived from Expectation Confirmation Theory [ECT] (Oliver, 1980), as the users' intention to continue or discontinue using a service or device after using them. "[…] Research shows online students are more likely to quit class if they do not like the instructor, the format, or the feedback. Because they work independently, relying almost wholly upon self-motivation and self-direction, online learners may be more inclined to withdraw from class if they do not get immediate results" (Paul & Jefferson, 2019, p. 3). OL mainly relies on web 2.0 technological tools to enhance learning. As stated by Hartshorne and Ajjan (2009), this technology is expected to enhance learners' satisfaction with online courses, learners' interaction with their fellows and instructors, and thus improve their learning.

Tratnik et al. (2019) investigated students' satisfaction in the two versions of an English class. The findings indicated that students were overall more satisfied with the F2F format. Course delivery, motivation, course quality, students' expectations, the perceived level of knowledge acquisition, and interaction between students were highlighted as the factors significantly contributing to students' satisfaction. Lower levels of OL motivation were reported as the reason behind the lower level of satisfaction with OL. Al-Samarraie et al. (2018) suggested that students need to be satisfied with the online learning systems if we want them to keep using them.

2.1.4. Autonomy in Online vs. F2F Courses

OL is not suitable for every student. To succeed in OL contexts, students must have some learning abilities. The concept of autonomy, which is used interchangeably as self-directed learning capability, self-regulation, self-sufficiency, self-motivation, self-discipline, self-organization, is deemed a necessary capability for students to succeed in OL settings (Artino, 2008). Self-regulatory learning is defined by Schunk and Zimmerman (1994) as "the process whereby students activate and sustain cognitions that are systematically oriented toward the attainment of their goals" (Cited in Tsai, Shen, & Fan, 2013, p. 107). In this sense, the students possessing self-regulatory or self-directed learning capabilities are expected to be more privileged compared to the ones lacking these capabilities (Reinhold et al., 2021). Frick (2006) and Leasure et al. (2000) reported that self-directed learners benefited more from the online version of course delivery, so they tended to take online courses more. In addition, Martin et al. (2020) reported that as effort regulation increased, academic success increased. Because of the transition to online teaching, "a more tutor-led approach was adopted, which may affect students' long-term learning as a less independent mindset is fostered" during the pandemic (Mullen et al., 2021, p. 19). Otter et al. (2013) highlighted that online courses necessitate more

autonomy when studied alone. Gaytan (2015) reported student self-discipline as the most influential variable influencing learner retention in online courses based on faculty perceptions. Jaggars (2014) found that students needed to "teach themselves" in online courses. This fact influenced their selection; more specifically, they preferred the courses in which they would not need an instructor online. In other words, the students wanted to take F2F courses in which they would not have to teach themselves.

2.1.5. Effectiveness of the Instructional Process in Online vs. F2F Courses

F2F or online, each course needs a plan to teach. This plan stems from a curriculum that includes (1) objectives to be reached, (2) content used to reach objectives, (3) methods, techniques, and materials utilized to deliver the content, and (4) assessment techniques conducted to measure the learning gains or success of the curriculum. More concretely, "the institution of education is activated by a curriculum" (Oliva, 1997, p. 22). The third component of a curriculum is very important as it deals with the implementation of any curriculum, which influences the overall outcomes. Therefore, it needs careful planning and the utmost attention. That is because if the online course is designed effectively and includes equivalent learning experiences [methods, techniques, and materials], the students will reach the course objectives (Simonson & Schlosser, 1999). Some studies, presented below, have compared the implementation processes of the two course offerings.

Neuhauser (2002), who offered the same course both online and F2F, investigated course effectiveness, effectiveness of tasks, test grades, and final grades. No significant difference was found in final grades, participation grades, assignments, or test scores. However, the students taking the online format had slightly higher averages. The online course was found by 96% of online group to be either as effective or more effective in terms of learning than their F2F course. The effectiveness of individual activities ("lectures, discussions, pretests, student presentations, thoughts for the day, assignments, chapter posttests, and chapter reviews") was also analyzed. There were no significant differences in learning as a result of the findings. Alsaaty et al. (2016) examined business students' perceptions towards F2F learning versus OL in higher education. 30.2% of the students said that the materials used and presented in online classes were convenient, easy to understand, and easy to navigate, while 69.2% found online materials inconvenient. Last, one of the findings of Gaytan's (2015) research showed that students complained about little instruction time, which translates into students' desire to receive more instruction, including content in online courses.

3. Methodology

3.1. Research Model

Cross-sectional survey design was used as the research model for this study, because data were gathered "at just one point in time, although the time it takes to collect all of the data may take anywhere from a day to a few weeks or more" (Fraenkel & Wallen, 2009, p.391).

3.2. Research Sample

The target population of this study included all pre-service teachers studying in Turkish universities who experienced both online and F2F courses, while the sample consisted of 338 pre-service teachers. The sample included students from two public universities in Turkey. They were selected with the cluster random sampling method as it is more effective with larger numbers of clusters which decreases the time and effort spent on finding representative samples for the target population (Fraenkel & Wallen, 2009).

As shown in Table 1, the average age was 21.8; there were more females (65.1%) than males (34.9%); 51.2% were from University B, while 48.8% were from University A. The sample included more second graders (46.8%) than fourth (32.5%) and third graders (32.2%). In addition, pre-service teachers from various departments participated in this study. Among these departments, participants from the Classroom Teaching Department had the highest proportion (26.9%), while the Science Department had the lowest (4.7%).

Table 1. *Demographic Characteristics of the Sample*

Variables	Categories	*M*	*SD*	*f*	%
Age		21.78	2.76		
University	University A			165	48.8
	University B			173	51.2
Gender	Female			220	65.1
	Male			118	34.9
Department	Classroom Teaching			91	26.9
	Turkish			43	12.7
	English Language Teaching			32	10.5
	Social Studies			28	8.3
	Psychological Guidance			42	12.4
	Pre-school			67	19.8
	Science			16	4.7
	Mathematics			19	5.6
Grade level	Second			119	35.2
	Third			109	32.2
	Fourth			110	32.5

3.3. Data Collection Tools and Procedure

Data were collected using a questionnaire developed by the researcher based on the studies of Kaya (2021b), Otter et al. (2013), and Platt, Raile, and Yu (2014). During the instrument development process, expert opinion was sought to satisfy validity, which refers to "the appropriateness, meaningfulness, correctness, and usefulness of the inferences a researcher makes" (Fraenkel & Wallen, 2009, p. 147). Based on suggestions from experts, the instrument was further developed. The instrument, dubbed "The Questionnaire for Comparative Perceptions of Online and Face-to-Face Courses," had five sub-dimensions: (1) Effectiveness of the instructional process; (2) interaction; (3) autonomy; (4) learning gains; and (5) satisfaction. The sub-dimensions included seven-point Likert scale items ranging from 1 (strongly disagree) to 7 (strongly agree). Afterwards, the reliability of the instrument was calculated using Cronbach's alpha coefficient to test the internal consistency of the items, which resulted in a value of .98. Cronbach's alpha coefficient values for the sub-dimensions were .93 for instructional process effectiveness, .92 for interaction, .92 for autonomy, .89 for learning gains, and .96 for satisfaction. Nunally (1978) recommends a Cronbach's alpha of .70 or higher for sufficient reliability in social science instruments, so the obtained values indicate that this questionnaire has sufficient reliability. Taken together, this instrument was judged valid and reliable enough to measure participants' comparative perceptions about the two course offerings.

3.4. Data Analysis

To find answers for the first research question that sought the sample's comparative perceptions about online and F2F courses, data were analyzed with descriptive statistics. On the other hand, Multinomial Logistic Regression, which can be used when there are more than two categories (Field, 2013), was used to answer the second question seeking the predictors influencing the sample's preference of education mode, which had three categories: online, F2F and hybrid education. Before conducting the analysis, the assumptions of Multinomial Logistic Regression were checked, and then it was run, as there was no assumption violation.

3.5. Ethical

The data collection phase began after receiving ethical approval from the "Agri İbrahim Çeçen University Scientific Research Ethics Committee" (decision numbered 325 in 25.11.2021).

3.6. Limitations of the Study

The data collection instrument was validated through expert opinions, its construct-related validity could not be approved through exploratory factor analysis (EFA) as the conduct of EFA yielded two factors, which might have resulted from the comparative items used in the instrument. Therefore, these results were not used in this study. However, the items used in the instrument were taken from previously validated instruments (e.g., Kaya, 2021b; Otter et al., 2013 and Platt, Raile & Yu, 2014). In other words, the construct-validity procedures used in previous research show that these items refer to the specific constructs/sub-dimensions in this instruments. In addition, expert opinion was sought to check its content-related validity. Therefore, it is

alleged that the items used in this instrument represent the content to be assessed, so valid inferences can be made using this instrument.

4. Findings

The corresponding findings with respect to the first question, which was formulated to find out pre-service teachers' comparative perceptions about online and F2F courses, are reported in Table 2.

Table 2. *Comparative Perceptions of the Pre-Service Teachers*

Sub-dimensions	*M*	*SD*
Effectiveness of the instructional process	3.64	2.04
Interaction	3.45	2.03
Autonomy	4.09	1.94
Learning gains	3.99	2.02
Satisfaction	3.85	2.28

As seen in the table, the participants' most positive perceptions about online courses were found in the autonomy sub-dimension (*M*=4.09, *SD*=2.04). It was followed by learning gains (*M*=3.99, *SD*=2.02), satisfaction (*M* =3.85, *SD*=2.28), Effectiveness of Instructional Process (*M*= 3.64, *SD*=2.04) and interaction (*M*=3.45, *SD*= 2.03), respectively.

More detailed information is presented in Table 3. Note that each sub-dimension of the instrument has differing numbers of items and that higher values indicate superiority of the online courses over F2F courses.

Table 3. *Comparative Perceptions of the Sample*

Sub-dimensions	Items	*M*	*SD*
	Compared to face to face courses…		
Effectiveness of instructional process	1. online courses provide a better learning experience.	3.59	2.29
	2. the amount of material that is presented to students in an online course is greater.	3.71	2.31
	3. online courses provide higher-quality teaching.	3.57	2.26
	4. I learn easier in online courses.	3.79	2.34
	5. the activities in online courses are more effective.	3.53	2.29
Interaction	6. I interact with my teachers more in online courses.	3.38	2.30
	7. I interact with other students more in online courses.	3.01	2.19
	8. I receive feedback from my teachers more when taking online courses.	3.57	2.21
	9. I am more willing to express my ideas when taking online courses.	3.82	2.34
Autonomy	10. I must be more self–motivated when taking online courses.	3.97	2.21
	11. I must be more willing to teach myself when taking online courses.	4.11	2.22
	12. I am more willing to spend the time on coursework when taking online courses.	4.19	2.27
	13. I must spend more time reading course materials on my own when taking online courses.	4.29	2.16
	14. I must be more disciplined in their studying when taking online courses.	3.89	2.25
Learning gains	15. I learn more in online courses.	3.78	2.28
	16. I get better grades in online courses.	4.46	2.19
	17. I gain more knowledge in online courses.	3.73	2.23
Satisfaction	18. I wish to take more online courses.	3.90	2.37
	19. I am willing to take more online courses.	3.83	2.35
	20. I am satisfied with online courses more.	3.85	2.36

Starting with the effectiveness of the instructional process, the findings indicated that online courses offered a slightly better and/or more effective instructional process than face-to-face (F2F) courses. The highest value was obtained with item 4, indicating *"I learn easier in online courses"* (*M*=3.79, *SD*=2.34) while the lowest value, which is almost in between, was obtained with item 5, indicating "the activities in online courses are more effective" (*M*=3.53, *SD*=2.29).

With respect to interaction, the findings revealed that the participants interacted with their teachers (*M*=3.38, *SD*=2.30) and other students (*M*=3.01, *SD*=2.19) in online courses less than in F2F courses. On the other hand,

they received feedback from their teachers slightly more when taking online courses (*M*=3.57, *SD*=2.21) and they were more willing to express their ideas when taking online courses (*M*=3.82, *SD*=2.34).

Regarding autonomy, the findings indicated that the participants needed to be more autonomous when taking online courses with a score close to or above 4. The findings related to learning gains highlighted that although the participants got higher grades in online courses (*M*=4.46, *SD*=2.19), they learned less (*M*=3.78, *SD*=2.28) and *"they gained less knowledge in online courses"* (*M*=3.73, *SD*=2.23). Last of all, the findings with respect to satisfaction revealed that pre-service teachers were satisfied with online courses more.

Multinomial logistic regression was run to find answers for the second research question formulated to analyze the predictors influencing pre-service teachers' education preferences. The dependent variable was pre-service teachers' preferences for education modes. There were three categories of the dependent variable: online, F2F, and hybrid education.

Table 4. *Course Preferences of the Sample*

		f	%
Education Mode	F2F	106	31.4
	Online	111	32.8
	Hybrid	121	35.8

The findings presented in Table 4 indicated that the participants preferred to take hybrid education more (*f*=121) than online (*f*=111) and F2F education (*f*=106).

Multinomial logistic regression analysis showed that the likelihood ratio test of the full model versus null (the model with the intercept only) was statistically significant, χ^2 (18) = 288.78, with Nagelkerke R^2 = .65, and Cox and Snell R^2 = .57. This result indicated that the multinomial logistic regression model was more effective than the null model and the model improved as a result of the predictors entered.

Table 5. *Multinomial Logistic Regression Analysis of 338 Observations*

	Variables	*B*	*S.E. of B*	Wald	*df*	*P*	Odds ratio
F2F vs. online	Intercept	-6.24	.93	44.85	1	.00*	
	Gender	.62	.49	1.63	1	.20	1.86
	University	-.66	.45	2.13	1	.14	.51
	Grade level			1.22	2	.54	
	2nd vs. 3rd grade	.14	.53	.08	1	.78	1.16
	2nd vs. 4th grade	-.78	.57	1.93	1	.16	.45
	Effectiveness of the instructional process	.87	-.22	16.25	1	.00*	2.39
	Interaction	.31	.22	1.92	1	.16	1.36
	Autonomy	.44	.21	4.49	1	.03*	1.55
	Learning gains	.09	.26	.12	1	.73	1.10
	Satisfaction	1.18	.25	21.53	1	.00*	3.24
F2F vs. hybrid	Intercept	-2.65	.68	15.19	1	.00*	
	Gender	.80	.41	3.82	1	.049*	1.10
	University	-.86	.37	5.41	1	.02*	1.03
	Grade level			1.22	2	.54	
	2nd vs. 3rd grade	-.05	.42	.01	1	.91	.95
	2nd vs. 4th grade	-.66	.47	1.95	1	.16	.52
	Effectiveness of the instructional process	.28	.20	1.82	1	.17	1.32
	Interaction	-.27	.20	1.83	1	.18	.76
	Autonomy	.13	.17	.56	1	.45	1.14
	Learning gains	.12	.21	.32	1	.57	1.12
	Satisfaction	.80	.21	13.91	1	.00*	2.22

p<.05

The individual parameter estimates are presented in Table 5. As seen, the table has been split into two halves, because these parameters have been used in a way to compare pairs of outcome categories. F2F education was specified as a reference category, therefore it was compared to online education in the first table, and then it

was compared to hybrid education in the second half of the table. More concretely, the participants first chose between F2F and online education, then between F2F and hybrid education.

As seen in the first split that compared F2F education preference to online education preference, gender (Wald's $\chi2 = 1.63$, $p > .05$), university (Wald's $\chi2 = 2.13$, $p > .05$), grade level (Wald's $\chi2 = 1.22$, $p > .05$), interaction (Wald's $\chi2 = 1.92$, $p > .05$) and learning gains (Wald's $\chi2 = .12$, $p > .05$) were nonsignificant variables influencing this sample's preferences.

The significant variables, on the other hand, were effectiveness of the instructional process (Wald's $\chi2 = 16.25$, $p < .05$), autonomy (Wald's $\chi2 = 4.49$, $p < .05$) and satisfaction (Wald's $\chi2 = 21.53$, $p < .05$). The odds ratio levels showed that the most influential predictor was satisfaction (3.24), which was followed by effectiveness of instructional process (2.39), and autonomy (1.55), respectively. With respect to the direction of the relationship, these findings suggested that as the participants' satisfaction with online courses, autonomous capability and the online courses' effectiveness increased, their probability of preferrring online education increased.

The second split, which compared F2F education preference to hybrid education preference, highlighted the influence of the same and different variables on the outcome variable. Grade level (Wald's $\chi2 = 1.22$, $p > .05$), instructional process (Wald's $\chi2 = 1.82$, $p > .05$), interaction (Wald's $\chi2 = 1.83$, $p > .05$), autonomy (Wald's $\chi2 = .56$, $p > .05$) and learning gains (Wald's $\chi2 = .32$, $p > .05$) were found to be nonsignificant variables, while gender (Wald's $\chi2 = 3.82$, $p > .05$), university (Wald's $\chi2 = 5.41$, $p < .05$) and satisfaction (Wald's $\chi2 = 13.91$, $p < .05$) were significant. Females and the students from University B preferred hybrid education over F2F education more than others. In addition, as satisfaction with online courses increased, the probability of preferring hybrid education over F2F education also increased. Last, the most influential variable in predicting the outcome variable was satisfaction, with an odds ratio of 2.22, which was followed by gender (1.10) and university (1.03), respectively.

All in all, the results of multinomial logistic regression analysis conducted with this sample of participants revealed that the effectiveness of the instructional process in online courses, autonomy in online courses, satisfaction with online courses, gender, and university type influenced this sample's preferences significantly, be it F2F vs. online or F2F vs. hybrid.

Last, the contingency table of predicted versus observed responses for predictors is presented in Table 6. As seen in the table, the model resulted in an overall success rate of 72.8%. Sample's preference of F2F education was predicted with a success rate of 81.1% correctly by the model, while it was 74.8% for online education and 63.6% for hybrid education.

Table 6. *The Observed and Predicted Frequencies for Course Preferences By Multinomial Logistic Regression With the Cutoff Of 0.50*

Observed		Predicted			
		Course Preferences			Percentage
		F2F	Online	Hybrid	Correct
Course	F2F	86	3	17	81.1%
Type	Online	6	83	22	74.8%
	Hybrid	22	22	77	63.6
Overall Percentage					72.8%

In simpler terms, of the 106 participants who were predicted by the model to prefer F2F education, 86 observations or classifications were correctly predicted, while 20 were misclassified. Regarding online education preferences, 83 were predicted correctly, while 28 were misclassified, and with respect to hybrid education, 77 were correctly predicted, while 44 were misclassified. The comparatively lower success rate of hybrid education can be accounted for by participants' preferring both online and F2F courses. In other words, hybrid education included both types of course offerings.

5. Conclusion and Discussion

This research was conducted to find out pre-service teachers' comparative perceptions about F2F and online courses. Further aim was to discover variables influencing their education mode preferences. The findings are discussed with respect to corresponding literature below.

Preliminary findings revealed that the participants preferred hybrid education more than online or F2F education. Interestingly, F2F education was the least preferred one. This shows that DE, which started as the only emergent option to continue education all around the world because of the pandemic that restricted and even shut the door on F2F education, is now seen as a preferred option. Research studies conducted at the beginning of and during the pandemic highlighted many problems encountered during DE (see Kaya, 2020, Kaya, 2021a, and 2021b), so the results of this research imply that many of these problems or obstacles have been overcome and the students are accustomed to OL and they do not want to abandon OL.

Obviously, and quite reasonably, there must be some reasons behind these learners' course preferences. The second aim of this research, in this sense, was to find out what influenced pre-service teachers' preferences. The discussion with respect to findings and corresponding literature is presented below.

The first variable expected to influence their preferences was learning gains. In parallel to previous research (e.g., Aly, 2013, 2016; Arbaugh et al., 2009; Basile and D'Aquila, 2002; Cavanaugh, 2001; Gagne & Shepherd, 2001; Smith et al., 2015), the findings of this research showed that online learners can learn as much as or more than their counterparts learning F2F in terms of learning gains and final grades. Further findings indicated that students could earn higher grades in online courses as suggested in the earlier studies (e.g., Dendir, 2016; Enriquez, 2010). On the other hand, these findings are opposite to the studies that concluded that online students underperformed their F2F counterparts in terms of their overall performance and final grades (e.g., Arias, Swinton & Anderson, 2018; Chen, Jones & Moreland, 2010; Dendir, 2019; Johnson & Palmer, 2015; Morgan, 2015; Parsons-Pollard et al., 2008). Despite these findings, this variable was not found to be a significant predictor influencing their education mode preference. This finding points to some other variables that might have influenced their preferences.

The next variable was interaction, which has been reported to be a positive predictor contributing to learner satisfaction (e.g., Alqurashi, 2019), learner engagement (e.g., Bolliger & Halupa, 2018) and academic performance (e.g., Shea, Joaquin, & Wang, 2016). Although the findings of this study indicated some problems with respect to interaction between student-student and student-instructor in online courses, it was not found to be a significant factor for their preferences, in contrast to Jaggars (2014), who reported it as a reason behind selecting online courses rather than F2F courses.

As suggested by Al-Samarraie et al. (2018), students need to be satisfied with online learning systems if we want them to keep utilizing them. The next variable in this sense was satisfaction. Preliminary findings indicated that the participants were more satisfied with online courses in contrast to Bristow et al. (2011) who reported negative attitudes towards online courses and Tratnik et al. (2019) who reported that students were overall more satisfied with the F2F format of an English course. Further findings of this study revealed that it was the most effective factor influencing their education preferences. More concretely, as their satisfaction with online courses increased, they preferred to take online or hybrid education rather than F2F education. In this sense, the predictors enhancing the learners' satisfaction with online learning need to be investigated in detail, and necessary actions or precautions should be taken to increase satisfaction with online courses as DE is expected to be a means for delivering education all around the world.

Autonomy, which is deemed necessary for students to succeed in online courses (Artino, 2008), was the other variable expected to influence the participants' preferences. Preliminary findings indicated that students needed to be more autonomous in online courses, as suggested by Otter et al. (2013). In parallel to the findings reported by Gaytan (2015), who found student self-discipline as the most influential factor influencing student retention in online courses based on faculty perceptions, and Jaggars (2014), who found that students lacking this capability preferred to take F2F courses, the findings of this study indicated that the participants were more self-directed in online courses, so they preferred to take online education rather than F2F education. These findings highlight that online courses are not appropriate for each and every student; therefore, students should be given the right to choose between online and F2F course delivery, or students with higher levels of autonomy might be directed to online courses if such an opportunity is available at universities.

As suggested by Simonson and Schlosser (1999), if the online course is designed effectively and includes equivalent learning experiences [methods, techniques, and materials], the students will reach the course objectives. In other words, the instructional process is deemed important for the success of an online course. The preliminary findings comparing the instructional processes of the two course types showed that the

instructional processes of online courses were slightly better than those of face-to-face courses, and further findings highlighted this as the second-most influential factor influencing the participants' preferences. More concretely, rather than F2F education, they preferred to take online education due to the more effective instructional process during online courses.

Last of all, gender, university type and grade level were added as possible variables that might cause differences in participants' preferences. Among them, gender and university type were found to be significant factors influencing their preferences between F2F and hybrid education, while they were non-significant factors influencing their preferences between F2F education and online education. In this sense, further research can be planned to find out the likely reasons causing gender and university-related differences. On the other hand and last, grade level did not cause any significant difference.

6. Recommendations

Students' preference for online or hybrid education can be deemed as a great improvement for the educational area, and it will surely bring new opportunities. In this sense, further research can focus on better opportunities of OL. In addition, similar research is needed to be conducted with different participants from other universities in different departments or countries in order to compare and contrast these findings.

Universities spent a lot on online management systems, so practitioners or executives should not shut the door on online courses after the pandemic is over; instead, they should sustain online courses. For example, online and F2F formats of the same courses can be offered at the same time, and rather than instructors choosing between them, students can be given the right to do so.

Last of all, this study was planned in 2021 during the COVID-19 pandemic and the aim was to further evaluate and discuss DE and its opportunities. Ethical permission was taken in 2021. After further research, data collection, data analysis and reporting of the findings, this manuscript was sent to this journal in 2022. Based on feedback from independent referees and the editor in January 2023, this manuscript was further developed and resent. Finally, this manuscript, after analysis of developments, was accepted for publication in this journal in 10.02.2023. A date when Turkey woke up to a catastrophic earthquake in 06.02.2023. This disaster, which affected 10 cities in Turkey, unfortunately, took thousands of lives and left millions living in those cities homeless. As a result, the Turkish Council of Higher Education decided to continue education at universities via online opportunities so that the students' dormitories can be utilized as shelters/homes for those left homeless. As seen, even before the influences of COVID-19 had not come to an end and this article was accepted for publication, another disaster occurred that shut the door on F2F education again. The natural disasters like pandemics, floods, earthquakes etc. are the realities of the world, and they might occur at any time which might make it impossible or difficult to meet F2F with learners. Therefore, we, educators, scientists or researchers working in education area, should not shut the door on technology and online learning, rather we need to work hard to improve or develop online courses and online curricula in order to continue education in a healthy and safe way. Note that this paragraph was added while doing the last reading of this article before publication and this fact, actually, increases the significance of this article even more. Research studies necessitate great amount of time and effort to arrive at important findings which can be used as valid suggestions for betterment of societies in general. Therefore, all stakeholders including policy-makers, decision-makers, practitioners etc. are strongly recommended to follow these research studies.

7. References

Adnan, M., & Anwar, K. (2020). Online learning amid the COVID-19 pandemic: Students' perspectives. *Journal of Pedagogical Sociology and Psychology*, *2*(1), 45-51. https://doi.org/10.33902/JPSP. 2020261309

Ally, M. (2008). Foundations of educational theory for online learning. In T. Anderson (Ed.), *The theory and practice of online learning* (pp. 15-44). AU Press.

Al-Samarraie, H., Teng, B. K., Alzahrani, A. I., & Alalwan, N. (2018). E-learning continuance satisfaction in higher education: a unified perspective from instructors and students. *Studies in Higher Education*, *43*(11), 2003-2019. https://doi.org/10.1080/03075079.2017.1298088

Aly, I. (2013). Performance in an online introductory course in a hybrid classroom setting. *Canadian Journal of Higher Education, 43*(2), 85–99. https://files.eric.ed.gov/fulltext/EJ1013589.pdf

Aly, I. (2016). Comparison of students' performance in a managerial accounting course taught in blended learning, traditional classroom, and online setting. *Quarterly Review of Business Disciplines, 2*(4), 325–336.

Alqurashi, E. (2019). Predicting student satisfaction and perceived learning within online learning environments. *Distance Education, 40*(1), 133-148. https://doi.org/10.1080/01587919.2018.1553562

Alsaaty, F.M., Carter, E., Abrahams, D., & Alshameri, F. (2016). Traditional versus online learning in institutions of higher education: Minority business students' perceptions. *Business and Management Research, 5*(2), 31-41. https://doi.org/10.5430/bmr.v5n2p31

An, Y. J., & Frick, T. (2006). Student perceptions of asynchronous computer-mediated communication in face-to-face courses. *Journal of Computer-Mediated Communication, 11*. https://doi.org/10.1111/j.1083-6101.2006.00023.x

Arbaugh, J. B., Godfrey, M. R., Johnson, M., Pollack, B. L., Niendorf, B., & Wresch, W. (2009). Research in online and blended learning in the business disciplines: Key findings and possible future directions. *The Internet and Higher Education, 12*(2), 71–87. https://doi.org/10.1016/j.iheduc.2009.06.006

Arias, J. J., Swinton, J., & Anderson, K. (2018). Online vs. face-to-face: A comparison of student outcomes with random assignment. *E-Journal of Business Education & Scholarship of Teaching, 12*(2), 1-23. https://files.eric.ed.gov/fulltext/EJ1193426.pdf

Artino, A. R. (2008). Promoting academic motivation and self-regulation: Practical guidelines for online instruction. *TechTrends 52*(3), 37–45. https://doi.org/10.1007/s11528-008-0153-x

Basile, A., & D'Aquila, J. M. (2002). An experimental analysis of computer-mediated instruction and student attitudes in a principles of financial accounting course. *Journal of Education for Business, 77*(3), 137–143. https://doi.org/10.1080/08832320209599062

Bolliger, D. U., & Halupa, C. (2018). Online student perceptions of engagement, transactional distance, and outcomes. *Distance Education, 39*(3), 299-316. https://doi.org/10.1080/01587919.2018.1476845

Bristow, D., Shepherd, C. D., Humphreys, M., & Ziebell, M. (2011). To be or not to be: That isn't the question! An empirical look at online versus traditional brick-and-mortar courses at the university. *Marketing Education Review, 21*(3), 241–250. https://doi.org/10.2753/MER1052-8008210304

Cavanaugh, C. S. (2001). The effectiveness of interactive distance education technologies in K-12 learning: A meta- analysis. *International Journal of Educational Telecommunications, 7*(1), 73–88. https://www.ic.unicamp.br/~wainer/cursos/2s2004/impactos2004/CavanaughIJET01.pdf#:~:text=As%20a%20result%20of%20the%20statistical%20processes%20applied,close%20approach%20to%20significance%20with%20strong%20negativeeffect%20sizes

Chen, C. C., & Jones, K. T. (2007). Blended learning vs. traditional classroom settings: Assessing effectiveness and student perceptions in an MBA accounting course. *Journal of Educators Online, 4*(1), 1–15. https://files.eric.ed.gov/fulltext/EJ907743.pdf

Chen, C. C., Jones, K. T., & Moreland, K. (2010). Distance education in a cost accounting course: Instruction, interaction, and multiple measures of learning outcomes. *Journal of Educators Online, 7*(2), 1–20. https://doi.org/10.9743/JEO.2010.2.3

Ekwunife-Orakwue, K. C., & Teng, T. L. (2014). The impact of transactional distance dialogic interactions on student learning outcomes in online and blended environments. *Computers & Education, 78*, 414-427. https://doi.org/10.1016/j.compedu.2014.06.011

Johnson, D. M., & Palmer, C. C. (2015). Comparing student assessments and perceptions of online and face-to-face versions of an introductory linguistics course. *Faculty Publications, 4162*. 1-18. https://digitalcommons.kennesaw.edu/facpubs/4162

Dell, C. A., Low, C., & Wilker, J. F. (2010). Comparing student achievement in online and face-to-face class formats. *Journal of Online Learning and Teaching, 6*(1), 30–42. https://jolt.merlot.org/vol6no1/dell_0310.pdf

Dendir, S. (2019). Performance differences between face-to- face and online students in economics. *Journal of Education for Business, 94*(3), 175–184. https://doi.org/10.1080/08832323.2018.1503586

Dereshiwsky, M., & Rich, A. (2011). Assessing the comparative effectiveness of teaching undergraduate intermediate accounting in the online classroom format. *Journal of College Teaching & Learning (TLC), 8*(9), 19–27. DOI: 10. 19030/tlc.v8i9.5641

Enriquez, A. G. (2010). Enhancing student performance using tablet computers. *College Teaching, 58*(3), 77–84. https://doi.org/10.1080/87567550903263859

Faux, T. L., & Black-Hughes, C. (2000). A comparison of using the Internet versus lectures to teach social work history. *Research on Social Work Practice, 10*, 454–466. https://doi.org/10.1177/10497315000100040

Field, A. (2013). *Discovering statistics using IBM SPSS statistics*. (4th ed.). Sage.

Fortune, M. F., Shifflett, B., & Sibley, R. E. (2006). A comparison of online (high tech) and traditional (high touch) learning in business communication courses in Silicon Valley. *Journal of Education for Business, 81*(4), 210–214. https://doi.org/10.3200/JOEB.81.4.210-214

Fraenkel, J. R., & Wallen, N.E. (2009). *How to design and evaluate research in education* (7th Ed.). McGraw Hill.

Gagne, M., & Shepherd, M. (2001). Distance learning in accounting: A comparison between a distance and a traditional graduate accounting class. *T.H.E. Journal, 28*(9), 58–60. http://www.thejournal.com/magazine/vault/A3433.cfm

Gaytan, J. (2015). Comparing faculty and student perceptions regarding factors that affect student retention in online education. *American Journal of Distance Education,* 29(1), 56–66. https://doi.org/10.1080/08923647.2015.994365

Hartshorne, R., & Ajjan, H. (2009). Examining student decisions to adopt Web 2.0 technologies: theory and empirical tests. *Journal of Computing in Higher Education, 21*(3), 183-198. https://doi.org/10.1007/s12528-009-9023-6

Herman, T., & Banister, S. (2007). Face-to-face versus online coursework: A comparison of learning outcomes and costs. *Contemporary Issues in Technology and Teacher Education, 7*(4), 318–326. https://citejournal.org/wp-content/uploads/2016/04/v7i4currentpractice1.pdf

Jaggars, S. S. (2014). Choosing between online and face-to-face courses: community college student voices. *American Journal of Distance Education. 28*. 27-38. https://doi.org/10.1080/08923647.2014.867697

Kanik, M. (2021). Students' perception of and engagement in reactive online education provided during the COVID-19 pandemic. *International Online Journal of Education and Teaching (IOJET), 8*(2). 1063-1082. https://files.eric.ed.gov/fulltext/EJ1294304.pdf

Kaya, S. (2020). *Zorunlu uzaktan eğitimde karşılaşılan sorunlar: Öğretim elemanı ve öğrenci görüşleri* [Problems encountered in compulsory distance education: Opinions of instructors and students]. Paper presented at VIIth International Eurasian Educational Research Congress, Eskişehir/Turkey.

Kaya, S. (2021a). The factors predicting students' participation in online English courses. *Eurasian Journal of Educational Research 91*, 301-320, https://doi.org/10.14689/ejer.2021.91.14

Kaya, S. (2021b). Predictors of online learning satisfaction of pre-service teachers in Turkey. *Research in Pedagogy*, *11*(2), 586–607. https://files.eric.ed.gov/fulltext/EJ1329437.pdf

Keller, J. H., Hassell, J. M., Webber, S. A., & Johnson, J. N. (2009). A comparison of academic performance in trad- itional and hybrid sections of introductory managerial accounting. *Journal of Accounting Education, 27*(3), 147–154. DOI: 10.1016/j.jaccedu.2010.03.001

Kuo, Y.-C., Walker, A. E., Schroder, K. E. E., & Belland, B. R. (2014). Interaction, internet selfefficacy, and self-regulated learning as predictors of student satisfaction in online education courses. *The Internet and Higher Education, 20*, 35–50. https://doi.org/10.1016/j.iheduc.2013.10.001

Leasure, A., Davis, L., & Thievon, S. (2000). Comparison of student outcomes and preferences in a traditional vs. world wide web-based baccalaureate nursing research course. *Journal of Nursing Education, 39*, 149-154. https://doi.org/10.3928/0148-4834-20000401-04

Martin, F., Sun, T., & Westine, C. D. (2020). A systematic review of research on online teaching and learning from 2009 to 2018. *Computers & Education, 159*, 1–17. https://doi.org/10.1016/j.compedu.2020.104009

Meehan, M., & Howard, E. (2020). *Report on undergraduate mathematics students' perceptions of the affordances and constraints of the online environment for learning*. Retrieved from https://www.ucd.ie/msc/t4media/msc_students_perceptions_online_learning.pdf

Morgan, J. D. (2015). Online versus face-to-face accounting education: A comparison of CPA exam outcomes across matched institutions. *Journal of Education for Business, 90*(8), 420–426. https://doi.org/10.1080/08832323.2015.1087371

Moore, M. G. (1989). Editorial: Three types of interaction. *American Journal of Distance Education, 3*(2), 1–7. https://doi.org/10.1080/08923648909526659

Mullen, C., Pettigrew, J., Cronin, A., Rylands, L., & Shearman, D. (2021). The rapid move to online mathematics support: changes in pedagogy and social interaction. *International Journal of Mathematical Education in Science and Technology*. https://doi.org/10.1080/0020739X.2021.1962555

Nartiningrum, N., & Nugroho, A. (2020). Online learning amidst global pandemic: EFL students' challenges, suggestions, and needed materials. *English Franca: Academic Journal of English Language and Education*, *4*(2), 115-140. http://dx.doi.org/10.29240/ef.v4i2.1494

Nemetz, P. L., Eager, W. M., & Limpaphayom, W. (2017). Comparative effectiveness and student choice for online and face-to-face classwork. *Journal of Education for Business, 92*(5), 210–219. https://doi.org/10.1080/08832323.2017.1331990

Neuhauser, C. (2002). Learning style and effectiveness of online and face-to-face ınstruction, *The American Journal of Distance Education, 16*(2), 99-113. https://doi.org/10.1207/S15389286AJDE1602_4

Nunnally, J. (1978). *Psychometric theory.* McGraw-Hill.

Oliva, P. F. (1997). *Developing the curriculum* (4th Ed.). USA.

Oliver, R. L. (1980). A cognitive model of the antecedents and consequences of satisfaction decisions. *Journal of Marketing Research*, *17*(4), 460-469. https://doi.org/10.2307/3150499

Otter, R., Seipel, S., Graeff, T., Alexander, B., Boraiko, C., Gray, J., ... Sadler, K. (2013). Comparing student and faculty perceptions of online and traditional courses. *The Internet and Higher Education, 19*, 27-35. https://doi.org/10.1016/j.iheduc.2013.08.001

Parsons-Pollard, N., Lacks, R. D., & Grant, P. H. (2008). A comparative assessment of student learning outcomes in large online and traditional campus-based introduction to criminal justice courses. *Criminal Justice Studies, 21*(3). https://doi.org/10.1080/14786010802355826

Paul, J., & Jefferson, F. (2019). A comparative analysis of student performance in an online vs. face-to-face environmental science course from 2009 to 2016. *Frontiers in Computer Science, 1*(7). https://doi.org/10.3389/fcomp.2019.00007

Paul, R. C., Swart, W., Zhang, A. M., & MacLeod, K. R. (2015). Revisiting Zhang's scale of transactional distance: Refinement and validation using structural equation modeling. *Distance Education, 36*(3), 364–382. https://doi.org/10.1080/01587919.2015.1081741

Platt, C. A., Raile, A. N., & Yu, N. (2014). Virtually the same? Student perceptions of the equivalence of online classes to face-to-face classes. *Journal of Online Learning & Teaching, 10*(3), 489–503. https://jolt.merlot.org/vol10no3/Platt_0914.pdf

Reinhold, F., Schons, C., Scheuerer, S.,Gritzmann, P., Richter-Gebert, J., & Reiss, K. (2021). Students' coping with the self-regulatory demand of crisis-driven digitalization in university mathematics instruction: Do motivational and emotional orientations make a difference? *Computers in Human Behavior, 120*, 1–10. https://doi.org/10.1016/j.chb.2021.106732

Shea, J., Joaquin, M. E., & Wang, J. Q. (2016). Pedagogical design factors that enhance learning in hybrid courses: A contribution to design-based instructional theory. *Journal of Public Affairs Education, 22*(3), 381-397. https://doi.org/10.1080/15236803.2016.12002254

Shachar, M., & Neumann, Y. (2003). Differences between traditional and distance education academic performan- ces: A meta-analytic approach. *The International Review of Research in Open and Distributed Learning, 4*(2), 318–334. https://doi.org/10.19173/irrodl.v4i2.153

Simonson, M., & Schlosser, C. (1999). Theory and distance education: A new discussion. *The American Journal of Distance Education, 13*(1), 60–75. https://doi.org/10.1080/08923649909527014

Smith, R. L., Flamez, B., Vela, J. C., Schomaker, S. A., Fernandez, M. A., & Armstrong, S. N. (2015). An exploratory investigation of levels of learning and learn- ing efficiency between online and face-to-face instruction. *Counseling Outcome Research and Evaluation, 6*(1), 47–57. https://doi.org/10.1177/2150137815572148

Swart, W., MacLeod, K., Paul, R., Zhang, A., & Gagulic, M. (2014). Relative proximity theory: Measuring the gap between actual and ideal online course delivery. *American Journal of Distance Education, 28*(4), 222–240. https://doi.org/10.1080/08923647.2014.924721

Thong, J. Y., Hong, S. J., & Tam, K. Y. (2006). The effects of post-adoption beliefs on the expectation-confirmation model for information technology continuance. *International Journal of Human-Computer Studies*, *64*(9), 799-810. https://doi.org/10.1016/j.ijhcs.2006.05.001

Tratnik, A., Urh, M., & Jereb, E. (2019). Student satisfaction with an online and a face-to-face Business English course in a higher education context. *Innovations in Education and Teaching International, 56*(1), 36-45. https://doi.org/10.1080/14703297.2017.1374875

Tsai, C. W., Shen, P. D., & Fan, Y. T. (2013). Research trends in self-regulated learning research in online learning environments: A review of studies published in selected journals from 2003 to 2012. *British Journal of Educational Technology, 44*(5), E107–E110.

Wagner, S. C., Garippo, S. J., & Lovaas, P. (2011). A longi tudinal comparison of online versus traditional instruction. *MERLOT Journal of Online Learning and Teaching, 7*(1), 68–73. https://jolt.merlot.org/vol7no1/wagner_0311.pdf

Warren, L. L., & Holloman, Jr, H. L. (2005). On-line instruction: Are the outcomes the same?. *Journal of Instructional Psychology, 32*(2), 148–152. https://www.thefreelibrary.com/On-line+instruction%3a+are+the+outcomes+the+same%3f-a0134381063