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Undividing Digital Divide

Digital Literacy

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Internet Access and Educational Achievement: The Digital Divide Among OECD Countries



Kutay Uzun

1 Introduction

With the advances in technology, many aspects of life including education have taken a sharp turn towards a very wide availability of knowledge and materials. However, this availability also revealed a divide regarding who can access this widely-available knowledge and how often. Commonly referred to as the digital divide, this gap in accessing digitally available knowledge is defined as the separation between those with and without access to technology for any purpose (West, 2011). It refers to the privileged status of a portion of the world population through owning computers, accessing the internet and having digital literacy in relation to another portion that does not possess those qualities or opportunities (Sanders & Scanlon, 2021).

Although the digital divide was initially perceived through the presence or absence of internet access, a somewhat narrow perception, it has more recently been referred to as the sum of digital disadvantages in the use of information technologies including the knowledge and skills necessary to use them (Alam & Imran, 2015; van Dijk, 2005, 2006). According to Mossberger et al. (2003), the digital divide is a multidimensional phenomenon whose dimensions consist of access to technology, skills to use it and having the economic and democratic means to utilize technology because having access to technology necessitates having the economic means to obtain it and one also needs computer literacy and skills to use it in addition to a democratic political environment that allows its use.

Another framework that focuses on the multidimensionality of the term digital divide is by van Dijk (2002), which uses four categories related to access, namely mental, material, skills and usage types of access. In this framework, mental access refers to one's interest in, lack of anxiety about and fondness of digital tools. Material access refers to computer ownership. Skills access means possessing digital skills

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based on education and the user-friendliness of the digital tools. Lastly, usage access refers to the opportunities to use digital tools through distribution equality. Van Dijk describes these different categories as successive, cumulative, recursive and general and obviously, all these categories refer to a continuum or binary opposition signalling inequality among the peoples of the world.

The digital disadvantages were emphasized in the previous paragraphs because connecting one's self to the modern society nowadays depends on internet access, which means a lack of it severs that connection, leaving the deprived in a disadvantaged position (Zappalà et al., 2000). The social inequality brought about by the digital divide has been subject to numerous academic studies. For instance, Kahan (2019) show that the digital divide is present especially in rural areas where people do not have access to the internet as much as those in urban areas. African countries also seem to be disadvantaged regarding internet access in comparison to the rest of the world (Friederici et al., 2020). Similarly, Central Asian countries have difficulties in internet access due to the high costs and limited availability (World Bank, 2020a, 2020b). Southeast Asian countries have also been found to be disadvantaged regarding internet access (Watts, 2020). Indeed, such difficulties reveal social inequalities in terms of age, immigration, civil issues, income and education (Haight et al., 2014).

The present study deals with the educational aspect of the digital divide because through computers, learners can access information, extend opportunities for communication, cooperation and collaboration, be it with their peers, teachers or other experts that are not physically accessible (Rao, 2005). Crucial as all these are for education, access to a computer with an internet connection makes it possible for learners to share the learning experiences and benefit from the social aspect of learning in real time (Sife et al., 2007). At the same time, the absence of access as reviewed in the previous paragraph indicates a widening digital divide in education (Warschauer & Ames, 2010).

It is known that learners spend more time with computers at home than at school and access to computers at home is a related construct to learning through digital resources at home (Kerawalla & Crook, 2002; Yuen & Park, 2012). However, access to computers at home is, by itself, a construct that is tied to the purchasing power of a household so, in the case of developing countries where the income per capita levels are low, education is negatively affected by the absence of access to computers at home (Alvarez, 2020), deepening the digital divide in education.

From the relevant literature, it is seen that education and internet access are related concepts and the digital divide has the potential to result in educational inequalities in addition to social ones. In that respect, this study aims to find out if internet access can explain educational achievement in OECD countries. As an exploratory factor regarding the possible relationship between educational achievement and internet access, the availability of a computer in the household is also investigated in relation to internet access. To meet the aims of the study, the following research questions have been formulated:

1. Does educational achievement differ according to internet access at home?
2. Is there a difference in the availability of a computer at home in the OECD countries divided by internet access?

2 Methodology

The study adopted a quantitative design to model if access to the internet was a related construct to the educational achievement of OECD countries. For educational achievement, the PISA results of 2018 were used for the models as they were the latest available (OECD, 2021a, 2021b, 2021c, 2021d). In line with the date of the PISA results, the percentage of households with access to internet 2018 data were retrieved from OECD Databases (OECD, 2021a, 2021b, 2021c, 2021d). Those that did not have internet access data pertaining to 2018 were excluded from the study. As such, 30 out of 38 OECD countries were included in the study. The excluded ones due to the lack of 2018 data were Australia, Canada, Chile, Costa Rica, Japan, New Zealand, Switzerland and the USA. Since educational spending on secondary education was correlated with internet access ($r = 0.50, p < 0.01$), PISA reading ($r = 0.53, p < 0.01$), maths ($r = 0.62, p < 0.001$), science ($r = 0.58, p = 0.001$) scores and the average scores ($r = 0.58, p = 0.001$), the 2017 data (latest available) was taken from World Bank Databases (World Bank, 2020a, 2020b) and used as a confounding variable.

Data for access to a computer at home was also taken from the OECD databases (OECD, 2021a, 2021b, 2021c, 2021d). For this data, too, 30 out of 38 OECD countries were included due to the availability of internet access data for those countries. It was seen that a sum of 220,278 responses from 30 countries was present in this data set.

Before analysing data, OECD countries were divided into three internet access categories as low, mid and high using a two-step cluster analysis based on log-likelihood. Since the comparison of PISA scores according to those categories using educational spending as a covariance necessitated an ANCOVA model, the assumptions of ANCOVA were initially tested. The results are presented below in Table 1:

Table 1 Assumption tests for ANCOVA

Score	Variance equality	Heteroscedasticity	Residual normality
Average	$F_{(2, 27)} = 0.297, p = 0.746$	$F_{(1, 28)} = 0.062, p = 0.805$	$SW = 0.973, df = 29, p = 0.653$
Reading	$F_{(2, 26)} = 0.596, p = 0.558$	$F_{(1, 27)} = 0.057, p = 0.813$	$SW = 0.961, df = 29, p = 0.347$
Maths	$F_{(2, 27)} = 0.242, p = 0.787$	$F_{(1, 28)} = 0.029, p = 0.867$	$SW = 0.965, df = 29, p = 0.445$
Science	$F_{(2, 27)} = 0.915, p = 0.412$	$F_{(1, 28)} = 0.884, p = 0.355$	$SW = 0.976, df = 29, p = 0.732$

Seeing that all the assumptions were met for all the models, ANCOVA's were run for each model.

The data set including information about access to a computer with a binary set of options (i.e. Yes/No). For this reason, a Chi-Squared test was run to see if the internet access categories were independent regarding the responses. Adjusted residuals were also interpreted to reveal which observed frequencies were significantly different from expected frequencies.

3 Findings

The descriptive results and the results of the cluster analysis are presented below in Table 2.

As seen in the table, Colombia and Mexico were clustered in the low internet access group with a mean percentage of 52.76 ($SD = 0.14$). In the mid internet access group, Greece, Hungary, Ireland, Israel, Italy, Lithuania, Latvia, Poland, Portugal, Slovakia, Slovenia and Turkey were present with a mean percentage of 83.55 ($SD = 4.35$). The high internet access group consisted of Austria, Belgium, Czechia, Spain, France, Germany, Denmark, Estonia, Finland, United Kingdom, Iceland, South Korea, Luxembourg, the Netherlands, Norway and Sweden with a mean percentage of 95.06 ($SD = 2.85$).

The descriptive results for the PISA scores of 2018 among those countries are shown below in Table 3.

The descriptive results indicated visible differences among the PISA scores of the OECD countries divided by internet access. For instance, the average score of the mid access group was 74.57 points higher than that of the low access group. Similarly, the average score of the high access group was 17.09 points higher than that of the mid access group. The difference between the average scores of the high and low access groups was 91.66 points. Similar differences in favour of the higher internet access groups were also present when the scores were treated separately as reading, maths and science.

Table 2 Descriptive results for internet access

Internet access	Countries	<i>M</i>	<i>SD</i>
Low ($n = 2$)	COL, MEX	52.76	0.14
Mid ($n = 11$)	GRC, HUN, ISR, ITA, LTU, LVA, POL, PRT, SVK, SVN, TUR	83.55	4.35
High ($n = 17$)	AUT, BEL, CZE, DEU, DNK, ESP, EST, FIN, FRA, GBR, IRL, ISL, KOR, LUX, NLD, NOR, SWE	95.06	2.85
Total ($N = 30$)	OECD	85.72	11.14

Table 3 Descriptive results for 2018 PISA scores

Internet access	Score	<i>M</i>	<i>SD</i>
Low (<i>n</i> = 2)	Average	410.67	7.54
	Reading	416.00	5.66
	Maths	400.00	12.73
	Science	416.00	4.24
Mid (<i>n</i> = 17) ^a	Average	485.24	16.39
	Reading	483.44	17.24
	Maths	488.12	18.44
	Science	484.24	16.62
High (<i>n</i> = 11)	Average	502.33	14.71
	Reading	499.46	17.27
	Maths	506.09	12.69
	Science	501.46	17.52
Total (<i>N</i> = 30)	Average	486.53	26.78
	Reading	484.86	26.28
	Maths	488.83	30.11
	Science	486.00	26.25

^a Spain reading score unavailable

The ANCOVA results for the comparison of average PISA scores among the internet access groups, controlling for secondary education spending, are tabulated below in Table 4.

The results showed that there was a statistically significant difference in the average PISA scores of the internet access groups with a very large effect using secondary educational spending as a covariate ($F_{(2, 26)} = 18.22, p < 0.001, \eta_p^2 = 0.58$). Pairwise comparisons with Bonferroni tests revealed that the average score of the low access group was significantly lower than both the mid and the high access

Table 4 Average PISA scores ANCOVA results

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P</i>	η_p^2
Corrected model	15,041.451	3	5013.817	22.621	0.000	0.72
Intercept	174,751.1	1	174,751.1	788.432	0.000	0.97
Secondary educational spending	755.236	1	755.236	3.407	0.076	0.12
Internet access	8078.645	2	4039.322	18.224	0.000	0.58
Error	5762.737	26	221.644			
Total	7,122,244	30				
Corrected total	20,804.19	29				

$R^2 = 0.72$ (Adjusted $R^2 = 0.69$)

Table 5 PISA reading scores ANCOVA results

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P</i>	η_p^2
Corrected model	12,304.230	3	4101.41	14.591	0.000	0.64
Intercept	174,348.3	1	174,348.3	620.261	0.000	0.96
Secondary educational spending	445.447	1	445.447	1.585	0.220	0.06
Internet access	6978.532	2	3489.266	12.413	0.000	0.50
Error	7027.218	25	281.089			
Total	6,836,977	29				
Corrected total	19,331.45	28				

$R^2 = 0.64$ (Adjusted $R^2 = 0.59$)

groups ($p < 0.001$). On the other hand, the average scores did not differ between the mid and the high access groups ($p > 0.05$).

The results of the ANCOVA for the PISA reading scores are presented in Table 5.

ANCOVA results showed that the PISA reading scores of the internet access groups were significantly different with a very large effect when secondary educational spending was used as a covariate ($F_{(2, 25)} = 12.41$, $p < 0.001$, $\eta_p^2 = 0.50$). In the pairwise comparisons, it was seen that the reading scores of the low access group were significantly lower than those of the mid ($p = 0.001$) and the high ($p < 0.001$) access groups. The scores did not differ significantly between the mid and the high access groups ($p > 0.05$).

The ANCOVA results for the PISA maths scores are shown in Table 6.

Analyses showed that, after controlling for secondary educational spending, the maths scores of the internet access groups were significantly different with a very large effect ($F_{(2, 26)} = 22.86$, $p < 0.001$, $\eta_p^2 = 0.64$). The results of the pairwise comparisons revealed that the maths scores of the low access group were significantly lower than those of the mid and the high access groups ($p < 0.001$). There was no significant difference between the scores of the mid and the high access groups ($p > 0.05$).

The ANCOVA results for the PISA science scores are shown in Table 7.

Table 6 PISA maths scores ANCOVA results

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P</i>	η_p^2
Corrected model	20,454.000	3	6818	30.416	0.000	0.78
Intercept	165,912.6	1	165,912.6	740.152	0.000	0.97
Secondary educational Spending	1386.507	1	1386.507	6.185	0.020	0.19
Internet access	10,247.25	2	5123.623	22.857	0.000	0.64
Error	5828.167	26	224.16			
Total	7,195,023	30				
Corrected total	26,282.17	29				

$R^2 = 0.78$ (Adjusted $R^2 = 0.75$)

Table 7 PISA science scores ANCOVA results

Source	SS	df	MS	F	P	η_p^2
Corrected model	13,063.673	3	4354.558	16.356	0.000	0.65
Intercept	178,376.5	1	178,376.5	669.976	0.000	0.96
Secondary educational spending	583.459	1	583.459	2.191	0.151	0.08
Internet access	7181.377	2	3590.688	13.486	0.000	0.51
Error	6922.327	26	266.243			
Total	7,105,866	30				
Corrected total	19,986	29				

$R^2 = 0.654$ (Adjusted $R^2 = 0.614$)

The results revealed that the PISA sciences scores of the internet access groups were significantly different with a very large effect when secondary educational spending was treated as a covariance ($F_{(2, 26)} = 13.49, p < 0.001, \eta_p^2 = 0.51$). Pairwise comparisons showed that the science scores of the low access group were significantly lower than those of the mid and the high access groups ($p < 0.001$). There was no significant difference between the mid and the high access groups ($p > 0.05$).

Access to a computer at home was another variable investigated in this study in regards to the digital divide in education. The results are presented below in Table 8.

Table 8 shows the frequencies of the responses as well as the adjusted residuals for the observed vs expected frequencies. Chi-square analysis showed that there were significant differences in the availability of a computer at respondents' homes according to the groups divided by internet access ($X^2 = 12,149.383, df = 2, p < 0.001$). When the adjusted residuals are investigated, it was seen that the observed frequency of positive responses for the availability of a computer at home was much lower than the expected frequency ($Resid = -108.72$). For the mid access group, no significant gap was present between the observed and expected frequencies with an adjusted residual value of -0.02 . The observed frequency for the high access group was significantly higher than the expected frequency with an adjusted residual value of 54.70 .

Table 8 Access to computers at home

Response	Value	Internet access			Total
		Low	Mid	High	
Yes	Count	8639	58,162	132,176	198,977
	Resid	-108.715	-0.023	54.700	
No	Count	4940	6228	10,133	21,301
	Resid	108.715	0.023	-54.700	
Total	Count	13,579	64,390	142,309	220,278

4 Discussion

The preliminary results of the study showed that Colombia and Mexico clustered in the low internet access group while Greece, Hungary, Ireland, Israel, Italy, Lithuania, Latvia, Poland, Portugal, Slovakia, Slovenia and Turkey were in the mid-access group. The high-access group consisted of Austria, Belgium, Czechia, Spain, France, Germany, Denmark, Estonia, Finland, United Kingdom, Iceland, South Korea, Luxembourg, the Netherlands, Norway and Sweden with almost complete internet coverage in households according to the cluster analysis.

The results of the cluster analysis reveal an economic pattern in the internet access groups. When the 2020 Gross Domestic Product (GDP) data for OECD countries is investigated, it is seen that the high-access group has a mean GDP of \$58,463.560 ($SD = \$20,647.05$), the mid-access group has a mean GDP of \$35,305.260 ($SD = \5005.034) and the low-access group has a mean GDP of \$17,060.84 ($SD = \2922.516), indicating a sizable difference among the economies of the groups divided by internet access (OECD, 2021a, 2021b, 2021c, 2021d). Quite expectedly, countries with bigger economies seem to be able to provide better internet services to their citizens, resulting in the clusters achieved in this study. In other words, the digital divide among the OECD countries has an economic basis.

When the PISA scores were compared regarding Reading, Maths, Science and average scores controlling for secondary educational spending, a clear disadvantage on behalf of the low internet access group was revealed. The PISA scores of the low-access group, namely Colombia and Mexico, were significantly lower than the mid and the high-access groups even after the effects of educational spending was ruled out of the ANCOVA model. In addition, all the models produced very large effects, indicating that a large portion of the variances in the models was explained by internet access. The mid and the high access groups did not differ in any of the PISA scores.

The availability of a computer in the household, a construct naturally related to a student's internet access, was found to be lower in the low internet access group than the other groups. On the other hand, the observed value was significantly higher than the expected value in the high-access group and there was no significant difference between the observed and the expected value in the mid-access group. Judging by the high adjusted residual values for both the low and the high internet access groups, the results indicated a clear disadvantage on behalf of the former and an advantage on behalf of the latter.

Taken together, the significant disadvantage of the low internet access group in both PISA scores and the availability of a computer at home confirmed the digital divide in education in terms of material and usage types of access in van Dijk's (2002) term. van Dijk's categorization refers to computer ownership (material access) and equal distribution of usage opportunities (usage access). In that respect, the results confirmed the unequal distribution of hardware indicating constraints in access in poorer countries which also had educational consequences. In other words, those

countries seemed to lack the democratic and economic means of accessing technology (Mossberger et al., 2003) and the educational achievement levels of their students were lower than the countries in the other groups, potentially due to being more deprived of opportunities to access information, collaboration and sharing learning experiences which would be facilitated by internet access (Rao, 2005; Sife et al., 2007).

5 Conclusion

This study aimed to find out if educational achievement differed according to internet access. The data sources of the study were the PISA scores, computer ownership and internet access data of the OECD countries. The results indicated a visible disadvantage for the OECD countries with low internet access even after the effects of the budget for education was ruled out. Those countries were also found to be disadvantaged in terms of computer ownership.

The results of the study show that the digital divide in education is present and has undesired outcomes in terms of educational achievement, as evidenced in the PISA scores. Students fortunate enough to have been born in countries with stronger economies and widespread internet access outperform those born in weaker economies and limited access to the internet. In that respect, support programs targeting educational achievement should also consider internet access as an integral part of education and distribute funds accordingly.

It should also be noted that the study is limited to the data provided by OECD for the year 2018. Especially in the last few years, the Covid-19 pandemic has hit the entire world, forcing many countries to provide educational services online. Based on the results of this study, it is possible to infer that the digital divide in education must have deepened recently, especially in weaker economies where access to the internet is limited.

References

- Alam, K., & Imran, S. (2015). The digital divide and social inclusion among refugee migrants. *Information Technology and People*, 28(2), 344–365.
- Alvarez, A. V., Jr. (2020). The phenomenon of learning at a distance through emergency remote teaching amidst the pandemic crisis. *Asian Journal of Distance Education*, 15(1), 144–153. <https://doi.org/10.5281/zenodo.3881529>
- Friederici, N., Wahome, M., & Graham, M. (2020). *Digital entrepreneurship in Africa: How a continent is escaping Silicon Valley's long shadow*. The MIT Press.
- Haight, M., Quan-Haase, A., & Corbett, B. A. (2014). Revisiting the digital divide in Canada: The impact of demographic factors on access to the internet, level of online activity, and social networking site usage. *Information, Communication & Society*, 17, 503–519. <https://doi.org/10.1080/1369118X.2014.891633>

- Kahan, J., (2019). *It's time for a new approach for mapping broadband data to better serve Americans*. Retrieved from <https://blogs.microsoft.com/on-the-issues/2019/04/08/its-time-for-a-new-approach-for-mapping-broadband-data-to-better-serve-americans/>.
- Kerawalla, L., & Crook, C. (2002). Children's computer use at home and at school: Context and continuity. *British Educational Research Journal*, 28(6), 751–771.
- Mossberger, K., Tolbert, C. J., & Stansbury, M. (2003). *Virtual inequality: Beyond the digital divide*. Georgetown University Press.
- OECD (2021a). *OECD data: Access to computers from home*. Retrieved from <https://data.oecd.org/ict/access-to-computers-from-home.htm>.
- OECD (2021b). *OECD data: Gross domestic product*. Retrieved from <https://data.oecd.org/gdp/gross-domestic-product-gdp.htm>.
- OECD (2021c). *OECD data: Internet access*. Retrieved from <https://data.oecd.org/ict/internet-access.htm>.
- OECD (2021d). *PISA 2018 Results*. Retrieved from <https://www.oecd.org/pisa/publications/pisa-2018-results.htm>.
- Rao, S. S. (2005). Bridging digital divide: Efforts in India. *Telematics and Informatics*, 22(4), 361–375.
- Sanders, C. K., & Scanlon, E. (2021). The digital divide is a human rights issue: Advancing social inclusion through social work advocacy. *Journal of Human Rights and Social Work*, 6, 130–143.
- Sife, A., Lwoga, E., & Sanga, C. (2007). New technologies for teaching and learning: Challenges for higher learning institutions in developing countries. *International Journal of Education and Development Using ICT*, 3(2), 57–67.
- van Dijk, J. (2002). A framework for digital divide research. *The Electronic Journal of Education*, 12(1–2), 1–7. Retrieved from <https://core.ac.uk/download/pdf/31150071.pdf>.
- van Dijk, J. A. G. M. (2005). *The deepening divide: Inequality in the information society*. Sage.
- van Dijk, J. A. G. M. (2006). Digital divide research, achievements and shortcomings. *Poetics*, 34(4–5), 221–235.
- Warschauer, M., & Ames, M. (2010). Can one laptop per child save the world's poor? *Journal of International Affairs*, 64(1), 33–51.
- Watts, G. (2020). COVID-19 and the digital divide in the UK. *The Lancet Digital Health*, 2(8), 395–396.
- West, J. C. (2011). *Without a net: Librarians bridging the digital divide*. Libraries Unlimited.
- World Bank. (2020a). *COVID-19 prompts urgency of bridging digital divide in Central Asia*. Retrieved from <https://www.worldbank.org/en/news/press-release/2020a/12/02/urgency-of-bridging-digital-divide-in-central-asia-increases-as-a-result-of-the-covid-19-pandemic>.
- World Bank. (2020b). *Expenditure on secondary education (% of government expenditure on education)*. Retrieved from <https://data.worldbank.org/indicator/SE.XPD.SECO.ZS>.
- Yuen, H. K., & Park, J. H. (2012). The digital divide in Education and students' home use of ICT. In *Proceedings of the 2nd International Conference on The Future of Education*. Simonelli Editore University Press.
- Zappalà, G., Parker, B., & Green, V. (2000). *Social exclusion and disadvantage in the new economy*. Research & Advocacy Team, The Smith Family.

Understanding Digital Divide in English Language Classrooms: A Case Study on Its Causes, Effects, and Solutions



Ahmet Erdost Yastıbaş and Meltem Huri Baturay

Abstract This chapter aims to help understand digital divide in English language classrooms by focusing on its causes, effects, and solutions. The present study was designed as a case study. Two Turkish EFL teachers participated in the study. The data were collected through a semi-structured interview and analyzed through content analysis. The findings of the present study have indicated that, according to the participants, there were two causes of digital divide in English language classrooms, digital divide could affect both EFL students and teachers generally negatively, and it could be handled with individual and social solutions. The findings of the present study were discussed.

1 Introduction

Digital inequalities demonstrate a gap mainly related to access to technology. Digital divide (DD) is traditionally defined in the literature as the gap in accessing technology (Carrier, 2018; Dewan & Riggins, 2005; Gunkel, 2003; Light, 2001; Rogers, 2001; Yaman, 2015; Yu, 2018). Inequality also refers to another gap related to the use of technology with the aim of educating people and learning. As a result, DD is also defined as the gaps that exist in accessing the technology and using it for educational purposes (Artini, Santosa, & Suwastini, 2020; Cullen, 2001; Hargittai, 2003; Organization for Economic Co-operation & Development, 2001; Selwyn, 2004; Van Dijk et al., 2003; Warschauer, 2003). Artini et al. (2020) define it under two levels one of which is related to purely accessing it and the second is related to effectively using it for an educational aim. The second-level DD demonstrates the difference between a producer who is able to use it and a consumer who is not able to use it (Dolan, 2016).

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The first-level DD can stem from the socio-economic status of the individuals (Carrier, 2018; Dolan, 2016; Talae & Noroozi, 2019; Warf, 2019). The individuals who cannot afford to buy digital devices and pay for internet connection become disadvantaged compared to the ones who can afford them. Thus, not being able to use technology for their learning may influence the learning of these disadvantaged ones negatively (Carrier, 2018; Neupane, 2016; Talae & Noroozi, 2019). Also, the second-level DD can be the result of not having enough skills to use technology for educational purposes (Artini et al., 2020; Starkey et al., 2017). EFL teachers and students can have deficient skills in using technology for educational purposes because they may not have received enough training about how to use it for educational purposes (Carrier, 2018). Moreover, the difference in in-class and out-of-school usage of technology and the previous knowledge and experience of teachers can lead to second-level DD for students (Dolan, 2016). Besides all, the other factors that cause DD can be social, geographical, and political (Warf, 2019). Social issues such as gender, race, and religion can create some inequalities among people in some societies, which makes these individuals feel discriminated against due to the social barriers they are faced with. There are some countries in different parts of the world such as underdeveloped or developing, whose citizens cannot reach sources efficiently or at least at the level required due to their economic conditions. The educational institutions and schools in such countries may lack technology, limitations in internet connection and bandwidth, insufficient infrastructure, and even electricity (Carrier, 2018), which again creates a DD in the first level of education (i.e. schools). According to Yu (2018), schools should be the places where educational infrastructure is allocated wisely and prepared so that it can be benefited by teachers and students effectively, which can in turn result in the enrichment of education, empowerment of teachers' performance and students' achievement and finally, it supports flexible learning and increases quality in education. Any problems in the educational infrastructure of schools impact the use of technology and prevent technology integration into teaching. In addition, the gaps in access to technology and the use of technology affect the frequency of using technology in education negatively (Ercikan et al., 2018).

Regarding the first-level DD, as Artini et al. (2020) and Neupane (2016) recommended, equal access to technology should only be provided by governments because government-initiated practices can either minimize or prevent DD at schools (Karabacak, 2016). To deal with the causes of the second-level DD, Artini et al. (2020) advised stakeholders and policymakers to help and encourage teachers and students to advance their use of technology. Carrier (2018) also suggested providing teachers and students with digital literacy skills with training so that both teachers and students can make use of it appropriately with their competencies. Only then, they can use technology effectively and efficiently to achieve the pre-determined learning goals (Carrier, 2018). According to Carrier (2018), the training for teachers should focus on how to use technology effectively in their classes; how to design and develop their course accordingly; and how to encourage students to use technology for their learning outside the class, while the training for students should concentrate

on how to use technology for their learning in and outside the classroom as individuals or within teams or pairs interactively by using technology, and how to develop learning strategies that they can make use of in any learning environment. In addition, Neupane (2016) proposed that students should be encouraged to use technology in their learning.

As the explanations above indicate, DD can be considered an extensive and common problem in education in general and ELT in particular. Therefore, it is necessary to understand the causes of DD behind, how it affects English as a foreign language (EFL) teachers and students, and how it can be dealt with to sustain the quality use of technology in ELT. Although Yaman (2015) stated that DD could deeply influence designing instructional materials, teaching/learning of students, assessing students, and recognizing students' learning styles and multiple intelligences negatively, there are few studies in ELT literature that have focused on DD in ELT in the world. In one of these studies, Neupane (2016) and Rashid et al. (2018) found out that there was a DD between the EFL students in terms of the second-level DD, due to their lack of skills to use technology for their education or their feeling of uncomfortable with their level of competence regarding such skills (Rashid et al., 2018). It is suggested that if EFL teachers have more access to technology, EFL students can use technology better. In addition to these studies, Schieble (2010) indicated that if EFL teacher candidates are trained sufficiently regarding how to use technology in their teaching practices, they could integrate it into their teaching practices in a pedagogically sound way and also help students to make use of it appropriately for their learning.

As the literature above shows, there is a scarcity of research on DD in ELT literature in the world and in Turkey. Therefore, the aim of the present study was to contribute to ELT literature in terms of DD by finding out what causes it, how it affects EFL teachers' teaching English and students' English language learning, how EFL teachers deal with DD, and what EFL teachers think about overcoming problems with DD. Accordingly, the following research questions were tried to be answered in the present study by focusing on EFL teachers:

1. What are the opinions of the EFL teachers on the causes of DD in English language classes?
2. What are the opinions of the EFL teachers on the effect(s) of DD on their students' English language learning?
3. What are the opinions of the EFL teachers on the effect(s) of DD on their English language teaching?
4. How do EFL teachers try to deal with DD in their English language classes?
5. What do EFL teachers think about overcoming or lessening DD?

2 Methodology

2.1 Research Design

A case study aims to research a modern phenomenon in the real context where it occurs (Yin, 2009). Accordingly, the present study was designed as a case study in that it has concentrated on and investigated a contemporary phenomenon (i.e., digital divide) in its real context (i.e., English language classrooms where DD exists). In addition, a multiple-case study deals with more than one case to investigate a modern phenomenon (Yin, 2009). In accordance with this, the present case study was designed as a multiple-case study since it focuses on two cases (i.e., two EFL teachers) to research DD.

2.2 Participants

Two Turkish EFL teachers (2 male) who experienced DD in their English language classes voluntarily participated in the research. They were 35 and 36 years old and had seven years of teaching and twelve years of teaching experience.

2.3 Data Collection Tool

The data were collected through a semi-structured interview which was prepared depending on the literature reviewed in the study. It focused on the causes of DD in English language classes, the effects of DD on ELT teachers and students, the individual solutions that ELT teachers tried to overcome DD in English language classes, and the suggestions that ELT teachers offered to deal with DD in ELT.

2.4 Data Analysis

The researchers used content analysis to analyze the collected data. The data were first transcribed by one of the researchers. Then, the researchers read the data a few times and derived codes from the data. Second, they categorized the data under themes depending on the similarities and differences between the derived codes. Third, they organized and presented the data by using the themes and did not make any comments in this step. Fourth, they interpreted the data without any conflict with it.

Table 1 The themes developed and codes derived after content-analysis

Themes	Codes
Causes of digital divide in English language classes	Financial situation of students
	Using the computer for social media, games, and entertainment
Effect of digital divide on EFL students' English language learning	Decreasing students' English language learning performance
Effects of digital divide on EFL teachers' English language teaching	Recognizing the difference in students' English language learning performance
	Negative impact on all instructional practices
Individual solutions to deal with digital divide in English language classes	Trying to use technology more in classes despite restrictions
	The need for a social solution
Suggestions to deal with digital divide in English language classes	Computer labs in a neighborhood
	Training teachers for using technology
	Providing students with the access to technology

2.5 Trustworthiness

First, the data were thickly described by the researchers in presenting the analysis of the data in the findings. Second, the researchers made the content analyses of the data separately, compared and contrasted their analyses with each other, and made their necessary changes in consensus.

2.6 Findings

The findings of the present study were presented according to the order of the themes in Table 1 below.

2.6.1 Causes of Digital Divide in English Language Classes

According to participants 1 and 2, the first-level DD (i.e., the gap in accessing technology) existed in their classes because of *the financial situation of their students* which prevented them from having access to the technological tools that they could use when they learn English. To illustrate:

Participant 1: "The primary reason for this [digital inequality] is the economic situation..."

Participant 2: “In fact, there are 4 or 5 students who experience digital inequality in my class. We [English language teachers] saw that the primary reason for them to have this inequality is the lack of devices... They could not buy [technological devices], have such an opportunity.”

Participant 1 believed that his students *used the computer for social media, games, and entertainment*, so this situation led to the second-level DD (i.e., the gap in using technology for educational purposes). The excerpt below clearly shows this.

Participant 1: “... but there are some [students] who do not use it [technology] for education though they have it. It emerged to some extent during this pandemic period... Children got relaxed a lot in the pandemic... the students who used the computer for certain hours, let’s say, one hour, two hours in a day under the supervision of their mothers and fathers before started to sit in front of the computer from morning till night. Owing to this, they got addicted a little. This situation led to an effect on children like this: children do not feel the need to do homework, do research, watch something on the computer. Generally, the use of it [the computer] for the game, entertainment purposes or social media weighs a little more.”

In addition, participant 2 related the cause of the second-level DD to the first-level DD with respect to his students. That is, *his students’ lack of access to technological tools* led them not to use them for educational purposes. The excerpt below supports this.

Participant 2: “There were a lot of my students who experienced this inequality during distance education... There were students who did not have devices...”

To sum up, finance can lead to first-level DD by affecting EFL students’ access to technological devices negatively. It can also cause second-level DD among EFL students due to its negative effect on their access to technology. Second-level DD can also be caused by EFL students as they may prefer using technology for other purposes rather than education.

2.6.2 Effect of Digital Divide on EFL Students’ English Language Learning

Participants 1 and 2 thought that DD *decreased the English learning performance of the students who could not access technology* compared to the ones who could access the technology. The following excerpts reveal this.

Participant 1: “... I can observe this in students who have computers at home and are interested in foreign songs: the pronunciation of the students who watch foreign songs on Youtube at home is very good. You notice such students. Or he/she [the student] is not afraid of making a few sentences... Such students [who have computers at home] are a little comfortable... As I said, there are ones [students] who learn a language ... or with a book. Those students have problems producing the language. Especially, they have difficulty expressing themselves.”

Participant 2: “... if we look at it depending on opportunities, not inequality, I had a student who used English best, was most active, improved basic skills in my seven-year teaching career. I am talking about the main skills. Maybe his/her grammar was not good, maybe his/her knowledge of vocabulary was not great, but especially his/her speaking was magnificent. There was nothing that he/she could read. I had a student who could write everything

including formal documents and articles in high school. The main reason for this was digital opportunities. The child had played lots of computer games, [and] watched a lot of TV series since he was in primary school.”

To conclude, having the opportunity to access technological tools can help EFL students to improve themselves in terms of different aspects of English such as pronunciation and speaking because they can be exposed to English more. Yet, not having technological tools may affect the improvement of EFL students in different aspects of English negatively as they may be exposed to English less.

2.6.3 Effects of Digital Divide on EFL Teachers’ English Language Teaching

Participant 1 mentioned that DD helped him to *recognize the difference in English language learning performance* between the students who had access to technology and the ones who could not access technology. The excerpt below points out this.

Participant 1: “As I said again, I can see its [accessing technology and not accessing technology] difference in listening. In listening activities, for example, when we open something on the smart board, the students who mingle with technology at home or benefit from technology for education or, let’s say, in activities such as songs and games which have educational contribution are very good in listening lessons. Others have problems with this subject because as I said, the children who always write, read suffer from this [the difficulty in listening lessons].”

According to participant 2, DD *affected all instructional practices negatively*. The following excerpt reveals this.

Participant 2: “Digital inequality has affected the instructional activities of all teachers including me in the country seriously.”

To summarize, access to technology can create a difference in the English language learning of the students who access technology and the ones who cannot access technology because it can contribute to the improvement of English language learning of the students who have access to technology. In addition, an English language teacher’s instruction can be influenced by DD negatively.

2.6.4 Individual Solutions to Deal with Digital Divide in English Language Classes

Participant 1 *tried to use technology more in his classes despite some restrictions* (i.e., the lack of time and crowded classes). The excerpt below clearly shows this.

Participant 1: “... Or, let’s say, we [teachers] use activities such as songs and games. There are a lot of games used for language teaching on the internet nowadays. We try to make students do these, but as I said, for example, the size of one of my classes is very crowded. When we [teacher and students] do an activity, each student has one minute. In fact, they do not have. The length of the lesson is 35 minutes. The time that a student must use the

smart board is 40-45 seconds... this situation is related to classroom size. If the size of the class is less, of course, you can reduce this inequality in the class to some extent. If children [students] can use the smart board in the classes comfortably, it can be better for them, the child cannot use it if the class is very crowded. If everyone [students] touches the smart board once, it takes 3-4 minutes to come from the desk to the smart board. If he/she does the activity in 15-20 seconds, he/she returns to his/her desk in the same amount of time, 3-4 seconds. Time finishes. That is, a lesson cannot be enough for students in terms of technology."

Participant 2 *tried to be active in solving DD in his classes but emphasized the need for a social solution*. To illustrate:

Participant 2: "Yes, I have personal efforts to eliminate digital inequality... I try to do this. To be honest, I think of how I can become more active, but as this problem is related to education, can not be solved personally, is completely social, they are the problems that one person can not overcome... because no inequality can be solved personally, with personal efforts. They can be solved with a social approach."

In conclusion, although classroom size and the lack of time may create barriers in terms of EFL students' use of technology in an English language class, an EFL teacher can try to create opportunities for his/her students to use technology as much as possible in an English language class personally. Yet, such efforts may not be enough to deal with the issues created by DD, so this situation may require more than individual solutions.

2.6.5 Suggestions to Deal with Digital Divide in English Language Classes

Participant 1 suggested *opening computer labs in neighborhoods in a city* to deal with DD in English language classes. The excerpt below shows this.

Participant 1: "At least, I think if there are big and regular computer laboratories in each neighborhood where there are hundreds of computers, the children in the neighborhoods can come to them [computer labs] like a library, use the computers for one or two hours with their ID numbers, e-school passwords, or a password they have after being registered there... but let's think that there is such a computer laboratory in the neighborhood and if there are opportunities that the children in the neighborhood come daily, can use computers for one, two hours, can research, can do homework, I think that it can contribute more."

Participant 2 recommended *training EFL teachers about how to use technology* and *providing EFL students with access to technology*. The excerpt below supports this.

Participant 2: "Of course, opportunities that will eliminate, minimize digital inequality... For this, can it be started from the individual? Of course, it can be started. The teacher who will teach or consult has to be certainly qualified in digital platforms, be sufficient no matter what the branch is. Secondly, there should be a system that can provide students who can access this [technology] with the infrastructure. Ministries can provide this. A special budget should be spared for this. A serious budget should be allocated for these."

In short, opening new computer laboratories in neighborhoods in a city can be a good solution for EFL students who cannot have access to technological tools and

the internet. This can also be done by the ministries. Training EFL teachers about how to use technology can be a good solution to second-level DD that some EFL students experience because if EFL teachers know how to use different technologies, they can guide their students to use those technologies for educational purposes.

3 Discussion

The findings of the present study have indicated that the participant EFL teachers encountered two levels of DD in their English language classes in line with the literature (Neupane, 2016; Rashid et al., 2018). According to the participants, their students were exposed to first-level DD due to the financial status of their families as stated in the literature (Carrier, 2018; Dolan, 2016; Talae & Noroozi, 2019; Warf, 2019). This situation resulted in the lack of technological tools that can be used for English language learning among the students. Also, the lack of technological tools, correspondingly, led to the second-level DD among the students, which was related to the acquisition of necessary skills for technology use in their lessons. Therefore, these two cases create a digital divide between the students who cannot access technology and others who can have access to technology, and it may affect the former group of students more negatively in their English language courses.

Lack of access to technology for the aim of using it for educational purposes can affect students' learning negatively as Carrier (2018), Neupane (2016), and Talae and Noroozi (2019) emphasized. Accordingly, the findings of the present study have revealed that the students, who lacked technology access, had low English language learning performance compared to the ones who could access technology as stated in the literature (Neupane, 2016). In addition, the findings of the present study have indicated that the students who had access to technology experienced second-level DD as they did use their computers for their English language learning as explained by Artini et al. (2020), which is the reason for second-level DD. According to one of the participants in the present study, this situation was the result of his students' using computers for long hours during distance education. Also, this finding may stem from the fact that these students may not have sufficient knowledge, skills, and competencies to use technology for their English language learning (Artini et al., 2020; Starkey et al., 2017). DD among students in an English language learning class could also affect an EFL teacher's teaching practices negatively (Yaman, 2015) as they may refrain from using required technology to enrich their teaching, which may potentially decrease their motivation and encouragement for using it. Besides, the findings that DD had a negative impact on one of the participants' instructional practices, while it helped the other participant to realize the difference caused by DD in his students' English language learning performance.

According to the findings of the present study, the participant EFL teachers have tried their individual strategies to reduce DD in their English language classes, to somehow overcome it or at least to decrease its negative effect, but their efforts may not be enough to deal with DD problem in general because the reasons of DD can

be various such as social, geographical, economical, and/or political (Carrier, 2018; Dolan, 2016; Talae & Noroozi, 2019; Warf, 2019); thus, the solutions to DD are beyond personal efforts. This case clearly explains the suggestions delivered by the participant EFL teachers in the present study since their suggestions require state-initiated actions as Artini et al. (2020) and Neupane (2016) recommended. That is, establishing available computer labs in each neighborhood, training EFL teachers on how to use technology in education, and providing students with access to technology can not be achieved individually, but with state-initiated actions, because state-initiated actions can prevent or reduce DD at schools (Karabacak, 2016). Moreover, the suggestion of one of the participants overlaps with a finding of another study that teachers should be trained in terms of how to use technology for education (Carrier, 2018) so that they could have enough knowledge, skills, and competencies to use technology appropriately in their classes. In addition, the findings of the present study have pointed out another solution to DD that the participant EFL teachers did not mention. This finding has been the result of the fact that although the students of one of the participants already have access to technology, they do not use it for their English language learning. Therefore, training such EFL students to improve their technological skills, instructing them appropriately during their use, and guiding them effectively on how to use technology for their English language learning can be another solution to DD, which would enable them to make use of technology appropriately with their developed competencies (Carrier, 2018). Also, another solution that the findings indicated is the conditions of the schools. Schools and the facilities they present have a central place in the quality of education, which, therefore, influences the prevention or reduction of DD in teaching (Carrier, 2018; Yu, 2018). Thus, improving the conditions of the schools can correspondingly contribute to the individual efforts of EFL teachers to reduce DD in their classes and to provide equal opportunities for students.

4 Conclusion

We are living in a digital era; from our daily chores, to work and education we are using technology extensively. Thinking of how technology advances over years, it may be sometimes hard to catch and supply all necessary tools and devices in time at hand in some situations. Considering educational settings, the requirement of a computer/laptop and sufficient internet connection with a satisfactory bandwidth has increased in the latest years, and particularly with the corona pandemic, this requirement was striking. In or out of school students need technological tools etc. to be educated efficiently, which is more than a choice but a must for today's educational arena. However, changing from country to country or school to school, there are always some who cannot access it sufficiently, which creates DD among the students. Thus, it is quite normal for a student to experience DD in an educational environment considering a wide range of parameters that may cause this divide. One of them is

related to the financial situation of the students, and the other one is not having technological tools.

DD may also negatively affect the English language learning performance of EFL students who do not have access to technology and similarly have a negative impact on the English language teaching practices of EFL teachers. EFL teachers may try to deal with DD on their own, but more effective decisions could be taken for the solutions by carrying out state-initiated actions or collaborating with other stakeholders at the school.

References

- Artini, N. N., Santosa, M. H., & Suwastini, N. K. A. (2020). Investigation of current digital divide between university lecturers and students in the English as a foreign language context in North Bali. *International Journal of Education*, 13(2), 113–121.
- Carrier, M. (2018). English for the underserved: Closing the digital divide. *Training, Language and Culture*, 2(4), 9–25.
- Cullen, R. (2001). Addressing the digital divide. *Online Information Review*, 25(5), 311–320.
- Dewan, S., & Riggins, F. J. (2005). The digital divide: Current and future research directions. *Journal of the Association for Information Systems*, 6(12), 298–337.
- Dolan, J. E. (2016). Splicing the divide: A review of research on the evolving digital divide among k–12 students. *Journal of Research on Technology in Education*, 48(1), 16–37. <https://doi.org/10.1080/15391523.2015.1103147>
- Ercikan, K., Asil, M., & Grover, R. (2018). Digital divide: A critical context for digitally based assessments. *Education Policy Archives*, 26(51), 1–19.
- Gunkel, D. J. (2003). Second thoughts: Toward a critique of the digital divide. *New Media & Society*, 5(4), 499–522.
- Hargittai, E. (2003). The digital divide and what to do about it. In D. C. Jones (Ed.), *New economy handbook* (pp. 821–839). Emerald Group Publishing Limited.
- Karabacak, K. (2016). Evaluation of Fatih project in the frame of digital divide. *Turkish Online Journal of Educational Technology-TOJET*, 15(2), 61–72.
- Light, J. (2001). Rethinking the digital divide. *Harvard Educational Review*, 71(4), 709–734.
- Neupane, B. (2016). *Teachers' and students' perceptions on digital divide in English language learning* (Master's thesis, Department of English Education Faculty of Education, Tribhuvan University Kirtipur, Kathmandu, Nepal). Retrieved from <http://107.170.122.150:8080/xmlui/bitstream/handle/123456789/424/12868.pdf?sequence=1&isAllowed=y>
- Organization for Economic Co-operation and Development. (2001). *Understanding the digital divide*. Retrieved from <https://www.oecd.org/digital/ieconomy/1888451.pdf>
- Rashid, S., Cunningham, U., Watson, K., & Howard, J. (2018). Revisiting the digital divide(s): Technology-enhanced English language practices at a university in Pakistan. *Australian Journal of Applied Linguistics*, 1(2), 64–87.
- Rogers, E. M. (2001). The digital divide. *Convergence*, 7(4), 96–111.
- Schieble, M. (2010). The not so digital divide: Bringing pre-service English teachers' media literacies into practice. *Journal of Media Literacy Education*, 2(2), 102–112.
- Selwyn, N. (2004). Reconsidering political and popular understandings of the digital divide. *New Media & Society*, 6(3), 341–362.
- Starkey, L., Sylvester, A., & Johnstone, D. (2017). Negotiating digital divides: Perspectives from the New Zealand schooling system. *Journal of Research on Technology in Education*, 49(1–2), 31–42.

- Talae, E., & Noroozi, O. (2019). Re-conceptualization of “digital divide” among primary school children in an era of saturated access to technology. *International Electronic Journal of Elementary Education*, 12(1), 27–35.
- Van Dijk, J., & Hacker, K. (2003). The digital divide as a complex and dynamic phenomenon. *The Information Society*, 19(4), 315–326.
- Warschauer, M. (2003). Demystifying the digital divide. *Scientific American*, 289(2), 42–47.
- Warf, B. (2019). Teaching digital divides. *Journal of Geography*, 118(2), 77–87.
- Yaman, İ. (2015). Digital divide within the context of language and foreign language teaching. *Procedia-Social and Behavioral Sciences*, 176, 766–771.
- Yin, R. K. (2009). *Case study research: Design and methods* (4th ed.). SAGE Publications Inc.
- Yu, Z. (2018). Third-level digital divide in English teaching and Learning. *International Journal of Information and Communication Technology Education (IJICTE)*, 14(3), 68–80.

Bridging the Digital Divide Using the TPACK Model in the Context of Turkey



Gülten Genç and Rabia Dülger

1 Introduction

Thanks to information and communication technologies, such new concepts as e-mail, e-learning, e-school and e-government are among those that have recently become parts of people's daily lives. As suggested by Çukurçayır and Çelebi (2009), these technical notions have elevated knowledge to the top of the priority list and have made the intellectual capital crucial. So, the cyclical relationship between knowledge and technology (Acun, 1998) might be seen clearly at this point. As knowledge production contributes to technological development, technological development also contributes to knowledge accumulation. As a result, it was anticipated that educational institutions, where knowledge is primarily produced, would inevitably be affected by these cyclical relationships and technological developments.

This influence, however, has not been felt in all parts of the world or even in all regions of the countries equally. The fact that nations and individuals could not have equal conditions in accessing information and communication technologies caused cultural and economic inequalities in the societies. This phenomenon has been called as "digital divide" and has been defined in many different ways. One of the first definitions came from OECD in 2001 as "digital divide refers to the gap between individuals, households, businesses and geographic areas at different socio-economic levels with regard both to their opportunities to access information and communication technologies (ICTs) and to their use of the Internet for a wide variety of activities".

As the Internet grows in prominence and becomes a vital part of people's lives and cultures, the importance of everyone having access to it grows. Given the UN

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report (UN, 2011: 22), which argues that internet access is a human right; it is clear that removing all barriers to internet access is crucial in today's societies. However, being competent in using the internet is as important as accessing it.

Recent research over time has emphasized that digital inequality is not solely a result of physical impediments to access and added a new dimension (Fuchs & Horak, 2008: 101) as "the capability to use them", the capability to use them in such ways that oneself and others can benefit". Countries that are profoundly affected by the digital divide suffer not only from political and economic collapses but also from educational deficiencies, and they inevitably fail to achieve average living standards in all aspects of life (Ronning, 2006).

From this standpoint, having all kinds of technological equipment in schools or classrooms does not mean that digital inequality has disappeared. If the teacher, who is the number one actor in the educational environment, is not competent enough to use technology for educational purposes, it is not possible to talk about digital equality in that classroom environment. Accordingly, this article intends to figure out the extent to which students learning English in Turkey experience digital inequality by examining the studies on Technological Pedagogical Content Knowledge (TPACK) competencies of teachers. But first, we need to understand the role of digital divide in educational settings.

2 The Digital Divide in Education

As mentioned above, the digital divide has been defined in different ways. It was simply defined as the "the inequality of access to the internet" (Castells, 2002). However, when it comes to understand its effects in educational settings, it is wiser to adopt the definition which emphasizes the lack of ability to access and use the technology (Seferoğlu et al, 2008, Yu, 2002: 2, Chinn & Fairlie, 2004). It is obvious that the digital divide has a dual relationship with education level of the individuals. Individuals given the opportunity and sufficient education to use the technology and internet for educational and social purposes will have the strength to overcome the inequalities.

We've all seen school officials and politicians tout about their technologically advanced facilities. However, not just having access to and possessing technology, but also having teachers who know how to incorporate technical tools into educational contexts and use them successfully is something to be proud of, especially in educational settings. Many researchers (Vandenbroeck et al., 2007) have underlined that being able to use technological equipment in educational settings is just as crucial as being able to access them (Kezang & Whalley, 2007). Schools or classrooms with digital tools are useless without teachers who can successfully use them. Moreover, teachers that are ill-equipped to incorporate technology into the classroom will aggravate the existing digital divide. At this point, it is among the responsibilities of teachers to minimize the digital divide between students by reflecting the innovations related to ICT to the learning and teaching activities taking place in the

classroom (Uzunboylu & Tuncay, 2010). At the same time, teachers who play a role as a guide for students to reach the determined goals in the curriculum should have ICT competencies. Students should also strive to gain these competencies. Otherwise, the desired success will not be achieved from the curricula applied in primary education.

Finn and Inman (2004) propose three basic goals for incorporating information and communication technology into education: making computer technology more accessible to students, integrating computer technology into the realm of education, and better preparing students for their future careers by utilizing ICT's benefits.

The better the teachers reflect the developments and innovations in ICT to their classrooms and teaching process, the less digital inequality among students will be seen (Uzunboylu & Tuncay, 2010). Each one of the students might be offered high quality learning material as well as blended and personalized learning options which allow them to study on their own pace. It is now known by everyone that global competitive individuals cannot be raised by teachers transferring the knowledge in their own repertoire to students with traditional methods within four walls. As a result, it is inevitable that the expectations from the teachers of the 21'st century are quite high and having just core academic competencies are not enough to meet the needs of the learners.

As mentioned above, some conditions must be met in order for technology to be integrated into the education process and used effectively and smoothly. The most important among these are the presence of trained teachers, the availability of appropriate technological tools and the necessary technical infrastructure (Al-Bataineh and Brooks, 2003). Otherwise, technology will not go beyond being just a tool and will never serve its purpose.

From here on, the TPACK model, which is thought to play an important role in reducing digital inequality, will be discussed. Technological Pedagogical Content Knowledge is a paradigm developed by researchers who believe that pedagogical knowledge should be the foundation for the complete achievement of technology integration (Mishra & Koehler, 2006). The model was created by adding "Educational technologies" to Shulman's (1986) Pedagogical Content Knowledge (PCK) structure. In principle, the model advocates that teachers are supposed to integrate their content knowledge and pedagogical knowledge and use the best teaching methods to teach a particular subject. As a result, the model proposes to use technological, pedagogical, and content knowledge together for technology integration in education.

3 Technological Pedagogical Content Knowledge (TPACK)

Throughout history, knowledge of teacher education has been based upon teachers' content knowledge (Mishra & Koehler, 2006). Content knowledge points out the number and order of the knowledge itself in teachers' minds (Shulman, 1986). As Ball et al. (2008) express, Shulman and his workmates contributed to reframing the "teacher's knowledge" to make the "content" fit in the teaching process. However,

the interest in the school subject itself and its role during teaching and teachers' thought was overlooked even though earlier teacher education studies were applied in classrooms (Ball et al., 2008). That means the attention to the content was little, and Shulman (1986) called it a "missing paradigm". *"The missing paradigm refers to a blind spot concerning the content that now characterizes most research on teaching and, as a consequence, most of our state-level programs of teacher evaluation and teacher certification...What we miss are questions about the content of the lessons taught, the questions asked, and the explanations offered"* (Shulman, 1986, p. 7–8).

After that, Shulman (1986) developed teacher knowledge thinking by presenting "PCK" and identified it as the knowledge that makes the subject attainable. Shulman thought that pedagogical practice and certain content areas were interconnected and used the term "PCK" to express this relation (Schrum et al., 2007). Shulman's (1986) PCK framework aroused and heated debates on teachers' knowledge during his time. Pedagogical Content Knowledge (PCK) is the understanding of how to convey the content with a teaching method (Bibi & Khan, 2017). Therefore, Shulman drew a new direction to illustrate the knowledge necessary for teaching efficiently. Shulman did not dwell on developing pedagogical knowledge and content knowledge separately. Instead, he highlighted that combining both content and pedagogical knowledge of a teacher is the heart of efficient teaching. The intersection of content knowledge and pedagogical knowledge encompasses knowledge by which teachers are able to detect students' needs for a particular topic, identify the most appropriate learning approach(es), and figure out how to promote students' learning. When PCK was introduced, technology and the number of resources were slightly limited—considering the technology of that time- in the 1980s-the knowledge needed to utilize that technology was within the scope of pedagogical knowledge within the PCK framework. Mishra and Koehler (2006) recognized this shortcoming. They argued that "technological knowledge" (TK) should be included in the PCK framework as the 3rd knowledge domain. It was defined as "knowledge about standard technologies such as books, chalk, blackboard, and more advanced technologies, such as the Internet and digital video" (p. 1027). Technological knowledge involves the knowledge and skills required to use technologies, and by including this 3rd information field, they put forward the TPACK framework (Hofer & Grandgenett, 2012). Bagheri (2020) emphasizes that before introducing the TPACK framework by Mishra and Koehler (2006), it should not be forgotten that other researchers had shortly talked about integrating technology into the PCK framework. To mention the relationship between technology, pedagogy, and content, the term "integration literacy" was proposed by Gunter and Baumbach (2004), and "electronic PCK" is another term to identify a specific teacher proficiency for outstanding integration of technology (Franklin, 2004; Irving, 2006). Mishra and Koehler (2006) defined the TPACK framework as follows;

1. **Content Knowledge (CK):** It refers to any subject matter focusing on the teachers' knowledge requiring them to fully use it while teaching subjects at school (Koehler et al., 2014) such as a teacher's knowledge about Science and History.

2. **Pedagogical Knowledge (PK):** It refers to the teachers' knowledge about broad and various instructional techniques and methods to encourage students learning in the classroom (Koehler et al., 2014), such as knowledge about how to use task-based learning (TBLT) in teaching for your learners.
3. **Technology Knowledge (TK):** It refers to the teachers' knowledge containing the utilization of both traditional and new technologies integration in teaching. It facilitates the learning of learners as well (Koehler et al., 2014) such as, knowledge about how to use Web 2.0 and Web 3.0 (semantic web) tools.
4. **Technological Content Knowledge (TCK):** It refers to the knowledge of the mutual relationship and intersection between technology and content knowledge of how to use technology to create up-to-date content in different ways (Koehler et al., 2014) such as knowledge about how to use SPSS for the Scientific Research Methods course.
5. **Pedagogical Content Knowledge (PCK):** It refers to Shulman's (1986) concept of "an understanding of how particular topics, problems or issues are organized, represented, and adapted to the diverse interests and abilities of learners, and presented for instruction" (p. 8) (Koehler et al., 2014). It is the combination of content knowledge and pedagogical strategies to make the subject more easily understandable for the students such as knowledge of using analogy to teach various topics which are relatively difficult for the students.
6. **Technological Pedagogical Knowledge (TPK):** It refers to the knowledge that contains several techniques in instruction. It is the knowledge of how learning and teaching can be changed by particular technologies used in specific ways (Koehler & Mishra, 2009).
7. **Technological Pedagogical Content Knowledge (TPACK):** It refers to the complex relationships of technology, pedagogy, and content and the interplays of these three essential components of knowledge. It provides teachers to create suitable and subject-matter-specific teaching techniques in the classroom (Koehler & Mishra, 2009).

Education circles, defending that the ability to produce science and technology can only be provided with a good education, state that contemporary technologies should be used as educational tools within the scope of educational technologies (Polat, 2018). Polat adds that since the end of the 20th century, simple educational technologies such as chalkboards, books, and notebooks have developed remarkably, and in a short time, they have become quite diverse and capable. In this direction, today's computers, internet, tablets, memory cards, online media, and software facilitate the teaching-learning process for both teachers and students.

As Şahin (2011) states, if teachers want to be successful in teaching and have a better career in their professional lives, they should need self-development in pedagogy, technology, and their content individually. So as to back up students' learning, teachers should know using technologies in the best way in education. Similarly, Aksin (2014) emphasizes that teachers must recognize the role of technology in education and know how it is used to attain success in the professional sense because they will encounter the student groups who use today's technology tools such as

computers, the internet, tablets, and smartphones almost every day. As can be seen clearly, technology affects the teachers on a large scale, and here is the knowledge to make the best use of technology while helping students' learning of the school subjects is named "technological pedagogical content knowledge" (TPACK) by Mishra and Koehler (2006) and this frame is a demand for the researchers who measure the technology competencies of teachers.

Mahdum (2015) states, "in the past, mastering the content and pedagogical competence was enough for someone to be considered a good teacher. Teachers could teach students with these two competencies." (p. 168). Nevertheless, in recent years, teachers had expanded their competence repertory.

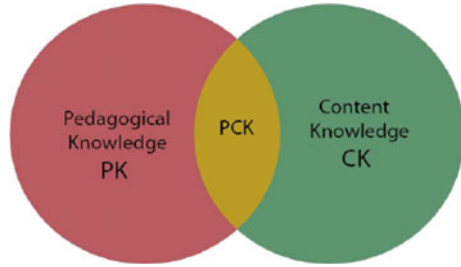
They should add a new mastership into their existing competencies: technology competence (TK). In order to do that, three domains of knowledge need to be mastered by teachers: technology knowledge, pedagogical and content knowledge. The relationship among them is significant. So, at that point, technology integration into the classes is an obligation nowadays. Teachers should know how to use technology by integrating their content and pedagogical knowledge in their courses and supporting their new generation and "digital native" students learning.

Koehler and Mishra (2009) remark that new technologies result in difficulties, so they express that gaining a new skill is challenging. For instance, teachers encounter intensive and more use of technology, and they see this as a complex situation since they have inadequate information and insufficient experience and practice with technologies in their teaching and learning process. According to Rocha et al. (2011) (as cited in Delen, 2016), it cannot be neglected that changes and novelties in the methods and plannings contribute effectively to the teaching and learning process. However, technology integration into the courses is found an intricate process. For this reason, teachers should be aware of the fact that effective teaching is based upon the combining of various knowledge components. In these circumstances, as Yıldız (2020) suggests, the TPACK knowledge development supports teachers in creating an influential environment for the new generation.

The TPACK framework is a frame for teachers, including technology integration called technological pedagogical content knowledge. The original acronym was "TPCK" in literature until, but right now, it is called "TPACK" or technology, pedagogy, and content knowledge because it was found a little bit problematic in its articulation by some dealt with the structure of Technological Pedagogical Content Knowledge (Thompson & Mishra, 2007). As Koehler and Mishra (2009) state, this framework bases upon Lee Shulman's construct of PCK to involve technological knowledge. That is, TPACK Framework is an extensive form of Shulman's PCK. The improvement of TPACK by teachers is crucial for successful teaching within the scope of technology. Therefore, flexible reaching to knowledge which is appropriately arranged, rich, and integrated with various fields containing students' thought and learning, school subject knowledge, and ever-increasing technology knowledge interconnect with "efficient teaching" (Koehler & Mishra, 2009).

Historically, the basis of teacher education knowledge has centered upon the teachers' knowledge of content. However, more recently, teacher education has

Scheme 1 Two circles showing the combination of pedagogical knowledge and content knowledge



switched its focus, principally pedagogy, and emphasized overall pedagogical classroom implementations independent from the subject matter and often for content knowledge (Mishra & Koehler, 2006). So, they describe this separate way of teacher knowledge with two circles independent of one another.

Shulman (1986) thought about teacher knowledge and introduced the thought of “Pedagogical Content Knowledge”. Shulman (1986) said the crossing (PCK) consists in it “the most regularly taught topics in one’s subject area, the most powerful analogies, illustrations, examples, explanations, and demonstrations—in a word, the way of representing and formulating the subject that makes it comprehensible to others” (p. 9) (Scheme 1).

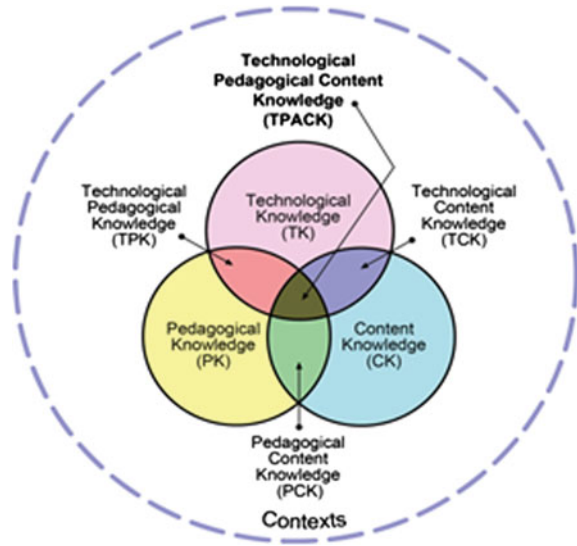
When Lee Shulman puts his claim forward, issues about technologies were not at the forefront. However, recently, new technology has changed the classroom atmosphere, or it has the potential to do so. For that reason, the teachers have to do more than just learning how to use the available technological instruments since the existing technology becomes outdated. They also have to be knowledgeable, with new techniques and skills. Hence, technology knowledge has become an essential aspect of overall teacher knowledge (Mishra & Koehler, 2006).

Unlike a simple glance at technology, Mishra and Koehler (2006) put forth that their TPACK Framework highlights interactions, connections, constraints, and affordances among the components: content, pedagogy, and technology. In this model, knowledge of content, pedagogy, and technology is the heart of good teaching. In brief, at the center of effective and succeeding teaching with technology, there are three core components: Content (C), Pedagogy (P), and Technology (T). In addition, the connections between and among them are needed. Therefore, these three knowledge bases, C, P, and T, constitute the core of the TPACK Framework (Koehler & Mishra, 2009) (Scheme 2).

4 The Strategies of TPACK Development

There are countless kinds of strategies to develop TPACK. Learning Technology By Design (LTBD), Technology Mapping (TM), and Learning Activity Types (LAT) are three main strategies. The learning Technology By Design approach was introduced

Scheme 2 The TPACK Framework and its components proposed by Koehler and Mishra



by Koehler and Mishra (2005) to help teachers create an adaptable perception of technology, and also in-service teachers find technologic solving to pedagogical matters by working cooperatively in groups (Koehler & Mishra, 2005). It provides TPACK development and technology integration in pedagogical knowledge for teachers. In the LTBD strategy, teachers work collaboratively, and the main focus is to find solutions to one particular problem. They create peculiar ways to cope with the problem and plan many tasks to detect their problem using technology. The primary topic is to use numerous distinctive tools to deal with the problem, not one specific technological tool. In LTBD, teachers are informed about these tools, but the main focus is forming a task for a specified topic (Baş, 2019).

The other one is Technology Mapping (TM). Again this is a strategy for teachers to manage compelling problems about learning or teaching in their lectures. First of all, the topics are determined, and the teachers choose a then suitable pedagogical technological tool. So, a particular technology form, Technology Mapping, works. Then, there are short sessions to show how teachers can use a technological tool. Finally, teachers are expected to use this tool for the subjects they encounter any difficulties while teaching. In this way, teachers can form actual duties during the process.

Developing TPACK by Learning Activity Types (LAT) was introduced by Hofer and Harris (2015). It helps teachers integrate technology in an effective way for student-focus and curriculum-based lectures. It provides them to have technologically enhanced lessons. There are nine kinds of curriculum domains as K-6 Literacy, mathematics, music, physical education, science, secondary English language arts, social studies, visual arts, and world languages. Each one of these domains has its own classifications according to the topic. The LAT is a process consisting of 5 steps (Hofer & Harris, 2015) as choosing learning goals, considering classroom and

school contexts, selecting activity types to combine and sequence, deciding about assessment strategies and choosing tools and resources.

The teachers plan their lessons in steps determined by the types of learning activities. Firstly, they detect the learning aims, and then they select suitable activities according to the goals. Finally, they determine appropriate technologies in classifications within the relevant content. It is believed that this lesson plan designing back up teachers' TPACK development (Baş, 2019).

5 TPACK and Teachers

As a result, TPACK is a conceptual framework which defines the knowledge teachers need for effective pedagogical practice in a learning environment strengthened with technology. It involves the intricate network that exists between content, pedagogy, and technology knowledge domains and guides teachers to match their instructional purposes with successful use of technology (Padmavathi, 2017). However, it is clear that teachers will have some difficulties in this regard and will need support to overcome these difficulties.

Teachers might simply tend to add ICT into their traditional teaching style without understanding the ways of integrating ICT into their professionalism. The design of the technological tools is expected to be based on the curriculum. Technology integration is described as the utilization of technologies and resources to assist learning and teaching across the curriculum (Harris et al., 2010). At this point, teachers' incompetency might cause some problems. Teacher training programs at the faculties fall short of providing sufficient training and practice for teachers and teacher candidates to use and integrate technology sufficiently (Bingimlas, 2009; Chen, 2008; Ertmer, 2005).

Teachers should be directed to use the TPACK model at every stage of the profession. For this purpose, the first place where education will be given should be during undergraduate years. Teacher training programs at the faculties ought to involve a direct education which offers some approaches and strategies to integrate technology into the curriculum. It is also critical that teacher candidates should start education about using and integrating technology in their teaching practice courses. In this sense, the next group expected to receive education and training is in-service teachers. In service teachers are supposed to have pedagogic content knowledge. They mostly need different types of learning activities involving technological tools to integrate the instructional programs. Various training programs in the form of workshops, seminars and webinars could be organized and carried out by the ministries and universities. The more teachers and pre-service teachers receive and implement this training, the more educational institutions will be familiar with TPACK model which means that so many students will be given the opportunity to access ICT.

It should always be kept in mind that preparing teachers for this new educational environments and increasing their knowledge and skills on TPACK will both bring many new opportunities to the classroom environment and serve to close the digital

inequality. It will also give the teachers the convenience to use technology for meaningful purposes. However, as suggested by Ashton (1984) to get the most benefit from these training activities teachers should be eager and motivated to take part. In the literature, there are some studies examining the opinions of teachers after technology integration training and the results of these studies show that teachers' post-training productivity and their attitudes towards integrating technology into the curriculum have increased positively (Zhao & Bryant, 2006).

In addition, due to the constantly renewed and developing nature of technology and technological tools, it is not possible for such trainings to be one-time only. Teachers, who play the role of agents of change in societies, have a mission to renew themselves professionally, to be open to innovations and to bring these innovations together with their students. Therefore, following the developments and innovations in the technological field and adapting them to educational activities should be seen as an important part of teachers' professional development activities.

6 TPACK and EFL Teachers in Turkish EFL Context

The use of technology in EFL classrooms is arguably very important, yet teachers' awareness of this importance and their effort to develop professionally to be responsive to the needs of today's foreign language learners who are quite familiar with technology is even more important. In order to ensure that "all" students benefit from the advantages of technology at the maximum level in the foreign language learning process, an EFL teacher should have a deep understanding of TPACK and implement effective EFL teaching accordingly. As pointed out by Albion et al. (2010) in the 21st-century, Pedagogical Content Knowledge is not sufficient for teaching anymore especially in this age in which there are numerous technology resources available for online English learning. EFL teachers are expected to use them in school environment to enhance teaching and also raise the awareness of the learners about those resources. In addition, when considering foreign language education specifically, the rich content of technological resources in the teaching of language skills such as listening, speaking, reading and writing will help to provide effective teaching. Especially for students like Turkey learning English as a foreign language, technological opportunities gain more importance in terms of providing a real language usage environment. Moreover, an EFL teacher who is competent enough in TPACK can take the advantage of the blessings of technology and move away from the "one size fits all" perspective, revealing the weak and strong sides of the students and enabling them to turn to individual work. Because the skillful use of technology will provide a power to enable this.

When all these are taken into account, the results of TPACK studies in Turkish EFL context arouse interest. In terms of Turkish EFL context, it is seen that various studies have been carried out to determine the TPACK levels of both in-service and pre-service EFL teachers and different results have emerged (Ersanlı, 2016; Kurt et al., 2014; Öz, 2015; Sarıçoban et al., 2019; Solak & Çakır, 2014). In general,

studies show that the in-service and pre-service English teachers have moderate or satisfactory levels of TPACK. Two of these studies (Ersanlı, 2016 and Kurt et al., 2014) were conducted with pre-service EFL teachers, and a 5-week training program was implemented for teacher candidates to develop TPACK proficiency, and it was observed that this targeted training program significantly increased the TPACK proficiency levels of pre-service EFL teachers. These results suggest that it would be a good idea to enrich teacher candidates' education programs by adding some elective or compulsory courses to increase TPACK proficiency.

7 Conclusion

Today, with the widespread use of ICT, there has been a shift in the definition of the concept of digital divide. The concept concentrates on having the knowledge and skills that will best serve the purpose used, rather than physically reaching the ICT. In educational settings, it is concerned with whether actors have the knowledge and equipment and utilize effectively to maximize learning. Employing TPACK model which was developed by Koehler and Mishra (2009) and defined as knowledge that is needed by teachers to strengthen the learning and teaching process with technological tools is thought to help bridge the digital divide. In cases where students do not have the opportunity to individually access and effectively use technology and ICT, the digital divide experienced can be overcome with teachers who are competent to integrate and use technology into the curriculum and school setting. However, this benefit can only be achieved if teachers have a high level of TPACK proficiency. Teacher candidates and if needed also in-service teachers should be trained to adopt different pedagogical ways to get efficiency from information and communication technologies, use technology effectively and support students in this sense.

References

- Acun, R. (1998). Bilim, bilgi teknolojisi ve Türkiye. In B. Yediyıldız, M. Ç. Özdemir & F. Unan (Ed), *Milli kültürler ve küreselleşme içinde* (s. 83–92) Konya.
- Aksin, A. (2014). *Competencies of technological pedagogical and content knowledge of social studies teachers: A case study of Amasya province*. Unpublished Doctoral Dissertation. Atatürk University, Erzurum, Turkey.
- AL-Bataineh, A., & Brooks, L. (2003). Challenges, advantages, and disadvantages of instructional technology in the community college classroom. *Community College Journal of Research and Practice*, 27, 473–484. <https://doi.org/10.1080/713838180>
- Albion, P., Jamieson-Proctor, R., & Finger, G. (2010). Auditing the TPACK confidence of Australian pre-service teachers: The TPACK confidence survey (TCS). In D. Gibson & B. Dodge (Eds.), *Proceedings of Society for Information Technology & Teacher Education International Conference 2010* (pp. 3772–3779). Chesapeake, VA: AACE.
- Ashton, P. (1984). Teacher efficacy: A motivational paradigm for effective teacher education. *Journal of Teacher Education*, 35, 287–232.

- Bagheri, M. (2020). Validation of Iranian EFL teachers' technological pedagogical content knowledge (TPACK) scale. *TESL-EJ*, 24(2), n2.
- Ball, D. L., Thames, M. H., & Phelps, G. (2008). Content knowledge for teaching: What makes it special. *Journal of Teacher Education*, 59(5), 389–407.
- Baş, K. (2019). *Examining the role of the learning activity types approach in teachers' technology integration (Unpublished Master's Thesis)*. Boğaziçi University.
- Bibi, S., & Khan, S. H. (2017). TPACK in action: A study of a teacher educator's thoughts when planning to use ICT. *Australasian Journal of Educational Technology*, 33(4).
- Bingimlas, K. A. (2009). Barriers to the successful integration of ICT in teaching and learning environments: A review of the literature. *Eurasia Journal of Mathematics, Science & Technology Education*, 5(3), 235–245.
- Castells, M. (2002). *The internet galaxy*. Oxford University Press.
- Chen, C. H. (2008). Why do teachers not practice what they believe regarding technology integration? *The Journal of Educational Research*, 102(1), 65–75.
- Chinn, M., & Fairlie, R. (2004). The determinants of the global digital divide: A cross-country analysis of computer and internet penetration. *Oxford Economic Papers*, 59. <https://doi.org/10.1093/oeq/gpl024>
- Çukurcayır, M. A., & Çelebi, E. (2009). Information society and Turkey in the process of implementing e-government ZKU. *Journal of Social Sciences*, 5(9), 59–82.
- Delen, K. (2016). *The investigation of technological pedagogical and content knowledge level by Turkish teachers of English (Master's thesis)* Çağ University, Mersin, Turkey.
- Ersanlı, C. Y. (2016). Improving technological pedagogical content knowledge (TPACK) of pre-service English language teachers. *International Education Studies*, 9(5), 18–27.
- Ertmer, P. A. (2005). Teacher pedagogical beliefs: The final frontier in our quest for technology integration. *Educational Technology Research and Development*, 53(4), 25–39.
- Finn, S., & Inman, G. J. (2004). Digital unity and digital divide. *Journal of Research on Technology in Education*, 36(3), 297–317. <https://doi.org/10.1080/15391523.2004.10782417>
- Fuchs, C., & Horak, E. (2008). Africa and the digital divide. *Telematics and Informatics*, 25, 99–116.
- Franklin, C. (2004). Teacher preparation as a critical factor in elementary teachers: Use of computers. In R. Ferdig, C. Crawford, R. Carlsen, N. Davis, J. Price, R. Weber & D. Willis (Eds.), *Proceedings of SITE 2004—Society for Information Technology & Teacher Education International Conference* (pp. 4994–4999). Association for the Advancement of Computing in Education (AACE).
- Gunter, G., & Baumbach, D. (2004). Curriculum integration. In A. Kovalchick & K. Dawson (Eds.), *Education and technology: An encyclopedia*. ABC-CLIO, Inc.
- Harris, J., Grandgenett, N., & Hofer, M. (2010). Testing a TPACK-based technology integration assessment rubric. https://www.researchgate.net/publication/267772378_Testing_a_TPACK-Based_Technology_Integration_Assessment_Rubric.
- Hofer, M., & Harris, J. (2015). Developing TPACK with learning activity types. In M. Hofer, L. Bell, & G. Bull (Eds.), *Practitioner's guide to technology, pedagogy, and content knowledge (TPACK): Rich media cases of teacher knowledge* (pp. 7–1).
- Hofer, M., & Grandgenett, N. (2012). TPACK development in teacher education: A longitudinal study of preservice teachers in a secondary MA Ed. program. *Journal of Research on Technology in Education*, 45(1), 83–106.
- Irving, K. E. (2006). The impact of technology on the 21st-century classroom. In *Teaching science in the 21st century*, pp. 3–20.
- Kezang, & Whalley, J. (2007). Closing the digital divide: The role of services and infrastructure in Bhutan. *Prometheus*, 25(1), 69–84.
- Koehler, M. & Mishra, P. (2005) Teachers Learning Technology by Design. *Journal of Computing in Teacher Education*, 21(3), 94–102.
- Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for integrating technology in teachers' knowledge. *Teachers College Record*, 108(6), 1017–1054.
- Koehler, M., & Mishra, P. (2009). What is technological pedagogical content knowledge? *Contemporary Issues in Technology and Teacher Education*, 9(1), 60–70.

- Koehler, M. J., Mishra, P., Kereluik, K., Shin, T. S., & Graham, C. R. (2014). The Technological pedagogical content knowledge framework. In *Handbook of research on educational communications and technology* (pp. 101–111). Springer, New York.
- Kurt, G., Mishra, P., & Koçoğlu, Z. (2013). *Technological pedagogical content knowledge development of Turkish pre-service teachers of English*. Paper presented at the meeting of the Society for Information Technology and Teacher Education, New Orleans, LA.
- Kurt, G., Akyel, A., Koçoğlu, Z., & Mishra, P. (2014). TPACK in practice: A qualitative study on technology integrated lesson planning and implementation of Turkish pre-service teachers of English. *ELT Research Journal*, 3(3), 153–166.
- Mahdum, M. (2015). Technological pedagogical and content knowledge (TPACK) of English teachers in Pekanbaru, Riau Indonesia. *Mediterranean Journal of Social Sciences*, 6(5), 168–168. <https://doi.org/10.5901/mjss.2015.v6n5s1p168>
- Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record*, 108(6), 1017–1054.
- OECD. (2001). *The digital divide: Diffusion and use of ICT's*. OECD Press.
- Öz, H. (2015). Assessing pre-service English as a foreign language teachers' technological pedagogical content knowledge. *International Education Studies*, 8(5), 2015.
- Polat, T. (2018). Examining technopedagogical knowledge competencies of foreign language teachers in Turkey (Master's thesis). Gazi University.
- Padmavathi, M. (2017). Preparing teachers for technology based teaching-learning using TPACK. *Journal on School Educational Technology*, 12(3), 1–9.
- Prensky, M. (2001). Digital natives, digital immigrants. *On the Horizon MCB University Press*, 9(5), 1–6.
- Rocha, A. M. M. D., Mota, P. A. D. S., & Coutinho, C. P. (2011). TPACK: Challenges for teacher education in the 21st century.
- Ronning, H. (2006). Systems of control and regulation: Copyright issues, digital divides and citizens "rights". *Systems of Control and Regulation*, 20(1), 20–34.
- Sarıçoban, A., Tosuncuoğlu, İ., & Kırmızı, Ö. (2019). A technological pedagogical content knowledge (TPACK) assessment of pre-service EFL teachers learning to teach English as a foreign language. *Journal of Language and Linguistic Studies*, 15(3), 1122–1138. <https://doi.org/10.17263/jlls.631552>.
- Schrum, L., Thompson, A., Maddux, C., Sprague, D., Bull, G., & Bell, L. (2007). Research on the effectiveness of technology in schools: The roles of pedagogy and content. *Contemporary Issues in Technology and Teacher Education*, 7(1), 456–460.
- Seferoğlu, S. S., Akbıyık, C., & Bulut, M. (2008). Elementary school teachers' and teacher candidates' opinions about computer use in learning-teaching process. *Hacettepe University Journal of Education*, 35, 273–283.
- Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher*, 15(2), 4–14. <https://doi.org/10.3102/0013189X015002004>
- Solak, E., & Çakır, R. (2014). Examining preservice EFL teachers' TPACK competencies in Turkey. *Journal of Educators Online*, 11(2), 1–22.
- Şahin, I. (2011). Development of survey of technological pedagogical and content knowledge (TPACK). *Turkish Online Journal of Educational Technology-TOJET*, 10(1), 97–105.
- Thompson, A. D., & Mishra, P. (2007). Editors' remarks. *Journal of Computing in Teacher Education*, 24(2), 38–64. <https://doi.org/10.1080/10402454.2007.10784583>
- UN Office of the High Commissioner for Human Rights. (2011). *Internet should remain as open as possible—UN expert on freedom of expression*. Geneva.
- Uzunboylu, H., & Tuncay, N. (2010). Divergence of digital world of teachers. *Educational Technology ve Society*, 13(1), 186–194.
- Vandenbroeck, M., Verschelden, G., Boonaert, T., & ve Haute, L. V. (2007). Changes in the digital divide: A case from Belgium. *British Journal of Educational Technology*, 38 (4), 742–743.

- Yıldız, B. (2020). *Exploring the predictive power of in-service efl instructors' informal technology usage situations on their tpack levels*. Unpublished Master's thesis, Bahçeşehir University, Istanbul, Turkey.
- Yu, P. K. (2002). *Bridging the Digital Divide: Equality in the Information Age*, 20 *Cardozo Arts and Ent. L.J.* 1 (2002).
- Zhao, Y., & Bryant, F.-L. (2006). Can teacher technology integration training alone lead to high levels of technology integration? A qualitative look at teachers' technology integration after state mandated technology training. *Electronic Journal for the Integration of Technology in Education*, 5, 53–62.

Today's Two Important Skills: Digital Literacy and Critical Thinking



Semahat Aysu 

1 Introduction

Digital literacy of students and their skills to use the new technologies effectively and efficiently both for their learning and their future career is the concern of our age since the fast and vast information makes people adapt themselves to continuously changing life (Sharkey & Brandt, 2008; Shopova, 2014). In other words, as Halpern (2003) states, it is important among wide variety of information to choose, interpret and evaluate the necessary and relevant information and she also puts emphasis on knowing how to learn and think critically. Critical thinking helps people find the relevant and correct information on a specific subject (Cottrell, 2005). Therefore, digital literacy and critical thinking are two vital skills for the twenty first century (Halpern, 2003). Furthermore, Kong (2014) notes that these twenty-first century skills should be mastered for the success in the life. Therefore, schools should train students in order to support them to keep up with the changes in the digital world through using the critical thinking skills. Although Halpern (2003) discusses how and which part of critical thinking skills can be taught, she summarizes some studies about critical thinking skills which are learnt at school and then used in different settings. She suggests that “Critical thinking instruction needs to focus overtly and self-consciously on the improvement of thinking, and the learning experience needs to include multiple examples across domains in order to maximize transfer” (p. 13). Similarly, Cottrell (2005) and Paul and Elder (2014) note that critical thinking can be developed through practice or changing behaviours and learning how to deal with the emotional barriers. Paul and Elder (2014) make a good analogy between the intellectual and physical improvement. Both of them entail a great deal of practice.

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To sum up, in the present study these two crucial skills of twenty first century (digital literacy and the skills of critical thinking) will be discussed and their effects on education will be elaborated. Some previous studies will be summarized with their suggestions and implications.

2 Digital Literacy

Under the concept of digital literacy, other associated terms should be identified such as information literacy (Hobbs, 2010; UNESCO, 2008; Welsh & Wright, 2010) and media literacy (Bevort & Breda, 2008; Boyd, 2016; Linuma, 2016) in order to show the similarities and consistency between them as they are one part of the same family (Hobbs, 2010). Also, while discussing the most important skills in the digital age, the notions “digital literacy or technological literacy or computer literacy” are used interchangeably but in this study digital literacy will be employed.

According to the report of The European Parliament and the Council of the EU (2006), there should exist eight key competences for lifelong learning and “Digital competence” is one of them. Digital competence (literacy) is defined as “the ability to use computers, social media, and the Internet” (Hobbs, 2010, p.17). Definition of digital literacy is elaborated in the report of The European Parliament and the Council of the EU (2006) as in the following “Skills needed include the ability to search, collect and process information and use it in a critical and systematic way, assessing relevance and distinguishing the real from the virtual while recognising the links. Individuals should have skills to use tools to produce, present and understand complex information and the ability to access, search and use internet-based services” (p.16). On the other hand, Sharkey and Brandt (2008) note that the skills and the knowledge that digital literacy involves depend on the people or the settings. For example; in K-12, students need to use internet to seek information about the school subjects, use presentation programs (Hobbs, 2010) and educators need to use technological tools for classroom practices and teaching supplements (Hall et al., 2014); adults should have the ability to use digital tools for work, leisure and communication (The European Parliament & the Council of the EU, 2006, p. 15).

3 Information Literacy (IL)

The term information literacy (IL) refers to “how to access information in digital formats and how to evaluate information and use it appropriately” (Welsh & Wright, 2010, p.1). In short, it comprises seeking information, retrieving and using it (Hobbs, 2010; Sharkey & Brandt, 2008). This is a vital skill for lifelong learning and knowledge societies and it is regarded as a basic human right by UNESCO. The person who is information literate has the capacity to do the following (UNESCO, 2008, p. 12).

- a. Recognise information needs
- b. Locate and evaluate the quality of information
- c. Store and Retrieve information
- d. Make effective and ethical use of information, and
- e. Apply information to create and communicate knowledge.

This skill is related to problem solving and communication skills and it in turn helps people to be competent in their life. Therefore, studies on information literacy including these five elements are carried out not only in schools but in higher education as it is considered as an important skill since cognitive skills, particularly critical thinking, are required while creating and using new knowledge (UNESCO, 2008).

As it is proposed by Linuma (2016), “Our world is being transformed by knowledge building culture in which people collaborate, organize and build information using the internet” (p. 18). Therefore, students should be trained to become information literate as this new world with full of vast and fast information requires people to be engaged knowledge builders.

Sharkey and Brandt (2008) emphasize that technological and information literacy skills are two important skills and they complete one another. Thus, the term “information technology literacy” is used in some places. Acquiring these two skills allow people to adapt to the changing world for the continued lifelong learning.

4 Media Literacy

Hobbs (2010) describes media literacy as “associated with critical analysis of news, advertising and mass media entertainment” (p. 17) and it includes “television and film, radio and recorded music, print media, the Internet and all other new digital communication technologies” (p. 50).

As stated by Boyd (2016), students can reach information very quickly and easily through various search engines, databases or YouTube channels. Similarly, Linuma (2016) points out “Today, users can experiment easily with video editing, digital publishing as well as digital art creation. Participatory media, such as blogs, wikis, video blogs, and social network services are also being used to foster various interactions both inside and outside classrooms” (p. 18). Thus, learners interact with each other both inside and outside the school through these channels and they create and share new knowledge. It is a necessity to learn how to use the technology and the information to generate new knowledge. Linuma, (2016, p. 19) exemplifies necessary skills for just one area, video creation and streaming, in the media literacy skills as in the following (Table 1).

Using digital media and its tools effectively and appropriately is not easy. It consists of many skills or competencies, which are showed in Fig. 1. The competencies help people in lifelong learning while they consuming or producing knowledge through the Internet (Hobbs, 2010). Similarly, Sharkey and Brandt (2008) note that digital and information literacy skills can be acquired as basic digital skills such

Table 1 Participatory media skills and literacies

	Productive “writing” skill	Receptive “reading” skills
Participatory media literacies	Multimedia authoring, e.g., images, moving images, writing	Searching and reading
		Navigating and reading
		Linking and sharing
	Digital publishing, e.g., images, moving images, writing	Multimedia interpretation and enjoyment, e.g., video contents, audio contents
	Video creation Audio creation	Assessing credibility of information

Fig. 1 Essential competencies of Digital and Media Literacy (Hobbs, 2010, p. 18)



as finding information using the internet and writing a paper or as high-level information skills such as seeking the various sources, assessing them through critical thinking and in turn accepting or rejecting the idea.

Bevort and Breda (2008) add that “Information technology is not simply an “object” of knowledge. Familiarity and a certain level of skill are required” (p. 141). In other words, students should be trained and observed. They recommend that there is a great necessity for the media teaching in the schools, particularly for the new media. However, lack of both equipment in the schools and teachers’ digital media competency are regarded as the restrictions.

Besides digital, information and media literacy training, it is stated that training also “requires a critical and reflective attitude towards available information and a responsible use of the interactive media” in the report of The European Parliament and the Council of the EU (2006, p. 16). Therefore, not only digital or information literacy skills but critical thinking skills should be covered in this study.

5 The Skills of Critical Thinking

Critical thinking is a broad and complex term but a comprehensive definition is proposed by Halpern (2003, p. 6) as in the following.

Critical thinking is the use of those cognitive skills or strategies that increase the probability of a desirable outcome. It is used to describe thinking that is purposeful, reasoned, and goal directed—the kind of thinking involved in solving problems, formulating inferences, calculating likelihoods, and making decisions, when the thinker is using skills that are thoughtful and effective for the particular context and type of thinking task.

Cottrell (2005) emphasizes that critical thinking consists of various skills and attitudes and it is directly related to reasoning which means the analysis of the situation and reaching a conclusion. Therefore, problem-solving and effective communication are other skills (Paul & Elder, 2014).

Thinking critically has been important but it is much more important in twenty-first century as the world is constantly changing technically and it, in turn, is becoming more complex with a great deal of information. Therefore, people can come across novel problems at their workplace and they should be ready for lifelong learning and for using the information efficiently (Halpern, 2003).

According to Halpern (2003, pp. 14–15), the characteristics of critical thinker will

- Recognize semantic slanting and guilt by association.
- Seek out contradictory evidence.
- Use the metacognitive knowledge that allows novices to monitor their own performance and to decide when additional help is needed.
- Make risk: benefit assessments.
- Generate a reasoned method for selecting among several possible courses of actions.
- Give reasons for choices as well as varying the style and amount of detail in explanations depending on who is receiving the information.
- Recall relevant information when it is needed.
- Use skills for learning new techniques efficiently and relating new knowledge to information that was previously learned.
- Use numerical information including the ability to think probabilistically and express thoughts numerically.
- Understand basic research principles.
- Demonstrate an advanced ability to read and write complex prose.
- Present a coherent and persuasive argument on a controversial, contemporary topic.
- Provide complex instructions in language that is appropriate for the audience.
- Use matrices and other diagrams for communication.
- Synthesize information from a variety of sources.
- Determine credibility and use this information in formulating and communicating decisions.

Based on the Delphi panel carried out by Facione (1990), 6 cognitive skills and their various sub-skills of these skills are stated: “Skill 1. Interpretation and it covers categorization, decoding significance, and clarifying meaning. Skill 2. Analysis covers examining ideas, detecting arguments, and analysing arguments into their component elements. Skill 3. Evaluation covers assessing claims and assessing arguments. Skill 4. Inference covers querying evidence, conjecturing alternatives, and drawing conclusions. Skill 5. Explanation covers stating results, justifying procedures, and presenting arguments. Skill 6. Self-regulation covers self-examination and self-correction” (p. 5–6) and the California Critical Thinking Dispositions Inventory (CCTDI) is used to measure the characteristics of critical thinking (Goldberg et al. 2015).

There are many advantages of being a critical thinker and these are listed as follows: “improved attention and observation, more focused reading, improved ability to identify the key points in a text or other message rather than becoming distracted by less important material, improved ability to respond to the appropriate points in a message, knowledge of how to get your own point across more easily, skills of analysis that you can choose to apply in a variety of situations (Cottrell, 2005, p. 4).

As a conclusion, in order to train students, digital and information literacy skills and critical thinking should be used together while incorporating technology with critical thinking into the classes. Sharkey and Brandt (2008) exemplify a few classes in Purdue University. For example, in English literature class students are required to analyse a text critically and present it as a final project. They can use various sources (photos, journals, music, etc.) to support their ideas.

6 Studies About Training Students and Teachers in Terms of Digital Literacy and Critical Thinking Skills

As Hinrichsen and Coombs (2013) point out, there is a necessity for both integration of technology into curriculum and integration of curriculum into technology because they draw our attention to the students who are digitally competent but not critically competent. Similarly, Talib (2018) notes the fact that students do not have critical and technical digital competency. Thus, digital literacy pedagogy helps students understand, adapt and use the digital tools, which are a part of their lives. For this reason, they emphasize both using devices and software in the curriculum and practices in each step of curriculum design. Additionally, Waddell and Clariza (2018) put emphasis on digital literacy training of students but they express their concern about how critical pedagogy in the development of digital literacy can be integrated into curriculum. By answering the following questions, curriculum designers and teachers can plan it step by step in the curriculum “How do different technologies allow us to make different kinds of critical interventions in our classrooms or professional practice? How does the use of technology enable (or hinder) these interventions? How

Table 2 Studies about digital literacy training with critical thinking across the world

Research	Country	Participants
Bevort and Breda (2008)	Europe and Canada	12–18-year-olds
Hall et al. (2014)	Leicester, The UK	Secondary school teachers
Kong (2014)	Hong Kong	Secondary school students
Porat et al. (2018)	Israel	Secondary school students
Saxena et al. (2018)	India	Dental students
List (2019)	The USA	Pre-service teachers
Purnama et al. (2021)	Indonesia	Elementary school students
Setiawardani et al. (2021)	Indonesia	Higher education
Shopova (2014)	Bulgaria	Higher education
Techataweewan and Prasertsin (2018)	Thailand	Undergraduate students

does the effective use of technology for instruction vary in different organizational, cultural, and social contexts?” (p. 232).

As it is stated above, teachers decide on the teaching–learning process by means of the critical approach because students should be trained how they will deal with the vast and fast information on the internet, which is digital literacy. However, instructors sometimes are lack of digital literacy. Therefore, not only students but teachers also should be trained (Boyd, 2016). In the following, Table 2 demonstrates the studies which were carried out in different countries with different age groups. Each of them will be summarized below.

Firstly, studies about students’ digital literacy skills will be discussed as they are regarded as digital natives and they can access the internet whenever they want. However, they might be the victims of cyber world due to the lack of their digital literacy skills. Therefore, supervision of parents and teachers is a must and they should provide support to develop their digital literacy skills with critical thinking (Purnama et al., 2021). Thus, training students in digital literacy skills is of great concern to today’s societies. In the following, studies with different age groups in different countries will be summarized.

Shopova (2014) examined sixty students’ use of information and communication technologies (ICT) at the South-West University in Bulgaria. Results showed that development of digital literacy of students and their skills in ICT must be the centre of education, which helps students to achieve better performance and keep up with the rapidly changing social, economic and cultural life.

In the study of Kong (2014), it was aimed to help secondary school students in Hong Kong to develop both information literacy and critical thinking skills in the created digital classrooms. It was an experimental study conducted during 13 weeks. Results showed that students had significant development in their domain knowledge, information literacy competence and critical thinking skills.

Bevort and Breda (2008) discussed the use of digital media by 9000 young people (12 to 18- year -olds) in Europe and Canada. Results demonstrated that students widely use the internet outside the school. This implies that schools do not train the young people about the use of internet. They learn how to use it individually. So, they cannot receive necessary digital skills at school. They also suggest that some necessary regulations on the prohibition of the use of digital media in the schools should be taken into consideration. Through training and intervention, students' digital literacy skills and critical thinking skills can be developed.

Purnama et al. (2021) conducted a study with elementary school students in Indonesia in order to examine the relationship between digital literacy skills and students' online risks, self-control or parental mediation. Students' digital literacy skills and parental mediation promote their self-control. This implies that children who have low digital literacy skills might be the victims of internet-based crimes. On the other hand, if they have high digital literacy skills, these students can secure themselves online or minimize internet-based crimes. Thus, the relationship between digital literacy skills and online risks is correlated positively. Finally, parental mediation cannot explain their self-control.

Setiawardani et al. (2021) investigated the futuristic pedagogical competencies that enhance the digital literacy of students in Indonesia in the digital age. The sample is selected randomly in this study to measure the literacy abilities of students in the University of Education of Indonesia. Findings demonstrated that developing digital literacy of students is influenced by the implementation of a critical pedagogic model.

Porat et al. (2018) aimed to examine the digital literacy skills of secondary school students and to compare between students' self-assessment of their literacy level and their actual performance of digital assignments. They collected data from 280 Israel junior-high school students in 2016 and analysed with Pearson correlation method through SPSS software. The results demonstrated that students had significant confidence on the rated digital skills while their actual performance was lower.

Techataweewan and Prasertsin (2018), who examined the definition, practices and elements of digital literacy to improve the quality of learning for undergraduate students in Thailand, analysed the gathered data from 1.183 undergraduate students in 14 universities with the confirmatory factor analysis (CFA) approach. According to the findings, digital literacy criteria for students comprised of four factors: operation skills, thinking skills, collaboration skills and awareness skill.

Saxena et al. (2018), who proposed to examine digital literacy and smartphone use, focus on the 260 Central Indian dental students. Analysing the collected data with SPSS software, the findings revealed that dental students wanted to adopt the digital age in the education process and suggested educators and policy makers to

change their education methods. In addition, the findings provided an opportunity for students to improve their current learning methods.

All these studies examined the students' digital literacy skills but teachers' digital literacy skills, attitudes or perceptions should also be taken into consideration as Hobbs (2010) notes that teachers might be reluctant to use the instructional practices. They might not use technological tools effectively or they might not have time to develop students' digital literacy competency while they are dealing with teaching for high-stakes tests. Therefore, Hall et al. (2014) summarized the results of a project which aimed to create holistic and integrated change on secondary school teachers in Leicester while supporting them in the process of transforming their digital literacy into classroom. The results showed that cooperative work should be integrated. Also, social and ethical problems should be taken into consideration while integrating technology into classroom practices. Similarly, List (2019) investigated the beliefs of 188 pre-service teachers in the USA about digital literacy as they will be the teachers who will implement digital literacy skills with critical thinking in their future classes. According to the findings of the study, participants shared the same beliefs as in the literature, which are related to the conceptions of digital literacy development: an automatic process (digital natives), skills-based and sociocultural perspectives. Furthermore, they also focused on additional conceptions of digital literacy: autonomous learning, access to technological tools, project-based, lack of digital literacy. Additionally, most of the participants mentioned that they developed their digital literacy skills in a formal setting and they note that they develop these skills in elementary school more than middle and high schools.

After discussing the studies conducted across the world about digital literacy and critical thinking, similar studies carried out in Turkey are illustrated in Table 3 and will be summarized in the following part.

The study of Ata and Yıldırım (2019) aimed to find out 295 pre-service teachers' perceptions of digital literacy through both quantitative and qualitative data. Findings showed that they had positive perceptions to use the digital tools appropriately and effectively.

Akayoğlu et al. (2020) conducted a study with pre-service EFL teachers to reveal their digital literacy which helps them to think critically while using technological tools or platforms. 113 students participated in this qualitative study. Findings showed

Table 3 Studies about digital literacy training with critical thinking in Turkey

Research	Country	Participants
Akayoğlu et al. (2020)	Turkey	Turkish pre-service EFL teachers
Ata and Yıldırım (2019)	Turkey	Turkish pre-service EFL teachers
Ayyıldız et al. (2021)	Turkey	Turkish academics and prospective teachers in faculties of education
Erol and Aydın (2021)	Turkey	Turkish language teachers in public schools
Gökdaş and Çam (2022)	Turkey	Science teachers

that these pre- service teachers believed that they were digital literate enough to use the digital tools and platforms.

Ayyildiz et al. (2021) revealed the views of Turkish academics and the prospective teachers in faculties of education. Two data collection tools were used: the “Academician’s Digitalization Scale” for the academics and the “Students’ Perception Scale about Instructors’ Technology Integration Competence” for students. Data were analysed by SPSS 24 and AMOS 24 software programs. Department and age of academics had a statistically significant effect on the digitalization of academics while gender of prospective teachers affects their ideas.

Apart from studies conducted at universities, the following two studies covered the teachers who worked in public school. In other words, they were in-service teachers and their views and digital literacy level were examined.

Erol and Aydin (2021) examined digital literacy of 188 Turkish language teachers through the Digital Literacy Scale and analysed the data via SPSS 21 software. According to the results, the digital literacy level of Turkish language teachers was high, but it decreased when they get older. Besides age, their experience, their daily use of technology and internet, and using distance education and social media affected their digital literacy level. However, their gender did not have a statistically significant effect on their digital literacy level.

Gökdaş and Çam (2022) investigated the level of digital literacy of 88 science teachers during the distance education via both a scale and an interview form. Gender did not affect their digital literacy level whereas experience affected it negatively. That is, when work experience increased, digital literacy level decreased.

7 Conclusion

In recent years, the most important skills of digital age, which are digital literacy and critical thinking skills have been examined by many researchers but studies above are just a few out of numerous examples which examine the digital literacy through critical thinking. Besides these studies, here are some suggestions about the instructional practices to develop students’ digital literacy with critical thinking skills: “Keeping a media-use diary, using information search and evaluation strategies, reading, viewing, listening and discussing, close analysis, cross-media comparison, gaming, simulation and role playing, multimedia composition” (Hobbs, 2010, p. 23). Furthermore, software programs and web-based tools can be used such as word processor, presentation programs, blogs or wikis. This helps the teachers to address the different needs of learners. Also, it is a shift from teacher-centred class to learner- centred class, which implies students are active learners by means of the technology use. In this type of learning, following strategies might be used: reciprocal teaching, cooperative learning, project-based learning, strategy instruction, inquiry-based learning (Brooks-Young, 2007).

References

- Akayoğlu, S., Satar, H. M., Dikilitaş, K., Cirit, N. C., & Korkmazgil, S. (2020). Digital literacy practices of Turkish pre-service EFL teachers. *Australasian Journal of Educational Technology*, 36(1), 85–97.
- Ata, R., & Yıldırım, K. (2019). Exploring Turkish pre-service teachers' perceptions and views of digital literacy. *Education Sciences*, 9 (40). <https://doi.org/10.3390/educsci9010040>.
- Ayyıldız, P., Yılmaz, A., & Baltacı, H. S. (2021). Exploring digital literacy levels and technology integration competence of Turkish academics. *International Journal of Educational Methodology*, 7(1), 15–31. <https://doi.org/10.12973/ijem.7.1.15>.
- Bevort, E., & Breda, I. (2008). Adolescents and the internet: Media appropriation and perspectives on education. In P. C. Rivoltella (Ed.), *Digital literacy: Tools and methodology for information society* (pp. 140–165). IGI Publishing.
- Boyd, D. (2016). What would Paulo Freire think of blackboard: Critical pedagogy in an age of online learning. *International Journal of Critical Pedagogy*, 7(1), 165–186.
- Brooks-Young, S. (2007). *Digital-age literacy for teachers: Applying technology standards to everyday practice*. ISTE Publications.
- Cottrell, S. (2005). *Critical thinking skills: Developing effective analysis and argument*. Palgrave Macmillan.
- Erol, S., & Aydin, E. (2021). Digital literacy status of Turkish teachers. *International Online Journal of Educational Sciences*, 13(2), 620–633.
- Facione, P. A. (1990). *The California critical thinking skills test-college level. Technical report: Experimental validation and content validity*. California Academic Press (ERIC Document No: TM 015818).
- Goldberg, I., Kingsbury, J., Howell, T., & Howard, D. (2015). Measuring critical thinking about deeply held beliefs: Can the California critical thinking dispositions inventory help? *Inquiry: Critical Thinking Across the Disciplines*, 30(1), 40–50. <https://doi.org/10.5840/inquiryct20153016>.
- Gökdaş, F., & Çam, A. (2022). Examination of digital literacy levels of science teachers in the distance education process. *Educational Policy Analysis and Strategic Research*, 17(2), 208–224. <https://doi.org/10.29329/epasr.2022.442.9>.
- Halpern, D. F. (2003). *Thought and knowledge: An introduction to critical thinking*. Lawrence.
- Hall, R., Atkins, L., & Fraser, J. (2014). Defining a self-evaluation digital literacy framework for secondary educators: The DigiLit Leicester project. *Research in Learning Technology*, 22(21440). <https://doi.org/10.3402/rlt.v22.21440>
- Hobbs, R. (2010). *Digital and media literacy: A plan of action*. The Aspen Institute. https://www.aspeninstitute.org/wp-content/uploads/2010/11/Digital_and_Media_Literacy.pdf
- Hinrichsen, J., & Coombs, A. (2013). The five resources of critical digital literacy: A framework for curriculum integration. *Research in Learning Technology*, 21(21334). <https://doi.org/10.3402/rlt.v21.21334>.
- Kong, S. C. (2014). Developing information literacy and critical thinking skills through domain knowledge learning in digital classrooms: An experience of practicing flipped classroom strategy. *Computers and Education*, 78, 160–173.
- Linuma, M. (2016). *Learning and teaching with technology in the knowledge society: New literacy, collaboration and digital content*. Springer.
- List, A. (2019). Defining digital literacy development: An examination of preservice teachers' beliefs. *Computers and Education*, 138, 146–158.
- Paul, R., & Elder, L. (2014). *Critical thinking: Tools for taking charge of your learning and your life*. Pearson.
- Porat, E., Blau, I., & Bark, A. (2018). Measuring digital literacies: Junior high-school students' perceived competencies versus actual performance. *Computers and Education*, 126, 23–36. <https://doi.org/10.1016/j.compedu.2018.06.030>

- Purnama, S., Maulidya, U., Machali, I., Wibowo, A., & Narmaditya, B. S. (2021). *Does digital literacy influence students' online risk? Evidence from Covid-19* (Vol. 7). Heliyon. <https://doi.org/10.1016/j.heliyon.2021.e07406>.
- Saxena, P., Gupta, S. K., Mehrotra, D., Kamthan, S., Sabir, H., Katiyar, P., & Prasad, S. V. S. (2018). Assessment of digital literacy and use of smart phones among Central Indian dental students. *Journal of Oral Biology and Craniofacial Research*, 8, 40–43. <https://doi.org/10.1016/j.jobocr.2017.10.001>.
- Setiawardani, W., Robandi, B., & Djohar, A. (2021). Critical pedagogy in the era of the industrial revolution 4.0 to improve digital literacy students welcoming society 5.0 in Indonesia. *Journal of Elementary Education*, 5(1), 107–118.
- Sharkey, J., & Brandt, D. S. (2008). Integrating technology literacy and information literacy. In P. C. Rivoltella (Ed.), *Digital literacy: Tools and methodology for information society* (pp. 85–97). IGI Publishing.
- Shopova, T. (2014). Digital literacy of students and its improvement at the university. *Journal on Efficiency and Responsibility in Education and Science (ERIES Journal)*, 7(2), 26–32.
- Talib, S. (2018). Social media pedagogy: Applying an interdisciplinary approach to teach multi-modal critical digital literacy. *E-Learning and Digital Media*, 15(2), 55–66. <https://doi.org/10.1177/2042753018756904>.
- Techataweewan, W., & Prasertsin, U. (2018). Development of digital literacy indicators for Thai undergraduate students using mixed method research. *Kasetsart Journal of Social Sciences*, 29, 215–221. <https://doi.org/10.1016/j.kjss.2017.07.001>.
- The European Parliament and the Council of the EU. (2006). Recommendation of the European Parliament and of the Council of 18 December 2006 on key competences for lifelong learning. *Official Journal of the European Union*, 39, 10–18.
- UNESCO. (2008). *Towards information literacy indicators*. UNESCO Institute for Statistics.
- Waddell, M., & Clariza, E. (2018). Critical digital pedagogy and cultural sensitivity in the library classroom: Infographics and digital storytelling. *C&RL News*, 228–232.
- Welsh, T. S., & Wright, M. S. (2010). *Information literacy in the digital age: An evidence-based approach*. Chandos Publishing.

EFL Teachers' Perceptions of Undividing Digital Divide: Hindering or Supporting Qualities of an Educational Context



Ferzan Atay  and Hossein Vafadar 

1 Introduction

The term “digital divide” is defined as the gap between people who have access to the Internet, computers, and different forms of Information and Communication Technology (ICT) and those who do not. Digital divide is considered a complicated phenomenon because socio-economic, institutional, and physiological factors affect it (Srinuan & Bohlin, 2011). According to Norris (2001), the digital divide has three diverse aspects (1) global divide, which refers to ICT diversity between countries around the world, (2) social divide, which refers to differences in access to ICT between nations of the societies, and (3) democratic divide, which refers to the discrepancy between people who use and who do not use the range of ICT tools in their public life. There are also substantial differences between individuals (rich or poor), regions (rural or urban), and groups (educated or uneducated) in terms of access to ICTs.

With the sudden and unexpected closing of all schools and universities around the world because of COVID-19 pandemic, all teachers and students started to live a new educational life. This condition necessitated them to learn new skills and get new information in order to continue their education. The changes in education system in most countries were intermingled with the absence of access or deficiency in access to ICTs and their related tools across the globe (Lieberman, 2020). Therefore, countries recognized the need to find solutions for removing problems and disparities in ICTs

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or the so-called “digital divide” and this brought new dimensions to the world of technology. Some scholars (Lim, 2002; van Dijk, 2006; van Dijk & Hackrt, 2003) claimed that “digital divide should be defined in terms of both access and use”. Teachers were required to deliver their lessons online via different ICT tools and programs and, therefore, students had no longer face-to-face communication with each other and their teachers. All the students had to do their homework without any obvious oral instruction like in face-to-face education. These modifications in the traditional model of education, which led to a new instructional design of online education, increased the responsibility of both teachers and students. Brockett and Hiemstra (1991), in their Personal Responsibility Orientation model, state that students are necessarily responsible for their own learning which their teachers facilitate. But the new teaching and learning environment was unfamiliar to some students and teachers. The challenge related to the new learning environment was associated with access to ICT resources such as computers, laptops, smart phones, Internet connections, etc. (Arthur-Nyarko & Kariuki, 2019). According to Lembani et al. (2019), availability of ICTs is unequal among different people, households, and spaces. Geographical location, financial condition, infrastructure, age, gender, and all these have an influence on access to ICT and ICT tools. Chen and Wellman (2004) state that there are huge disparities between rich and poor countries, higher and lower income groups, and males and females in access to ICT resources and infrastructure. As human beings’ lives become increasingly integrated with IT, the digital divide will continue to be more and more disparate (Hsieh et al., 2008). According to Dewan and Riggins (2005), there are two levels of the digital divide. The first one is the inequality in accessing ICT, both in terms of hardware and software. Many countries worldwide face numerous problems in implementing and accessing ICT. Also, there are differences in Internet access among people with diverse demographics. For example, National Center for Education Statistics (NCES, 2018) data indicated that students with educated parents or higher-income families have more chances to access to ICT. The second one is the inequality in the ability to use ICT. As stated by Dewan and Riggins (2005), this problem arises from a discrepancy in the computer skills of people; for example, some people are not very skilled or talented in utilizing software and working with Internet to benefit from information online (van Dijk & Hacker, 2003). Dewan and Riggins (2005) emphasize that the second level of the digital divide is more important because the greater part of people in any social system has gained ICT access. In 2011, Wei, Teo, Chan, and Tan expanded Dewan and Riggins’ (2005) levels and added the third level to the digital divide and named it the “digital outcome divide” which means the differences in achieving outcomes. They explained that despite access to ICT and being skillful in manipulating it, some people do not utilize ICT. Some scholars (Liaw, 2007; Wu, 2010) relate this problem to motivation which influences people to accept or not accept using ICT.

There are some previously done research studies concerning the digital divide around the world (Abdollahyan et al., 2013; Billon et al., 2009; Bucy, 2000; Chang et al., 2014; Daguno-Bersamina & Relativo, 2020; Hindman, 2000; Santos, 2020; Zhou et al., 2011). But these researches have different results indicating the need for further studies.

In their cross-country study, Billon et al. (2009) investigated the digital divide's relative and multidimensional character. Their study showed that in developed countries, the digitalization pattern is described by the service sector, education, and governmental success. On the contrary, in developing countries, population age and urban population are positively associated with ICT adaption, while Internet costs have negative impact on it.

Chang et al. (2014) also studied the digital divide between university students from Korea and Cambodia. Developing countries like Cambodia are not economically, politically, and socially in good condition, affecting their citizens' living standards and welfare. Their study investigated the effect of ICT access on the intention of students to participate in online activities. The results confirmed that technological and social access have an impact on extrinsic motivational access and skills access of students.

In another study, Zhou et al. (2011) used survey data from three South Asian countries (Bangladesh, Nepal, and Sri Lanka) to analyze factors that influence ICT use. The results of the findings obtained from this study showed that education has an important role in using computer and Internet in these developing countries, which are provided with low-cost Internet access.

Bucy (2000) in his survey study which conducted in two states in the USA found that income, age, education, and family structure have significant effects on the Internet usage of individuals. He added that older people, single mothers, and low-income individuals are disadvantaged in using Internet.

Hindman (2000), in his survey study, investigated the effects of living in a metropolitan or nonmetropolitan area on the home Internet use of people. He detected that income, age, and education affect the Internet use of people more than the geographical location of their houses.

In a study done in Philippines, Santos (2020) explained that of 6.5 million students who have access to the Internet, about 20% use computer shops or other public places to use Internet and computers. And about 2.8 million students have no access to the Internet at all. The reason is that most of the people in Philippines (53%) live in rural areas, which always have problem with access and speed of the Internet.

As Daguno-Bersamina and Relativo (2020) state in their study which conducted in Philippines, the availability of ICT resources have an important role in students distance learning. They say that students who are from low-income families or who live in rural areas do not have access to ICT and its related tools. In addition, they say that only 17% of students in Philippines have access to the Internet at their houses, and only 3.74% own a mobile phone.

Abdollahyan et al. (2013) in their study investigated the various digital skills of 376 Iranian undergraduate students from Tehran University. They defined five process skills as: (1) Accessing ability, (2) Analyzing ability, (3) Evaluating ability, (4) Creating ability, and (5) Participating ability. In this study, they focused on basic computer and web operating skills. The results obtained from this study revealed that (1) male students are more familiar with digital skills than female students, (2) older students' familiarity with digital skills is significant, (3) students who live in campus (third and fourth year students) are more familiar with digital skills, (4) students who

have laptop or desktop are more familiar with digital skills, (5) the number of places of access to the computer and Internet available to the students is also important in their familiarity with digital skills, (6) the daily use of Internet affects the digital skills of students too, (7) students who started using Internet earlier in their life are more familiar with digital skill, and (8) students who have digital skills self-efficacy are also more skilled in using digital skills. These findings indicate that there is inequality in using ICT among the students in the University of Tehran.

2 Methodological Design

This qualitative study employed the “Grounded Theory” (GT) approach, exploring the two open-ended questions as follows:

- (1) What are the key features that EFL teachers consider central to their perception of undividing digital divide?
- (2) What do EFL teachers believe are the qualities of an educational context that support or hinder undividing digital divide?

We were interested in exploring participants’ experiences and perspectives, how they interpret the issue and finding meaning through their perspectives. GT approach is fitting in conducting this qualitative research as it offers inductive and sequenced reasonings to examine the data and arrives at the concepts and theories (Glaser & Strauss, 2017). As per this approach, coded meanings were extracted from interviews in this study, organized into concepts, and compared with one another, and finally, themes or theories were identified and discussed.

3 Sampling and Data Collection

The purposive sampling procedure was employed, and a sample of 13 EFL teachers, from Hakkari university in Turkey, among 35 Master’s Degree students, were selected to participate in this study. In the purposive sampling technique, researchers select the sample based on particular characteristics or specific purposes (Cohen et al., 2007). This study explores the EFL teachers’ perspectives on undividing digital divide. Accordingly, the researchers selected the participants who were only EFL teachers and therefore excluded 22 participants who did not meet the required conditions. The participants’ first language was Turkish. As presented in Table 1, the demographic information shows that ten participants were male, and three were female. The participants were aged between 24–38, and the mean age was almost 30. Their average experience of teaching was almost seven years.

All participants were informed about the purpose and procedure of the study on the interview handouts containing the two interview questions and their willingness to partake in this study. In one hour-long interview session, the participants

Table 1 Demographic information of participants

Participants	Gender	Age	Experience (year)	Location (village, city)	Level of teaching
A	M	34	10	Village	High school
B	M	30	8	Village	High school
C	F	26	4.5	City	High school
D	M	26	3	City	High school
E	M	27	3	City	Secondary school
F	F	24	1	City	Secondary school
G	M	38	16	City	High school
H	M	35	7	City	High school
I	M	27	2	Village	Secondary school
J	M	31	9	City	Secondary school
K	M	33	6	City	High school
L	M	26	4	Village	High school
M	F	34	12	City	High school

Note Participants are represented by letters to keep the participants' information confidential

responded to two interview questions related to their perception of the key features of undividing digital divide and the qualities of an educational context that support or hinder undividing digital divide.

4 Data Analysis

The data-analytic procedure was conducted by applying Constant Comparative Analysis (CCA) to sort and organize the initial information or codes into concepts or categories, compare them across categories, refine them, and then generate a theory or related themes (Glaser & Strauss, 2017).

Dörnyei (2007) suggested three coding procedures open, axial, and selective, i.e., the data is opened up into chunks and segments, clustered into categories, sub-categories, or concepts, and then organized into the core themes. Therefore, CCA coding proceeded first by reviewing the interview notes several times, and then the researchers assigned labels or codes that designated participants' accounts. Afterward, in order to reduce the codes into manageable and meaningful locatable segments, the patterns in the data were identified by comparing the codes, and they were reduced into categories and sub-categories with an established connection between them. Next, all codes sharing similar meanings or closely related were clustered under one relevant category and sub-category. Once all codes, categories, and sub-categories were revised and refined, the relationship, frequency, and underlying concepts among codes were specified and then organized into conceptual themes.

Throughout this process, care was taken that all coding categories well fit the data and provided an explanation for the issues that are the focus of the study. As stated by Mackey and Gass (2012), theoretical sampling in Grounded theory explains that the data obtain saturation, and the process ends when all new data fit into existing categories.

To validate the data coding by researchers, a well-qualified EFL teacher was invited to recode the interviewees' accounts; as stated by Mackey and Gass (2012), 15–20% as a commonly accepted amount of double-coding, randomly selected participants' interview. The inter-rater reliability results, Cohen's kappa, indicated that there was 97% agreement between coders, showing a perfect degree of reliability in assigning codes for the interview data. In order to have a better sense of coding output, the final emerged themes with their categories and sub-categories are presented in Tables 2 and 3.

5 Findings

(RQ1) What are the key features that EFL teachers consider central to their perception of undividing digital divide?

6 Equal Chance of Digital Accessibility

One of the features that EFL teachers consider central to their perception of undividing digital divide is the equal chance of digital accessibility in implementing distance learning and teaching. They believed that the most apparent struggles in digital accessibility equity are access to technological infrastructure, digital equipment, and appropriate learning and teaching platforms. Access to technological infrastructure is a basic step to Internet use, accessibility to the digital world, and participation in digital activities. For example, basic infrastructure is required to use the Internet, such as bandwidth, hardware, and connection. Using a dial-up modem or low-speed and even less network coverage Internet can give a different experience than high-speed broadband. As participant C stated:

Another issue we encountered during Covid-19 was geographical restrictions. My school is located in Van's countryside. Some students requested Internet access from Internet service providers but could not obtain it due to the neighborhood in which they resided. Because there was no Internet infrastructure in the area. It took a long time to get necessary Internet access in those neighborhoods. Hence, students in those areas could not participate in online classes, and as a result, they fell even further behind in the learning process.

It cannot be taken for granted that every user consistently utilizes the Internet because they have access to the Internet and required infrastructure; however, inequality of digital equipment availability was not ruled out by the participants. The

Table 2 The coding list and themes of interview data (RQ1)

Themes	Categories	Sub-categories
Equal chance of digital accessibility	1. Technological infrastructure and access	Poor infrastructures, including network, power, inaccessibility, poor to no Internet access, network coverage problem, no telephone signals in their villages, no access to the fast Internet
	2. Digital equipment	Lack of digital gadgets, no access to the mobile phones, computer availability
	3. Appropriate platform for learning and teaching	Not appropriate channels of teaching, a suitable platform of education, effective applications
Digital usage knowledge and adaption	1. Digital skills	Insufficient digital abilities, increasing students' and teachers' digital competence, not familiar with the distance learning, lack of information and competence in computer skills
	2. Adaptions	Adapting new styles of teaching, the new digital education world
Financial affordability	1. Institutional affordability	No supporting grants, insufficient digital facilities
	2. Instructors' affordability	No access to pc at home, low incomes
	3. Students' affordability	Students could not afford the Internet bills, students using each other's computers or mobile devices, no access to a computer, unequal computer access across households, family income

availability of digital resources will significantly influence the students' distance learning and lead to an education gap. Lack of digital gadgets such as mobile phones, tablets, and personal computers were the points the participants made that brought inequalities in implementing distance learning. An example statement made by participant D is:

Unfortunately, students and teachers living in geographies where opportunities are scarce, especially in rural areas were left away from education due to the widely unbalanced and unequal family income and because they did not have wide access to technological tools and Internet access. Not every student could attend the remote class at the same time, could not understand the homework correctly, and could not complete it on time and submit it, creating a big gap in learning. Especially rural areas, and underdeveloped regions in certain fields,

Table 3 The coding list and themes of interview data (RQ2)

Themes	Categories	Sub-categories
Providing institutional support for digital accessibility	1. Institutional technology support	Infrastructure and fast Internet, digital instruction platform enabling authentic interactions and socializing, providing effective to-do applications, providing free or cheap rental gadgets and personal computers, Internet accessibility packages, equality in the access to resources, allocate resources toward in-home technology
Adapting new working methods of instruction	1. Styles of teaching	Adapting new working methods of instruction, methods of increasing interactions and socializing, adaptable content of teaching
	2. Employing skilled teachers	Hiring competent teachers and staff with digital abilities
Increasing digital skills and usage knowledge	1. Teacher training	Educating instructors under new digital abilities, increasing teachers' digital literacy
	2. Student training	Increasing students' digital skills and knowledge of use
	3. Home guidance	Raising family awareness of digital literacy, procedural knowledge workshops
Providing financial support	1. Conferring grants to instructors	Providing teachers with financial support to prepare digital resources, digital development
	2. Conferring grants to students	Supporting students in preparing hardware, Internet bill affordability, grants to prepare distance learning

were deprived of access to technology. The influence of geography on access to facilities, technology, and the Internet was felt to a large extent. In crowded families with many children who had no access to digital gadgets or a sharing device, since each sibling had lesson hours at the same time, they could not attend at the same time. Therefore, they fell behind in the lesson, and thus there were big educational gaps.

In addition to technology infrastructure and gadgets accessibility contributing to the digital divide, inaccessibility of appropriate learning and teaching platforms also amplifies the existing inequities. As some participants posited, online teaching and learning platforms have many challenges and shortcomings, such as an inflexible

context for authentic interactions and students' socializing. For example, participant A believed that:

As a teacher, the main challenge for the teachers was the 'non-authentic interactions' and 'lack of spontaneous interaction'. From the student part, they highlighted the main challenges such as 'heavy workloads and fatigue' and 'loss of motivation.' Even while remote learning had no effect on overall student performance, particular educational activities, such as practical work and projects provided online, were less appealing to students since they required greater engagement among classmates and with the teacher.

7 Digital Usage Knowledge and Adaption

A range of differences in digital usage knowledge, skills of use, and adaption to the new digital world can cause new divides and disparities in the new digital world (Gui & Argentin, 2011). As Hargittai (2004) noted, whether a higher rate of accessibility is reached, there are still certain portions of populations that would not be able to benefit from this medium. Therefore, the major issue in undividing digital divide, as stated by participants, is that there is a divide between information haves and have-nots due to insufficient digital abilities and knowledge of use by students and teachers. Additionally, some are more likely to suffer from adapting to technological innovations and new teaching styles in this new digital education world. For example, participant H explained that:

Learning activities in universities and schools are not limited to content delivery but can include tutoring and supervision, assignments, examinations, laboratory work, and other interactive activities. During pandemics, all these activities had to undergo a shift and adaptation to the new situation. To sustain high-quality education, it was necessary to scaffold appropriate behaviors and create a more sophisticated learning design.

8 Financial Affordability

As emphasized by the participants, the levels of financial affordability are also key in enabling individuals and institutions to undividing the digital divide and inequalities. Unequal distribution of resources due to financial restrictions causes unequal access to digital technologies. Groups with financial affordability are able to access and provide relevant resources such as conferring supportive grants to technology utilization and giving digital facilities by institutions, taking advantage of relevant digital facilities and resources by teachers and students, and families across households. Participant K's remarks as an example demonstrate the issue of financial affordability:

Another significant issue in our school was low-income levels. Most of the parents in our school had financial difficulties, so they could not provide opportunities for their children to access the necessary resources for online education.

(RQ2) What do EFL teachers believe are the qualities of an educational context that support or hinder undividing digital divide?

9 Providing Institutional Support for Digital Accessibility

In the interviews, EFL teachers suggested multiple qualities of educational institutions that could support or hinder undividing digital divide. The majority of participants voiced providing institutional support for digital accessibility as one of the critical qualities. As Participant B mentioned, the critical issue that causes digital divides is poor or no Internet coverage in some regions, which requires relevant institutions to take necessary measures to provide Internet infrastructures and signal coverage. Participant C highlighted that “The influence of geography on access to facilities, technology, and the Internet was felt to a large extent.” In some participants’ opinion, to meet equality in the access to in-home technology resources, free or cheap rental gadgets, and personal computers, Internet accessibility packages can be allocated to the users.

However, in addition to the availability of digital gadgets, the institutions should provide students with fast-speed Internet accessibility packages. Participant F remarked:

For some students, it’s simply not possible to get fast Internet where they live. Even if, they could have a computer due to lack of proper Internet services, they sometimes could not successfully participate in the course.

Participants (A, B, H, K, M) also outlined that institutions need to provide a digital instruction platform enabling authentic interactions and socializing and effective to-do applications to undivide the digital divides. For example, participant L explained that:

First of all, online meeting services such as ZOOM, Skype, and Google Meet were insufficient for communication between learners. In English Language Teaching, speaking practice among peers comforts students to prepare their dialogues. The lack of communication among peers disabled these kinds of dialogues. In the end, the attempts to create such dialogues resulted in chaos as all of the students would start to talk to each other at the same time, in the same online meeting room. This deficiency affected the teaching process as a student-centered approach would not be possible in spoken English.

10 Adapting New Working Methods of Instruction

The increasingly fast technological advances bring dramatic changes daily and cause a considerable digital divide between working methods and users. This, therefore, highlights the significance of adopting new working and effective methods of instruction and adaptable teaching content that meet the students’ needs, particularly their

interactions, learning motivation, and socializing in the new digital world of instruction. During the Covid-19 pandemic, the education industry underwent transitions at all levels, from basic school to university. Many colleges, schools, and universities were forced to switch their activities to a distance learning mode during the pandemic due to the need for physical separation. Therefore, many schools and universities had to change and adapt their working methods in order to sustain high-quality teaching and learning during the pandemic. The available digital teaching and learning tools laid a solid, not flexible platform; as Participant A said:

Learning activities in universities and schools are not limited to content delivery but can include tutoring and supervision, assignments, examinations, laboratory work, and other interactive activities. During pandemics, all these activities had to undergo a shift and adaptation to the new situation. To sustain high-quality education, it was necessary to scaffold appropriate behaviors and create a more sophisticated learning design.

In addition to employing working and adaptable methods and platforms, digital divides are also observed between skilled and non-skilled users. Participants also stressed recruiting competent teachers and staff with digital abilities as one of the qualities of undividing digital divide. As Participant M stated:

With a sudden pass to the digital world during the pandemic, many incapacities in people were uncovered. Among the teachers working in the Ministry of Education, there was a heterogeneous dispersed group including both the young but good at computers and the experienced but unfamiliar with computer skills. I remember some of my colleagues asking questions about how to use the Zoom software and calling me for help right in the middle of their classes. They were not able to unmute themselves or activate the whiteboard to write something on it. Some did not have an e-mail address to sign up for a Zoom account.

11 Increasing Digital Skills and Usage Knowledge

Now, more than ever, digital users need to be provided with professional development opportunities that equip them with the knowledge and skills to manage the new digital world of education effectively. From the participants' standpoint, increasing digital skills and usage knowledge and maintaining a sustainable digital practice is integral as it helps build a sense of keeping up with technology changes, uniting with advances, and managing digital divides. The majority of participants noted that by being educated and more deliberate about digital literacy and knowledge of use, teachers and students are more likely to cultivate a more professional workforce with fewer digital divides. Participant D mentioned that students sometimes misuse technology opportunities and consequently use them for different purposes such as playing online games or surfing the Internet rather than connecting and benefitting from digital facilities. The other side of the coin is that some teachers do not possess the necessary knowledge and skills to use them correctly with maximum efficiency in line with correct purposes. Therefore, training and increasing users' digital skills and knowledge of use is a crucial quality of undividing digital divides, as this is well reflected in participant's A note:

Such assistance and training would boost students' and teachers' self-confidence and effectiveness, as well as their ability to manage their workload and professional techniques while improving the educational process.

Furthermore, another important but frequently underestimated aspect of digital divide exists at home. Participant I described that parents with higher educational levels are also more likely to guide, support, and monitor their children's usage of devices and the Internet at home. Therefore, home guidance such as raising families' awareness of digital literacy and holding procedural knowledge workshops for families could help minimize digital divides due to the unfamiliarity of families with digital instruction and use.

12 Providing Financial Support

On the issue of inequality, the economy and income level play a significant role in breaking down inequalities. Stronger economies are required to distribute the necessary digital infrastructure to various groups and regions. According to Rogers' diffusion of innovations theory (2003), richer people and firms or countries are more likely to have the possibility to adapt and use technological innovations. A stronger economy or a high individual's income can adopt newer expensive technologies or provide the necessities of digital use. Educational context, teachers, students, and families with strong financial levels tend to have more possibilities of presenting higher levels of technology adoption and requirements of digital use. Most participants of this study also mentioned that educational institutions can provide financial support to teachers and students as a way of undividing digital divide, such as providing teachers and students with financial support to prepare digital resources and digital development and cover distance learning expenses. For example, Participant H recommended that:

Public libraries can bridge the digital divide by providing computer resources for free. Rental centers might help by making computers available for a low monthly price, though they may lead to interest and debt problems. Internet cafes are available in cities, though countries need more. Pool their resources to purchase technology for low-income families. Lobby the school district to allocate resources toward in-home technology upgrades.

13 Discussion

The first research question of this study aims at figuring out the key features that EFL teachers consider central to their perception of undividing digital divide. The EFL teachers who participated in this study believed that there was no equal chance of digital accessibility for the students and teachers. They said that not all students and teachers have equal access to technological infrastructure, digital equipment, and appropriate platforms for learning and teaching. This study echoed the findings

of some previous studies (Daguno-Bersamina & Relativo, 2020; Hindman, 2000; Santos, 2020), which illustrated that the availability of ICT resources and related equipment has an important role in distance learning and teaching. According to Hindman (2000), living in metropolitan areas increases the chance of access to the Internet and other digital equipment. He also stated that income, age, and education affect the Internet use of people. Santos (2020), in his study, showed that some students have no personal Internet connection at their homes or do not own laptops or smartphones and use public places to access the Internet and digital equipment like computers. He also said that some of the students have no access to the Internet at all.

The participants of the present study also believed that digital usage knowledge and adaptations are significant in the distance learning and teaching procedure. They believed that most of the students and teachers are not familiar with ICT and its related tools. Moreover, their insufficient digital abilities and knowledge hinder them from using ICT. This finding was congruent with the research of Chang et al. (2014), who found that technological and social access has an important influence on extrinsic motivational access and skills access of students.

Another crucial perception of the EFL teachers about undividing digital divide was the financial affordability of institutions, teachers, and students. They believed that institutions did not support their teachers and students financially or did not provide any digital facilities for them. These findings were in parallel with the findings of some studies (Bucy, 2000; Daguno-Bersamina & Relativo, 2020; Santos, 2020), which indicated that low-income individuals are disadvantaged in using ICT and its related tools. Daguno-Bersamina and Relativo (2020) in their study showed that students who were from low income families did not have access to the Internet because they could not afford the bills. They also stated that most of the students did not own mobile phones in order to connect to the Internet and participate in online education.

The second research question of this study quests for answers to the question of what EFL teachers believe the qualities of an educational context that support or hinder undividing digital divide are. The analysis of the data obtained from interviews displayed that most EFL teachers believed that providing institutional support for digital accessibility is crucial. They stated that most students were from low-income families who did not have access to digital gadgets like laptops or smartphones or lived in rural areas without Internet access due to a lack of appropriate Internet infrastructure. Teachers also said that most of the teachers who lived and worked in rural areas had the same problem as students. Billon et al. (2009), in their study, explained that in developed countries, the digitalization pattern is defined by the service sector and governmental success. So in countries like Turkey, the government should supply appropriate infrastructure and access to free Internet in areas which need financial support.

Another issue that the participants of the current study talked about was adapting new working methods of instruction. With the sudden closing of schools and universities across the world because of COVID-19 pandemic, all teachers have been requested to deliver lessons in online platforms. Therefore, many schools and

universities had to change and adapt their working methods in order to sustain high-quality teaching and learning during the pandemic. The available digital teaching and learning tools laid a solid, not flexible platform. So some institutions around the world started to educate their teachers to adapt new methods of teaching in order to meet their students' needs.

The analysis of the qualitative data collected from the participants through interviews clarified that EFL teachers believed that increasing digital skills and usage knowledge of teachers and students could help supporting digital divide. Most of the participants explained that by being educated and more deliberate about digital literacy and knowledge of use, teachers and students could have more fruitful teaching and learning experiences while doing online education. The study conducted by Abdollahyan et al. (2013) to examine the various digital skills of students related to online education and the digital divide yielded results that are in parallel with the results of this study in that both of the studies revealed that students who are more familiar with digital skills and have digital skills self-efficacy are more skilled in using digital skills.

The last issue that the participants of this study discussed was providing financial support for the teachers and students. They believed that governments and institutions could provide teachers and students to prepare digital resources, hardware, and so on. The findings of this study with respect to the influence of providing financial support in decreasing undividing digital divide among teachers and students were in parallel with the findings attained from the study conducted by Billon et al. (2009). Their study revealed that in developed countries, the digitalization pattern is described by the service sector and governmental success. Also, the study of Chang et al. (2014) indicated that because the developing countries are not economically, politically, and socially in good condition, and this affects the living standards and welfare of their citizens, extrinsic motivational access and skills access of students and teachers are affected too.

14 Conclusion

The COVID-19 pandemic was a crisis for everyone around the globe and elicited inequality between countries. The pandemic told us many things about the pre-pandemic era, especially about social, educational, and economic conditions of people who live in different regions of the world as well as forewarning us about post-pandemic era. The crisis especially affected the education systems of countries and the educational life of millions of teachers and students. However, economically strong countries could turn this crisis into an opportunity, equip their schools and universities with different ICT tools, give necessary training about using these tools to their teachers and students and made their life easier than before. Yet, low-income countries could not provide their people the same welfare as the high-income countries. It took a long time to prepare a digital base for their educational systems. Most

of the teachers and students living in rural areas and students from low-income families did not have access to the Internet connection, nor had they access to computers and smartphones. The COVID-19 pandemic warned the world, especially authorities to find ways to eliminate inequality, inequity, and injustice, especially in education. It demonstrated that education should not be an unaccessible phenomenon to the people of the world and that everyone should have access to ICT and become a digitally literate person no matter what their social status is.

References

- Abdollahyan, H., Semati, M., & Ahmadi, M. (2013). An analysis of the second-level digital divide in Iran: A case study of University of Tehran undergraduate students. In J. Losey, B. Lennett, & S. Meinrath (Eds.), *Internet freedom, Nuanced Digital Divides, and the Internet craftsman* (pp. 257–270). Routledge.
- Billon, M., Marco, R., & Lopez, F. L. (2009). Disparities in ICT adoption: A multidimensional approach to study the cross-country digital divide. *Telecommunications Policy*, 33, 596–610.
- Brockett, R. G., & Hiemstra, R. (1991). *Self-direction in adult learning: Perspectives on theory, research, and practice*. London.
- Bucy, E. P. (2000). Social Access to the Internet. *The International Journal of Press/Politics*, 5(1), 50–61.
- Chang, Y., Wong, S. F., & Park, M. C. (2014). A three-tier ICT access model for intention to participate online: A comparison of developed and developing countries. *Information Development*, 1–17.
- Chen, W., & Wellman, B. (2004). The global digital divide within and between countries. *IT & Society*, 1(7) 39–45.
- Cohen, L., Manion, L., & Morrison, K. (2007). *Research methods in education* (6th ed.). Taylor and Francis.
- Daguno-Bersamina, K., & Relativo, J. (2020). Life after lockdown: How schools and classes will be like in the Philippines. *Philstar Global*. <https://www.philstar.com/headlines/2020/05/29/2013427/life-after-lockdown-massive-shift-online-learning-mounts-digital-gap-between-rich-and-poor-widens>
- Dewan, F. J., & Riggins, S. (2005). The digital divide: Current and future research directions. *Journal of the Association for Information Systems*, 6(12), 298–337.
- Dörnyei, Z. (2007). *Research methods in applied linguistics*. Oxford University Press.
- Glaser, B. G., & Strauss, A. L. (2017). *The discovery of grounded theory: Strategies for qualitative research*. Routledge.
- Gui, M., & Argentin, G. (2011). Digital skills of the Internet natives: Differences of digital literacy in a random sample of northern Italian high school students. *New Media and Society*, 2(17), 1–18.
- Hargittai, E. (2004). Internet access and use in context. *New media & Society*, 6(1), 137–143.
- Hindman, D., B. (2000). The rural-urban digital divide. *Journalism and Mass Communication Quarterly*, 77(3), 549–560.
- Hsieh, J. J. P. A., Rai, A., & Keil, M. (2008). Understanding Digital Inequality: Comparing continued use behavioral models of the social-economically advantaged and disadvantaged. *Management Information Systems Quarterly*, 32, 97–126.
- Lembani, R., Gunter, A., Breines, M., & Dalu, M. T. B. (2019). The same course, different access: The digital divide between urban and rural distance education students in South Africa. *Journal of Geography in Higher Education*, 44(1), 70–84.
- Liaw, S. S. (2007). Computers and the Internet as a job assisted tool: Based on the three-tier use model approach. *Computers in Human Behavior*, 23(1), 399–414.

- Lieberman, M. (2020). Five things you need to know about students absences during COVID-19. *Education Week*.
- Lim, J. (2002). East Asia in the information economy: Opportunities and challenges. *Info*, 4(5), 56–63.
- Mackey, A., & Gass, S. M. (Eds.). (2012). *Research methods in second language acquisition: A practical guide*. Wiley Blackwell Publication.
- NCES, (2018). National Center for Education Statistics, NCES.
- Norris, P. (2001). *Digital divide: Civic engagement, information poverty, and the Internet worldwide*. Cambridge University Press.
- Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). Free Press.
- Santos, A. (2020). In the Philippines, Distance Learning Reveals the Digital Divide. *The Heinrich-Böll-Stiftung European Union*. <https://hk.boell.org/en/2020/10/06/philippines-distance-learning-reveals-digital-divide>
- Srinuan, C., & Bohlin, E. (2011). Understanding the digital divide: A literature survey and ways forward. In *22nd European Regional Conference of the International Telecommunications Society (ITS): Innovative ICT Applications—Emerging Regulatory, Economic and Policy Issues*. Budapest, Hungary, International Telecommunications Society (ITS), Calgary.
- Van Dijk, J. (2006). Digital divide research, achievements and shortcomings. *Poetics*, 34, 221–235.
- Van Dijk, J., & Hacker, K. (2003). The digital divide as a complex and dynamic phenomenon. *Information Society*, 19(4), 315–327.
- Wu, T. (2010). *The master switch*. Random House.
- Zhou, Y., Singh, N., & Kaushik, P. D. (2011). The digital divide in rural South Asia: Survey evidence from Bangladesh, Nepal and Sri Lanka. *IIMB Management Review*, 23, 15–29.

The Role of Mediating Artifacts on the Writing Development of Students Through Scaffolding Instruction: The Case of Iran



Nasibeh Bagherpour and Kaveh Jalilzadeh

1 Introduction

There is a growing consensus that more attention must be devoted to ideas that have benefited language teachers in devising and implementing more efficient methods of coaching students. In recent years, innovative technology that enables both synchronous and asynchronous communication has garnered considerable interest in the field of language studies. In first language (L1) courses offered at the college level in a variety of nations, the rise of modern technology in the instruction of writing has been remarkable. In the last several decades, writing and technology have mostly centered on various computer programs and tools, including word processors, e-mails, online chats, bulletin board debates, and Web page initiatives. Modern distant learning includes synchronous/asynchronous online courses, hybrid or blended courses that combine face-to-face contact with online delivery, and technology-enhanced courses that combine face-to-face interactions with technological integration. Many ESL students practice their writing abilities asynchronously, as via email (Zeiss & Isabelli, 2005). Additionally, an increasing number of second language teachers have integrated computer-mediated devices into their lessons (Campbell, 2003, 2005; Johnson, 2004). According to past study in the field of language education, there are few records of the application of technology to EFL writing instructions in an Iranian environment.

Writing, in accordance with the process approach, is a recursive, illustrative, and reproducing process (Flower & Hayses, 1981). It focuses on the writer, the writing

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process, and writing tactics. The purpose of the process method in the classroom is to help students acquire practical skills for getting started, writing, revising, and editing (Silva & Matsuda, 2002). Instead of a private and lonely act, the process approach to writing is a collaborative procedure. Writing fits naturally with the notions of social, cooperative/collaborative, and constructivist endeavors (Donato, 2004; Flower & Hayes, 1984; Matsuda, 2003; Tuzi, 2004).

Moreover, interaction is one method constructivists approach the idea of mediation, according to their perspective. Considered as one of the possible sources of mediation is peer contact. Strong theoretical and pedagogical underpinnings are required for the implementation of small group and pair work in the classroom, especially in second language classes. The pair work is consistent with the social constructivist perspective on education from a theoretical approach. Also, the foundations of social constructivism are founded on Vygotsky's work (1978). According to Vygotsky, human development is fundamentally a socially situated activity, comparable to a kid whose social interaction develops when exposed to a more capable member of society. The more capable member provides suitable assistance to the beginner, who is then pushed beyond their current level and toward their potential level. In the literature, this idea of help is referred to as scaffolding. However, peer-to-peer scaffolding can also occur while working in groups or couples (Donato, 1994; Storch, 2002). Alternatively, from a pedagogical standpoint, the use of small group and pair work is supported by the communicative approach to L2 education, which emphasizes giving learners with opportunities to use the target language. The usage of pair collaboration in writing classes is confined to the early phases (brainstorming) or the end stages (editing) of the writing process (the peer review stage). Ferris (2003) outlined the advantages of such peer evaluations. Peer review increases students' awareness and facilitates the development of analytical and critical reading and writing skills.

E-learning, which no longer presume that language learning would require face-to-face interaction, might be used to expand the classroom idea in Iran, where EFL university students are deficient in general English, particularly in their writing ability. Teachers should act as mediators between the classroom and the realm of natural language development (Legutke, cited in Nunan, 2011). The objective of the present study was to determine if Iranian TEFL university students benefit from:

- (1) The effect of mediated asynchronous classes on their writing performance.
- (2) The impact of mediated pair work in face-to-face classrooms on students' writing performance.
- (3) facilitated individual work in in-person classes.

Additionally, taking into account the flaws of traditional teaching methods, scaffolding as assistance-based education and the use of various mediation tools during instruction are likely to minimize learners' anxiety, foster a positive attitude toward learning, and offer an authentic atmosphere.

Moreover, there appears to be a paucity of in-depth experimental research precisely within the context of task-based scaffolding training. The purpose of this study was to determine whether scaffolding EFL learners' narrative essays in three

experimental groups (i.e., individual face-to-face group, collaborative face-to-face group, and individual asynchronous computer mediated group) and the control group differed in terms of accuracy, fluency, and complexity in the process of writing development. In other words, the present study evaluated the disparate effects of the three mediating artifacts on the writing improvement of students.

2 Literature Review

Lev Vygotsky's work is the foundation of SCT's fundamental principles, as Walqui (2006) asserts that the key elements of Vygotsky's learning theory may be grouped into five assumptions:

- (1) Learning results in growth.
- (2) Language is the most important instrument for cognition.
- (3) Mediation is essential for education.
- (4) Social connection is the foundation of learning and growth.
- (5) ZPD is the most important learning environment.

Mediation, as the most fundamental idea in Sociocultural Theory (SCT), may be handled by: (1) tools and artifacts; (2) techniques and processes; (3) interaction, and (4) sign use (Ellis, 2003). Specifically in second language acquisition mediation entails the mediation of others in social engagement; in this study, a space or room was provided for the participants to engage in such interaction. This study considered mediation by others in social contact, as well as mediation by objects, task, and technology (Ellis, 2003; Lantolf, 2000a).

Moreover, L2 development demonstrated the importance of learner interaction, and a number of research suggest that peers may function as effective mediators (Bagherpour & Rashtch, 2017; Khosravi et al., 2021; Swain & Lapkin, 1998, 2002; Swain, 2001).

A core principle of scaffolding education is that cognitive capacities can only be completely comprehended by actively assisting the growth of the learners. Scaffolding teaching is primarily based on the premise that mediated contact is necessary to comprehend the scope of an individual's functioning, but that this interaction also immediately influences the development of these skills. According to Vygotsky's theory, talents emerge from interactions with the environment, and interactions are constantly mediated; hence, sensitivity to mediation illuminates the learner's future development (Poehner & Lantolf, 2005). That is, what an individual is able to achieve with mediation today, he or she is able to do alone tomorrow.

In addition, the mediated learning experience involves intentionality, reciprocity, and transcendence beyond the present moment, so enabling the learner to establish connections to comparable prior experiences and generalize the learned information to different contexts (Feuerstein, 2000). During a mediated learning experience, the mediator participates in a task with a learner while observing the learner's awareness of mediation and making any required adjustments (Poehner, 2008).

Individualization, record keeping, and response grading are three distinct, though linked, educational objectives that have influenced the development of Computer-Assisted Instruction (CAI). Individualization in CAI refers to the fact that students may work independently and at their own speed on the computer (Chapelle & Jamieson, 1986). To create an optimum learning route during a class, the lesson designer must have a thorough grasp of how students learn. This traditional perspective on individualization in CALL has lately been reevaluated. Some instructors have advocated that students utilize the computer to explore and play with content (such as the target language) through group work, games, and student-initiated interactions (Beatty, 2003). The capacity to gather data and maintain records is a second benefit of CALL. It is possible to gather and evaluate information on any student-computer interaction (Donaldson & Haggstrom, 2006). Regarding response grading, the third influential principle, instructors' roles should be adjusted.

Regarding the changes that occur among teachers and instructors, Mason and Rennie (2008) stated that 'teachers' and 'tutors' will need to change their roles from being the sole source of knowledge to roles in which their experience is used to assist and direct students in contextualizing knowledge within the context of their experience. This increases the autonomy accomplishment of students.

Also, concerning the environment of language acquisition in Iran, there are no alternative opportunities for language practice. The provision of a pseudo-context via the World Wide Web appeared to be advantageous for them. Therefore, kids might be given with a space for language practice. A second argument is that, because the current generation of children is attracted with new technology such as mobile phones and laptops, this medium may make kids feel less anxious in face-to-face lessons compared to asynchronous classrooms. In order to fill this gap, the researcher deemed it important to study the influence of mediating artifacts on the writing performance of participants within the context of task-based scaffolding instruction.

Furthermore, feedback is viewed as a sort of mediation in writing classrooms. The idea of mediation is built on the belief that material and symbolic instruments mediate human connections with the world (Lee, 1997). Providing students with corrected feedback may enhance both the learning process and its final product (Panahi et al., 2013). In conjunction with student-teacher conferences, written feedback has been proven to be useful as well (Fregeau, 1999).

3 Method

In this study, one instructor (the researcher), two raters, and 83 undergraduate students from the English Translation Department of Islamic Azad University South Tehran Branch participated over the course of one semester. Random assignment of individuals to the experimental and control groups. All of the participants were between the ages of 18 and 25, and they were all native Persian speakers. The students registered in four sections of "Advanced Writing," a mandatory course for sophomore English Translation majors. This course's curriculum includes one 105-min lesson

every week, for 16 weeks, to teach students how to compose an English essay. All of the participants completed the Oxford Quick Placement Test at the beginning of the semester and a week before to the experiment (OQPT). Individuals who scored one Standard Deviation (SD) above and one SD below the mean on the OQPT were added into this study to guarantee that the sample consisted of only the participants with the same skill level. The mean was 23.8 and the standard deviation was 6. Those with scores more than or less than 17 and 30 were eliminated from the research. 83 out of 98 students who took the OQPT belonged to Level 1 of the Association of Language Testers in Europe (ALTE) and so represented a homogenous group in terms of language proficiency. Randomly dividing the qualifying individuals into three experimental groups.

Three of the four groups served as experimental groups, while the fourth served as a control group that received lecture-discussion training. One of the three experimental groups got asynchronous computer mediation via the class website and their personal profile, while the other two received face-to-face individual teaching in the classroom environment and face-to-face collaborative instruction, respectively (in the classroom context).

Each of the four groups, IACMG, IFFG, CFFG, and CG, took a pre-instruction essay writing assessment prior to the start of teaching. As the final exam, a posttest was administered at the last session. IACMG students viewed the classroom website offline while completing their tasks. The IFFG and CFFG held their meetings in schools. One additional face-to-face session was held for IACMG during the first week to guarantee that every member of the group had sufficient computer literacy to utilize the internet.

Accuracy, complexity, and fluency were utilized as production metrics in the current study. Skehan (1996) said that fluency, accuracy, and complexity were objectives for L2 teaching; that is, accuracy was the ability to manage a current level of interlanguage (IL), fluency was the ability to use such an IL system in real time, and complexity was the development of an IL system. In order to conduct this analysis, all textual materials were initially coded for T-units and clauses. Hunt (1966) defines a T-unit as “one main sentence plus any subordinate clauses that are connected to or embedded within it” (p. 735). However, in order to achieve the goal of this study, it was deemed a suitable method for analyzing the textual data.

Regarding precision, two production metrics were employed: general measures—the proportion of error-free clauses (EFC) and error-free T-units (EFT). According to Polio (1997), comprehensive measurements might not be suitable for a homogenous population. In addition, he stated that error-free T-units (EFTs) and error counts were more trustworthy measurements of proficiency range. Regarding the two global measures of correctness, Polio’s (1997) error rules were utilized as criteria, except her treatment of spelling errors (i.e., punctuation and capitalization). Regarding target language usage (TLU), spelling errors regarding the difference between a and a were disregarded.

The quantitative measures shown in Table 1 have been used to analyze the participants’ writings.

Table 1 The quantitative measures for the analysis of students' writing

Fluency	Complexity	Accuracy
No. of words per text	Percentages of clauses per T-unit	Error free clauses per clause
No. of T-units per text	Proportion of subordinate clauses to dependent clauses	Error free T-units per T-unit
No. of clauses per text	Subordinate clauses per total clauses	

For any given sample, these criteria served as indicators of how well and how consistently the students controlled the changes needed to communicate an intended message to an intended audience. Students' writing samples were the best measure of their writing ability and could provide meaningful information for evaluating the curriculum as well as each student's strengths and weaknesses (Weigle, 2002).

It is also worth mentioning that the participants' scripts were scored by two raters. Because of the unavoidable variability that exists among different raters, attempts were made to reduce the variability of raters' judgment and to increase the raters' levels of agreement with each other. The two raters who shared similar backgrounds in terms of qualifications and teaching experience and about ten years of experience teaching advanced writing and essay writing courses at university level were Ph.D. holders. They took a 45-min training session was held. In that session, the raters were briefed about the purpose of the study and the Polio's guideline was introduced. In order to ascertain that an acceptable level of agreement existed among the raters in coding of written output data, and in accordance with the recommendation of Polio (1997), guiding principles were formulated. To avoid coding mistakes which is of the greatest causes of disagreement amongst raters, Polio's guideline was given to the raters. Then, a random sample of 20 texts was coded by the second rater. Based on these ratings, the inter-rater reliability was estimated. Discussion between raters settled all divergences and led to decontamination of the protocols used for the error-free clause identification.

Inter-rater reliability for the number of T-units, error-free T-units, number of, and number of words identification was 0.77, 0.88, 0.82, and 0.81 respectively. Table 2 shows the summarized results. The results of Pearson correlation indicated that there were significant agreements between the two raters who rated the writing in terms of:

1. Words ($r(18) = 0.81, p = 0.000$, representing a large effect size),
2. Clauses ($r(18) = 0.82, p = 0.000$, representing a large effect size),
3. Error free T-Units ($r(18) = 0.88, p = 0.000$, representing a large effect size) and
4. T-Units ($r(18) = 0.77, p = 0.000$, representing a large effect size).

The researcher chose the tasks using Hyland's categorisation. These tasks were developed to gradually strengthen the freedom and control of the learners, progressing from simple realization exercises to the usage of task models with varying degrees of assistance. Throughout this procedure, the researcher served as an assistant and scaffolder, assisting the participants until they no longer need assistance.

Table 2 Inter-rater reliability indices

		WORDR2	CLR2	ERFR2	TUR2
WORDR1	Pearson correlation	0.814 ^a			
	Sig. (2-tailed)	0.000			
	N	20			
CLR1	Pearson correlation		0.829 ^a		
	Sig. (2-tailed)		0.001		
	N		20		
ERFR1	Pearson correlation			0.889 ^a	
	Sig. (2-tailed)			0.000	
	N			20	
TUR1	Pearson correlation				0.771 ^a
	Sig. (2-tailed)				0.002
	N				20

^aCorrelation is significant at the 0.01 level (2-tailed)

There are several procedures and recommendations in the literature that are useful for a variety of contexts, including language classes. Clay and Cazden (1992) introduced the concept of instructional scaffolding, which was utilized in the present study.

Setting the topic was the very first stage in creating the writing tasks; the researcher took into account the participants’ interest in order to inspire them during the learning process. The subsequent stage was to improve accessibility. According to Van Lier (2004), Clay and Cazden (1992) intended to simplify the work by “enhancing accessibility.” Moreover, in accordance with the conclusion of Robinson (2003), the level of complexity of assignments might be lowered. Robinson (2005a) refers to cognitive task elements that might raise or decrease the cognitive demands of a task in relation to task complexity. Concerning cognitive factors, a difference must be established between resource-directing variables and resource-distributing variables (Robinson, 2005a). The number of items and linkages to be identified and specified [\pm few elements], the temporal and geographical references of the task [\pm Here-and-Now], and the need to provide reasons to back claims made [\pm no reasoning demands] were integral components of tasks. According to several studies conducted in this field, cognitive task complexity can be reduced on these developmental dimensions if there are [+ few components], [+ Here-and-now], and [+ no reasoning demands]. Additionally, task difficulty may decrease along resource-dispersing dimensions unrelated to particular language traits. Examples of resource-distributing factors include the amount of time allotted for preparation [\pm planning], the reduction in the number of activities that must be completed concurrently [\pm single task], and the learners’ prior language and extra-linguistic knowledge [\pm prior knowledge]. According to Robinson (2005b), activities with [+ planning], [+ single task], and [+ prior knowledge] are cognitively simpler on these resource-dispersing aspects. The researcher

manipulated the difficulty of the tasks in order to aid the participants in becoming more autonomous.

It is also important to note that the researcher modified Robinson's (2001) framework to give learners with greater mediation and assistance. As the narrator's language proficiency improves, the conceivable method of evaluating narrative activities increases the requirements placed on them. Rewriting a very short narrative based on a known book, with preparatory time, may be appropriate for low-level learners, but writing a personal story spontaneously to a group might be more appropriate for advanced learners.

Progression between these two tasks might move in the direction of increasing difficulty on a number of overlapping dimensions. Robinson (2001) suggested that these dimensions would include in the following form:

Model narrative structure:

simple language > complex language (lexically and grammatically)

simple story > complex story (many characters, episodes)

familiar story > unfamiliar story

Model narrative mode:

written > pictures > video > given theme

(closed task > open task)

Telling conditions:

extensive preparation time > no planning time

reference materials (pictures, notes) > no reference materials

no time limit > time pressure

The third and fourth steps aimed at enhancing the interaction maintenance and encouraging learners to take part in constructive activities. The above-mentioned steps, along with the low general English proficiency level of the participants, the researcher has chosen narrative genre of writing which made the tasks manageable for learners, so that they didn't become frustrated to cooperate in the process of task completion.

The next step focused on working with new knowledge; therefore, the researcher used some pictures based on Hyland's (2003) work as visual input and helped the learners to activate their schemata and their background knowledge about the task which was under their production.

The last step mentioned by Clay and Cazden (1992) was accepting partially correct responses. Basically, it can be mentioned that this step was essential since the teacher not only should have mediated in the process of learning but also motivated the participants to take part in task completion sequence. By accepting partially correct responses, the researcher also helped the participants to reduce their anxiety, so that

they felt free to take part in the process of task completion and accepted the assistance of their teacher in this process.

4 Results

Two One-way MANOVAs were run on three measures of Complexity (C), Accuracy (A), and Fluency (F) as dependent variables and for the three treatment conditions as independent variables. The research questions of this study is:

Do IACM, IFF, and CFF affect the EFL learners' writing performance in terms of CAF?

Before running the parametric tests of MANOVA, three assumptions needed to be verified, distributional normality, homogeneity of variances, and homogeneity of covariance matrices. As for distribution normality, the ratios of skewness and kurtosis over their standard errors were lower than ± 1.96 (Bae & Bachman, 1998). As shown in Table 3 it can be concluded that the data enjoyed normality.

The other two assumptions underlying MANOVA (homogeneity of variances and homogeneity of covariance matrices) were also examined. The assumption of homogeneity of variances was met. Table 4 displays the results of the Levene's test for equality of error variances. For both the pretest and the posttest, in terms of the CAF, the levels of significance for the observed F values exceeded 0.05, which shows the homogeneity of variances pretest of complexity [F (3, 79) = 2.30, $p = 0.08$], pretest of accuracy [F (3, 79) = 0.11, $p = 0.09$], pretest of fluency [F (3, 79) = 2.66, $p = 0.05$], posttest of complexity [F (3, 79) = 0.51, $p = 0.67$], posttest of accuracy [F (3, 79) = 2.68, $p = 0.05$], posttest of fluency [F (3, 79) = 1.19, $p = 0.31$]. As the data showed, for all six cases the p value was larger than 0.05 ($p > 0.05$) which shows that in all instances, the variances were homogeneous.

The third assumption behind MANOVA, which is the homogeneity of covariances was investigated through the Box's test. As Table 5 shows, the assumption was met for both the pretest as the levels of significance were higher than 0.05 [Box's M = 16.35, F (18, 17,322.49) 0.84, $p = 0.65$], and the posttest [Box's M = 24.54, F (18, 17,322.49) 1.26, $p = 0.19$].

Prior to running MANOVA, the three treatment groups were compared in terms of the CAF of their writing ability as shown in their pretest scores. The highest mean belongs to the collaborative group for complexity, the control group for accuracy, and the IACM group for fluency.

Considering homogeneity of the three groups in terms of their total scores as well as their CAF in pretest, a second MANOVA was run to compare the four groups in the same regards. Table 6 displays the descriptive statistics for the four groups on the posttests. The highest mean belongs to the collaborative group for CAF. The CFFG was followed by (a) IFFG, IACMG, and CG groups for complexity, (b) IFFG, IACMG and CG groups for accuracy, (c) IFFG, IACMG, and CG groups for fluency in descending order of mean score magnitude; The statistical significance of the observed differences was checked through a MANOVA.

Table 3 Descriptive statistics or total scores of pre and posttests

Group	N	Skewness	Kurtosis					
			statistic	Std. error	Ratio	Statistic	Std. error	Ratio
IACMG	Pre-complexity	20	-0.936	0.512	1.83	1.805	0.992	1.82
	Pre-accuracy	20	0.078	0.512	0.15	-1.123	0.992	1.13
	Pre-fluency	20	-0.805	0.512	-1.57	0.657	0.992	0.66
	Post-complexity	20	0.190	0.512	0.37	0.146	0.992	0.15
	Post-accuracy	20	-0.354	0.512	-0.69	-0.728	0.992	-0.73
	Post-Fluency	20	-0.341	0.512	-0.67	-0.877	0.992	-0.88
IFFG	Pre-complexity	26	0.441	0.456	0.97	-0.064	0.887	-0.07
	Pre-accuracy	26	-0.387	0.456	-0.85	0.996	0.887	1.12
	Pre-fluency	26	0.252	0.456	0.55	-0.272	0.887	-0.31
	Post-complexity	26	0.194	0.456	0.43	-0.795	0.887	-0.90
	Post-accuracy	26	-0.096	0.456	-0.21	-0.678	0.887	-0.76
	Post-Fluency	26	-0.197	0.456	-0.43	-0.845	0.887	-0.95
CFFG	Pre-complexity	21	0.106	0.501	0.21	0.754	0.972	0.78
	Pre-accuracy	21	-0.066	0.501	-0.13	-0.757	0.972	-0.78
	Pre-fluency	21	-0.001	0.501	0.00	0.154	0.972	0.16
	Post-complexity	21	-0.073	0.501	-0.15	-0.324	0.972	-0.33
	Post-accuracy	21	0.085	0.501	0.17	-1.019	0.972	-1.05
	Post-fluency	21	0.423	0.501	0.84	0.016	0.972	0.02
CG	Pre-complexity	16	0.351	0.564	0.62	-1.080	1.091	-0.99
	Pre-accuracy	16	0.415	0.564	0.74	0.891	1.091	0.82
	Pre-fluency	16	0.382	0.564	0.68	-0.685	1.091	-0.63
	Post-complexity	16	0.269	0.564	0.48	-0.817	1.091	-0.75
	Post-accuracy	16	-0.237	0.564	-0.42	0.028	1.091	0.03
	Post-fluency	16	-0.587	0.564	-1.04	0.568	1.091	0.52

Table 4 Levene's test of equality of error variances pre & posttests

	F	df1	df2	Sig		F	df1	df2	Sig
Pre-complexity	2.308	3	79	0.083	Post-complexity	0.510	3	79	0.677
Pre-accuracy	0.116	3	79	0.950	Post-accuracy	2.680	3	79	0.053
Pre-fluency	2.669	3	79	0.053	Post-fluency	1.196	3	79	0.317

Table 5 Box's test of equality of covariance matrices pre & posttests

Box'M	16.357	Box's M	24.554
F	0.843	F	1.266
df1	18	df1	18
df2	17,322.491	df2	17,322.491
Sig	0.650	Sig	0.199

Table 6 Descriptive statistics; posttests of complexity, accuracy, & fluency by groups

Dependent variable	Group	Mean	Std. error	95% Confidence interval	
				Lower bound	Upper bound
Post-complexity	IACMG	0.545	0.029	0.488	0.602
	IFFG	0.601	0.025	0.551	0.651
	CFFG	0.681	0.028	0.625	0.737
	CG	0.483	0.032	0.418	0.547
Post-accuracy	IACMG	0.462	0.037	0.388	0.537
	IFFG	0.610	0.033	0.545	0.675
	CFFG	0.705	0.036	0.632	0.777
	CG	0.463	0.042	0.380	0.545
Post-fluency	IACMG	6.704	0.289	6.128	7.280
	IFFG	7.527	0.254	7.021	8.032
	CFFG	8.923	0.282	8.361	9.485
	CG	5.917	0.324	5.273	6.561

As shown in Table 7, the results of MANOVA showed that the four groups (IACMG, IFFG, CFFG, CG) were significantly different in their total posttest scores as the observed F value was significant with a large effect size [$F(9, 237) = 5.62, p = 0.000, \text{Partial } \eta^2 = 0.176$]. Therefore, the null hypothesis was rejected.

This study evaluated the effects of the three distinct mediating artifacts IACMG, CFFG, and IFFG on the writing performances of the participants in terms of CAF. The collaborative teaching technique was proven to be superior in all three instances, but the IACMG strategy had no significant beneficial benefits. Regarding the targeted

Table 7 Multivariate tests; posttests of complexity, accuracy, and fluency by groups

Effect		Value	F	Hypo. df	Error df	Sig	Partial eta squared
Intercept	Pillai's trace	0.977	1088.319	3	77	0.000	0.977
	Wilks' lambda	0.023	1088.319	3	77	0.000	0.977
	Hotelling's trace	42.402	1088.319	3	77	0.000	0.977
	Roy's largest root	42.402	1088.319	3	77	0.000	0.977
Group	Pillai's trace	0.528	5.621	9	237.00	0.000	0.176
	Wilks' lambda	0.496	6.963	9	187.54	0.000	0.209
	Hotelling's trace	0.970	8.152	9	227.00	0.000	0.244
	Roy's largest root	0.918	24.181	3	79.00	0.000	0.479

areas of writing performance, the four groups exhibited distinct patterns of performance. Two (CFFG and IFFG) of the four instructional techniques (IACMG, IFFG, CFFG, and CG) exhibited substantial beneficial effects on the writing complexity of the participants, according to statistical analyses. In terms of complexity, the findings demonstrated some development in CFFG, but the other three groups did not demonstrate such development as a result of the teaching.

In terms of the writing performance of the participants, the CFFG surpassed the IACMG. Numerous SLA theories highlight the significance of group work for student progress (Donato, 1994; Ellis, 1994; Glendinning & Howard, 2001; Long, 1983; Schmidt, 1990; Storch, 2002; Swain & Lapkin, 1998; Wigglesworth & Storch, 2009).

In terms of teamwork, this study's findings are consistent with numerous other research (Donato, 1994; Ohta, 2001; Storch, 2002; Swain, 2000). The aforementioned researchers thought that group and pair work allowed for interaction and co-construction of knowledge between students. In addition, Long and Porter (1985) found that students working in pairs or small groups utilized the L2 more than those participating in class activities led by the teacher.

Pair and small group exercises were utilized for instructional purposes in L2 classrooms. Pair work activities gave students more time to speak the target language than teacher-led activities, fostered learner autonomy, and gave teachers opportunities to interact with individual students (Brown, 2001; Long & Porter, 1985). In addition, the degree of anxiousness decreased when students engaged in pair or small group activities as opposed to whole-class talks (Brown, 2001; Willis, 1996).

According to the findings of this study, the CFFG participants fared better than the other three groups. In accordance with the findings of this study, Wigglesworth and Storch (2009) discovered, through the analysis of pair dialogues, that when learners wrote their scripts in pairs, the process of writing enabled them to converse on many aspects of writing. In the process of creating ideas, they also encouraged students to cooperate on the substance of their essays. According to Swain and Lapkin (1995), collaborative groups were more effective at producing meta-talk or "language-related episodes" (p. 378) and chances for output adjustment.

In addition, the availability of peer input and the prospect of dyadic knowledge pooling appeared to increase the likelihood that an issue might be solved through collaborative dialogue (Swain, 2000, 2006). In addition, collaborative writing provided the participants the chance to provide and receive quick feedback on language. This was a missed opportunity when pupils wrote independently. This explains why couples tend to generate more fluent writings than individuals. In addition, empirical research studied how learners' opinions of the effectiveness of pair and small group activities for L2 learning influenced their immediate performance and/or later learning. In addition, the research of pair dialogues by Wigglesworth and Storch (2009) revealed that when learners generated their scripts in pairs, the writing process enabled them to interact on many writing aspects. In the process of creating ideas, they also encouraged students to cooperate on the substance of their essays.

As for the superiority of CFFG's performance over IFFG, IACMG, and CG's written performance, the present study's findings are consistent with those of Jabbarpoor and Tajeddin (2012). However, studies have shown no substantial difference between individual and group output tasks (Storch, 2005; Storch & Wigglesworth, 2007). In light of these findings, Nassaji and Tian (2010) concluded, "collaborative pair work may increase learners' interaction and attention to the target forms, but it may not definitely result in greater learning compared to solitary work" (p. 400). Similarly, Villamil and de Guerrero (1998) found in their study that peer aid can help L2 learners fulfill their revision potential to the degree that their language abilities allowed.

Comparing IACMG and CG to the IFFG learning group, the participants' post-test scores revealed an improvement. This might be justified due to the relevance of the teacher's role in planning, providing, directing, and manipulating necessary support. In this context, Puntambekar and Hubscher (2005) noted that for multi-mediated scaffolding to be effective, instructors must be both domain experts and facilitators. The varied roles of teachers, ranging from adaptable coach to activator, showed the context's significant influence (Wood & Ross, 2006). Consequently, the various responsibilities instructors accepted would depend on the exact step of the scaffolding progression.

Moreover, Feuerstein drew a contrast between the roles of instructors in SCT and those in regular education (2000). In a typical classroom, the student is exposed to a stimulus. In order for the learner's thought process to be effective, the mediator must pay close attention to the essential meditational principles of intentionality, reciprocity, mediation of meaning, and transcendence (Feuerstein, 2000; Kozulin, 2003). Also, the mediation's focus on the emotive dimension of learning and aspects such as individual differentiation, behavior management, goal setting, awareness improvement, and a sense of belonging forms a stark difference with prior conventional methods.

In spite of the favorable outcomes for pair work activities in this study, researchers noted that students preferred to rely on their professors for L2 information rather than seeing their peers as a useful way of language acquisition (Davis, 1997; Fotos, 1994; Mackey et al., 2001; Williams, 1999).

The instructor's or student's explanation may have an influence on the meditational tool. Aleven and Keondinger (2002) performed a research in which students utilized explanation as a meditational technique to facilitate their learning. They noted that explanation improves students' comprehension of problem-solving activities. The results suggested that CFFG progressed following the training. There was a considerable improvement in CFFG writing performance between the pretest and posttest. In addition, according to the statistical study, the participants' CAF writing skill improved.

In addition, IFFG participants fared better than IACMG members. This may be connected to the fact that the teacher serves as a role model for the pupils in the classroom. The cognitive and procedural character of modeling makes it a vital tool for scaffolding (Pawan, 2008). Even the teacher's motions in the classroom might be considered a sort of physical engagement. Significantly enhancing communication

with motivational function and comprehension with cognitive function are gestures (Mc Cafferty, 2002; Thompson, 2012, 2013). In addition, Mccafferty (2002) emphasized the mediational function of gestures. He stressed that gestures could be used as lexical elements, that they added a dramatic, playful character to encounters, and that they were reflections of mind (Cook & Meadow, 2006; Meadow & Wagner, 2005).

When IACMG was the subject of this investigation, the results suggested that IACMG did not demonstrate improvement following teaching. There was no significant change between the pre- and post-test writing performance of IACMG learners in terms of CAF.

This research supports the conclusions of (Chen, 2005; Harris & Parrish, 2006; Young & Duncan, 2014). They contrasted an online course to classroom-based education. In class, the individuals achieved much higher marks, indicating a significant change in their learning outcomes.

However, this study's conclusions are not consistent with Nutta (1998). Nutta (1998) compared the effects of computer-based vs teacher-led ESL education. The outcomes demonstrated that computer-based pupils performed better than teacher-led students.

5 Conclusions

Based on the findings of this study, the CFFG performed better than the other three groups (IACMG, IFFG, and CG), and the writing performance of the participants improved in terms of CAF. Research supports the considerable influence that collaborative writing has on the writing performance of students (DiCamilla & Anton, 1997; Donato, 1994; Storch, 2002; Swain & Lapkin, 1998). Various research supported the utilization of pair and small group activities. For instance, the interaction hypothesis (Gass, 1997; Pica, 1994) supports the notion that interaction can greatly facilitate L2 learning by providing learners with negative feedback, focusing on language form in the context of meaning, and encouraging learners to create complex and accurate forms of language.

Several theoretical approaches to L2 acquisition make it evident that pair and small group activities generate learning opportunities through various interactional characteristics that occur when learners engage in the conveyance of meaning. In addition, small group and pair work activities have received substantial theoretical and methodological support in L2 classrooms. In the paradigm of constructivists, for instance, interaction was regarded one of the means through which the idea of mediation might be achieved. Peer-to-peer interaction was one of the potential mediators. Literature has heavily stressed the crucial significance of social environment and the interdependent linkages between an individual's development and learning (Johnson, 2009; Kramsch, 2000; Lantolf, 2000a, b; Lave, 1991; Packer & Goicoechea, 2000; Rogoff, 1990; Walqui, 2006; Yim & Warschauer, 2017). Moreover, the dynamic nature of scaffolding with a strong emphasis on collaboration, the provision of mediation as tools-and-results (i.e., the inseparability of the interactive

process and the product), and the creation of ZPDs within which appropriate assistance is provided, highlighted the significance of social interaction (Askew, 2007; Chaiklin, 2003; Daniels, 2007; Lidz, 1991; Michell & Sharpe, 2005; Van Lier, 1996, 2007; Wood, 1998).

The use of instructional discourse in which teachers' and students' views and understandings converged to advance students toward their ZPDs' stated goals made scaffolding more successful (Aljaafreh & Lantolf, 1994; Anton, 1999; Frawley & Lantolf, 1984; Kramsch, 2000; Nassaji & Swain, 2000; Thrap, 1993). The detailed and exhaustive evaluation of collaboration inside ZPD required consideration of a number of interconnected elements. In this context, Gibbons (2012) and Panselinas and Komis (2009) emphasized the collaborative character of the scaffolding procedure via which teachers and students co-constructed knowledge.

The utilization of pair work activities was consistent with a social constructivist approach of learning, from a theoretical standpoint. However, peer-to-peer scaffolding also happened while working in groups or couples (Donato, 1994; Storch, 2002). Therefore, under this paradigm, learners should be encouraged to complete tasks collaboratively through interaction. Storch (2005) concluded, from a pedagogical standpoint, that the utilization of pair work was supported by a communicative approach to L2 education and its stress on providing learners with opportunities to utilize the L2. The findings indicated the participatory and social nature of such behaviours. According to Storch (2002), when working in pairs, students can support one another's performance. This sort of scaffolding happened when the interaction between couples followed one of two patterns: an expert/novice pattern or a collaborative pattern.

It is important to note that peer critique played an important part in the writing process. Peer response exercises provided students with additional opportunities to explore concepts, discover the best words to communicate their views, and negotiate with their readers. Several writing experts endorse the use of peer feedback in the writing of students (Celce-Murcia, 2001; Richards & Lockhart, 1994; Ur, 1996). For instance, Richards and Lockhart (1994) suggested that in a writing course, after finishing a first draft, students may collaborate in pairs to read each other's papers and offer recommendations for improvement. In addition, Zeng (2006) categorized the advantages of peer feedback as cognitive, linguistic, and social. In terms of linguistic advantages, Zeng (2006) showed that collaborative group output provided students with great opportunity to develop their reading and writing skills. In addition, Villamil and de Guerrero (1998) found that peer aid assisted L2 learners in recognizing their potential for effective revision based on their language talents. One of the benefits of cooperation is that participants acquire self-confidence and self-esteem; their tolerance for other viewpoints increases, and they like the non-threatening setting of working in small groups (Hedgecock & Lefkowitz, 1992; Romney, 2000). Hedgecock and Lefkowitz (1992) highlighted a number of academics whose "empirical findings imply that collaborating with peers improves revision processes and, consequently, results in higher quality output" (p. 257).

Watson (2007), in preparing a framework for SCT-based teaching practice, proposed a broad guideline comprising five macro-strategies within which instructors might innovate and build their own context-based micro-strategies. The proposed macro-strategies were: (1) fostering learners' self-awareness and autonomy through goal-setting and motivation enhancement; (2) emphasizing individual differences; (3) providing learning affordances or a variety of linguistic as well as social, historical, and cultural opportunities where individualized learning is possible; (4) facilitating collaborative problem-solving through scaffolding or the expert-novice interaction within the learners' zones of proximal development (ZPDs); and (5) promoting the development of learners' dispositions. Paying close attention to the multicultural nature of SLA environments (Daniels & Shumow, 2003) and culturally and socially activated learners (Freeman & Freeman, 2000) were the key factors that made the teachers' contribution more delicate and altered the authorities' perceptions of the ideal teacher. Even in peer-scaffolding environments, teachers' crucial role could not be neglected. As Klinger and Vaughn (2000) noted, the constructive effect of collaborative learning is not automatic; teachers must create the environment, supervise the groups, and modify the implementation techniques in order to get the intended result. The aforementioned research indicated that teachers must continually self-evaluate and work to address their instructional shortcomings. According to Johnson (2009), the responsibilities of instructors must be redesigned in accordance with SCT in order to transition learners from subject matter experts into novice teachers. In addition, teachers of foreign and second languages examined new methods for assisting students in learning a new language. With the introduction of new technology in the field of language teaching classes that supported both synchronous and asynchronous communication, course construction programs underwent significant changes. Writing and technology have mostly focused on computer programs and tools such as word processors, e-mails, online chats, message board debates, and Web page initiatives.

This study's findings have clear implications for the teaching of English in general and writing in particular. The study primarily provided insight on the concept of mediating artifacts and how it may be related to the development of L2 writing proficiency. In addition, the application of interaction in the teaching of L2 writing would be a suitable answer to the issues confronting English writing classrooms in Iran.

Specifically, this study sought to contribute to SCT-based research on the concept of group learning. The study highlighted the distinction between individual and group ZPD and demonstrated how a group of learners, as opposed to individual learners, acted collaboratively toward a common goal and shared responsibility in completing a task. This outcome might be seen as an indicator of shifting the activity from the individual learner to the group, consistent with the fundamental concept of Group DA, which advanced the group while concurrently aiding the individuals (Poehner, 2009).

Despite the findings of many research (Blake, 2000; Kelm, 1992) that computer-mediated communication (CMC) was a valuable instructional tool, Lantolf and Thorne (2006) contended that CMC did not ensure a better degree of participation

in exchanges between learners. Less-confident students profited from CMC classes; such students may find the CMC context more suited to their personalities (Lantolf & Thorne, 2006). Since CMC lowered performance pressure and learner anxiety, the majority of students perceived it to be more difficult than other modes of education (collaboration and face-to-face communication).

In addition, computers might play a significant role in teaching EFL writing ability. Using computers as a teaching tool saves teachers time and effort, and instructors simply need to watch students and provide comments without making them bored. Gruba (2004) suggested that a teacher would operate as a mediator between students and the computer during the learning process. One of the primary reasons EFL teachers cited for employing CALL was that learners may benefit from computers even in the absence of the instructor (Pennington, 1989).

The outcomes of this study indicate that instructors' advice aids students' learning processes. In addition, interaction should be emphasized to aid teachers in fostering the growth of their students. In doing so, it is important to emphasize co-construction of their language expertise. Consequently, this study may have paved the way for teachers by making them aware of their facilitative role as teachers and how to scaffold their students' writing processes. In addition, the integration of the methods and functions with the course contents introduces students to various mediational techniques that may eventually be internalized.

Within a sociocultural context, the outcomes of this study highlighted the significance of DA in L2 writing research, which is another addition of the current study to the field. In accordance with the majority of DA-based studies (Ableeva, 2010; Ahmed, 1994; Anton, 2003; Poehner, 2005), this study supported the efficacy of DA and offered L2 writing teachers with significant insights into the help of peers. It would be beneficial if the information received from the diagnostic on the shortcomings and strengths of the pupils was utilized to organize and structure instructional material.

Consideration of discourse analysis on peer-peer and student-teacher interaction would be an additional intriguing area of research. These relationships might also be investigated if the students worked in various contexts of mediation. In addition, the speech employed by pairs of males might be contrasted to that of pairs of females or male-female groupings. Future researchers could transcribe interaction sessions to identify the mediations given by peers in each pair, differentiate teacher mediation from peer mediation, and then examine them in terms of the typology of peer mediational moves/strategies in order to examine the type of mediation each pair receives from the peer in a joint activity.

The attitudes of learners about collaborative writing and the use of computer-assisted devices in their instructional programs, particularly writing courses, are another area of research that need greater examination. Very few studies have compared the attitudes of learners toward selecting the optimal medium of instruction for composition production. However, this study did not investigate the mindset of the learners; other researchers could investigate this topic. Furthermore, learners' impressions of the effectiveness of CALL, pair and small group activities for L2 learning might be investigated empirically. Consideration might also be given to

determining whether or not their views affected their performance and/or subsequent learning.

Besides, the sort of feedback that CALL groups can receive in comparison to collaborative groups and face-to-face groups is an interesting field of investigation. Consequently, the effect it may have on their writing skills is a subject worthy of further study. After completing the task, three experimental groups in the current study got written direct/indirect correction comments. For more research on the impact of written Corrective Feedback in general and the various sorts of Corrective Feedback, well-designed trials are required. The interested academics might conduct a comprehensive examination of the influence of different types or combinations of CF on student writing skills.

The implementation of electronic feedback in CALL classes and a comparison of the effectiveness of this sort of feedback to that of other types of input might be another area requiring more research. In Electronic feedback, the instructor indicates an error and provides a link to a database file containing examples of proper form (Milton, 2006). The researcher offers an additional line of inquiry in which learners in each of the experimental groups might receive both oral implicit and explicit CF. Furthermore, another area that remained unexplored in this study and is therefore worthy of consideration is oral CF (implicit or explicit) that could be provided to learners while they are performing the task to determine whether it could be as effective as the graduated feedback provided in accordance with the principles of the SCT paradigm.

References

- Ableeva, R. (2010). *Dynamic Assessment of listening comprehension in second language learning*. Unpublished doctoral dissertation, The Pennsylvania State University, University Park, University Park.
- Ahmed, M. K. (1994). Speaking as cognitive regulation: A Vygotskian perspective on dialogic communication. In J. P. Lantolf & G. Appel (Eds.), *Vygotskian approaches to second language research* (pp. 157–172). Ablex.
- Aleven, V., & Koedinger, K. R. (2002). An effective metacognitive strategy: Learning by doing and explaining with a computer-based Cognitive Tutor. *Cognitive Science*, 26, 147–179.
- Aljaafreh, A., & Lantolf, J. P. (1994). Negative feedback as regular and second language learning in the zone of proximal development. *The Modern Language Journal*, 78, 465–483.
- Anton, M. (1999). The discourse of a learner-centered classroom: Sociocultural perspectives on teacher learner interaction in the second language classroom. *The Modern Language Journal*, 83(3), 303–318.
- Anton, M. (2003). *Dynamic assessment of advanced foreign language learners*. Paper presented at the American Association of Applied Linguistics.
- Askew, M. (2007). Scaffolding revisited: From tool for result to tool-and-result. In J. Woo, H. Lew, K. Park & D. Seo (Eds.), *Proceedings of the 31st Conference of the International Group for the Psychology of Mathematics Education* (pp. 33–40). Seoul: The Korea Society of Educational Studies in Mathematics.

- Bae, J., & Bachman, L. F. (1998). A latent variable approach to listening and reading: Testing factorial invariance across two groups of children in the Korean/English two-way immersion program. *Language Testing*, 15, 380–414.
- Bagherpour, N., & Rashtchi, M. (2017). The Impact of Three Different Types of Mediational Artifact on EFL Learners' Writing Fluency. *Journal of Foreign Language Research*, 7(1), 27–52.
- Beatty, K. (2003). Computers in the language classroom. In D. Nunan (Ed.), *Practical English language teaching* (pp. 247–266). McGraw-Hill.
- Blake, R. (2000). Computer mediated communication: A window on L2 Spanish interlanguage. *Language Learning and Technology*, 4, 120–136.
- Brown, H. D. (2001). *Teaching by principles: An interactive approach to language pedagogy*. Longman.
- Campbell, A. P. (2003). Weblogs for use with ESL classes. *TSEL-EJ*, 9(2). Retrieved from <http://iteslj.org/Techniques/Campbell-Weblogs.html>
- Campbell, A. P. (2005). Weblog applications for EFL/ESL: Classroom blogging, two fundamental approaches. *TSEL-EJ*, 9(3). Retrieved from <http://www-writing.berkeley.edu/TESL-EJ/ej35/ml.html>
- Celce-Murcia, M. (2001). *Teaching English as a second or foreign language*. Mass.: Heinle & Heinle.
- Chaiklin, S. (2003). The zone of proximal development in vygotsky's analysis of learning and instruction. In A. Kozulin, B. Gindis, V. S. Ageyev, & S. M. Miller (Eds.), *Vygotsky's educational theory in cultural context* (pp. 39–64). Cambridge University Press.
- Chapelle, C., & Jamieson, J. (1986). Computer-assisted language learning as a predictor of success in acquiring English as a second language. *TESOL Quarterly*, 20(1), 26–45.
- Chen, L. (2005). Examining the role of computers in EFL instruction. *Electronic Journal for the Integration of Technology in Education*, 4, 30–63.
- Clay, M., & Cazden, C. (1992). A Vygotskian interpretation of reading recovery. In L. C. Moll (Ed.), *Vygotsky and education: Instructional implications and applications of socio-historical psychology* (pp. 206–222). Cambridge University Press.
- Cook, S. W., & Meadow, S. G. (2006). The role of gesture in learning: Do children use their hands to change their minds? *Journal of Cognition and development*, 7, 211–232.
- Daniels, H. (2007). Pedagogy. In H. Daniels, M. Cole & J. V. Wertsch (Eds.), *The Cambridge companion to Vygotsky* (pp. 307–331). Cambridge: Cambridge University Press.
- Daniels, D. H., & Shumow, L. (2003). Child development and classroom teaching: A review of the literature and implications for educating teachers. *Applied Developmental Psychology*, 23, 495–526.
- Davis, R. (1997). Group work is NOT busy work: Maximizing success of group work in the L2 classroom. *Foreign Language Annals*, 30, 265–279.
- DiCamilla, F. J., & Anton, M. (1997). Repetition in collaborative discourse of L2 learners: A Vygotskian perspective. *The Canadian Modern Language Review*, 53, 609–633.
- Donaldson, R., & Haggstrom, M. A. (2006). *Changing language education through CALL*. Routledge.
- Donato, R. (1994). Collective scaffolding in second language learning. In J. P. Lantolf & G. Appel (Eds.), *Vygotskian approaches to second language research* (pp. 33–56). Ablex.
- Donato, R. (2004). Aspects of collaboration in pedagogical discourse. *Annual Review of Applied Linguistics*, 24, 248–302.
- Ellis, R. (1994). *The study of second language acquisition*. Oxford University Press.
- Ellis, R. (2003). *Task-based language learning and teaching*. Oxford University Press.
- Ferris, D. (2003). *Response to student writing: Implications for second language students*. Lawrence Erlbaum.
- Feuerstein, R. S. (2000). Mediated learning experience, instrumental enrichment and the learning propensity assessment device. In *Interdisciplinary counsel on development and learning disorders, ICDLclinical practice guidelines: Redefining the standards of care for infants, children, and*

- families with special needs* (pp. 557–578). MD: The Interdisciplinary Council on Development and Learning Disorders.
- Flower, L., & Hayes, J. R. (1981). A cognitive process theory of writing. *College Composition and Communication*, 32(4), 365–387.
- Flower, L., & Hayes, J. (1984). Image, plans, and prose: The representation of meaning in writing. *Written Communication*, 1, 120–160.
- Fotos, S. (1994). Integrating grammar instruction and communicative language use through grammar consciousness-raising tasks. *TESOL Quarterly*, 28, 323–351.
- Frankley, W., & Lantolf, J. P. (1984). Speaking and self-order: A critique of orthodox L2 research. *Studies in Second Language Acquisition*, 6, 143–159.
- Freeman, D. E., & Freeman, Y. S. (2000). *Teaching reading in multilingual classrooms*. Heinemann.
- Fregeau, L. A. (1999). Preparing ESL students for college writing: Two case studies. *The Internet TESL Journal: (On-line)* 5(10). Retrieved from the World Wide Web: <http://iteslj.org/Articles/Fregeau-CollegeWriting.html>.
- Gass, S. (1997). *Input, interaction and the second language learner*. Routledge, Taylor & Francis Group.
- Gibbons, S. (2012). Mediating language learning: Teacher interactions with ESL students in a content-based classroom. *TESOL Quarterly*, 37(2), 247–273.
- Glendinning, E., & Howard, R. (2001). Examining the intangible process: Lotus Screen Cam as an aid to investigating student writing. *Edinburgh Working Papers in Applied Linguistics*, 11, 42–58.
- Gruba, P. (2004). Understanding digitized second language videotext. *Computer-Assisted Language Learning*, 17(1), 51–82.
- Harris, D., & Parrish, D. (2006). The art of online teaching: Online instruction versus in-class instruction. *Journal of Technology in Human Services*, 24(2), 105–117.
- Hedgecock, J., & Lefkowitz, N. (1992). Collaborative oral/aural revision in foreign language writing instruction. *Journal of Second Language Writing*, 1(3), 255–276.
- Hyland, K. (2003). *Second language writing*. Cambridge University Press.
- Hunt, K. (1966). Recent measures in syntactic development. *Elementary English*, 43, 732–739.
- Jabbarpour, S., & Tajeddin, Z. (2012). Enhanced input, individual output, and collaborative output: Effects on the acquisition of the English subjunctive mood. *Revista Signos*, 46, 213–235.
- Johnson, A. (2004). Creating a writing course utilizing class and student blogs. *The Internet TESL Journal*, 10(8). Retrieved from <http://iteslj.org/Techniques/Johnson-Blogs/>.
- Johnson, K. E. (2009). *Second language teacher education: Sociocultural perspective*. Routledge.
- Kelm, O. (1992). The use of synchronous and computer-networks in second language instruction: A preliminary report. *Foreign Language Annals*, 25(5), 441–454.
- Khosravi, R., Bagherpour, N., & Kaveh, J. (2021). Listening assessment task types, time-on-task, and the use of listening strategies among Iranian EFL learners. *Iranian Journal of Applied Language Studies*, 13(2), 53–68. <https://doi.org/10.22111/ijals.2021.6823>
- Klinger, J. K., & Vaughn, S. (2000). The helping behaviors of fifth graders while using collaborative strategic reading during ESL content classes. *TESOL Quarterly*, 34(1), 69–98.
- Kozulin, A. (2003). Psychological tools and mediated learning. In A. Kozulin, B. Gindis, V. Ageyev, & S. Miller (Eds.), *Vygotsky's educational theory in cultural context* (pp. 15–38). Cambridge University Press.
- Kramsch, C. (2000). Social discursive constructions of self in L2 learning. In J. Lantolf (Ed.), *Sociocultural theory and second language learning* (pp. 133–153). Oxford University Press.
- Lantolf, J. P. (2000a). Introducing sociocultural theory. In J. P. Lantolf (Ed.), *Sociocultural theory and second language acquisition* (pp. 1–24). Oxford University Press.
- Lantolf, J. P. (2000b). Second language learning as a mediated process. *Language Teaching*, 33(2), 79–96.
- Lantolf, J. P., & Thorne, S. L. (2006). *Sociocultural theory and the genesis of second language development*. Oxford University Press.
- Lave, J. (1991). Situating learning in communities of practice. In L.B. Resnick, J. M. Levine & S. Teasley (Eds.), *Perspectives on socially shared cognition*

- Lee, I. (1997). ESL learners' performance in error correction in writing. *System*, 25(4), 465–477.
- Lidz, C. S. (1991). *Practitioner's guide to dynamic assessment*. Guilford.
- Long, M. (1983). Native speaker/ non-native speaker conversation and negotiation of comprehensible input. *Applied Linguistics*, 4(2), 126–141.
- Long, M., & Porter, P. A. (1985). Group work, interlanguage talk, and second language acquisition. *TESOL Quarterly*, 19(2), 207–227.
- Mackey, A., McDonough, K., Fuji, A., & Tatsumi, T. (2001). Investigating learners' reports about the L2 classroom. *IRAL*, 39, 285–307.
- Mason, R., & Rennie, F. (2008). *E-learning and social networking handbook resources for higher education*. Routledge Taylor and Francis Group.
- Matsuda, P. K. (2003). Second language writing in the twentieth century: A situated historical perspective. In B. Kroll (Ed.), *Exploring the dynamics of second language writing* (pp. 15–34). Cambridge: Cambridge University Press.
- Mc Cafferty, S. G. (1992). The use of private speech by adult second language learners: Across-cultural study. *The Modern Language Journal*, 76, 179–189.
- Mc Cafferty, S. G. (1994). Adult second language learners' use of private speech: Are view of studies. *The Modern Language Journal*, 78(4), 421–436.
- Mc Cafferty, S. G. (2002). Gesture and creating zones of proximal development for second language learning. *The Modern Language Journal*, 86(2), 192–203.
- Meadow, S. G., & Wagner, S. M. (2005). How our hands help us learn. *Trends in Cognitive Sciences*, 9(5), 234–241.
- Michell, M., & Sharpe, T. (2005). Collective instructional scaffolding in English as a Second language classrooms. *Prospect*, 20(1), 31–58.
- Nassaji, H., & Swain, M. (2000). A Vygotskian perspective on corrective feedback: The effect of random versus negotiated help on the learning of English articles. *Language Awareness*, 9, 34–51.
- Nassaji, H., & Tian, J. (2010). Collaborative and individual output tasks and their effects on learning English phrasal verbs. *Language Teaching Research*, 14(4), 397–419.
- Nunan, D. (2011). Shifting sands: The evolving story of “voice” in qualitative research. In E. Hinkel (Ed.), *The handbook of research in second language teaching and learning* (pp. 190–207). New Jersey: Lawrence Erlbaum.
- Nutta, J. (1998). Is computer-based grammar instruction as effective as teacher-directed grammar instruction for teaching L2 structures? *CALICO Journal*, 16(1), 49–62.
- Ohta, A. S. (2001). *Second language acquisition processes in the classroom: Learning Japanese*. Lawrence Erlbaum.
- Packer, M. J., & Goicoechea, J. (2000). Sociocultural and constructivist theories of learning: Ontology, not just epistemology. *Educational Psychologists*, 35(4), 227–241.
- Pae, J. K. (2011). Collaborative writing versus individual writing: Fluency, accuracy, complexity, and essay score. *Multimedia-Assisted Language Learning*, 14(1), 121–148.
- Panahi, P., Birjandi, P., & Azabdaftari, B. (2013). Toward a sociocultural approach to feedback provision in L2 writing classrooms: The alignment of dynamic assessment and teacher error feedback. *Language Testing in Asia*, 3, 1–13. <https://doi.org/10.1186/2229-0443-3-13>
- Panselinas, G., & Komis, V. (2009). Scaffolding through talk in group work learning. *Thinking Skills and Creativity*, 4, 86–103.
- Pawan, F. (2008). Content-area teachers and scaffolded instruction for English language learners. *Teacher and Teacher Education*, 24(6), 1450–1462.
- Pennington, M. (1989). *Teaching languages with computers: the state of the art*. La Jolla, CA: Athelstan.
- Pica, T. (1994). Review article: Research on negotiation: What does it reveal about second-language learning conditions, processes, and outcomes? *Language Learning*, 44, 493–527.
- Poehner, M. E. (2005). *Dynamic assessment of oral proficiency among advanced L2 learners of French*. Unpublished dissertation, Pennsylvania State University, University Park.
- Poehner, M. E. (2008). *Dynamic assessment: A Vygotskian approach to understanding and promoting L2 development*. Springer.

- Poehner, M. E. (2009). Group dynamic assessment: Mediation for the L2 classroom. *TESOL Quarterly*, 43(3), 471–491.
- Poehner, M. E., & Lantolf, J. P. (2005). Dynamic assessment in the language classroom. *Language Teaching Research*, 9(3), 233–265.
- Polio, C. (1997). Measures of linguistic accuracy in second language writing research. *Language Learning*, 47(1), 101–143.
- Puntambekar, S., & Hubscher, R. (2005). Tools for scaffolding students in a complex learning environment: What have we gained and what have we missed? *Educational Psychologist*, 40(1), 1–12.
- Richards, J. C., & Lockhart, C. (1994). *Reflective teaching in second language classrooms*. Cambridge University Press.
- Robinson, P. (2001). Task complexity, task difficulty, and task production: Exploring interactions in a componential framework. *Applied Linguistics*, 22(1), 27–57.
- Robinson, P. (2003). Attention and memory during SLA. In C. Doughty & M. H. Long (Eds.), *Handbook of Second Language Acquisition* (pp. 631–678). Oxford University Press.
- Robinson, P. (2005a). Cognitive complexity and task sequencing: A review of studies in a Componential Framework for second language task design. *International Review of Applied Linguistics in Language Teaching*, 43(1), 1–33.
- Rogoff, B. (1990). *Apprenticeship in thinking: Cognitive development in social context*. Oxford University Press.
- Romney, J. C. (2000). Collaborative learning in a translation class. *The Canadian Modern Language Review*, 54(1), 48–67.
- Schmidt, R. (1990). The role of consciousness in second language learning. *Applied Linguistics*, 11(2), 192–196.
- Silva, T., & Matsuda, P. K. (2002). Writing. In N. Schmitt (Ed.), *An introduction to applied linguistics* (pp. 251–266). London: Arnold.
- Skehan, P. (1996). A framework for the implementation of task-based learning. *Applied Linguistics*, 17(1), 38–62.
- Storch, N. (2002). Pattern of interaction in ESL pair work. *Language Learning*, 52(1), 119–158.
- Storch, N. (2005). Collaborative writing: Product, process, and students' reflections. *Journal of Second Language Writing*, 14(2), 153–173.
- Storch, N., & Wigglesworth, G. (2007). Writing tasks and the effects of collaboration. In M. Pillar (Ed.), *Investigating tasks in formal language settings* (pp. 157–177). Clevedon: Multilingual Matters.
- Swain, M. (2000). The output hypothesis and beyond: Mediating acquisition through collaborative dialogue. In J. P. Lantolf (Ed.), *Sociocultural theory and second language learning* (pp. 97–114). Oxford University Press.
- Swain, M. (2001). Examining dialogue: Another approach to content specification and to validating inferences drawn from test scores. *Language Testing*, 18(3), 275–302.
- Swain, M. (2006). Linguaging, agency and collaboration in advanced language proficiency. In H. Byrnes (Ed.), *Advanced language learning: The contribution of Halliday and Vygotsky* (pp. 95–108). Continuum.
- Swain, M., & Lapkin, S. (1995). Problems in output and the cognitive processes they generate: A step towards second language learning. *Applied Linguistics*, 16(3), 371–391.
- Swain, M., & Lapkin, S. (1998). Interaction and second language learning: Two adolescent French immersion students working together. *The Modern Language Journal*, 82(3), 320–337.
- Swain, M., & Lapkin, S. (2002). Talking it through: Two French immersion learners' response to reformulation. *International Journal of Educational Research*, 37(3), 285–304.
- Thompson, I. (2012). Planes of communicative activity in collaborative writing. *Changing English*, 19(2), 209–220.
- Thompson, B. (2013). Overview of traditional/classical statistical approaches. In T. Little (Ed.), *The Oxford handbook of quantitative methods* (Vol. 1–2, pp. 7–25). New York, NY: Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780199934898.013.0002>

- Thrap, R. G. (1993). Institutional and social context of educational practice and reform. In E. A. Forman, N. Minick, & C. A. Stone (Eds.), *Context for learning: Sociocultural dynamics in children's development* (pp. 269–282). Oxford University Press.
- Tuzi, F. (2004). The Impact of e-feedback on the revisions of L2 writers in an academic writing course. *Computers and Composition*, 21(2), 217–235.
- Ur, P. (1996). *A course in language teaching: Practice and theory*. Cambridge University Press.
- Van Lier, L. (1996). *Interaction in the language curriculum: Awareness, autonomy, and authenticity*. Longman Group Limited.
- Van Lier, L. (2004). *The ecology and semiotics of language learning: A sociocultural perspective*. Kluwer Academic Publishers.
- Van Lier, L. (2007). Action-based teaching, autonomy, and identity. *Innovation in Language Learning and Teaching*, 1(1), 46–65.
- Villamil, O. S., & de Guerrero, M. C. (1998). Assessing the impact of peer revision on L2 writing. *Applied Linguistics*, 19(4), 491–514.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.
- Walqui, A. (2006). Scaffolding instruction for English learners: A conceptual framework. *International Journal of Bilingual Education and Bilingualism*, 9(2), 159–180.
- Watson, J. R. (2007). *Applying sociocultural theory to a language classroom environment with second-year students of college Russian*. Unpublished doctoral dissertation, Bryn Mawr College-Pennsylvania.
- Weigle, S. C. (2002). *Assessing writing*. Cambridge University Press.
- Wigglesworth, G., & Storch, N. (2009). Pair versus individual writing: Effects on fluency, complexity and accuracy. *Language Testing*, 26(3), 445–466.
- Williams, J. (1999). Learner-generated attention to form. *Language Learning*, 49, 583–625.
- Willis, J. (1996). *A Framework for Task-based Learning*. Longman.
- Wood, D. (1998). *How children think and learn: The social contexts of cognitive development* (2nd ed.). Oxford University Press.
- Wood, D., & Ross, G. (2006). The role of tutoring in problem solving. The selected works of Jerome S. Bruner In J. S. Bruner (Ed.), *In search of pedagogy* (Vol. I, pp. 198–208). Routledge, Taylor & Francis Group.
- Yim, S., & Warschauer, M. (2017). Web-based collaborative writing in L2 contexts: Methodological insights from text mining. *Language Learning & Technology*, 21(1), 146–165. Retrieved from <http://llt.msu.edu/issues/february2017/yimwarschauer.pdf>.
- Young, S., & Duncan, H. E. (2014). Online and face-to-face teaching: How do student ratings differ? *MERLOT Journal of Online Learning and Teaching*, 10(1), 70–79.
- Zeiss, E., & Isabelli, G. (2005). The role of asynchronous computer mediated communication on enhancing cultural awareness. *Computer Assisted Language Learning*, 18(3), 151–169.
- Zeng, Y. (2006). Peer feedback in college SLW classroom. *Sino-US English Teaching*, 27(3) Retrieved from: <http://www.airitilibrary.com/Publication/alDetailedMesh?docid=15398072-200603-3-3-1-6-a>.

Pre-service EFL Teachers' Perceptions Towards Online Education and Online Teaching Writing Skills During the Covid-19 Pandemic: A Phenomenological Research



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1 Introduction

Distance education is defined as a type of education in which teachers and learners do not interact on a face-to-face basis. Still, they use distance learning modes such as (e)mailing, video or audio conferencing, radio, television, and the Internet for communication instead (Malik, 2015). In this form of education, learners are mostly separated physically from their teachers, peers, and other educational institutions. Learning can be conducted individually, in groups with/out teachers. Learners have to use Web-based technologies to fulfill the necessities of courses (Yılmaz, 2019). Distance education necessitates learners to take responsibility to follow lessons (Zhao et al., 2014).

Distance instruction features a long history; at first, it started as correspondence courses in which understudies were generally conducted freely, perusing assignments and then submitting them to the teachers via mail. However, recent innovations in technology have created modern alternatives for conveying remote instruction available (Effken, 2008). In distant education, the leading roles of teachers change, and learners become the central figures in searching for and learning new instruction (Guohong et al., 2012).

The widespread use of information technology such as television, computer, and communication networks resulted in dramatic changes in people's living and learning habits (Guohong et al., 2012). Computer software and Web-based tools have become increasingly common in educational environments as they have progressed rapidly in various forms and purposes (Liu et al., 2019). Over a long time, the expanding ubiquity of Web technology has enabled an increasing number of learners to reach university education through remote instruction (Fengliang & Liang, 2019). The

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traditional teacher-directed teaching paradigm is being replaced by long-distance open education, based chiefly on modern information technology and multimedia technologies. Students can learn via satellite television or a computer network, with all instructional materials available for self-study (Liu et al., 2019).

Distance education based on the interaction types can be divided into two synchronous and asynchronous modes depending on the interaction type between teachers and learners. In synchronous learning, individuals can communicate online instantaneously at the same time though they are physically separated. Synchronous learning is performed through computer-based technologies and digital tools (Hrastinski, 2008; Tallent-Runnels et al., 2006). However, asynchronous learning is characterized by delayed communication between teachers and learners. In asynchronous learning, communication does not happen concurrently, and the interlocutors interact at different times through various communication technologies (Hrastinski, 2008; Wang & Wang, 2021). Synchronous learning helps learners grasp social images through facial expressions, body language, mimics, and gestures, which can foster social bonds and active engagement in communication. Additionally, simultaneous communication limits misunderstanding problems and helps manage time effectively (Peterson et al., 2018; Wang & Wang, 2021). However, the flexibility of asynchronous learning stemming from its communication format enables learners to learn in more comfortable environments. Learners have relatively more time to get prepared for the communication, and they can make up miscommunication by proceeding forward and backward, which in turn leads to more successful communication. This learning model is appropriate, especially for the learners who have communication and socialization problems due to their natures. Nevertheless, it involves several deficiencies due to insufficient audiovisual cues, difficulties in time management, and ineffective communication related to delayed feedback (Belcher, 1999; Echaury-Galván et al., 2021; Marra et al., 2004; Meyer, 2003; Tiene, 2000; Wang & Wang, 2021; Wang & Woo, 2007).

The Covid-19 pandemic started in the last quarter of 2019 in Wuhan City, China. However, its effect has been worldwide as it became a severe pandemic all at once (World Health Organization [WHO], 2020). Everybody, even the ones in the remotest parts of the world, has been affected directly or indirectly by the states' limitations and restrictions to eliminate and stop the deadly consequences of this pandemic. Distancing individuals in crowded places is one of those restrictions. Therefore, authorities aimed to conserve infections in restricted areas to prevent the spreading of the disease. Distancing measures were naturally followed in the education domain as educational institutions are at the center of ordinary life by affecting a whole neighborhood. The risk is even higher when we think of higher education as the mobility of university students' exceeds beyond their neighborhoods.

The Covid-19 pandemic caused uncertainty, fear, and safety and restriction issues among learners and teachers in education environments. As a result, most universities have to shift to distance education as their only way of instruction (Nwabuoku, 2020). Along with other countries, Turkey followed global developments and imposed necessary sanctions on all walks of life. Shifting to distant online education was one of the solutions for limiting transmissions of this contagious disease. Web-based tools

and the Internet enabled teachers and students to continue their educational programs in an online mode without interruptions. Foreign language education courses were one of those theoretical courses followed in an online mode at all levels of education, from primary to tertiary. Online platforms explicitly designed for educational purposes helped teachers and students conduct their foreign language lessons either synchronously or asynchronously without any disruptions. The following research questions guide the present research;

1. What were the pre-service English language teachers' perceptions of online education before the lockdown, and how did they change towards online education through the administration of online education during the Covid-19 pandemic?
2. What do pre-service English language teachers think about online education's pros and cons?
3. What are the pre-service English language teachers' perceptions towards online writing skills teaching, and what do pre-service English language teachers think about online writing skills teaching's pros and cons?

2 Literature Review

This part reviews research studies to outline the current situation in the literature and emphasize that there is a need for our study. We used WoS, ERIC, and SCOPUS as databases to search the target papers. We included only papers from academic journals, peer-reviewed ones between 2020 and 2022, and the ones in English. We reached 57 papers in total. We included 33 of them in the study as the others were not directly related to our study. We divided these papers into five themes: challenges and opportunities, skills, teachers, students, and materials and tools. The following paragraphs give an overall impression regarding research studies during the pandemic.

The first theme involved studies regarding challenges and opportunities faced by learners and teachers in distance education during the pandemic. For example, Ağçam et al. (2021) and Klimova et al. (2021) explored the perceptions of pre-service EFL teachers and EFL students on emergency remote teaching during the pandemic through interviews. The participants reported several challenges as well as opportunities. The challenges involved inefficiency regarding learning, technology, and the environment. The opportunities comprised flexibility, time-saving, appealing to learners in favor of virtual environments, and giving a chance for self-actualization. In addition, the participants preferred face-to-face education to distance education. Also, Yüce (2022) reached similar results in the study investigating EFL learners' perceptions of total digitalization in higher education and reported that the learners favored traditional face-to-face EFL classes. Similarly, Salih and Omar (2020) revealed how university EFL students perceive online instruction in Oman. Survey results showed that students held positive attitudes towards online instruction.

Moreover, Al-Samiri (2021) investigated the effects of moving to online education in Saudi universities. The author reported motivation, technological issues, inapt

learning contexts, and learners' mental health as challenges Saudi EFL learners and teachers face while highlighting flexibility regarding place and time and enhancing specific language skills as benefits of digital learning. Dvořáková et al. (2021) unearthed measures taken by the department of English at South Bohemia University, one of the higher education institutions in Czechia. Questionnaire results centered on satisfaction with remote education, comparing conventional lessons and online lessons, perceived stress levels, and skills acquisition. Students expected guidance, appropriate feedback, and motivation from instructors during remote teaching. Kolesova et al. (2021) investigated the reactions of both teachers and students in terms of the urgent transition to online instruction at St. Petersburg State University in Russia. Survey results showed that most teachers had a high level of adaptability to new teaching modes and materials, while both teachers and students had difficulties with language skill-based instructions. Additionally, Zou et al. (2021) looked at the perceptions of teachers and students regarding EFL online teaching and learning during the pandemic in a university context in China. Questionnaire and interview results reported that both teachers and students favored online teaching by indicating that teachers have more training and skills and high confidence for effective online delivery of instruction.

The second theme comprised studies handling language skills or skills needed by the participants in distance education during the pandemic. For instance, Akhter (2020) explored whether EFL learners studying at different colleges in Saudi Arabia face problems listening skills problems through a questionnaire. Students reported having high levels of difficulty regarding listening skills in online classes. Bayar and Karaduman (2021) questioned students' views on the effectiveness of EFL lessons in distance education by implementing a qualitative inquiry. Students stated that there should be more writing activities, comprehension texts, listening and speaking exercises to obtain fundamental skills in the target language. Bilotserkovets et al. (2021) investigated how EFL learners form media literacy skills during the emergent distance education in Ukraine. This case study revealed reflective-evaluative, collaborative, creative searching skills as positive dynamics in enhancing learners' proficiency in English. Bozavlı (2021) probed the possibility of learning a foreign language without schooling in a distant way, and the type of experiences learners attain in distance learning in Turkey. The data obtained for questionnaires showed that learners think that schools are necessary for learning a foreign language as motivation, and they gain insufficient levels of digital literacy skills in distance teaching. Cabrera-Solano et al. (2021) investigated the application of Pixton EFL writing classes to support instruction in Ecuador. The findings from action research indicated learners' positive perceptions regarding the pedagogical use of Pixton to improve their online writing skills.

Similarly, Chiablaem (2021) explored the views of EFL learners at a Thai university concerning the implementation of G Suite applications in an online English course during the pandemic. The quantitative data from the online questionnaire presented positive experiences in online lessons, and G Suite applications helped them improve their four skills and grammar and lexical knowledge in English. Finally, Mohammed (2022) tried to present an online course model, based on a learning

management tool named NEO, teaching speaking and listening skills to learners of Arabic as a foreign language at a college in South Africa. The course involved activities and resources, and the syllabus consisted of listening, speaking, and conversational Arabic components. Questionnaire results showed that the learners have positive views towards the online course and suggested that it can be a good alternative for teaching speaking and listening skills as it provides numerous technology-enhanced teaching resources.

The third theme focused on studies dealing with language teachers in distance education during the pandemic. For example, Rodríguez Pérez and Heinsch (2021) analyzed how foreign language teachers increase their communicative competences and the competences they need for online instruction. The results obtained from 14 foreign language teachers through diary analysis and interviews indicated that they have difficulties understanding and exercising non-verbal communication and developing class interactions that negatively affect foreign language education. Also, the study revealed teachers' insufficient digital competence training. Albaqami and Alzahrani (2022) examined the readiness of instructors for emergent distance education in Saudi universities by utilizing a mixed-methods involving a questionnaire and semi-structured interviews. The findings unearthed that they favor online tools in teaching EFL; however, they were caught unprepared to acquire new digital skills in a short time of the pandemic, which caused distress in instructors.

Furthermore, Alghamdi (2022) sought elementary school EFL teachers' perceptions of mobile-assisted language learning (MALL) in Saudi Arabia. The results obtained from questionnaire data indicated teachers' positive perceptions regarding MALL during the pandemic. However, most of the teachers reported insufficient skills in designing MALL activities. Fallah et al. (2021) explored EFL teachers' online professional identity types in private institutes during the pandemic in Iran. Semi-structured interview results revealed four characteristics affecting professional identities: competency and self-effectiveness, teacher roles, plans, and appreciation and connection that highly affect the reconstruction of professional identities of the teachers. Inan and Karaca (2021) searched for quality assurance practices in EFL classes in primary education during the sudden remote education in Turkey. The qualitative data reported that the addressed institution adapted to the sudden change thanks to its technology literate young teachers. However, they experienced problems integrating four language skills into the teaching and assessment process. Finally, Darwanto et al. (2021) delved into what skills teachers require to adapt to the new emergent distance education in Spain by following focus group discussions and surveys. The results showed that foreign language teachers have different digital skills levels, and they need training for the new emergent distance education.

The fourth theme discussed studies regarding materials and tools used in distance education during the pandemic. For example, Chen (2021) interrogated Chinese as a foreign language learners' application of scaffolding materials to enhance their learning in an autonomous online context during the pandemic. Data based on reflective reports, online tutorials, and interviews showed that scaffolding materials could facilitate international learners' autonomy in learning Chinese online. Echaury-Galván et al. (2021) reported the reflections of total immersion into a virtual

model from the perspectives of EFL students in higher education in Spain. The study emphasized certain benefits regarding improved knowledge and dealing with ICT tools. Evianty and Sari (2021) investigated the effectiveness of Corel Video Studio as a learning media tool in German reading courses. The learners were asked to prepare assignments through this tool with the primary purpose of developing their abilities. The quantitative analyses showed an essential increase in learning outcomes after using Corel Video Studio. Hanh and Huong (2021) searched for the influence of Flipgrid-based portfolios on high school students' EFL speaking scores in Vietnam through an experimental design. The findings unearthed that the Flipgrid-based portfolios significantly enhanced learners' speaking performances regarding their pronunciation and fluency. Harianja et al. (2021) tried to devise interactive multimedia for French learners at a high school in North Sumatra. The increase in learners' learning outcomes proved the effectiveness of this type of multimedia in foreign language education during the pandemic. Inpeng and Nomnian (2020) tried to enhance learners' language literacy in English, pedagogical knowledge, and ICT skills by integrating Facebook into a Teaching English as a Foreign Language (TEFL) program in a Thai university context. Survey results revealed that pre-service EFL teachers could carry out TEFL classes by benefiting Facebook at a high level.

Similarly, Otto and López-Medina (2021) reported using digital learning logs in preservice teacher training in Madrid. The results showed that most participants believed in the potential of learning logs to follow their learning process and enhance metacognitive awareness and language skills. Furthermore, Shen (2021) explored the implementation of online ICC training in a Chinese university. Data from mixed sources reported that online teaching might help EFL students as an effective way to develop their ICC both during and onwards of the pandemic. Additionally, Shumeiko and Nypadymka (2021) confirmed previous results discussed hereby suggesting the high value of available online resources at university level curricula during the pandemic in their study conducted in Ukraine.

The fifth theme addressed studies in terms of students in distance education during the pandemic. For example, Hundarenko et al. (2022) scrutinized EFL students' views regarding the pandemic-based rapid transition in education at a university in Slovakia. The students favored this new mode of education and expressed their readiness for further blended education. Similarly, Lian et al. (2021) surveyed Chinese EFL learners' perceptions of authentic language learning, self-directed learning, and self-efficacy during the pandemic. The results highlighted students' meaningful learning in technology-based online English courses.

In conclusion, the research studies presented and discussed in this part highlighted a research gap in the literature concerning classroom data concerning the investigation of the asynchronous mode of distance education with specific reference to EFL learners' writing skills during the emergent remote education. The current study aims to fill this gap by providing meaningful insights based on EFL learners' experiences during the pandemic.

3 Methodology

3.1 Research Design

This study employed a qualitative method by following a phenomenological design precisely. Phenomenological research refers to the attempts undertaken by researchers to understand and interpret how individuals experience a specific phenomenon from their perspectives (Lavrakas, 2008; Merriam, 2009).

3.2 Participants

The convenience sampling method was used in the study. This sampling enables researchers to obtain preliminary data quickly and cost-efficiently, and they can provide helpful information (Berg, 2001; Creswell, 2012). The 1st grade students studying at the English Language Teaching (ELT) department of education faculty of a public university in Turkey were the target group. There were two groups of 1st grade, Group A and Group B. Group A comprised 21 students, of which 5 were male students and 16 were female students. Group B comprised 22 students, of which 8 were male students and 14 were female students. The study involved 43 students in total.

3.3 Procedure

The “Writing Skills II” course was conducted face-to-face at the beginning of the spring term of the 2019–2020 academic year until the mid-term exams in March. The course instructor covered a unit every two weeks until the exams, three units total. The week’s subject was covered firstly, and a writing assignment was given for the next week. Writing assignments were checked at their due dates in the classroom, and feedback for each assignment was provided to students individually by the instructor and peers. However, the mid-term exam was the last encounter between the instructor and students. Suddenly, the severe effects of the Covid-19 pandemic forced the whole institution to a remote education. The asynchronous mode was the first type of distance education during those times as the instant move to remote education caught most universities unprepared in terms of technological infrastructure and the digital skills of teachers and learners. From that moment onwards, the course was delivered asynchronously by the instructor. The study topic and related materials were uploaded to the Learning Management System (LMS) of the university for students to study themselves, and next week a writing assignment based on the topic was given to the students. The students were required to upload their assignments to

the same system before the due dates. The process was finalized with three topics and three assignments, which continued for six weeks.

3.4 Data Collection and Analysis

The researchers designed an interview form involving semi-structured interview questions to collect data from the students. The interview forms were emailed to the students to avoid the adverse effects of the pandemic. The students were requested to answer the questions and sent to the researcher via email at their convenience. The results were analyzed through a constant comparative method. Constant comparative analysis refers to developing categories of information in an inductive way (Creswell, 2012; Hewitt-Taylor, 2001). The categories and themes obtained from the qualitative data were coded with the help of MAXQDA software. Sample illustrative quotations from the participants' responses were included under each category to depict the participants' experiences regarding asynchronous distance education.

3.5 Trustworthiness

“Trustworthiness” of the findings was confirmed via peer review and external auditor strategies throughout the data analysis process (Strauss & Corbin, 1998). For example, a peer (a colleague from a different university) was requested to review the findings with the researchers, and the themes remained the same after the reviews. In addition, the researchers consulted several external experts throughout the analyses to reach credible results.

4 Findings and Discussion

The current research utilizes constant comparative analysis to answer the study's research questions. The first question is, “*What were the pre-service English language teachers' perceptions of online education before the lockdown, and how did they change towards online education through the administration of online education during the Covid-19 pandemic?*” Two themes were created to find an answer to the first research question of the study. These themes are “knowledge about online education” and “prefer face-to-face education”. The first theme was created as ‘knowledge about online education’ because the first interview question aimed to find out participants' perceptions of online education and the change in their perceptions with its utilization. The second theme was created as ‘prefer face-to-face education’ because nearly all participants stated that face-to-face education is more efficient than online education. Moreover, pre-service English teachers stated that they

face many problems in online education and prefer face-to-face education instead of online education. The results also indicate that participants did not develop a positive perspective toward online education, despite their positive statements about the benefits of online education. It can be concluded that nearly all participants perceived online education as an obligatory alternative to face-to-face education during the Covid-19 pandemic. Some students' responses are presented below with the related themes;

Knowledge about online education:

S3: *'I had no previous knowledge of online education. All of the training I received before was face-to-face, so the training I experienced in this period was a first for me.'*

S6: *'I do not have a lot of knowledge about it, and I did not use it as a language student.'*

S7: *'Before the Coronavirus disease, I had never experienced any online classes or education styles like the same as most of the students.'*

S11: *'First of all, I actually did not know much about the online education system. I had heard about online courses or lessons but never attended any of them until now.'*

Students' responses to the first and second interview questions indicate that most had no prior knowledge about online education before the Covid-19 pandemic-related lockdown. Moreover, they had not attended an online lesson or course before the obligatory online education administration because of the pandemic. Some participants stated that they used some mobile applications to learn new languages, such as Busuu and Duolingo, but they stated that their experiences with these applications had not lasted for long because the content was not sufficient to develop all language skills.

Prefer face-to-face education:

S2: *'...I learned that no lessons can be more efficient than face-to-face.'*

S4: *'Sometimes, I have got questions to ask professors, and listening to them directly is better.'*

S5: *'I have learned that online education is not very useful for language learning, and language education needs to be a formal education. Also, I have learned that active participation is primary for language education.'*

S8: *'I do not think so, because I confronted many problems during online learning and I understand the importance of formal education.'*

S11: *'During the quarantine, I saw that online learning is not as efficient as formal education. It is hard to understand the topics and keep up with the instructor.'*

The second research question of the current study is, "What do pre-service English language teachers think about online education's pros and cons?". Four themes were created to represent qualitative data on the pros of online education. These themes are: "develop learners' autonomy," "enhance technological literacy," "improve content

knowledge,” and ‘flexibility of learning. “Among all these themes,” enhance technological literacy’ received the lowest repetition rate. The other three themes have too many repetitions from the participants. The pros of online education show that online education develops learner autonomy. Participants stated that online education made them more disciplined and responsible. Moreover, they thought that students should study individually to make progress in their language learning. Additionally, they said that time management is another important issue in online education. The second critical finding is that most participants thought that online education provides rich content that can be available without time and place limitations. Moreover, they thought they could access too many information sources in online education; either the instructor had provided the content, or they had searched themselves. Among all these four themes for the pros of online education, the flexibility of learning theme has the most repeated theme. Finally, the participants stated that online education gives them the freedom to learn the course content whenever and wherever they want. In other words, they mentioned that they could watch the video lessons even in their pyjamas at home in comfort.

Advantages of online education;

Develop learners’ autonomy:

S1: *‘Besides, it helped me to learn how to use some applications and devices by myself.’*

S3: *‘To me, one of the most powerful aspects of online education is that it forces students to study individually, conduct research, and be responsible by doing their homework regularly.’*

S6: *‘I learned self-discipline and time management.’*

Enhance technological literacy:

S1: *‘Whenever I did my homework, I learned different functions of my laptop and I immersed myself in technology. Therefore, it enhanced my knowledge about technology.’*

Improve content knowledge:

S1: *‘...we should have listened to native and professional speakers to obtain the exact sounds and practice them.... Hence, we could listen to and practice our target sounds directly.’*

S15: *‘For instance, I memorized more words in English because I focused more on homework.’*

S34: *‘Moreover, the information that I could not access by myself was shared by my instructor.’*

S2: *‘...the things I didn’t understand before, and I watched videos about grammar on Youtube, and I think it was useful for me.’*

The flexibility of learning:

S26: *‘...when I felt bad, I could maintain my education at any time.’*

S4: *'This opportunity creates an environment where students can attend classes wherever they live.'*

S6: *'Online language classes offer flexibility. I do not have to wear a formal outfit, and I can watch videos with my pyjamas.'*

S7: *'...the lessons which we could not catch are recorded by our lecturers, so we may have a chance to watch them later.'*

S8: *'I don't have to wake up very early in the morning. I can listen to the lessons which I missed over and over again whenever I want.'*

S10: *'I could choose my own learning environment that works better for my needs; drinking my coffee, sitting on my couch and listening to the teacher, and even sometimes listening to my instructor's lecture recording as I do my work out.'*

Disadvantages of online education;

Overall, five themes were created to analyze the data for the cons of online education. These themes are "technical issues," "learning environment issues," "language skills issues," "lack of motivation," and "interaction with the teacher." The "technical problems" and "learning environment-related problems" have the highest repetition rates among the themes for the cons of online education. Almost all participants had negative experiences with technology during their online education. Some of them stated that they did not have a proper internet connection. Some of them mentioned that their mobile devices or computers had not been sufficient enough to carry out online learning. The second most repeated theme is "learning environment-related problems." Most of the participants mentioned that they had had distractors such as noise in their learning environment during online education. Another essential data about the theme is that some of the participants perceived home comforts have a negative impact on their learning process, and this comfort leads them to become lazy. The third theme was created as "interaction with the teacher," and most participants stated that they had fewer opportunities to communicate with the teacher during online education. Some of the participants mentioned that whether they had sent an e-mail to the instructor, they did not know when to expect a response to their e-mail. In other words, they did not interact instantly like in face-to-face education. The other two themes are "lack of motivation" and "language skills related issues." The participants stated that they had felt unmotivated during online education because they had been isolated in this process. Some participants stated that online education had not been suitable for developing some language skills, such as speaking skills.

Technical problems

S1: *'Two weeks ago I had a lesson and tried to join it. However; during the lesson, I had an internet-based problem and I could not understand the topic comprehensively.'*

S2: *'...the lessons I couldn't take were too many because I don't always have internet.'*

S4: *'Accessibility to technology is one of the other problems we are likely to experience as learners. Sometimes, even professors may have problems with accessibility to technology.'*

S8: *'At the same time, I confronted technical difficulties because the distance education system is not a very powerful.'*

Learning environment-related problems:

S1: *'...at that time, my nephews made a noise. To the point; a suitable environment was not provided and I could not concentrate on the topic.'*

S3: *'When I wanted to ask questions to my teachers in face-to-face education, I had the opportunity to go to their offices and ask questions at anytime, and I could get answers to my questions instantly. However, in online education, this opportunity is more limited and sometimes the questions you send via e-mail or certain systems can escape from the teacher's sight.'*

S8: *'There are so many disturbances while sitting in front of a computer at home.'*

S11: *'The freedom and the comfort of home were like enemies; they were surrounding me and forcing me to give up to laziness and making focusing harder for me.'*

Language skills-related issues:

S2: *'...I also think I am inadequate in terms of speaking because I couldn't attend classes. My teacher made me do the homework, but the homework was not as effective as we talked about in class because I believe speaking can be improved through dialogue.'*

Lack of motivation:

S4: *'For me, the most difficult part is that I feel a lack of enthusiasm and concern despite all my efforts.'*

Interaction with the teacher:

S11: *'When I have a question to ask my instructor, online stuff makes that difficult.' because I didn't know when I would get a response. If I were at school, I could directly ask my teacher anything and get logical answers.'*

The third research question is, "What are the pre-service English language teachers' perceptions towards online writing skills teaching, and what do pre-service English language teachers think about online writing skills teaching's pros and cons?". The data was analyzed under two themes to find an answer to the third research question. These themes are "proper administration of writing steps" and "lack of feedback on written products of students." The first theme was repeated many times by the study participants, and nearly all of them think that teaching writing in online education is not as efficient as traditional writing teaching. Thus, they mentioned that writing steps had been carried out like in traditional classrooms. Some of the participants stated that they had written an essay at least three times in traditional classrooms, but they had written only once in online education.

Students stated that they read many reading passages in face-to-face writing courses and studied unknown vocabulary. In a further step, they were expected to use the target vocabulary in their essays, in different forms such as cause and effect essays, comparison and contrast essays. After they completed their essay writing process, they received feedback from the teacher about their essay, and they had another chance to focus on their piece of writing. In this regard, participants stated that face-to-face writing courses are more beneficial for their development of writing skills than online courses. On the other hand, they stated that they had limited opportunity to focus on their writing in online writing courses and they did not focus on their essays more than once. The second theme is 'lack of feedback on students' written products, which has too many repetitions by the study participants. They stated that they had not received feedback on their essays and had not corrected their mistakes in their written products.

Proper administration of writing steps:

1. S1: *'Consequently, we read our essays many times and corrected the wrong structure. But, during the lockdown, I wrote my essays once.'*
2. S5: *'Furthermore, in face-to-face education, we used to write an essay at least three times, but this time we wrote only once. This is important because I think writing an essay more than once could teach us better.'*

Lack of feedback on students' written products:

S2: *'Our teacher couldn't give us feedback on the homework we submitted, so we couldn't look at our mistakes.'*

S3: *'The only weakness in this situation is that when I needed feedback during writing, I was unable to reach my teachers to ask questions instantly.'*

S4: *'It is not easy to get feedback and correct our mistakes.'*

S11: *'Because we usually do feedback in class, but this cannot be possible in online lessons. So it is hard to see my mistakes on my own. Yet, sometimes I do research on writing skills and try to learn new things.'*

The present research findings show that pre-service English language teachers have little or no information about how online education is carried out, what it refers to, and how it is utilized in foreign language teaching and learning before the Covid-19 lockdown. However, when they received compulsory online education during the pandemic for nearly two years, they gained the necessary knowledge about online education and became aware of the features of online education. The results indicate that pre-service EFL teachers prefer face-to-face education to online education for some reasons, such as technical problems, language skills-related problems, course content-related problems, lack of interaction between student-teacher and student-student interaction in online classrooms, and learning environment-related problems. The result is in line with Ağçam et al.'s study (2021), in which they pointed out that most pre-service teachers of English language favored face-to-face education over emergency remote education, appreciating the enhanced effectiveness of in-class education. It can be said that the participants want to deliver their teacher training

courses in traditional classrooms. On the other hand, they emphasized the positive aspects of online education in their responses. They think that online education provides a more flexible learning environment for language learners because the learner can study the course content wherever and whenever he/she wants. Similarly, Ağçam et al. (2021) reported similar results in their article. Moreover, the language learner can adjust his/her learning pace and study the content repeatedly till he/she gets the mastery of the content. Another important finding is that the participants believe that online education develops learner autonomy and makes them more disciplined and responsible language learners. This result is in line with other studies (Torun, 2020; Uro et al., 2020). As it is known, student teachers will be the future teachers of English and will be role models for future generations. Being a creative and autonomous teacher is highly significant for raising creative, autonomous, and competent language learners who will overcome learning challenges in the future (Ağçam et al., 2021). From this perspective, current research sheds light on how pre-service English language teachers perceive online education and its impact on English language learning, with its opportunities and drawbacks. More specifically, the research also contributes to understanding teaching writing skills in an online learning environment from a pre-service English language teacher level.

5 Conclusion

The present research aimed to determine pre-service English language teachers' perceptions of online education during the Covid-19 pandemic. Additionally, it aimed to reveal pre-service English teachers' points of view about teaching writing skills in online learning environments. The results indicate that the participants prefer face-to-face education to online education. On the other hand, they mentioned positive aspects of online education that foster some important skills for them, such as being more disciplined people and being more autonomous language learners. The results indicate that as EFL learners and pre-service English teachers, the current study participants reflect an essential scope that they are the future teachers of English. Therefore, their teacher training courses will shape their beliefs about how to teach English effectively. In this respect, teacher trainers need to include content and teaching activities in planning and carrying out lessons in online learning environments, both combining asynchronous and synchronous instructional units (Moorhouse & Beaumont, 2020). Additionally, providing efficient feedback is another big issue concerning teacher trainers (Guillén et al., 2020). Thus, most participants mentioned that lack of feedback on their written products left them confused and unimproved in terms of their writing skills development.

The sampling and data gathering strategies used in this study have limitations. To begin with, the participants were pre-service English language teachers from a state university in Turkey. Second, the information was gathered from self-reports via an interview form. While these limitations caution against making broad generalizations, they point to areas where more research is needed. Other geographical

locations may enlighten researchers and practitioners about how generalizable the findings of this study are and will improve awareness of the benefits and drawbacks of online education in teacher education. Observations and data collection methods that encourage participants to self-reflect on concrete online education experiences, such as journals or stimulated recalls, will also reveal how students perceive learning. It is critical to rely on context-dependent information to improve the quality of online education courses. This was the driving force behind the current study, and it is hoped that it will contribute to the growing body of knowledge in language teacher education.

References

- Ağçam, R., Akbana, Y. E., & Rathert, S. (2021). Dealing with emergency remote teaching: The case of pre-service English language teachers in Turkey. *Journal of Language and Education*, 7(4), 16–29. <https://doi.org/10.17323/jle.2021.11995>.
- Akhter, T. (2020). Problems and challenges faced by EFL students of Saudi Arabia during COVID-19 pandemic. *Rupkatha Journal on Interdisciplinary Studies in Humanities*, 12(5), 1–7. <https://doi.org/10.21659/rupkatha.v12n5.rioc1s23n5>.
- Albaqami, S. E., & Alzahrani, D. (2022). Transition to online EFL teaching in Saudi Arabian universities during the COVID-19 outbreak. *Arab World English Journal (AWEJ) 2nd Special Issue on Covid 19 Challenges* (2), 216–232. <https://doi.org/10.24093/awej/covid2.14>.
- Alghamdi, N. (2022). EFL teachers' perceptions on the implementation of mobile-assisted language learning in Saudi Arabia during COVID-19: Challenges and affordances. *Journal of Language Teaching and Research*, 13(1), 92–100. <https://doi.org/10.17507/jltr.1301.11>.
- Al-Samiri, R. A. (2021). English language teaching in Saudi Arabia in response to the COVID-19 pandemic: Challenges and positive outcomes. *Arab World English Journal (AWEJ) Special Issue on Covid 19 Challenges*, (1), 147–159. <https://dx.doi.org/https://doi.org/10.24093/awej/covid.11>.
- Bayar, A., & Karaduman, H. A. (2021). Views of high school students on the effectiveness of 'English' course by means of a distance education. *Shanlax International Journal of Education*, 9(4), 359–73. <https://doi.org/10.34293/education.v9i4.4201>.
- Belcher, D. (1999). Authentic interaction in a virtual classroom: Leveling the playing field in a graduate seminar. *Computers and Composition*, 16(2), 253–267. [https://doi.org/10.1016/S87554615\(99\)00006-7](https://doi.org/10.1016/S87554615(99)00006-7)
- Berg, B. L. (2001). *Qualitative research methods for the social sciences* (4th ed). Allyn & Bacon.
- Bilotserkovets, M., Fomenko, T., Gubina, O., Klochkova, T., & Lytvynko, O. (2021). Fostering media literacy skills in the EFL virtual classroom: A case study in the COVID-19 lockdown period. *International Journal of Learning, Teaching and Educational Research*, 20(2), 251–269. <https://doi.org/10.26803/ijlter.20.2.14>.
- Bozavli, E. (2021). Is foreign language teaching possible without school? Distance learning experiences of foreign language students at Ataturk University during the Covid-19 pandemic. *Arab World English Journal*, 12(1), 3–18. <https://dx.doi.org/https://doi.org/10.24093/awej/vol12no1.1>.
- Cabrera-Solano, P., Gonzalez-Torres, P., & Ochoa-Cueva, C. (2021). Using Pixton for teaching EFL writing in higher education during the Covid-19 pandemic. *International Journal of Learning, Teaching and Educational Research*, 20(9), 102–115. <https://doi.org/10.26803/ijlter.20.9.7>.
- Chen, C. (2021). Using scaffolding materials to facilitate autonomous online Chinese as a foreign language learning: A study during the COVID-19 pandemic. *SAGE Open*, 1–12. <https://doi.org/10.1177/21582440211040131>.

- Chiablaem, P. (2021). Enhancing English communication skills of Thai university students through Google Apps for Education (GAFE) in a digital era during Covid-19 Pandemic. *Shanlax International Journal of Education*, 9(3), 91–98. <https://doi.org/10.34293/education.v9i3.3921>.
- Creswell, J. W. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (4th ed.). Pearson.
- Darwanto, B. A., Rini, S. E. S., & Herusatoto, H. (2021). Technology: Language teachers' digital and navigating skills in emergency education. *XLinguae*, 14(1), 141–158. <https://doi.org/10.18355/XL.2021.14.01.12>.
- Dvořáková, K., Emmer, J., Janktová, R., & Klementová, K. (2021). From F2F to ERT: University students' perception of remote learning during the first COVID-19 lockdown. *Journal on Efficiency and Responsibility in Education and Science*, 14(2), 89–100. <https://doi.org/10.7160/eriej.2021.140203>
- Echauri-Galván, B., García Hernández, S., & Fernández-Gil, M. J. (2021). Teaching English online during the national lockdown: Students' perceptions and experiences at a Spanish university. *Íkala, Revista De Lenguaje Y Cultura*, 26(3), 603–621. <https://doi.org/10.17533/udea.ikala.v26n3a08>.
- Effken, J. A. (2008). Doctoral education from a distance. *Nursing Clinics*, 43(4), 557–566. <https://doi.org/10.1016/j.cnur.2008.06.007>
- Evianty, R., & Sari, R. (2021). Implementation of blended learning based Leseverstehen teaching materials in Germany students of KKNi. *International Journal of Early Childhood Special Education (INT-JECSE)*, 13(2), 518–525. <https://doi.org/10.9756/INT-JECSE/V13I2.211088>.
- Fallah, R., Chalak, A., & Heidari Tabrizi, H. (2021). Reconstruction of Iranian English foreign language teachers' professional identity in online classes. *Problems of Education in the 21st Century*, 79(6), 858–879. <https://doi.org/10.33225/pec/21.79.858>.
- Fengliang, L., & Liang, W. (2019). Over-education and income of the distance learner. *Asia-Pacific Education Researcher*, 28(5), 421–428. <https://doi.org/10.1007/s40299-019-00443-7>
- Guillén, G., Sawin, T., & Avineri, N. (2020). Zooming out of the crisis: Language and human collaboration. *Foreign Language Annals*, 53, 320–328. <https://doi.org/10.1111/flan.12459>
- Guohong, G., Ning, L., Wenxian, X., & Wenlong, W. (2012). The study on the development of internet-based distance education and problems. *Energy Procedia*, 17, 1362–1368. <https://doi.org/10.1016/j.egypro.2012.02.253>
- Hanh, L. T. T., & Huong, T. T. B. (2021). Applying flipgrid-based portfolio to improve Vietnamese EFL high school students' speaking scores. *3L: Language, Linguistics, Literature the Southeast Asian Journal of English Language Studies*, 27(4), 85–100. <https://doi.org/10.17576/3L-2021-2704-07>.
- Harianja, N., Soraya, T. R., & Fibriasari, H. (2021). Development of interactive multimedia on learning descriptive text for French learners in North Sumatra. *International Journal of Early Childhood Special Education (INT-JECSE)*, 13(2), 1322–1330. <https://doi.org/10.9756/INT-JECSE/V13I2.211180>.
- Hewitt-Taylor, J. (2001). Use of constant comparative analysis in qualitative research. *Nursing Standard*, 15(42), 39–42.
- Hrastinski, S. (2008). Asynchronous and synchronous e-learning. *Educause Quarterly*, 31(4), 51–55.
- Hundarenko, O., Leláková, E., & Bačová, B. (2022). Sustainability of foreign language education at a Slovak university during COVID-19 global pandemic. *Arab World English Journal (AWEJ) 2nd Special Issue on Covid 19 Challenges*, (2), 48–63. <https://doi.org/10.24093/awej/covid2.4>.
- Inan, S., & Karaca, M. (2020). An investigation of quality assurance practices in online English classes for young learners. *Quality Assurance in Education*, 29(4), 332–343. <https://doi.org/10.1108/QAE-12-2020-0171>
- Impeng, S., & Nomnian, S. (2020). The use of Facebook in a TEFL program based on the TPACK framework. *LEARN Journal: Language Education and Acquisition Research Network Journal*, 13(2), 369–393.

- Klimova, B., Pikhart, M., Cierniak-Emerych, A., & Dziuba, S. (2021). Qualitative analysis of students' reflections on the current use of digital media in foreign language classes. *Sustainability*, 13(9082), 1–11. <https://doi.org/10.3390/su13169082>
- Kolesova, D. V., Moskovkin, L. V., & Popova, T. I. (2021). Urgent transition to group online foreign language instruction: Problems and solutions. *The Electronic Journal of e-Learning*, 19(1), 21–41.
- Lavrakas, P. J. (2008). *Encyclopedia of survey research methods* (Vols. 1–0). Sage Publications, Inc. <https://doi.org/10.4135/9781412963947>.
- Lian, J., Chai, C. S., Zheng, C., & Liang, J. C. (2021). Modelling the relationship between Chinese university students' authentic language learning and their English self-efficacy during the COVID-19 pandemic. *Asia-Pacific Edu Res*, 30(3), 217–228. <https://doi.org/10.1007/s40299-021-00571-z>
- Liu, Y., Fan, X., Zhou, X., Liu, M., Wang, J., & Liu, T. (2019). Application of virtual reality technology in distance higher education. In *Proceedings of the 2019 4th International Conference on Distance Education and Learning* (35–39). <https://doi.org/10.1145/3338147.3338174>.
- Malik, S. K. (2015). Strategies for maintaining quality. *Turkish Online Journal of Distance Education*, 16(1), 238–248.
- Marra, R. M., Moore, J. L., & Klimczak, A. K. (2004). Content analysis of online discussion forums: A comparative analysis of protocols. *Educational Technology Research and Development*, 52(2), 23–40. <https://doi.org/10.1007/BF02504837>
- Merriam, S. B. (2009). *Qualitative research: A guide to design and implementation*. Jossey-Bass.
- Meyer, K. A. (2003). Face-to-face versus threaded discussions: The role of time and higher-order thinking. *Journal of Asynchronous Learning Networks*, 7(3), 55–65. http://itecideas.pbworks.com/f/v7n3_meyer.pdf.
- Mohammed, T. (2022). Designing an Arabic speaking and listening skills e- course: Resources, activities and students' perceptions. *The Electronic Journal of e-Learning*, 20(1), 53–68.
- Moorhouse, B. L., & Beaumont, A. M. (2020). Utilizing video conferencing software to teach young language learners in Hong Kong during the Covid-19 class suspensions. *TESOL Journal*, 11(3), 1–6. <https://doi.org/10.1002/tesj.545>
- Nwabuoku, M. (2020). Surviving distance learning as an adult learner in higher education. *Adult Learning*, 31(4), 185–187. <https://doi.org/10.1177/1045159520959469>
- Otto, A., & López-Medina, B. (2021). Promoting metacognitive and linguistic skills: Digital learning logs in pre-service teacher training. *Journal of Language and Education*, 7(4), 117–126. <https://doi.org/10.17323/jle.2021.11680>.
- Peterson, A. T., Beymer, P. N., & Putnam, R. T. (2018). Synchronous and asynchronous discussions: Effects on cooperation, belonging, and affect. *Online Learning*, 22(4), 7–25. <https://doi.org/10.24059/olj.v22i4.1517>.
- Rodríguez Pérez, N., & Heinsch, B. (2021). The impact of digitalization on communicative competence in foreign languages in higher education. *Revista Latinoamericana de Tecnología Educativa*, 20(1), 71–85. <https://doi.org/10.17398/1695-288X.20.1.71>.
- Salih, A. A., & Omar, L. I. (2020). Season of migration to remote language learning platforms: Voices from EFL university learners. *International Journal of Higher Education*, 10(2), 62–73. <https://doi.org/10.5430/ijhe.v10n2p62>
- Shen, L. (2021). An investigation of learners' perception of an online intercultural communicative competence (ICC) training model. *International Journal of Emerging Technologies in Learning (iJET)*, 16(13), 186–199. <https://doi.org/10.3991/ijet.v16i13.24389>
- Shumeiko, N., & Nypadymka, A. (2021). ICT-supported students' independent work in the ESP context: The new reality in tertiary education. *Advanced Education*, 8(18), 79–91. <https://doi.org/10.20535/2410-8286.223286>.
- Strauss, A., & Corbin, J. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (2nd ed.). Sage.
- Tallent-Runnels, M. K., Thomas, J. A., Lan, W. Y., Cooper, S., Ahern, T. C., Shaw, S. M., & Liu, X. (2006). Teaching courses online: A review of the research. *Review of Educational Research*, 76(1), 93–135. <https://doi.org/10.3102/00346543076001093>

- Tiene, D. (2000). Online discussions: A survey of advantages and disadvantages compared to face-to-face discussions. *Journal of Educational Multimedia and Hypermedia*, 9(4), 369–382. <https://www.learntechlib.org/primary/p/9551/>.
- Torun, E. D. (2020). Online distance learning in higher education: E-learning readiness as a predictor of academic achievement. *Open Praxis*, 12(2), 191–208. <https://doi.org/10.5944/openpraxis.12.2.1092>
- Uro, G., Lal, D., & Alsace, T. (2020). *Supporting English learners in the Covid-19 crisis*. Council of the Great City Schools.
- Wang, J., & Wang, Y. (2021). Compare synchronous and asynchronous online instruction for science teacher preparation. *Journal of Science Teacher Education*, 32(3), 265–285. <https://doi.org/10.1080/1046560X.2020.1817652>
- Wang, Q., & Woo, H. L. (2007). Comparing asynchronous online discussions and face-to-face discussions in a classroom setting. *British Journal of Educational Technology*, 38(2), 272–286. <https://doi.org/10.1111/j.1467-8535.2006.00621.x>
- World Health Organization [WHO]. (2020). Novel Coronavirus (2019-nCoV) SITUATION REPORT-1. Retrieved September 16, 2020, from https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200121-sitrep-1-2019-ncov.pdf?sfvrsn=20a99c10_4.
- Yılmaz, A. B. (2019). Distance and face-to-face students' perceptions towards distance education: A comparative metaphorical study. *Turkish Online Journal of Distance Education-TOJDE*, 20(1), 191–207.
- Yüce, E. (2022). The immediate reactions of EFL learners towards total digitalization at higher education during the Covid-19 pandemic. *Kuramsal Eğitim Bilim Dergisi (Journal of Theoretical Educational Science)*, 15(1), 1–15. <https://doi.org/10.30831/akukeg.939836>.
- Zhao, H., Chen, L., & Panda, S. (2014). Self-regulated learning ability of Chinese distance learners. *British Journal of Educational Technology*, 45(5), 941–958. <https://doi.org/10.1111/bjet.12118>
- Zou, B., Huang, L., Ma, W., & Qiu, Y. (2021). Evaluation of the effectiveness of EFL online teaching during the COVID-19 pandemic. *SAGE Open*, 1–17. <https://doi.org/10.1177/21582440211054491>.

Digital Divide in the Digital Era and the Digitalization in Turkey and Around the World



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1 Introduction

It is a known fact that human beings have used various tools for different purposes since prehistoric times. The use of tools, which started with chipped stone and wood pieces in the historical time, continued with tools made from materials such as copper, bronze and iron that gave their name to prehistoric periods, and the use of technological and electronic devices together with internet infrastructure in the contemporary age has completely changed the world and way of human life. As civilization develops, the tools used also develop, and likewise, the development of civilization accelerates as advanced tools are used. For this reason, it can be mentioned that there is a two-way relationship between civilization and tool use. Day by day a lot of tools in our daily life have started to become technological and digital.

2 Technology and Education

In line with almost all sectors such as economy, production, health, transportation, communication, trade, and security, one of the key sectors in which the use of tools shows itself widely is education. Traditional educational tools such as paper, pencil and board have started to be replaced or used together with electronic and digital tools with the great developments in science and technology. Today, the use of technological tools such as computers, smartphones, tablets, and smartboards together with the internet infrastructure which can be collected under the heading of Information Communication Technologies (ICT), has greatly affected the education sector. In addition to the teaching materials, our teaching and learning methods and techniques

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have also undergone great changes with the integration of ICT in education. It is claimed that the integration of ICT with the education and training processes is a driving force for teaching and ICT has started an innovation process in the field of education (Salmon & Jones, 2004).

At different education levels, before the lesson, during the lesson and after the lesson, ICT is used in many different ways, such as collecting and disseminating information about the teaching content, communicating, interacting, online collaboration, self-study through e-learning platforms, acquiring relevant skills, planning the teaching process, developing content, measuring and evaluating and following the teaching.

The use of ICT in education is increasing day by day, but during the Covid-19 pandemic that emerged in 2019, a greater increase was observed in the use of ICT in education than ever before (Gür & Filiz, 2022). With the curfew implemented during the Covid-19 pandemic, the education was carried out for a certain period of time with a complete distance education model, which was not even possible to try before. This compulsory use of ICT and digital resources and tools experienced in the education processes continues for many students, teachers and education stakeholders as their knowledge, skills and socio-economic levels allow. During the implementation of the distance education model, people working in most professions, except for certain critical professions, also worked with the home-office model. They were able to maintain their business by using technological tools. In addition, during the curfew period, when face-to-face social relations were reduced to zero, people met their communication needs through telephone, internet, social media sites and instant communication programs.

3 Digitalization and Digital Personalities

It is obvious that there are many facilitating benefits that technology use brings to all areas of our lives, but there are differences between individuals in accessing technology and technological tools due to factors such as socio-economic level, attitude towards technology and previous experience.

Similar to today's popular classification of individuals made with expressions such as baby boomers, generation X, generation Y, and generation Z, another classification that becomes common is the one made with the current situation of digitalization and in which individuals are described as digital natives, digital immigrants and digital settlers according to their access to technology, technology usage habits and date of birth. The rapid and radical changes in technology in the twenty-first century have also caused individual profiles to differ (Kurt et al., 2013). For the first time, the concepts of digital native and digital immigrant were introduced by Marc Prensky (2001) to emphasize the importance of reconsidering education for both the future and the past. Digital natives are "*native speakers* of the digital language of the internet, computers and video games" (Kurt et al., 2013: 2) and they are very familiar with the technology and technological devices as they have grown up with them in

the information age (Cambridge Dictionary, 2021). It is thought that digital natives encompass Millennials, Generation Z, and Generation Alpha individuals who are good at consuming digital information and stimuli in a swift and comfortable way by using digital devices and platforms (Wikipedia contributors, 2021). On the other hand, digital immigrants were not born in the digital world and they are not native speakers of the digital language although they are benefiting from digital technology and are required to use digital devices. Digital immigrants are generally in Generation X and older, and their technology adaptation is in contrast to digital natives (Investopedia, 2021). Digital immigrants are people who were born and raised before the widespread adoption of computers, internet and technology and they tried to adopt digital technology in the adult period of their life. Therefore, they are not so quick or comfortable in using digital devices and platforms as digital natives. They are less able to use digital technology in a technical way and it is thought that digital immigrants will never develop their technological skills to be on par with digital natives (IGI Global, 2021). Parents who learn about digital technology from their children and teachers who learn educational technology tools to integrate digital technology into instruction are suitable examples for digital immigrants (Kurt et al., 2013). The third digital personality group consists of digital immigrants who still use digital technology although they are mainly based on text-based learning and teaching and prefer mostly analog and traditional forms of interaction. They are comfortable in an isolated network (Palfrey & Gasser, 2008). This classification emphasizes the emergence of digitalization in different dimensions among individuals and introduces the concept of digital divide.

4 Digital Divide

In an era where digitalization accelerates and computers are used more and more every day, Information and Communication Technologies (ICT) are integrated into every aspect of our lives and individuals are expected to improve their informatics skills. Individuals should have digital competence. According to UNESCO (2008), digital competence does not directly mean the technical operation of technological tools; instead, it refers to the mastery of certain capacities to search, select, analyze and evaluate information. However, at this point, differences arise between individuals in terms of access to digital resources and tools. Equal access to digital technology is becoming an expectation, as well as differences in access to digital technology between individuals are becoming reality and these differences are described as the digital divide. At first, the digital divide was mentioned between individuals who could afford to buy computers and those who could not (Brown et al., 1995). However, this divide simply meant having/not having computers and internet, being able to buy/not being able to buy them (Tolu, 2009). As more studies are carried out on this subject and the digital divide is handled in a multidimensional perspective, there have been changes in different dimensions such as “age, income, education, gender, ethnicity, geography, occupation (Wilson, 2006), intelligence, personality,

and health or disability (Van Dijk, 2006) among individuals” (Tolu, 2009: 3). With a brief and clear definition, the digital divide is explained as “any and every disparity within the online community” (Norris, 2001: 178). With an extensive explanation, the digital divide is described as “the gap between individuals, households, businesses and geographic areas at different socio-economic levels with regard both to their opportunities to access ICTs and to their use of the Internet for a wide variety of activities” (OECD, 2001: 5). The digital divide is handled as a global problem that affects millions of individuals from different regions of various ages and socio-economic groups. In another statement, the digital divide is conceptualized as “unequal patterns of material access to, usage capabilities of, and benefits from computer-based information- and communication technologies that are caused by certain stratification processes that produce classes of winners and losers of the information society, and participation in institutions governing ICTs and society” (Fuchs & Horak, 2007: 15).

According to Van Dijk and Hacker (2003), the digital divide is organized into four groups of barriers to access; the lack of mental access, the lack of material access, the lack of skill access and the lack of usage access. The lack of mental access is about the absence of basic digital experience. The lack of material access expresses not having a computer and internet connections. The lack of skill access means not having digital skills. Lastly, the lack of usage access refers to not having meaningful opportunities for using digital technology.

Another theoretical and conceptual classification of the digital divide is proposed by Selwyn (2004). He examined the digital divide in four groups; access stage, usage stage, engagement stage and consequences stage. The first stage, the access stage, is about physical and financial access and includes having ICT tools, access to network infrastructure and affordability of ICT services. The second stage is the usage stage and it is beyond the physical possession of technological equipment. It corresponds to having digital skills and being digitally literate to use digital services and ICT tools. Thirdly, the engagement stage is beyond the possession and use of ICT. Engagement in ICT is related to personal, psychological, technical and political needs. The context and circumstances should be appropriate to use ICT, create content, control and manipulate this content. The fourth stage is the consequences stage and is related to bridging the digital divide. In this stage, individuals are expected to use ICT in their daily life to a level where they can self-realize, take part in and contribute to learning activities for themselves and others with the aim of creating better social quality.

5 The Current State of Digitalization in Turkey and Around the World

Turkey as a transcontinental country mainly on Anatolian Peninsula and partly on Balkan Peninsula has a close relationship mainly with Asia, Europe and nearly all other parts of the world. Being a dynamic country, Turkey has made certain steps on the way to digitization.

According to the Presidency of the Republic of Turkey, Strategy and Budget Department, Department of Information and Communication Technologies, it has been observed that a great deal of effort has been made to become an information society in Turkey, as in the rest of the world, especially in the second half of the 1990s. In this period, besides the reports and research that came to the fore for the purpose of transition to the information society, studies for the coordination of certain elements of the information society were at the forefront. The transformation of Turkey into an information society is followed at various levels. Especially in line with the change in ICT in areas such as business, trade, public administration, development in education, skills and employment, development of information sector, transformation areas are followed by different indicators (Department of Information and Communication Technologies, n.d.). Keeping up with the digital transformation of government institutions and transforming the services offered by the government into e-services are expressed as the best examples of this digital transformation process.

“The e-Government Gateway is an online portal offering access to all public services from a single point. The aim of the portal is to offer public services to citizens, businesses, and government agencies in an efficient and effective manner through information technologies” (e-Government Gateway, n.d.). Through the e-government portal, 6656 different services are offered to 59 537 076 registered users by 884 institutions, and 3622 of these services appear as mobile services. In addition to the digitalization initiatives in government institutions, statistics on the access of individuals to digital resources and internet usage in Turkey can also give a general idea about the digitalization process.

According to ‘The Survey on Information and Communication Technology (ICT) Usage in Households and by Individuals in Turkey’ published by the Turkish Statistical Institute (TurkStat, 2021), the proportion of households with internet access has increased to 92.0% which means 92.0% of the households could access to internet from home in 2021. Of course, it is undeniable that the distance education and home-office working models that we have experienced during the Covid-19 pandemic process have increased internet usage rates. However, it is obvious that this ratio is a large ratio for a country with a population of more than 84 million. When the individual-based internet usage rates of the same survey are examined, internet usage of individuals aged 16–74 was 82.6% in 2021 as shown in Fig. 1.

As it can be understood from Fig. 1, both ratios of households with internet access and the ratio of individual internet usage have increased regularly between 2011 and 2021 years. The internet usage of individuals in relation to the gender variable was different for males and females. The proportion was 87.7% for males and 77.5% for

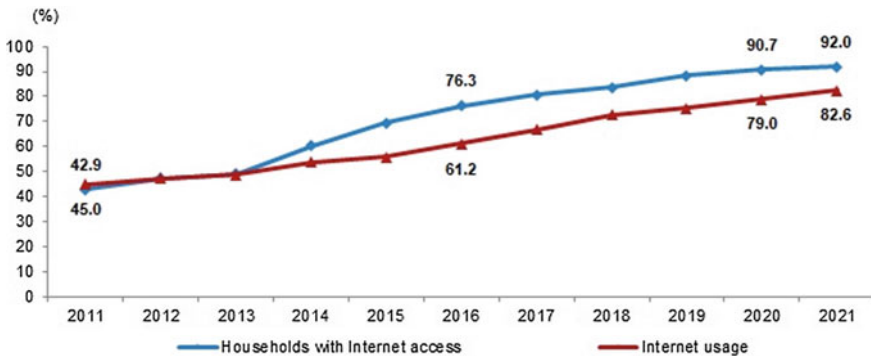


Fig. 1 Households with internet access and internet usage by individuals in Turkey. TurkStat: [https://data.tuik.gov.tr/Bulten/Index?p=Survey-on-Information-and-Communication-Technology-\(ICT\)-Usage-in-Households-and-by-Individuals-2021-37437](https://data.tuik.gov.tr/Bulten/Index?p=Survey-on-Information-and-Communication-Technology-(ICT)-Usage-in-Households-and-by-Individuals-2021-37437)

females which shows that the number of males who access the internet was more than the number of females (TurkStat, 2021).

Additionally, as stated in ‘Information and Communication Technology (ICT) Usage in Households and by Individuals Statistics Report’ by TurkStat in 2021, the proportion of availability of devices in households is declared to share information about ICT equipment and their usage. In the report, the ratio of desktop computer use was 16.8%, the ratio of portable computer (Laptop, netbook) use was 38.3%, the ratio of tablet computer use was 26.3%, and the ratio of mobile phone (including smartphone) use was 99.3%. As it can be inferred from the data, the mobile phone is the most popular ICT tool when the availability of information technologies in households is considered (TurkStat, 2021).

Following the consideration of ICT rates on a national basis, it would be appropriate to examine Turkey’s access rates to digital resources at an international level. As general information about internet users’ distribution in 2021, Fig. 2 is available.

As it is shown in Fig. 2, more than half of the internet users live in Asia with 53.4% rate and then comes Europe with 14.3% rate. The lowest rate is for Oceania/Australia with 0.6%. When the figure is examined in relation, it can be understood that the

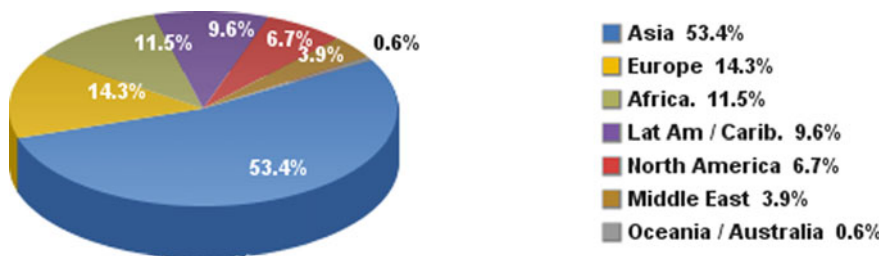


Fig. 2 Internet users’ distribution in the World—2021. Internet World Stats: <https://www.internetworldstats.com/stats.htm>

Table 1 World internet usage and population statistics. Internet World Stats: <https://www.internetworldstats.com/stats.htm>

World regions	Population (2022 Est.)	Population % of World	Internet users 31 Dec 2021	Penetration rate (% Pop.)
Africa	1,394,588,547	17.6	601,327,461	43.1
Asia	4,350,826,899	54.8	2,790,150,527	64.1
Europe	841,319,704	10.6	743,602,636	88.4
Latin America/Carib	663,520,324	8.4	533,171,730	80.4
North America	372,555,585	4.7	347,916,694	93.4
Middle East	268,302,801	3.4	205,019,130	76.4
Oceania/Australia	43,602,955	0.5	30,549,185	70.1
World total	7,934,716,815	100.0	5,251,737,363	66.2

internet usage rates are directly related to the total population and development levels of the countries. In a similar statistic survey, the numbers of internet users for all world regions are presented together with the total population of regions in Table 1.

When regions are sorted according to their total population, from the most populated to the least populated, the following ranking emerges, Asia (54.8%), Africa (17.6%), Europe (10.6%), Latin America/Caribbean (8.4%), North America (4.7%), Middle East (3.4%), and Oceania/Australia (0.5%). However, this ranking differs from the world regions' population ranking based on the penetration rate of internet users for each world region. The ratio of internet users to the total population in Asia makes 64.1%, in Africa 43.1%, in Europe 88.4%, in Latin America/Caribbean 80.4%, in North America 93.4%, in the Middle East 76.4%, in Oceania/Australia 70.1% and for world population in total 66.2%. According to penetration rates, the ranking of countries from highest to lowest is given as North America, Europe, Latin America/Caribbean, Middle East, Oceania/Australia, Asia, and Africa.

In another similar survey, internet access and use by households and individuals in OECD countries were examined and visualized in order according to country averages as shown in Fig. 3.

The countries with the highest internet access rate among OECD countries are Iceland, Norway and Ireland, while the countries with the lowest average are Mexico, Brazil and Italy. The OECD average is 90.5% and Turkey's internet access average is 81.4%, which is well below the OECD average.

The usage of technology has evolved into a crucial requirement for enterprises in the twenty-first century as a result of technological advancements (Görgülü et al., 2013). As in all other organizations, the progress in technology has caused radical changes in the general perspective and teaching techniques in the field of education. However, in this process of change, the definition and scope of education are reconsidered and the roles of schools, teachers and students have to be redefined depending on the existence of technological tools and infrastructure in the field of education

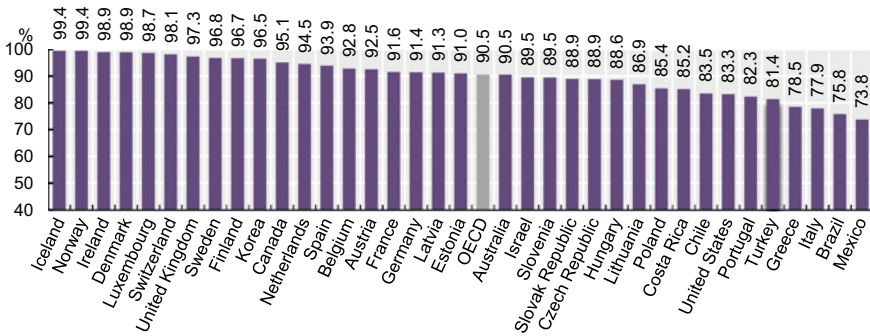


Fig. 3 Internet users' country averages, 2021. OECD (2022), ICT Access and Usage by Households and Individuals Database, <http://oe.cd/hhind>

(Şişman, 2013). In Turkey, the problem of technology integration in education is a valid issue on the agenda of the country and MoNE (Ministry of National Education).

In line with the problems experienced in the integration of technology into education in Turkey, and the problems experienced in accessing technology in urban and rural areas of the country, important projects have been implemented by MoNE since 2000 in primary and secondary education institutions. FATİH Project and EBA system are the two important projects developed to prevent inequality in access to technology among individuals and to pave the way for the use of technology in education for every individual in education (International Science Association, 2019). FATİH Project is basically described as Increasing Opportunities and Technology Improvement Movement and started in 2010 intending to ensure equality of opportunity in education and increase technological infrastructure in primary and secondary schools. On the other hand, EBA system which stands for Education Information Network is an online platform of information network that hosts specified e-contents according to the users. Moreover, during the curfew in the pandemic process, first and second-degree education institutions provided training on EBA system. In this process, universities in Turkey also provided their education with the distance education model by establishing distance education centres. It is undeniable that similar projects in Turkey have made significant contributions to technology integration in education, but this is a way that requires us to constantly move forward. The needs that arise in the use of technology in education processes should be met, potential problems should be prevented, and digital divide should be prevented by providing equal opportunity among individuals in accessing technology.

6 Conclusion

Human beings have used tools to facilitate their lives and tool use has contributed to civilization. With the advancement of technology, computers and the internet becoming an indispensable part of our daily lives, we have already entered a digitalization process. In addition to sectors such as economy, production, health, transportation, communication, trade and security, which are greatly affected by this digitalization process, education was also a sector that is positively affected. At first, the digitalization process and ICT tools had the function of supporting the education process, but with the Covid-19 pandemic, education was completely digitalized and given in the form of distance education.

In addition, many individuals use ICT tools such as PCs, laptops, tablets, smartphones, smartwatches, consoles, cameras, smart TVs, eReaders, and earpods for training, shopping, sending e-mail, obtaining information, processing, accessing remotely, listening to music, watching a movie, reading a book, following social media, reading news, playing a game, entertainment, making a presentation, communicating, making online conference and many other similar purposes in daily life.

The twenty-first century has also caused the individuals' profiles to change and similar to the popular classification of individuals as baby boomers, generation X, generation Y, and generation Z, individuals are classified as digital natives, digital immigrants and digital settlers according to their access to technology and their use of ICT tools. On the other hand, as the rate of development of technology increases, the differences in access to technology between individuals also increase, and this brings us to the concept of the digital divide. The concept of the digital divide does not only mean being able to afford technological tools, but also the digital divide also manifests itself with variables among individuals such as age, income, education, gender, ethnicity, geography, and occupation (Wilson, 2006), intelligence, personality, and health or disability situation (Van Dijk, 2006).

When the digitalization process in Turkey is examined, it is seen that state institutions are involved in the process involving reformist changes related to digitalization and transition to the information society, and it is seen that the services offered by many institutions and organizations include digital services. The e-Government Gateway platform offered by the Republic of Turkey can be given as the best example of this transformation process.

When looking at the most comprehensive surveys on digitalization at the individual level and access to digital resources in Turkey, studies involving the use of information and communication technology (ICT) at home and by individuals have been reached. According to the Turkish Statistical Institute (TurkStat, 2021), the proportion of households with internet access has increased to 92.0% and internet usage of individuals aged 16–74 is found to be 82.6% in 2021. The internet usage of genders is reported as 87.7% for males and 77.5% for females.

After mentioning the internet access rates in Turkey, internet access rates in the world are examined and a comparison is made with Turkey's situation. When the

total number of internet users in different World regions is examined, the regions with the highest ratio to lowest ratio are Asia (54.8%), Africa (17.6%), Europe (10.6%), Latin America/Caribbean (8.4%), North America (4.7%), Middle East (3.4%), and Oceania/Australia (0.5%). However, the ratio of the internet users to the total population which is described as the penetration rate is considered, the regions with the highest ratio to lowest ratio are North America (93.4%), Europe (88.4%), Latin America/Caribbean (80.4%), Middle East (76.4%), Oceania/Australia (70.1%), Asia (64.1%), Africa (43.1%) and the ratio for world population in total is 66.2%. It can be inferred that the difference in internet connection access rates between regions in the world points to the digital divide between regions and shows the connection between digitalization and development.

Another study includes internet user rates among OECD countries. It is stated that the countries in the north of Europe such as Iceland, Norway, Ireland, Denmark and Luxembourg have the highest rates of internet users. In the same survey, it is shown that countries with different population distribution, socioeconomic status and geographical locations, such as Mexico, Brazil, Italy, Greece, and Turkey, rank lower with a lower ratio. These results again point to the digital divide that exists within and between different countries.

As a result, digitalization is gaining momentum day by day and it continues to facilitate our lives in different dimensions. However, the potential danger here is that as digitization rates increase, the rate of the digital divide between individuals and between countries will increase. One of the best examples of the need for digitalization is that the rapid transition to distance education, which has become a necessity during the pandemic process, is more easily resolved by the countries that have made important progress in digitalization, while a more difficult transition process is experienced by the countries that lagged behind in digitalization. Significant progress has been made in the digitalization process in Turkey, but in comparison with other countries, it is obvious that Turkey has the potential to reach better points. For this reason, the digitalization process should be continued and necessary measures should be taken to bridge the digital divide experienced by disadvantaged groups. Digitalization in education should be promoted and the digital divide in education should be prevented by integrating the use of ICT in education.

References

- Brown, H. R., Barram, J. D., & Irving, L. (1995). *Falling Through the Net: A Survey of the "Have-Nots" in Rural and Urban America*. Retrieved September 7, 2009, from <http://www.ntia.doc.gov/ntiahome/fallingthru.html>.
- Cambridge Dictionary. (2021). *Digital native*. <https://dictionary.cambridge.org/tr/s%C3%B6z%C3%BCk/ingilizce/digital-native>
- e-Government Gateway (n.d.). Presidency of the republic of Turkey digital transformation office. 2021, <https://www.turkiye.gov.tr/non-citizens>.
- Department of Information and Communication Technologies (n.d.). *Transformation in Our Country to Information Society*—Presidency of the Republic of Turkey, Strategy and Budget

- Department, 2021, from <http://www.bilgitoplumu.gov.tr/bilgi-toplumu/ulkemizde-bilgi-toplum-una-donusum/>.
- Fuchs, C., & Horak, E. (2007). Informational capitalism and the digital divide in Africa. *Masaryk University Journal of Law and Technology*, 1(2), 11–32.
- Görgülü, D., Küçükali, R., & Ada, Ş. (2013). Okul yöneticilerinin teknolojik liderlik öz yeterlilikleri. *Eğitim Teknolojisi Kuram Ve Uygulama*, 3(2), 53–71.
- Gür, H., & Filiz, A. (2022). Parents' views on distance education during the Covid-19 pandemic. *Journal of Educational Technology and Online Learning*, 5(1), 84–104.
- IGI Global. (2021). *What is Digital Immigrant?* <https://www.igi-global.com/dictionary/digital-natives/7645>.
- International Science Association. (2019). *Main problems of Turkish education system and current discussions on education report*. Ankara: ISCASS.
- Investopedia. (2021). *Digital immigrant definition*. <https://www.investopedia.com/terms/d/digital-immigrant.asp>.
- Kurt, A. A., Günüç, S., & Ersoy, M. (2013). The current state of digitalization: Digital native, digital immigrant and digital settler. *Ankara University Journal of Faculty of Educational Sciences (JFES)*, 46(1), 1–22.
- Norris, P. (2001). *Digital divide: Civic engagement, information poverty, and the internet worldwide*. Cambridge University Press.
- OECD (Organisation for Economic Co-operation and Development) (2001). *Understanding the digital divide*. <http://www.oecd.org/dataoecd/38/57/1888451.pdf>.
- Palfrey, J., & Gasser, U. (2008). *Born digital: Understanding the first generation of digital natives*. Basic Books.
- Prensky, M. (2001). Digital natives, digital immigrants. *On the Horizon*, 9(5), 1–5.
- Salmon, D., & Jones, M. (2004). Higher education staff experiences of using web-based learning technologies. *Educational Technology and Society*, 7(1), 107–114.
- Selwyn, N. (2004). Reconsidering political and popular understanding of the digital divide. *New Media and Society*, 6(3), 341–362.
- Şişman, M. (2013). *Türk eğitim sistemi ve okul yönetimi*. Ankara: Pegem Akademi.
- Tolu, H. (2009). *The relationship between Digital Divide and Open Source Software/Free Software in Turkey*. MA thesis, University of Bristol.
- TurkStat. (2021). *Survey on information and communication technology (ICT) usage in households and by individuals, 2021*. Turkstat Corporate. 2021, [https://data.tuik.gov.tr/Bulten/Index?p=Survey-on-Information-and-Communication-Technology-\(ICT\)-Usage-in-Households-and-by-Individuals-2021-37437](https://data.tuik.gov.tr/Bulten/Index?p=Survey-on-Information-and-Communication-Technology-(ICT)-Usage-in-Households-and-by-Individuals-2021-37437).
- UNESCO. (2008). *ICT competency standards for teachers*. <http://unesdoc.unesco.org/images/0015/001562/156210e.pdf>
- Van Dijk, J. (2006). Digital divide research, achievements and shortcomings. *Poetics*, 34, 221–235.
- Van Dijk, J., & Hacker, K. (2003). The digital divide as a complex and dynamic phenomenon. *The Information Society*, 19(4), 315–326.
- Wikipedia contributors. (2021, May 28). *Digital native*. Wikipedia. https://en.wikipedia.org/wiki/Digital_native.
- Wilson, E. J. (2006). *The information revolution and developing countries*. MIT Press.

Critical Pedagogy and Digital Education in Second Language Learning: A Poststructuralist Perspective



Eser Ördem 

1 Introduction

There have been a lot of studies on ideology and critical pedagogy from a poststructuralist perspective in recent decades (Newman, 2001). Ideology has been defined in different ways, and therefore one can easily encounter various and ambiguous portrayals and descriptions of this term. Thus, ideology is quite a complex term referring to a wide range of ideas. Steger and James (2010) give a general definition by stating that ‘ideologies are patterned clusters of normatively imbued ideas and concepts, including particular representations of power relations. These conceptual maps help people navigate the complexity of their political universe and carry claims to social truth’ (p.xii). Poststructuralism refers to individual interpretation and flux of ideas and develops a critical perspective towards any object, event, social event, phenomenon or idea (Newman, 2001). Truth itself is harshly criticized and deconstructed. Theoretically poststructuralism has developed various ideas.

This study intends to focus on the relationships between ideology, critical pedagogy and digital divide within the framework of poststructuralism in the Turkish context. Since poststructuralism deconstructs essentialism and forefronts individual autonomy based on dislocation of power, it remains important to develop a critical approach towards non-critical digital education. This study develops a critical perspective to English language teaching and learning by stressing the fact that digital platforms should create space for social dialogue by criticizing mechanical skills. It is claimed that unless essentialism is criticized and questioned in Turkey within the tenets of poststructuralism, neoliberalism cannot be avoided in political arena in Turkey.

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2 Ideology and Critical Pedagogy

Various ideological patterns have been analyzed in different ways by different researchers. Dominant power in a certain society always tends to justify their policies and produce estranged groups. Minar (1961) defines ideology as normative, structured, persuasive and central to social interaction. Similarly, Mullins (1972) interprets ideology in a different way focusing on the effect of power on cognition and directing individuals 'thinking processes and actions through logical and well-organized content. Althusser (1971) defines ideology as production of discourses by the state that lead to subjective beliefs. Duncker (2006) notes that any political institution aims to express absolute ideas or truths related to their ideology. Eagleton's (2007) approach towards ideology is multi-faceted. In his terms, ideology may refer to illusion, identity formation, a complex combination of discourse and power, false ideas leading to domination of power, a set of ideas belonging to certain groups, positioning subjects and distortion of realities. Žižek (1989) describes ideology as a set of beliefs, notions and myths shaped by the ruling class or major institutions that structure our social reality. For him, these processes are unconsciously provided to us because ideology functions implicitly and hidden in such a way that beliefs and ideas regarding ideology seem natural to us by forming our social reality.

Critical pedagogy aims to deconstruct neoliberal ideology by prioritizing socio-political issues in order to gain awareness of the hidden curriculum and commercial interests (Freire, 2000; Giroux, 2020). EFL and ELT departments in Turkey are largely dependent on Anglo-American neoliberal ideology because their commercial interests are easily visible considering their dominance in Turkey. The absence of participatory approach in EFL curriculum in Turkey causes EFL learners to be disconnected from real life situations. They are generally taught anodyne topics which are irrelevant to the current socio-political issues. By spreading the English language, linguistic human rights are violated because there is space only for English (Phillipson, 1992). Considering the overwhelming presence and prevalence of English at all levels of education in Turkey, it can be interpreted that there is little room for other languages (Phillipson, 2017). A critical perspective is deliberately ignored or excluded from the curriculum. In order to develop a radical perspective, participatory approach or critical pedagogy is desperately needed (McLaren, 2016). However, ELT and EFL departments in Turkey tend to neglect this perspective, which allows neoliberal ideology to be dominant in Turkey (Pennycook, 1990).

The metanarrative of neoliberalism remains a strong discourse in the context of Turkey. This colonizing mind is closely related to commercial interests (Harvey, 2007). Thus, it can be said that benefiting from digital education on a superficial level hardly leads to social change in the society. Digital education is an enormous advantage only if it allows learners to negotiate socio-political issues and prepare their own curriculum based on the current political issues. In a way, it should eviscerate neoliberal ideology through English and unmask the hidden interests of neoliberal elites. There is a close relationship between critical pedagogy and digital education if new discourses against neoliberalism are produced by learners as well as teachers.

Otherwise, learners will be limited to performing only mechanical and repetitive tasks ending in non-authentic use of English. Agency and subjectivity should be prioritized by involving learners in preparing their own curriculum within the framework of participatory approach and critical pedagogy (Pennycook, 2002, 2017).

Therefore, I maintain that poststructuralism and critical pedagogy can help learners and teachers to incorporate a radical perspective into digital education. If digital education becomes a buzzword and represents only neoliberal ideology and functions as a metanarrative, then poststructuralism is needed to deconstruct this ideology and embrace critical pedagogy as well.

3 Poststructuralism

Poststructuralism centralizes and problematizes subjectivity and diversity by emphasizing the politics of (dis)location (Newman, 2001). Any kind of essentialism is criticized in poststructuralism. However, Newman (2001) insistently emphasizes that poststructuralists cannot avoid and escape the place. Although they strive to develop a critical perspective towards structuralism and modernism that preserve place, they trap themselves into the place that has been strictly avoided in postanarchism, a radical extension and continuation of anarchism and postanarchism. This attitude can be accomplished by dislocating politics from essentialist ideas that repeatedly reinforce domination and find a place in political arena. Poststructuralists maintain that subjects are shaped by power relations that are unstable and dispersed. Therefore, a centrally dominant power does not constitute subjects. Rather, subjects are constituted on a slippery ground, which means that power relations are decentralized, deconstructed and diffused (Newman, 2001). Therefore, poststructuralism refers to a set of complex power and discursive relations and practices that aim to dislocate all kinds of essentialist ideas and fixed templates. It intends not to solve these problematic issues but rather to problematize and paradoxize these historically deep-rooted issues. As Newman (2001) put it, Stirner (1993) similarly showed that rejection of power should not be handled based on essentialist ideas and identities. Therefore, Stirner (1993) develops the concept of ownness that denotes individual freedom which gains meaning within the struggle of power relations between the individual and authority. Although truths are interpretable and relative in discursive practices, authority always aims to establish a certain and determined truth in individuals whereby they can find themselves struggling against power. Repeated discourses of this precise and determined truth by authority are reinforced, manipulated, justified and rationalized. Thus, individuals face the risk of gaining their individual and social autonomy and lack self-expression in the sense of reflecting their ownness in Stirner's terms (Inglehart et al., 2005). Based on Foucault's ideas of power relations, Falzon (2006) develops the concept of social dialogue by which individuals can challenge power relations established by authority. Falzon (2006) maintains that social dialogue refers to positive discursive practices that always remind others that each individual has distinctive ideas that provide challenges. Unless individuals find

themselves in social dialogue, they remain solipsistic because when individuals meet others, they are faced with multiplicity, plurality and challenging discursive practices (Falzon, 2006). Discourses in poststructuralism are often related to power and power relations that are decentralized and diffuse (Newman, 2001). Therefore, in order to get rid of power and domination that threat subjects and subjectivity, poststructuralists often tend to get trapped in a new place because the theory of dislocation has been undertheorized so far (Newman, 2001). That is, the outside still contains a gap and a void that needs to be theorized. Essentialist ideas fill in this void and find a place for themselves. Therefore, the problem of place recurs and is repeated due to this void in the politics of dislocation.

Since subjects in and beyond poststructuralism are faced with lack and emptiness where subjects are imposed by power and domination. It is this lack that power exploits. However, this lack and emptiness are regarded as constitutive, creative and productive. Thus, identities are always unstable because of this lack. It is this lack and emptiness that essentialist ideas find a place for themselves. Since power is multiform, multilayered multifaceted, plural, metaphorical, hidden, implicit, dispersed, diffuse and decentralized in spheres such as language, politics and philosophy, it always exercises itself in various spheres by means of essentialist ideas, beliefs and myths. Therefore, power itself embodies an identity that is shaped by lack. Thus, poststructuralism is mainly an attempt to criticize authority. However, poststructuralists tend to become trapped in the problem of place. Therefore, Newman (2001) claims that there is another step to move, which is to dislocate the place of power and maintains that poststructuralists preserved this place and therefore created a theoretical void. In order to problematize this issue more radically, the enigma of place should be abandoned. Only in this way can a radically new perspective can be developed.

Essentialism refers to exercising power based on essentialist categories such as subjectivity, politics and rationalism (Chatterjee, 1986). Presence of essentialism molds individuals' minds in a certain way (Fairclough, 1992). Political stances shape how and what second language teachers teach in classroom settings. Culture, in this sense, can be defined as a set of practices that are shaped based on essentialist ideas (Ahiska, 2003). Second language teachers can teach items based on modern power relations. They do not teach only linguistic, communicative, pragmatic and strategic competence. Essentialist categories are often reinforced and exercised in language classroom settings. Although considerable progress has been made in second language teacher education, the problem of essentialism has not been addressed thoroughly. We still lack transformative practices that criticize essentialist ideas because possible identities are not recognized or reflected in second language teacher education. Binary identities are constantly created and reinforced in this field. Presence of nationalism and religions as well as even modernity often offers essentialist identities that are not questioned (Ahiska, 2010). Capitalism becomes one of the most dominant trends that shapes second language teachers 'curriculum that can be seen as a place of structure determining dispersal of essentialism. Thus, teaching language becomes politically structured, which only reinforces already-determined identities. In this sense, it is plausible to understand that poststructuralists' conceptualization of the subject is unstable and dispersed. Therefore, the subject is considered

to be open to resistance. Capitalism that acts as a form of state power remains as the key tool to resist power and forces (Apple, 1995). Political and economic power dominates all spheres of society including second language teacher education that is constituted by these forces. A critical perspective against essentialism in second language teacher education is embodied in participatory approach that proposes radical critical approaches through negotiation and social dialogue. The poverty of second language teacher education lies in its essentialist practices because possible identities are not allowed. Thus, this field can be seen as a reflection of capitalist domination because it is capitalist relations that determine content and curriculum of this discipline. This economic and political power in the state capitalism represents ideologies of certain groups that exercise their essentialist ideas. This discipline places itself for the interests of these groups that find themselves in capitalist relations. Thus, second language teacher education may encounter the risk of being trapped in economic reductionism which is constantly exercised. Political force is another risk that dominates second language teacher education. Thus, the place of power seems to be clear in this field.

4 Digital Education in Second Language Teaching in Turkey

EFL publishers and their textbooks dominate the market in Turkey and provide students with online activities and tasks, which are repetitive and mechanical. Learners cannot intervene in the curriculum imposed by global textbook publisher. Thus, learners are flanked by the schools' curriculum and online curriculum. Learners are hardly responsible for their learning because they are asked to follow whatever is presented to them. Since digital education lacks the elements of critical pedagogy, learners are barely aware of socio-political issues. Thus, learners are hardly prepared to discuss the current socio-political issues such as immigration, crime, violence, neoliberalism, invasions, violation of human rights, pandemic, racism, terror, gender and war. Digital education needs to be designed to develop democratic skills and social dialogue emanating from critical pedagogy. How digital products are prepared and constituted should be deconstructed and criticized by learners. Critical pedagogy aims to emancipate learners from the imposed curriculum and banking model of education. Digital education in EFL teaching represents the best example of banking model of education because it imposes certain skills, tasks and activities on learners. Learners are not equipped with the elements of critical pedagogy. Rather, they are taught only anodyne topics that are devoid of socio-political issues. Thus, digital divide does not result from producing inequalities about whether learners possess a certain device or access online learning but from hindering learners from expressing their ideas regarding socio-political issues and intervening in the preparation of their own curriculum. As a result of this problem, the learners in Turkey have difficulty in reaching a good command of English. This can be interpreted as syndromic, chronic

problem as well as a scandal. This neoliberal approach needs to be deconstructed through digital education that needs to be revised. In addition, the revised Bloom's Taxonomy and Freire's model of critical pedagogy need to be incorporated into digital education in EFL learning. The hidden neoliberal practices can be unearthed and criticized to unmask the real global neoliberal elites so that space can be created for learners who would like to create social change locally or globally. However, in the context of Turkey, this critical perspective is often undervalued or ignored because of the effect of western-oriented ideas. Taking for granted that global EFL and ESL textbooks belonging to Anglo-American cultures represent the best model for language education results from the fact that the West is superior to the East, the idea of which has been reinforced in Orientalism.

Digital education reduced to online learning without active participation of learners from the perspective of critical pedagogy may pose a severe risk for learners to be disconnected from real life practices. Limiting learners to digital education may cause them to alienate themselves from socio-political issues and to be depoliticized. In addition, degrading the importance of face to face education or impeding them from creating an emancipatory curriculum may render digital education less reliable and less liberal. In recent decades, some countries have already started to mention post-digital era and address the problems in this new post-digital world, which means that the problem per se is more profound than accessibility to or possession of digital device. Digital divide is not understood in terms of accessibility, rather how people are homogenized through digital education. The absence of diversity in second language learning takes place by ridding critical pedagogy and the tenets of poststructuralism because unmasking the hidden power of neoliberalism is something not desired by the institutions in Turkey. The educational institutes that mediate English in Turkey have been under the intensive influence of Anglo-American corporates and organizations such as the British Council and the World Bank as well as the effect of Orientalism as a superior constitutive element.

5 Discussion and Conclusion

The nature of digital education in second language learning needs to be questioned because EFL or ELT departments in Turkey often base their ideas on neoliberal ideologies that refer to complex formations of ideas that aim to coerce people in a certain society. Neoliberal elites remain invisible through digital platforms that limit the visibility and mobility of EFL and ESL learners. Filling in the blanks, completing the sentences and doing some repetitive tasks that hinder learners from thinking critically and that ban the discussion of sociopolitical issues imply that digital education can be the main hindrance to social change in a certain society because panopticon as a practice of surveillance functions more effectively through digital platforms and online learning. Unless they pay for these textbooks, they do not have the rights to access this digital world, which leads to economic and social inequality. What is worse is, however, that ESL and EFL learners access this world

without any real interaction because of the obligatory tasks that they have to. A radical and huge chasm takes place between online learning and real life practices, which drives them to feel disconnected from the current socio-political issues that mainly shape their lives.

They often strive to dominate a group of people with neoliberal ideas to attract them (Storey, 2015). Neoliberalism becomes an important tool in their hands. Thus, these ideologies may be persuasive and prevalent in the context of Turkey where English is seen as superior and constitutive. Poststructuralism is an attempt to question the nature of ideologies and neoliberalism (Newman, 2001). Although poststructuralism has developed a very strong theoretical background in recent decades (Newman, 2001; Sarup, 1993; Williams, 2005; Žižek, 1989), neoliberalism in second language learning has been more effective in practice.

Poststructuralism never refers to people's general will or a whole society that convenes around a certain idea (Newman, 2001). Poststructuralism is based on disagreements and conflicting ideas. However, neoliberalism aims to prioritize individual freedom to hinder learners from taking collective action. Therefore, this ideology expects all people to behave in the same way, which is consuming and obeying the rules of marketing. It is radically behavioristic in this sense. Conventionalism is often rejected in poststructuralism because individual autonomy and self-expression are emphasized in it (Inglehart et al., 2005). These two concepts are closely related to the term 'ownness' emphasized by Stirner (1993). The constant flow of ideas and beliefs governed by the ruling class and the media shapes people's social reality in such a way that there seems no way to escape from this reality except the freedom of self-expression and individual autonomy. The critical perspective of poststructuralism is by no means wanted in the society because it strongly emphasizes the importance of ownness, self-expression, individual autonomy and critical thinking. It is easier to manipulate the people by creating dichotomies and antinomies through selection and salience that are the main elements of framing that partially deals with reality. Constitution of this reality is similar to formation of social reality through conscious and deliberate manipulation (Žižek, 1989). As long as these essentialist traditions are reinforced, the emergence of poststructuralism will be delayed. In addition, neoliberalism will sustain its impressive and immense effect in the near future. Based on these negative connotations of neoliberalism and thus the banking model of education, this paper strongly recommends that the tenets of poststructuralism should be incorporated into education, political sphere and academia, which can be done by applying direct democracy and augmenting critical thinking programs and curricula including adult education that incorporates critical thinking skills. Otherwise, neoliberalism will continue to remain as an immense threat to the value of individual autonomy and ownness. Each individual in Turkey should be able to question the historical roots of this ideology because the ruling class is inclined to utilize these historically polarized groups and essentialist ideas by endorsing neoliberalism that leads people nowhere because its myelin sheath is thin.

References

- Ahiska, M. (2003). Occidentalism: The historical fantasy of the modern. *The South Atlantic Quarterly*, 102(2–3), 351–379.
- Ahiska, M. (2010). Occidentalism in Turkey: Questions of modernity and national identity in Turkish radio broadcasting. IB Tauris.
- Althusser, L. (1971). *Ideology and ideological state apparatuses in L. Althusser Lenin and Philosophy and Other Essays*. New Left Review.
- Apple, M. W. (1995). *Education and power* (2nd ed.). Routledge.
- Byrne, A. (2013). The British Council and cultural propaganda in the United States, 1938–1945. *Journal of Transatlantic Studies*, 11(3), 249–263.
- Chatterjee, P. (1986). *Nationalist thought and the colonial world*. Zed Books.
- Duncker, C. (Ed.). (2008). *Ideologiekritik aktuell: Ideologies today*. Turnshare.
- Eagleton, T. (2007). *Ideology: An introduction, new and (updated)*. Verso.
- Fairclough, N. (1992). *Discourse and social change*. Polity Press.
- Falzon, C. (2006). *Foucault and social dialogue: Beyond fragmentation*. Routledge.
- Freire, P. (2000). *Pedagogy of the oppressed* (Trans. M. Bergman Ramos). New York: Continuum.
- Giroux, H. A. (2020). *On critical pedagogy*. Bloomsbury Publishing.
- Harvey, D. (2007). Neoliberalism as creative destruction. *The Annals of the American Academy of Political and Social Science*, 610(1), 21–44.
- Inglehart, R., & Welzel, C. (2005). *Modernization, cultural change, and democracy: The human development sequence*. Cambridge University Press.
- McLaren, P. (2016). Revolutionary critical pedagogy: Staking a claim against the macrostructural unconscious. *Critical Pedagogy*, 7(8), 1–42.
- Minar, D. M. (1961). Ideology and political behavior. *Midwest Journal of Political Science*, 5(4), 317–331.
- Mullins, W. A. (1972). On the concept of ideology in political science. *American Political Science Review*, 66(2), 498–510.
- Newman, S. (2001). *From Bakunin to Lacan: Anti-authoritarianism and the dislocation of power*. Lexington Books.
- Pennycook, A. (1990). Critical pedagogy and second language education. *System*, 18(3), 303–314.
- Pennycook, A. (2002). *English and the discourses of colonialism*. Routledge.
- Pennycook, A. (2017). *The cultural politics of English as an international language*. Routledge.
- Phillipson, R. (1992). *Linguistic imperialism*. Oxford University Press.
- Phillipson, R. (2017). Myths and realities of global English. *Language Policy*, 16(3), 313–331.
- Sarup, M. (1993). *An introductory guide to post-structuralism and postmodernism*. Harvester Wheatsheaf.
- Skutnabb-Kangas, T. (2006). Language policy and linguistic human rights. In T. Ricento (Ed.), *An introduction to language policy: Theory and method* (pp. 273–291). Blackwell Publishing.
- Steger, M. B., & James, P. (2010). Introduction: Ideologies of globalism. In P. James & M. B. Steger (Eds.), *Globalization and Culture. Volume IV, Ideologies of Globalism* (pp. ix–xxxi).
- Stimer, M. (1993). The ego and its own. (Trans. S. Byington).
- Storey, J. (2015). *Postmodernism. Cultural theory and popular culture*. Routledge.
- Williams, J. (2005). *Understanding Poststructuralism*. Acumen.
- Žižek, S. (1989). *The sublime object of ideology*. Verso.