iejee

June 2022 Volume 14 Issue 5

www.iejee.com

international electronic journal of elementary education

KURA group Education & Publishing

INTERNATIONAL ELECTRONIC JOURNAL OF ELEMENTARY EDUCATION

ISSN: 1307-9298

www.iejee.com
iejee@iejee.com

KURA group
Education & Publishing

iejee

International Electronic Journal of Elementary Education
March 2022, Volume 14, Issue 5

Table of Contents

ISSN: 1307-9298

iejee

International Electronic Journal of Elementary Education
June 2022, Volume 14, Issue 5, 573-585

Protective Factors and Burnout Risk of Teachers During the COVID-19 Pandemic – A Two-Step Cluster Analysis

Camelia-Mădălina Răducu[a], Elena Stănculescu[b]

Received : 1 March 2022
Revised : 5 June 2022
Accepted : 28 June 2022
DOI : 10.26822/iejee.2022.264

[a] Camelia-Mădălina Răducu, Faculty of Psychology and Educational Sciences, University of Bucharest, Bucharest/Romania,
E-mail: camelia.madalina.raducu.unibuc@gmail.com
ORCID: https://orcid.org/0000-0002-3897-4850

[b] **Corresponding Author:** Elena Stănculescu, Faculty of Psychology and Educational Sciences, University of Bucharest, Bucharest/ Romania
E-mail: elena.stanculescu@fpse.unibuc.ro
ORCID: https://orcid.org/0000-0002-3912-812x

Abstract

Teacher burnout has been shown to be one of the most common negative consequences of the COVID-19 pandemic. This study aimed to identify distinct psychological resources and burnout risk profiles of teachers and examine their association with Kolb's educator roles and their professional experience. Methods: The survey data were collected from 330 preschool and primary school (84 males, M_{age} = 38.3, *SD* = 9.14) teachers using a convenience sampling method. Results: The two-step cluster analysis revealed two distinct profiles. The first profile, "high psychological resources, no burnout risk," was characterized by absent symptoms of burnout and increased levels of well-being, self-control, and positive emotionality. The second profile, "moderate psychological resources, mild burnout," was associated with medium levels of well-being, self-control, and positive emotionality accompanied by mild burnout. Our findings highlighted that cluster one had a significantly higher score for the facilitator role and cluster two for the expert and coach roles. Additionally, teachers with less professional experience were more likely to belong to cluster one, considering their adequate skills in digital literacy. Conclusions: These findings provide new insights into the explanation of teacher burnout and the design of intervention programs.

Keywords:

COVID-19, positive emotionality, professional experience, self-control, teacher burnout, well-being

Introduction

The last two school years have been extremely challenging for most teachers. At first, there was an unprecedented situation generated by the coronavirus pandemic caused by COVID-19, which led to the total closure of schools in March 2020. Then, teachers experienced other new changes in the organization of the instructional-educational process during the 2020–2021 school year. Specifically, they were forced to adapt quickly to different teaching approaches, such as social distancing classes, hybrid teaching, and virtual instruction, and juggle between them depending on government policies and the rate of infection.

The new demands added more difficulties to the already-full workloads of teachers. These professionals were affected by burnout, anxiety, and increased depression even before COVID-19 (Ferguson et al., 2012; Mahan et al., 2010; McLean & Connor, 2015). Such symptoms lead to frustration, dissatisfaction with teaching, job absenteeism, and low self-efficacy (Arvidsson et al., 2019; Capri & Guler, 2018; Pellerone et al., 2020).

Theoretical Background

Work-related burnout of teachers

Teacher burnout was first conceptualized by Maslach et al. (1997) as a tripartite model of three progressive stages of burnout. The first stage, exhaustion, is described as emotional and physical fatigue resulting from having too many demands and insufficient resources to meet them. The next stage, cynicism, is characterized by increased apathy, decreased empathy, and feelings of resentment or blame for others in the educational endeavor, including administrators, parents, and students. The final stage of burnout is a lack of accomplishment when teachers perceive that the job is impossible and no longer believe they can teach successfully. Additionally, the socio-contextual burnout (Pietarinen et al., 2013) is highlighted by the professional community, and teacher-pupil interactions are the primary arenas of teacher burnout, particularly concerning perceived inadequacy and cynicism.

In the general context of the impoverishment of the teaching occupation (Ferguson et al., 2012), the psychological resources of teachers were negatively affected by the pandemic crisis, with new stressors proximal to burnout, such as fear of COVID-19 (Stănculescu, 2021), anxiety about teaching demands, parent communication, and administrative support (Pressley, 2021; Răducu & Stănculescu, 2022). The lack of resources also affected the accomplishments of teachers, demonstrating that the greater the perception of a resource deficit, the lower teachers perceive their accomplishments (Sokal et al., 2020). Moreover, social relationships at all levels were impacted by the coronavirus pandemic, increasing the socio-contextual burnout reported among teachers (Pietarinen et al., 2021; Pyhältö et al., 2020).

Thus, it is critical to help teachers face this difficulty by identifying the protective factors that help safeguard them and promote optimal adaptability and resilience during stressful times at work (Ainsworth & Oldfield, 2019; García, 2019; Răducu & Stănculescu, 2021). Identifying the profiles of teachers who thrive in online teaching settings could improve psychosocial support (McKenzie et al., 2019; Răducu & Stănculescu, 2021) and the work lives of teachers (Farley & Chamberlain, 2021; Kumar et al., 2021; Vercambre et al., 2009). Additionally, preventing burnout increases the self-efficacy of teachers, job satisfaction, engagement, and well-being (Abós et al., 2019; Capri & Guler, 2018; Christensen et al., 2020; Fathi & Saeedian, 2020; Hampton et al., 2020; Perera et al., 2018).

Moreover, preventing teacher burnout improves the personal and professional lives of teachers and the online behavior of students (Pirc et al., 2021). This situation creates a stable learning environment (Kalyon, 2020; Lam et al., 2009; Sönmez & Betül Kolaşınlı, 2021), stimulating the motivation and learning of students (Harriott & Kamei, 2021; Lam et al., 2009; Shen et al., 2015).

Individual Traits in Preventing Teacher Burnout

The most common individual characteristics discussed in the literature are emotional intelligence (EI). The trait EI is a set of emotion-related self-perceptions and dispositions located at the lower levels of personality hierarchies and described under four dimensions: well-being, self-control, positive emotionality, and sociability (Petrides & Furnham, 2001).

There is a mounting body of evidence lending support to the critical role of EI competency and the organizational commitment, job satisfaction, performance, self-efficacy, self-esteem, well-being, and health indicators of teachers in the educational field (Anari, 2012; Fabio & Palazzeschi, 2008; González-Valero et al., 2019; Mohamad & Jais, 2016; Penrose et al., 2007; Sahin, 2017; Stănculescu, 2014; Toprak & Savaş, 2020; Vesely et al., 2013). EI also decreases occupational stress and prevents burnout symptoms and negative feelings (García, 2019; Kumara, 2021; Leonova et al., 2021; Martínez-Monteagudo et al., 2019; Răducu & Stănculescu, 2021; Schoeps et al., 2021). Similarly, EI has been revealed by several studies to be crucial for supporting the academic and social development of students in the teacher-student relationship (Alam & Ahmad, 2018; Chișa & Rusua, 2016; Curci et al., 2014; Fabio & Palazzeschi, 2008).

Emotional resources were also related to personality traits and burnout. For instance, a significant relationship between personality types, EI, and the three dimensions of burnout was revealed in the study by Pishghadam and Sahebjam (2012). It was indicated that the best predictors for emotional exhaustion were neuroticism and extroversion, the intrapersonal scale of EI and agreeableness for cynicism, the interpersonal scale of EI, and conscientiousness for personal accomplishment.

Work-related Traits in Preventing Teacher Burnout

Concerning work-related characteristics, we consider the teaching role and professional experience to be the most relevant for the present study because they

have been mentioned in the literature as essential in profiling teachers (Albuquerque et al., 2014; Garvis et al., 2011; Kolb et al., 2014; Răducu & Stănculescu, 2022).

There is a small body of research investigating the link between teaching roles and burnout. Still, it has been highlighted in a few studies that teachers who guide and direct students by asking questions, exploring options, and suggesting alternatives (Facilitator role) are the least likely to experience burnout (Akbari & Tavassoli, 2011; Ghanizadeh & Jahedizadeh, 2016; Hosseini Fatemi & Raoufi, 2014). Regarding profiling teaching roles, in his theory of experiential learning (ELT), Kolb (2014) proposed a framework, the educator role profile (ERP). Four different types of educators who teach using four teaching roles were described in ERP: (1) the facilitator, who helps learners get in touch with their personal experience and reflect on it, (2) the expert, who helps learners organize and connect their reflections to the knowledge base of the subject matter, (3) the evaluator, who adopts an objective results-oriented role, and (4) the coach, who helps learners apply knowledge to achieve their goals. This framework was used in this research to obtain information concerning the link between teaching roles and burnout.

Professional experience is also identified in the literature as a significant factor in preventing burnout. In this regard, it has been shown in previous studies that teachers with more professional experience were less vulnerable to burnout (Pietarinen et al., 2021; Pyhältö et al., 2020; Tikkanen et al., 2017). Nonetheless, the levels of stress and anxiety were increased by the pressure of moving the whole instructional process to a remote environment concomitant to learning in a short time with the use of new technologies (Fernández-Batanero et al., 2021; Knopik & Domagała-Zyśk, 2022; Wang & Li, 2019) and generated exhaustion and burnout even in the case of experienced teachers (Pressley, 2021; Răducu & Stănculescu, 2022)Moreover, it has been revealed in the few studies conducted in the pandemic context that older teachers often have weaker digital skills, highlighting the need for professional development in using digital technologies (Hämäläinen et al., 2021). At the same time, the younger teachers used more tools for teaching and learning, demonstrated better digital competence, and had more confidence in using digital technology and openness to new technology (Lucas et al., 2021).

Recently, there has been an increased interest in individual variations in teacher burnout in identifying teacher burnout profiles (Mäkikangas & Kinnunen, 2016; Pyhältö et al., 2020). Burnout has been clustered with protective factors, such as well-being, work engagement, resilience and coping strategies, self-efficacy, and collaboration within the community (Ferradás et al., 2019; García, 2019; Pyhältö et al., 2020; Salmela-Aro et al., 2019; Tikkanen et al., 2017). Still, the results on teacher prevention burnout profiles and factors contributing to individual variations were insufficient. Teachers may engage in different personal capacities and utilize various strategies to relieve stressors depending on their profiles. Extending the small body of literature examining individual variations and their determinants in preventing teacher burnout is required in this regard.

This study aimed to identify distinct psychological resources and burnout risk profiles in preschool and primary school teachers and examine their relationships with Kolb's educator roles and professional experience. This analysis aimed to identify homogeneous groups or clusters based on their common characteristics. Considering previous studies on the relationship between well-being and teacher burnout (Bakioğlu & Kiraz, 2019; Ballantyne & Retell, 2020; Ferradás et al., 2019; Vesely et al., 2013), we developed the first research question (RQ1): Were there distinct teacher profiles based on psychological resources (e.g., well-being, self-control, positive emotionality, and burnout risk) during the COVID-19 pandemic? Based on the well-established association between professional experience (Salmela-Aro et al., 2019; Tikkanen et al., 2017; Vercambre et al., 2009) and burnout, we developed the second research question (RQ2): Was there a positive association between profile membership and sociodemographic variables? Lastly, the teaching role has been linked to burnout by previous studies (Akbari & Tavassoli, 2011; Ghanizadeh & Jahedizadeh, 2016; Hosseini Fatemi & Raoufi, 2014). Therefore, we developed our third question (RQ3): Was there a positive association between profile membership and Kolb's educator roles?

Methods

Participants

The sample for this research was composed of 330 Romanian teachers (*N* = 108 preschool teachers, *N* = 222 primary school teachers, 75% women, M_{age} = 38.3 years, *SD* = 9.14). Their reported professional experience was less than one year (4.5%), between two and five years (10.9%), between six and 10 years (19.1%), between 11 and 20 years (25.5%) and more than 20 years (40%). A convenience sampling method was used. The sample was selected from the teacher register held by the Ilfov School Inspectorate via an e-mail paper survey sent to teachers. The total response rate was 45% from registered teachers.

Procedure

All the teachers were fully informed of the details of the study, and the confidentiality of all data obtained was guaranteed before the professionals completed the survey. The survey comprised two sections.

The first section refers to the sociodemographic information of participants (e.g., gender, teaching grades, years of professional experience, and the urban or rural teaching environment). The second section involved reporting the levels of burnout, well-being, self-control, positive emotionality, and the preference for a specific type of teaching role. The study was conducted under the Declaration of Helsinki. The study was also approved by the University of Bucharest Ethics Committee (no 11/ 26.04.2021) and followed its recommendations. Data were collected via Google Forms during spring 2021. The link to the online survey was posted with a short description of its purpose and the amount of time needed to complete it. Certificates of participation in the research were provided to the teachers in exchange for completing the questionnaires. The selection criteria for inclusion in this study were a primary or preschool level of teaching. All participants were involved voluntarily and gave their written informed consent before completing the questionnaire.

Measures

Teacher burnout. Given the pandemic context, the socio-contextual teacher burnout inventory (STBI, Pietarinen et al., 2013) has been used for measuring teacher burnout. This nine-item (e.g., "with this work pace, I do not think I will make it to the retiring age") scale was evaluated based on a Likert scale that ranged from one (completely disagree) to seven (completely agree). The established three constructs were teacher exhaustion, cynicism toward the teacher community, and inadequacy in the pupil-teacher relationship. The Cronbach's alpha for the entire scale was 0.90 (95% CI [0.89, 0.91]), and for its dimensions: exhaustion - 0.84 (95% CI, [0.93, 0.95]), cynicism - - 0.85 (95% CI [0.84, 0.97]) and inadequacy - 0.84 (95% CI, [0.93, 0.95]).

Well-being. The well-being of teachers was measured with the well-being subscale from the trait emotional intelligence questionnaire-short form for adults (TEIQue-ASF; Petrides, 2009). This scale consists of 30 items evaluated on a Likert scale from one (completely disagree) to seven (completely agree), in which items (e.g., "I generally do not find life enjoyable.") measure emotional intelligence under four aspects: well-being, self-control, emotionality, and sociability. A high internal consistency was indicated by the 0.90 Cronbach's α of this research (95% CI, [0.88, 0.91]). The Cronbach's α for the well-being subscale was 0.80 (95% CI, [0.75, 0.85]).

Self-control. The self-control of teachers was measured using the self-control subscale from the TEIQue-ASF; Petrides, 2009). This subscale is composed of six items (e.g., "'I usually find it difficult to regulate my emotions.") The Cronbach's α for the well-being subscale was 0.83 (95% CI, [0.82, 0.85]).

Positive emotionality. The positive emotionality of the teachers was measured with the emotionality subscale from the TEIQue-ASF; Petrides, 2009)]. This subscale contained eight items (e.g., "Expressing my emotions with words is not a problem for me."). The Cronbach's α for the emotionality scale was 0.94 (95% CI, [0.93, 0.95]).

Educator roles. We represented the pedagogical and content-related aspects of the teaching role, focusing on KERP (Kolb et al., 2014). KERP is a self-assessment tool that includes items related to an individual teaching role, beliefs about teaching and learning, goals for the educational process, and instructional practices (Kolb et al., 2014). KERP included 30 items that are forced-choice types of four educator roles: (1) facilitator (e.g., I aim for learners to develop a lifelong love of learning), (2) expert in the subject matter (e.g., I share my subject matter knowledge and expertise), (3) evaluator/standard setter (e.g., I use tests to evaluate the understanding of a subject by learners), and (4) coach (e.g., I believe learning occurs best in a real-life context). The Cronbach's α for the subscales was as follows: facilitator was equal to 0.83 (95% CI, [0.82, 0.85]), expert was equal to 0.63, (95% CI, [0.62, 0.65]), evaluator was equal to 0.57 (95% CI, [0.56, 0.59]), and coach was equal to 0.72 (95% CI, [0.71, 0.74]).

Statistical Analysis

A two-step cluster analysis with the Euclidean measure and the Akaike information criterion (AIC) was used to explore the possible profiles in our sample. This technique has advantages compared to more traditional clustering procedures (Kent et al., 2014). In it, the number of clusters is based on statistical measures of fit [AIC or BIC, average silhouette (an indicator of cohesion and separation), and ratio of sizes (largest cluster to smallest cluster)] and atypical values of analyses (i.e., outliers). The principle of parsimony was followed in the model selection criteria. According to these criteria, the best cluster solution was the one with the lowest AIC value. A good level fit (cutoff > 0.5) was highlighted by the average silhouette coefficient, and a cutoff < 2.0 in the case of the ratio of sizes, as recommended by Kent et al. (2014). Using the best cluster solution allows for measuring the improvement of homogeneity within each cluster and the heterogeneity between the clusters from one cluster to n + 1 cluster by adding one cluster at each step. One-way ANOVA tests were performed to verify the differences in the indicators of the clusters between the distinct profiles, the association between profile membership, and Kolb's educator roles. Also, a multinomial logistic regression was used to calculate the predictive roles of the sociodemographic variables (e.g., gender, education level, urban/rural education, and professional experience) on profile membership.

Results

Step 1: Preliminary analysis – descriptive statistics and correlations

The descriptive statistics for demographic characteristics, depending on the level of burnout, are shown in Table 1. The means, SD, univariate normality coefficients, and correlation matrix are presented in Table 2.

Before conducting the two-step cluster analysis, two assumptions were verified. The first assumption regarding the independence of the variables included in the cluster model was satisfied (as shown in Table 2), considering the cutoff criterion ($r < 0.70$), as suggested by Nunnally (1994). The second assumption, related to the univariate normality of all the indicators of the profiles, was also met. As shown in Table 2, the cutoff criteria recommended in the literature (skewness < 2; kurtosis < 7) (West et al., 1995) were not exceeded.

Step 2: Cluster analysis (RQ1)

Identifying the Number of Profiles

Inspecting the graph of AIC created by autoclustering (see Figure 1), we found multiple solutions ranging from two to four clusters. We minimized the AIC, but not at the cost of the other fit index, which is the measure of cohesion and separation (average silhouette coefficient).

The best solution was the model with two clusters. As the number of clusters increased, there was a decrease in the fit criteria model (i.e., the reduction of the silhouette coefficient and the ratio sizes), despite the decrease in AIC values (Table 3).

Characteristics of the identified profiles

The first cluster (n = 199; 60.3%) from our analysis was the "high psychological resources, no burnout risk" profile. It included teachers with higher scores on well-being, self-control, and positive emotionality, accompanied by the lowest scores on burnout. This meant no risk of burnout (see Table 3). The second cluster (n = 131; 39.7%) was the "moderate psychological resources, mild burnout risk" profile. Teachers belonging to this profile had medium scores on well-being, self-control, and positive emotionality, combined with a mild risk of developing burnout.

Table 1

Sociodemographic Variables and Descriptive Statistics, Depending on the Burnout Risk of the teachers.

Sociodemographic Variables		Burnout risk		Total
		No risk	Moderate level	
Gender	Male	139	107	246
	Female	44	40	84
Teaching level	Preschool	60	48	108
	Primary	123	99	122
Place	Urban	124	93	217
	Rural	59	54	113
Professional Experience (Years)	<2	12	3	15
	2–5	30	6	36
	6–10	48	15	63
	11–20	30	54	84
	>20	63	69	132

Table 2

Means, SD, Univariate Normality Coefficients, And Correlation Matrix

Clusters' indicators	Mean (SD)	Skewness (Std. Err)	Kurtosis (Std. Err)	1	2	3	4
Well-being	5.44(0.95)	-0.04(134)	-1.10(268)	—			
Self-control	4.70(0.87)	0.64(134)	-0.01(268)	.42**	—		
Positive emotionality	4.74(0.99)	0.08(134)	-0.72(268)	.59**	.43**	—	
Burnout	33.65(13.53)	-0.03(134)	-1.01(268)	.52**	.50**	.53**	—

**$p < 0.01$.

Figure 1

Auto-Clustering According to Akaike's Information Criterion (AIC).

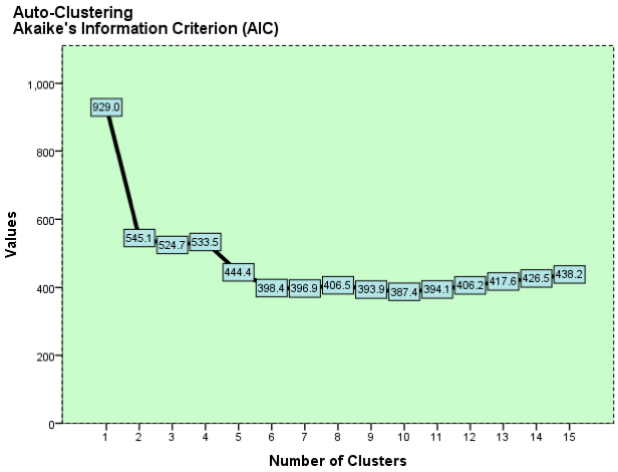


Table 3

The Goodness of Fit Indicators in the Mode

Number of Clusters	Average Silhouette	Akaike's Information Criterion (AIC)	Ratio of sizes
2	0.5	545.1	1.52
3	0.4	524.7	4.75
4	0.4	533.5	11.40

Table 4

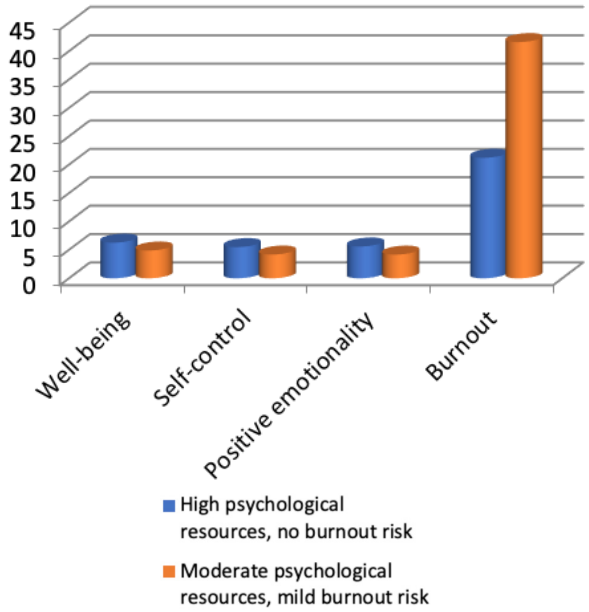
Means and SD of the Indicators of the Profiles Across Two Clusters

Indicators of the Profiles	Cluster 1	Cluster 2
	High Psychological Resources, No Burnout Risk	Moderate Psychological Resources and Mild Burnout Risk
Well-being	6.28(0.57)	4.90(0.73)
Self-control	5.50(0.72)	4.19(0.49)
Positive Emotionality	5.61(0.67)	4.18(0.73)
Burnout	21.23(8.57)	41.61(9.53)

Several one-way ANOVAs were conducted to examine the differences in the level of the indicators of the clusters between the two profiles. Significant differences for all indicators were revealed by the results. In the first cluster, higher scores emerged for: (1) well-being (Welch $F_{1, 315.569} = 369.148$; $p < 0.001$), (2) self-control (Welch $F_{1, 203.969} = 327.813$; $p < 0.001$), (3) positive emotionality (Welch $F_{1, 290.987} = 331.206$; $p < 0.001$), and (3) lower score for teacher burnout (Welch $F_{1, 293.652} = 406.369$; $p < 0.001$).

Figure 2

Indicators of the Profiles (means) Across the Two Clusters



Step 3: Cluster analysis and teacher variables

Association between profile membership and sociodemographic variables (RQ2)

The association between profile membership and sociodemographic variables (e.g., gender, teaching level, urban/rural education, and professional experience) was examined using multinomial logistic regression. According to the results, gender ($b = 0.07$, $SE = 0.276$, Wald = 0.07, $p = 0.791$), teaching level ($b = 0.27$, $SE = 0.261$, Wald = 1.11, $p = 0.296$), and urban-rural education ($b = 0.17$, $SE = 0.249$, Wald = 0.49, $p = 0.482$) were not significant predictors in the model. Instead, professional experience played a significant predictive role [$b = 0.41$, $SE = 0.10$, Wald = 17.09, $p < 0.001$; OR = 1.51, 95% CI (1.24, 1.89)]. Overall, the following patterns were shown in the results. Men and women were not predominantly represented in one of the two profiles. In other words, no gender differences were found in terms of distribution in the two clusters. The same pattern was found for teachers in rural or urban education. Even in the case of those working in preschool and primary education, no statistically significant differences were observed between the two profiles. However, concerning professional experience, professionals with less experience (less than one year and up to ten years), i.e., the youngest and most familiar with the digital environment, were less likely to belong to the mild profile and more likely to belong to the high mental health profile (Figure 3). An opposite pattern was found in the case of teachers with the highest levels of experience. They were more likely to belong to the "moderate psychological resources and mild burnout" risk profile and less likely to belong to the other.

Association between profile membership and Kolb's educator roles (RQ3)

The results obtained from various one-way ANOVAs provided evidence for a significant association between profiles and Kolb's educator roles, i.e., (1) facilitator role ($F_{1,328}$ = 120.347; p < 0.001), (2) expert role ($F_{1,328}$ = 80.921; p < 0.001), and (3) coach role ($F_{1,328}$ = 10.291; p < 0.001), except for the evaluator role ($F_{1, 328}$ = 2.911; p = 0.089). Cluster one had a significantly higher number for the facilitator role (M = 8.67, SD = 1.786) than cluster two (M = 6.01, SD = 2.358). In contrast, cluster two had a significantly higher number for the expert role (M = 8.92, SD = 2.782) than cluster one (M = 6.12, SD = 2.701). The same pattern was highlighted for the coach role—a higher number for *cluster* two (M = 9.04, SD = 3.255) than cluster one (M = 7.90, SD = 3.021). As mentioned, for the evaluator role, no significant differences were found (cluster one: M = 7.09, SD = 2.376; cluster two: M = 6.57, SD = 2.898).

Discussion

In the coronavirus pandemic context, teacher burnout has become a global epidemic (Pressley, 2021) and a significant concern in the educational debate, both for practitioners and professionals and psychologists and experts in educational policy. The main aim of this research was to identify protective factors and the risk of burnout profiles of the teachers in the framework of Kolb's experiential learning theory (Kolb et al., 2014). We also explored associations between profile membership and sociodemographic variables on the one hand and Kolb's educator roles on the other. Two different profiles were revealed by the two-step cluster analysis.

The "high psychological resources, no burnout risk" included teachers with higher scores on well-being, self-control, positive emotionality, and no burnout risk. Teachers who perceive and express emotions show empathy, build good relationships, and master their emotions, impulsiveness, and stressful feelings. Therefore, these teachers are more protected against burnout symptoms. Their increased self-esteem, happiness, and optimism are also beneficial resources that help them manage stressors (Petrides & Furnham, 2001; Răducu & Stănculescu, 2022). Our results align with previous research highlighting the relationship between well-being and burnout (Akbari & Tavassoli, 2011; Bakioğlu & Kiraz, 2019; Ferradás et al., 2019; Schoeps et al., 2021; Tikkanen et al., 2017). More specifically, the cluster of "high psychological resources, no burnout risk" included teachers who showed minimal scores on the burnout scale, meaning, in fact, no risk of burnout. They found resources to protect themselves in an adverse context for which no one was prepared. Their dispositional traits, meaning self-control, positive emotionality, and well-being, contributed to buffering the negative impact of stressors .

The "moderate psychological resources, mild burnout risk" included teachers with medium scores on well-being, self-control, positive emotionality, and mild burnout risk. In this regard, teachers who were less skillful in perceiving and expressing emotions, showing empathy, building good relationships, and mastering their emotions, impulsiveness, and stressful feelings were more likely to experience burnout symptoms (Akbari & Tavassoli, 2011; Mérida-López & Extremera, 2017; Pishghadam & Sahebjam, 2012). Their low self-esteem, happiness, and increased pessimism make them far more vulnerable to work-related stressors (Răducu & Stănculescu, 2022). Even if "moderate psychological resources, mild burnout risk" teachers reported symptoms of burnout, exhaustion, cynicism toward the teacher community, and inadequacy in the pupil-teacher relationship, this does not mean that they fulfill the clinical burnout criteria. Still, this means they have an increased risk of developing it.

These findings are in line with previous studies, in which it has been shown that emotional resources are strong predictors of teacher burnout (Kumara, 2021; Martínez-Monteagudo et al., 2019; Mérida-López & Extremera, 2017). However, the previous research on teacher burnout was expanded by the results, showing more refined socio-contextualized differences in teacher prevention burnout profiles in terms of well-being, self-control, and positive emotionality.

The results imply a variation in teaching roles and professional experience among teachers. Some of the teachers seemed to prefer specific teaching roles that were less burdensome. It was shown by the results that the teacher protective burnout profiles differed primarily in their preferred teaching role. The teachers characterized by a facilitator role were more likely to be assigned to the "high psychological resources, no burnout risk" profile. This alignment may be because the facilitator teaching role has produced the highest average values in the online exams of students (Agustino & Pertiwi, 2020). On the other hand, our findings emphasize that the teachers included in the second cluster, i.e., "moderate psychological resources, mild burnout risk," had a higher score on expert and coach educator roles. The coach teaching role was previously proven to be the most appropriate role in one-on-one teaching for students with the lowest mean grades in the pandemic context (Agustino & Pertiwi, 2020). Nonetheless, the possibility of practice in online learning classrooms is limited and highly restrained. Second, concerning the expert role, the results align with previous studies. In those studies, this role was revealed to be the least engaging and inaccessible in the opinions of students related to online teaching (Syahrin & Salih, 2020).

Therefore, experts were expected to feel more stress due to the difficulty of capting and maintaining

the attention of students. In this regard, the present research has enriched the gap in the literature concerning the link between teaching roles as a protective factor against burnout. It was shown that the facilitator teaching role that helps learners contact their personal experience and reflect on it is the least stressful for online teaching (Răducu & Stănculescu, 2021). At the same time, experts and coaches were more stressed regarding online teaching. This may be because the purpose of the expert is to help learners organize and connect their reflections to the knowledge base of the subject matter through lectures and texts in a reflective-authoritative role (Kolb et al., 2014). These strategies may be less interesting and engaging for students. Second, the interest of the coach was to help learners apply knowledge to achieve their goals (Kolb et al., 2014). Still, this role—as is described in ELT—is more appropriate for one-on-one learning and in a remote environment. This strategy is almost impossible to use with every student. The evaluator teaching role was relatively equally represented in both profiles. Within Kolb's theory framework, this role involves setting standards of performance and structuring performance activities. The role of an evaluator teacher consists of the use of tests, assessments, and projects. Nonetheless, a personal relationship with the student was not created because the teacher focused on the subjects and evaluation. It was shown previously that the role of the evaluator teacher facilitated online learning among students from higher education (Agustino & Pertiwi, 2020). Still, it is required that learning should be more concrete, practical, and instructional and less often evaluated through tests and assignments in preschool and primary school education.

Additionally, a significant association between profile membership and professional experience was shown in the overall results. Teachers with less professional experience were more likely to belong to the "high psychological resources, no burnout risk" profile, and members of the profile "moderate psychological resources, mild burnout risk" were more likely to be experienced teachers. This may seem to contradict previous studies (Pyhältö et al., 2020) relating high levels of professional experience to a low risk of burnout. However, considering that the pandemic context created new stressors, such as technostress and a lack of resources and administrative support (Pressley, 2021; Răducu & Stănculescu, 2022; Wang & Li, 2019), the situation seems to have changed. Consequently, these results may align with the latest studies suggesting experienced and self-confident teachers in face-to-face teaching. In such conditions, these teachers may suddenly become deskilled when transitioning to online teaching, experiencing disempowerment, vulnerability, and frustration in using remote technology (Hämäläinen et al., 2021; Rahayu & Wirza, 2020). At the same time, openness to new technology, confidence, and increased digital competences (Lucas et al., 2021) could protect younger teachers from burnout symptoms.

This study contributes to expanding the empirical body of research on teacher burnout (Mojsa-Kaja et al., 2015; Pietarinen et al., 2021; Pozo-Rico et al., 2020). This study is one of the first studies to explore the individual traits of teachers in terms of personal resources and burnout risk profiles within the framework of Kolb's experiential learning theory (Kolb et al., 2014). The results showed that the well-being, self-control, and positive emotionality of teachers help them buffer work-related stressors in online teaching in the COVID-19 pandemic context. Moreover, the higher these internal resources were, the lower the risk of experiencing burnout. This highlights that emotional resources represent a strong internal barrier against imminent stressors and that preparing functional psychological strategies can prevent burnout syndrome. Our results also indicated that preferred teaching roles and professional experience are related to burnout risk. At the same time, the most protective role against burnout is the facilitator role. Expert and coach roles were associated with a mild burnout risk profile. The fewer years of teaching experience, the lower the burnout risk of teachers in an online teaching context. Accordingly, the most protected teachers in the pandemic context are those with the facilitator role, high well-being, self-control, and positive emotionality. At the same time, most at-risk teachers have expert and coach roles, with moderate levels of well-being, self-control, and positive emotionality. Another contribution of this study is based on a person-centered approach, meaning the two-step cluster analysis. We proved that there were no simple associations between the research variables. We found associations between the profile of distinct teachers and their predictors in terms of professional experience and Kolb's educator roles.

Moreover, this study brings constructs from the educational sphere, in contrast with previous studies that investigated the burnout profile of teachers only from the health psychology angle (Ferradás et al., 2019; Pyhältö et al., 2020; Salmela-Aro et al., 2019; Tikkanen et al., 2017). Therefore, two different perspectives were reunited into a new point of view on the burnout of teachers.

Thus, this study had two main educational implications. First, the need of teachers for the professional and personal development of emotional competencies to help them manage stress in the classroom in both normal and adverse educational, social, and health contexts was emphasized in this study. Second, teachers were encouraged by the theoretical framework of ELT to move away from the

consistent expert teaching role to the coach role. The teacher imposes an objective, results-oriented approach on young learners in the expert role. In the coach teaching role, the teacher works on a one-to-one approach to apply the learning concepts to the facilitator teaching role. This role uses a worm-affirmative role and promotes "inside-out" learning to draw out motivation and self-knowledge, creating personal relationships and dialogue with the students.

Regarding the limitations of this study, it is essential to note that a correlational design was employed, limiting our ability to infer causal links. Additionally, the current findings cannot be generalized due to the convenience sampling method used. Considering that most of the respondents were women, they were slightly overrepresented in the sample. In future studies, longitudinal designs are necessary to capture the possible developmental trajectories of burnout, in line with the theoretical assumption underlying protective factors. In those studies, factors like dispositional traits and coping strategies, and covariates, such as educator roles and digital literacy skills, should be considered in the context of technostress.

Conclusion

The new demands on the current education system have caused teachers to juggle three different teaching approaches: social distancing in classes, online teaching, and hybrid teaching. In this context, the short- and long-term impacts of the COVID-19 pandemic on preschool and primary education have led to increased levels of burnout among teachers (Pressley, 2021; Sokal et al., 2020). It has been shown in this study that the teachers who were less protected against the burnout profile during the adverse context of the COVID-19 pandemic were those with moderate levels of well-being, self-control, and positive emotionality. Additionally, teachers who preferred expert and coach educator roles were also protected against burnout. In contrast, the most protected against burnout were those with high levels of well-being, self-control, positive emotionality, and the advantages of the facilitator role in interacting with students. The results can be helpful for teacher training specialists. With such knowledge, it will be possible to help teachers cope with online teaching stressors, regulate their emotional resources, and use effective and less consuming teaching strategies specific to the facilitator role. The need to improve the digital skills of teachers must also be considered to facilitate and streamline their work(Harriott & Kamei, 2021). As all organizations must promote the health of their employees, in the case of teachers, educational managers must support the health and well-being of teachers. This may be done by creating good working conditions and developing programs to equip teachers with the emotional competency and coping strategies necessary, both in typical educational contexts and in adverse social and health conditions, as were those observed during the COVID-19 pandemic.

References

Abós, Á., Sevil-Serrano, J., Haerens, L., Aelterman, N., & García-González, L. (2019). Towards a more refined understanding of the interplay between burnout and engagement among secondary school teachers: A person-centered perspective. *Learning and Individual Differences*, *72*, 69–79.

Agustino, R., & Pertiwi, S. (2020). *Estimation of the Relationship Between Learning Styles Inventory and Online Learning During the Pandemic*. *3*(1), 553–561.

Ainsworth, S., & Oldfield, J. (2019). Quantifying teacher resilience: Context matters. *Teaching and Teacher Education*, *82*, 117–128.

Akbari, R., & Tavassoli, K. (2011). Teacher efficacy, burnout, teaching style, and emotional intelligence: Possible relationships and differences. *Iranian Journal of Applied Linguistics (IJAL), 14*(2), 31–61.

Alam, A., & Ahmad, M. (2018). The role of teachers' emotional intelligence in enhancing student achievement. *Journal of Asia Business Studies*, *12*(1), 31–43

Albuquerque, A., Sa, P., Aranha, A., & Resende, R. (2014). Teacher profile: The knowledge and the identity practices. *The Open Sports Sciences Journal*, *7*(1), 133–140.

Anari, N. N. (2012). Teachers: Emotional intelligence, job satisfaction, and organizational commitment. *Journal of Workplace Learning*, *24*(4), 256–269.

Arvidsson, I., Leo, U., Larsson, A., Håkansson, C., Persson, R., & Björk, J. (2019). Burnout among school teachers: Quantitative and qualitative results from a follow-up study in southern Sweden. *BMC Public Health*, *19*(1), 1–13.

Bakioğlu, F., & Kiraz, Z. (2019). Burnout and wellbeing of teacher candidates: The mediator role of cynicism. *Anales De Psicología/Annals of Psychology*, *35*(3), 521–528.

Ballantyne, J., & Retell, J. (2020). Teaching careers: Exploring links between well-being, burnout, self-efficacy and praxis shock. *Frontiers in Psychology*, *10*, 2255.

Capri, B., & Guler, M. (2018). Evaluation of burnout levels in teachers regarding socio-demographic variables, job satisfaction and general self-efficacy. *Eurasian Journal of Educational Research*, *18*(74), 123–144.

Chișa, A., & Rusua, A. S. (2016). Connecting emotional intelligence and academic achievement in adolescence: A systematic review. *BE-Ci*, *18,* 91–100.

Christensen, M., Dyrstad, J. M., & Innstrand, S. T. (2020). Academic work engagement, resources and productivity: Empirical evidence with policy implications. *Studies in Higher Education*, *45*(1), 86–99.

Curci, A., Lanciano, T., & Soleti, E. (2014). Emotions in the classroom: The role of teachers' emotional intelligence ability in predicting students' achievement. *The American Journal of Psychology*, *127*(4), 431–445.

Fabio, A. D., & Palazzeschi, L. (2008). Emotional intelligence and self-efficacy in a sample of Italian high school teachers. *Social Behavior and Personality: An International Journal*, *36*(3), 315–326. https://doi.org/10.2224/sbp.2008.36.3.315

Farley, A. N., & Chamberlain, L. M. (2021). The Teachers are Not Alright: A Call for Research and Policy on Teacher Stress and Well-Being. *The New Educator*, *17*(3), 1–19.

Fathi, J., & Saeedian, A. (2020). A structural model of teacher self-efficacy, resilience, and burnout among Iranian EFL teachers. *Iranian Journal of English for Academic Purposes*, *9*(2), 14–28.

Ferguson, K., Frost, L., & Hall, D. (2012). Predicting teacher anxiety, depression, and job satisfaction. *Journal of Teaching and Learning*, *8*(1), 27–42.

Fernández-Batanero, J.-M., Román-Graván, P., Reyes-Rebollo, M.-M., & Montenegro-Rueda, M. (2021). Impact of educational technology on teacher stress and anxiety: A literature review. *International Journal of Environmental Research and Public Health*, *18*(2), 548–562.

Ferradás, M. del M., Freire, C., García-Bértoa, A., Núñez, J. C., & Rodríguez, S. (2019). Teacher profiles of psychological capital and their relationship with burnout. *Sustainability*, *11*(18), 5096.

García, M. I. V. de V. (2019). Relationships Between the Dimensions of Resilience and Burnout in Primary School Teachers. *Lnternational Electronic Journal of Elementary Education*, *12*(2), 189–196.

Garvis, S., Twigg, D., & Pendergast, D. (2011). Breaking the negative cycle: The formation of self-efficacy beliefs in the arts. A focus on professional experience in pre-service teacher education. *Australasian Journal of Early Childhood*, *36*(2), 36–41.

Ghanizadeh, A., & Jahedizadeh, S. (2016). EFL teachers' teaching style, creativity, and burnout: A path analysis approach. *Cogent Education*, *3*(1), 1151997.

González-Valero, G., Zurita-Ortega, F., Chacón-Cuberos, R., & Puertas-Molero, P. (2019). Analysis of motivational Climate, Emotional Intelligence, and Healthy Habits in Physical Education Teachers of the future using structural equations. *Sustainability*, *11*(13), 3740.

Hämäläinen, R., Nissinen, K., Mannonen, J., Lämsä, J., Leino, K., & Taajamo, M. (2021). Understanding teaching professionals' digital competence: What do PIAAC and TALIS reveal about technology-related skills, attitudes, and knowledge? *Computers in Human Behavior*, *117*, 106672.

Hampton, D., Culp-Roche, A., Hensley, A., Wilson, J., Otts, J. A., Thaxton-Wiggins, A., Fruh, S., & Moser, D. K. (2020). Self-efficacy and satisfaction with teaching in online courses. *Nurse Educator*, *45*(6), 302–306.

Harriott, W., & Kamei, A. (2021). Social Emotional Learning in Virtual Settings: Intervention Strategies. *Lnternational Electronic Journal of Elementary Education*, *13*(3), 365–371. https://doi.org/10.26822/iejee.2021.196

Hosseini Fatemi, A., & Raoufi, R. (2014). Burnout and teaching style among Iranian English language educators in public schools and private institutes: A cross-comparison study. *International Journal of Research Studies in Language Learning*, *3*(6), 85–94.

Kalyon, D. Ş. (2020). Primary Teachers and Students Images of Teachers and Learning Environments. *Lnternational Electronic Journal of Elementary Education*, *13*(1), 155–167. https://doi.org/10.26822/iejee.2020.180

Kent, P., Jensen, R. K., & Kongsted, A. (2014). A comparison of three clustering methods for finding subgroups in MRI, SMS or clinical data: SPSS TwoStep Cluster analysis, Latent Gold and SNOB. *BMC Medical Research Methodology*, *14*(1), 1–14.

Knopik, T., & Domagała-Zyśk, E. (2022). Predictors of The Subjective Effectiveness of Emergency Remote Teaching During The First Phase of The COVID-19 Pandemic. *Lnternational Electronic Journal of Elementary Education*, *14*(4), 525–538. https://doi.org/10.26822/iejee.2022.261

Kolb, A. Y., Kolb, D. A., Passarelli, A., & Sharma, G. (2014). On becoming an experiential educator: The educator role profile. *Simulation & Gaming*, *45*(2), 204–234.

Kumar, D., Singh, D., & Parkash, P. (2021). Psychological Well-Being And Quality Of Worklife Of The School Teachers During The Covid-19 Situation. *European Journal of Molecular & Clinical Medicine*, *7*(7), 6309–6316.

Kumara, P. (2021). A Study Of The Relationship Between Occupational Stress And Emotional Intelligence Of Degree College Teachers. *Turkish Journal of Computer and Mathematics Education (TURCOMAT)*, *12*(3), 3490–3493.

Lam, S., Jimerson, S., Basnett, J., Cefai, C., Duck, R., Farrell, P., & Zollneritsch, J. (2009). *Exploring student engagement in schools internationally: A collaborative international study yields further insights*. A symposium at the 31st annual international school psychology association colloquium, Malta.

Leonova, I. M., Yevchenko, I. M., Masliuk, A. M., Brahina, K. I., & Salata, H. V. (2021). Emotional Intelligence as a Factor against Burnout in Female Students and Teachers. *Journal of Intellectual Disability-Diagnosis and Treatment*, *9*(3), 280–293.

Lucas, M., Bem-Haja, P., Siddiq, F., Moreira, A., & Redecker, C. (2021). The relation between in-service teachers' digital competence and personal and contextual factors: What matters most? *Computers & Education*, *160*, 104052.

Mahan, P. L., Mahan, M. P., Park, N.-J., Shelton, C., Brown, K. C., & Weaver, M. T. (2010). Work environment stressors, social support, anxiety, and depression among secondary school teachers. *AAOHN Journal*, *58*(5), 197–205.

Mäkikangas, A., & Kinnunen, U. (2016). The person-oriented approach to burnout: A systematic review. *Burnout Research*, *3*(1), 11–23.

Martínez-Monteagudo, M. C., Inglés, C. J., Granados, L., Aparisi, D., & García-Fernández, J. M. (2019). Trait emotional intelligence profiles, burnout, anxiety, depression, and stress in secondary education teachers. *Personality and Individual Differences*, *142*, 53–61.

Maslach, C., Jackson, S. E., & Leiter, M. P. (1997). *Maslach burnout inventory*. In C. P. Zalaquett & R. J. Wood (Eds.), *Evaluating stress: A book of resources* (pp. 191–218). Scarecrow Education.

McKenzie, J., Olson, R. E., Patulny, R., Bellocchi, A., & Mills, K. A. (2019). Emotion management and solidarity in the workplace: A call for a new research agenda. *The Sociological Review*, *67*(3), 672–688.

McLean, L., & Connor, C. M. (2015). Depressive symptoms in third-grade teachers: Relations to classroom quality and student achievement. *Child Development*, *86*(3), 945–954.

Mérida-López, S., & Extremera, N. (2017). Emotional intelligence and teacher burnout: A systematic review. *International Journal of Educational Research*, *85*, 121–130.

Mohamad, M., & Jais, J. (2016). Emotional intelligence and job performance: A study among Malaysian teachers. *Procedia Economics and Finance*, *35*, 674–682.

Mojsa-Kaja, J., Golonka, K., & Marek, T. (2015). Job burnout and engagement among teachers: Worklife areas and personality traits as predictors of relationships with work. *International Journal of Occupational Medicine and Environmental Health*, *28*(1), 345–361.

Nunnally, J. C. (1994). The assessment of reliability. *Psychometric Theory*. Tata McGraw-hill education.

Pellerone, M., Rapisarda, V., Trischitta, M. C. A., Vitale, E., & Ramaci, T. (2020). Burnout and Self-Perceived Instructional Competence: An Exploratory Study of a Group of Italian Female Elementary School Teachers. *International Journal of Environmental Research and Public Health*, *17*(4), 1356–1367.

Penrose, A., Perry, C., & Ball, I. (2007). Emotional intelligence and teacher self efficacy: The contribution of teacher status and length of experience. *Issues in Educational Research*, *17*(1), 107–126.

Perera, H. N., Granziera, H., & McIlveen, P. (2018). Profiles of teacher personality and relations with teacher self-efficacy, work engagement, and job satisfaction. *Personality and Individual Differences*, *120*, 171–178. https://doi.org/10.1016/j.paid.2017.08.034

Petrides, K. V. (2009). Psychometric Properties of the Trait Emotional Intelligence Questionnaire (TEIQue). In J. D. A. Parker, D. H. Saklofske, & C. Stough (Eds.), *Assessing Emotional Intelligence* (pp. 85–101). Springer US. https://doi.org/10.1007/978-0-387-88370-0_5

Petrides, K. V., & Furnham, A. (2001). Trait emotional intelligence: Psychometric investigation with reference to established trait taxonomies. *European Journal of Personality*, *15*(6), 425–448.

Pietarinen, J., Pyhältö, K., Haverinen, K., Leskinen, E., & Soini, T. (2021). Is individual-and school-level teacher burnout reduced by proactive strategies? *International Journal of School & Educational Psychology*, *18*, 1–16.

Pietarinen, J., Pyhältö, K., Soini, T., & Salmela-Aro, K. (2013). Reducing teacher burnout: A socio-contextual approach. *Teaching and Teacher Education*, *35*, 62–72.

Pirc, T., Podlesek, A., Peklaj, C., & Pecjak, S. (2021). Some Predictors of Perceived Support and Proximity in Students during COVID-19 Distance Learning. *Lnternational Electronic Journal of Elementary Education*, *14*(1), 51–62. https://doi.org/10.26822/iejee.2021.228

Pishghadam, R., & Sahebjam, S. (2012). Personality and emotional intelligence in teacher burnout. *The Spanish Journal of Psychology*, *15*(1), 227–236.

Pozo-Rico, T., Gilar-Corbí, R., Izquierdo, A., & Castejón, J.-L. (2020). Teacher Training Can Make a Difference: Tools to Overcome the Impact of COVID-19 on Primary Schools. An Experimental Study. *International Journal of Environmental Research and Public Health*, *17*(22), 5356–5368. https://doi.org/10.3390/ijerph17228633

Pressley, T. (2021). Factors Contributing to Teacher Burnout During COVID-19. *Educational Researcher*, *50*(5), 325–327. https://doi.org/10.3102/0013189X211004138

Pyhältö, K., Pietarinen, J., Haverinen, K., Tikkanen, L., & Soini, T. (2020). Teacher burnout profiles and proactive strategies. *European Journal of Psychology of Education*, *14*, 1–24.

Răducu, C.-M., & Stănculescu, E. (2021). Adaptability to Online Teaching during Covid-19 Pandemic: A Multiple Mediation Analysis Based on Kolb's Theory. *International Journal of Environmental Research and Public Health*, *18*(15), 8032.

Răducu, C.-M., & Stănculescu, E. (2022). Teachers' Burnout Risk During the COVID-19 Pandemic: Relationships With Socio-Contextual Stress—A Latent Profile Analysis. *Frontiers in Psychiatry*, *13*, 870098.

Rahayu, R. P., & Wirza, Y. (2020). Teachers' perception of online learning during pandemic Covid-19. *Jurnal Penelitian Pendidikan*, *20*(3), 392–406.

Sahin, H. (2017). Emotional Intelligence and Self-Esteem as Predictors of Teacher Self-Efficacy. *Educational Research and Reviews*, *12*(22), 1107–1111.

Salmela-Aro, K., Hietajärvi, L., & Lonka, K. (2019). Work burnout and engagement profiles among teachers. *Frontiers in Psychology*, *10*, 2254.

Schoeps, K., Tamarit, A., Peris-Hernández, M., & Montoya-Castilla, I. (2021). Impact of Emotional Intelligence on Burnout among Spanish Teachers: A Mediation Study. *Psicología Educativa. Revista de Los Psicólogos de La Educación*, *27*(2), 135–143.

Shen, B., McCaughtry, N., Martin, J., Garn, A., Kulik, N., & Fahlman, M. (2015). The relationship between teacher burnout and student motivation. *British Journal of Educational Psychology*, *85*(4), 519–532.

Sokal, L., Trudel, L. E., & Babb, J. (2020). Canadian teachers' attitudes toward change, efficacy, and burnout during the COVID-19 pandemic. *International Journal of Educational Research Open*, *1*, 100016. https://doi.org/10.1016/j.ijedro.2020.100016

Sönmez, S., & Betül Kolaşınlı, I. (2021). The effect of preschool teachers' stress states on classroom climate. *Education 3-13*, *49*(2), 190–202.

Stănculescu, E. (2014). Psychological predictors and mediators of subjective well-being in a sample of Romanian teachers. *Revista de Cercetare Şi Intervenţie Socială*, *46*, 37–52.

Stănculescu, E. (2021). Fear of COVID-19 in Romania: Validation of the Romanian version of the fear of COVID-19 scale using graded response model analysis. *International Journal of Mental Health and Addiction*, *20*, 1094–1109.

Syahrin, S., & Salih, A. A. (2020). An ESL Online Classroom Experience in Oman during Covid-19. *Arab World English Journal*, *11*(3), 42–55.

Tikkanen, L., Pyhältö, K., Pietarinen, J., & Soini, T. (2017). Interrelations between principals' risk of burnout profiles and proactive self-regulation strategies. *Social Psychology of Education*, *20*(2), 259–274.

Toprak, M., & Savaş, A. C. (2020). School headmasters' emotional intelligence and teachers' job satisfaction: Moderation effect of emotional labor. *New Horizons in Adult Education and Human Resource Development*, *32*(2), 4–18.

Vercambre, M.-N., Brosselin, P., Gilbert, F., Nerriére, E., & Kovess-Masféty, V. (2009). Individual and contextual covariates of burnout: A cross-sectional nationwide study of French teachers. *BMC Public Health*, *9*(1), 333–351.

Vesely, A. K., Saklofske, D. H., & Leschied, A. D. (2013). Teachers—The vital resource: The contribution of emotional intelligence to teacher efficacy and well-being. *Canadian Journal of School Psychology*, *28*(1), 71–89.

Wang, X., & Li, B. (2019). Technostress among university teachers in higher education: A study using multidimensional person-environment misfit theory. *Frontiers in Psychology*, *10*, 1791.

West, S. G., Finch, J. F., & Curran, P. J. (1995). *Structural equation models with nonnormal variables: Problems and remedies.* In R. H. Hoyle (Ed.), *Structural equation modeling: Concepts, issues, and applications* (pp. 56–75). Sage Publications, Inc.

This page is intentionally left blank.

www.iejee.com

iejee

International Electronic Journal of Elementary Education
June 2022, Volume 14, Issue 5, 587-603

The Impact of Collaborative Learning Techniques on Written Expression, Self- Regulation and Writing Motivation*

Esra Sever[a,**], Hayati Akyol[b]

Received : 3 March 2022
Revised : 28 May 2022
Accepted : 8 June 2022
DOI : 10.26822/iejee.2022.265

* This study was produced from the PhD thesis entitled "The Impact of Collaborative Learning on Written Expression, Self Regulation Skill and Writing Motivation".

[a,**] **Corresponding Author:** Esra Sever, Zonguldak Bülent Ecevit University, Ahmet Erdoğan VSHS, Department of Child Care and Youth Services, Zonguldak, Turkey
E-mail: esrasever.55@gmail.com
ORCID: https://orcid.org/0000-0002-1378-6335

[b] Hayati Akyol, Gazi University, Gazi Education Faculty, Department of Basic Education, Ankara, Turkey
E-mail: hayatiakyol@gmail.com
ORCID: https://orcid.org/0000-0002-4450-2374

Abstract

The study examines the effects of collaborative learning techniques on written expression, self-regulation and writing motivation. It was designed according to the pre-test-post-test control group experimental model. The research was conducted during the 2017-2018 academic year with a total of 88 students in in one control and two experimental groups. The first experimental group performed writing exercises according to Co-Op Co-Op and the second experimental group utilized the STAD technique. The control group, on the other hand, carried out writing studies according to the Turkish Lesson Teaching Program (MEB, 2018). Data were collected via a Personal Information Form, 6+1 Analytical Writing and Evaluation Scale, Writing Oriented Self-Regulation Scale and Writing Motivation Scale and were analyzed with the SPSS program. When the findings are examined, a significant difference was seen between the experimental groups and the control group's post-test score average for self-regulation in writing. No significant difference was found between the written expression skills and writing motivation post-test mean scores.

Keywords:

Co-Op Co-Op, STAD, Written Expression, Self-regulation, Writing Motivation, Elementary School

Introduction

Group-based methods and techniques are very important in a classroom environment where students are responsible for each other's learning activities, produce outcomes in line with common goals, aid each other in the learning process and provide mutual feedback (Fung, 2010; Shafiee & Khavaran, 2017). Many complex skills can be evaluated by dividing tasks into sub-steps during a group session. Learning groups can be created according to objectives, student characteristics and size. One group-based method in which students of different levels come together is the collaborative learning processes. Collaborative writing is the co-writing of a single text by two or more authors, with writers taking part in all stages of the creation process, and the finished work belonging to members of the group (Storch, 2013). In the collaborative writing process, students discuss the relationships between

content-related ideas and offer responses to each other's suggestions and explanations (Vass et al., 2008). Writing in small groups or pairs can improve writing skills, conceptual understanding, knowledge of the subject matter and reflective thinking (Nykopp et al., 2014).

When available research is examined, different learning techniques based on collaboration are seen as ways to improve writing skills (Abe, 2020; Anggraini et al., 2020; Fung, 2010; Lai et al., 2016; Teng, 2021). Two specific techniques, Co-Op Co-Op and Student Teams-Achievement Divisions (STAD), have been used widely in the research mainly because such methods can be planned in accordance with the stages of the writing process, students become responsible for each other's learning process and a more supportive classroom environment is created. The Co-Op Co-Op technique consists of a student-centered classroom discussion, the selection and formation of learning teams, choice of a team topic and sub-topics, preparation and presentation of sub-topics, preparation, presentation and evaluation of team presentations (Kagan, 1994). Lecture presentation, teams, tests, progress points and team award constitute the stages of the STAD technique (Slavin, 1995).

There are two basic processes for collaborative writing as determined by cognitive and sociocultural theories to be important for language learning: interaction and content generation (Storch, 2018). Piaget (1976) stated that during the collaborative process, discussions were held where cognitive conflicts occurred and were resolved. Vygotsky (1978) also emphasized that information is social and should be structured in collaborative environments in order to acquire and make use of it. In the collaborative writing process, each group member has a share of the decision-making process throughout the creation process.

When collaborative group work is included in an education or training process, some elements must be provided between collaborative groups. These are "positive dependence, responsibility to account individually and as a group, face-to-face supportive interaction, interpersonal and small group skills, and evaluation of the group's process (Johnson & Johnson, 2005). Individuals and groups maintaining these factors will be more successful in the development of complex skills, with a combination of many sub-skills such as the use of prior knowledge, adherence to the writing subject, choosing appropriate writing strategies, choosing the right words, establishing significant connections between sentences and style of expression. All aptitudes contribute to the emergence of a quality written product. When collaborative texts were examined, it was seen that a higher level was produced in terms of fluency, complexity and lack of errors compared to texts written individually (Dobao, 2012; Vass et al., 2008).

Writing is the process of fabricating the symbols and signs necessary to express our thoughts (Akyol, 2005), and the acquisition of such skill is not easy (Kellogg, 2006). Since cognitive processes are used more effectively in writing, it requires more cognitive effort than reading (Snowling, 2000). For this reason, establishing regular and continuous writing sessions is necessary to develop writing skills. It is also important to impart to students that effective writing happens in certain stages. While presenting an essay or paper from students, many skills are required before, during and after writing. Students can use these skills by making self-regulation for writing. Self-regulation refers to learning that results from students' self-generated thoughts and behaviors that are systematically oriented toward the attainment of their learning goals (Schunk & Zimmerman, 2013). Talented writers have extensive knowledge of the writing process, type of text and coordinating writing, as well as fluent text creation (McCutchen, 2000). Students who are good at writing have learned related strategies and use some of these techniques in the writing process including repeated reading, editing during the writing process, questioning the topic and considering the type of language they choose.

Supporting students during the writing process, proper planning, limiting writing to student discussions, providing timely feedback to students and creating collaborative learning groups help students encounter fewer problems during the writing process. Harris and Graham (2016) stated that writing skills will improve in environments that students enjoy and are presented with greater motivation. As experience with writing increases, students can bring their prior knowledge to the writing environment, organize the writing process better, identify deficiencies and plan subsequent writing exercises more easily. This increases motivation, affecting student attitudes towards writing positively. Motivation can also be expressed as the power source that drives an individual to write (Boscolo & Hidi, 2006). It is important for students who are lacking in skills to write often to gain experience with writing tasks that support future motivation. These individuals need to face complex writing tasks, get help in setting attainable targets, receive feedback on progress towards goals, learn writing strategies and how to employ them (Bruning & Horn, 2000). For the acquisition of writing skills, teachers are expected to include collaborative learning group sessions in classroom writing activities. When students learn together in groups, they do not feel alone in their writing tasks allowing them to overcome the difficult process with the support of the group when they find some difficulty writing, are hesitant about what to write or are discouraged and their motivation decreases.

Children frequently encounter this type of text through picture story books in preschool period and narrative texts in primary school textbooks. Thus, the

most common type of writing skills found in reading text in elementary schools is writing narrative text (Cole & Feng, 2015). When primary school level writing achievements are examined in the Republic of Turkey Ministry of National Education Board of Education Turkish Lesson Teaching Program (MEB, 2018), it is seen that the students will express themselves better in writing at the fourth-grade level compared to previous grade levels. Since it is thought that students will adapt better to lesson plans prepared according to the abovementioned techniques, learners were given narrative text writing tasks in collaborative groups with activities based on the Co-Op Co-Op and STAD techniques.

In examining national literature, the collaborative learning method is based on reading comprehension (Bozpolat, 2012; Tanrıverdi, 2019; Tok, 2008; Top, 2014; Yıldırım, 2010), speaking (Görgülü, 2009; Yılar, 2012), listening (Karabay & Yıldırım, 2016; Kırbaş, 2018) and writing skills (Bayburtlu, 2015; Dönmez & Gündoğdu, 2018; Karakoyun, 2010; Kardaş, 2013; Maden, 2011; Şahin, 2011; Ulaş et al., 2015; Yağmur Şahin, 2013).

When the international literature is examined, cooperative learning method improves writing skills, using language, understanding words, improving vocabulary (Choi & Mantik, 2017; Fung, 2010; Herder et al., 2018; Shafiee & Khavaran, 2017), self-regulation skills (Rojas). -Drummond et al., 1998; Qiu & Lee, 2020) and writing attitude (Sutherland & Topping, 1999) were found to have a positive effect.

When both national and international literature was reviewed, it was seen that studies conducted using the collaborative learning method were effective in the development of basic language skills. Considering studies on writing skills, the cooperative learning method is seen to be important in acquiring the cognitive and affective characteristics of writing. When writing by students produced individually and within groups is compared, it is seen that the texts created with the group are more qualified. For this reason, the collaborative learning method should be used more in developing writing skills. This research aims to examine the effects of STAD and Co-Op Co-Op technique, two collaborative learning techniques, on written expression, self-regulation skills and the writing motivation of primary school fourth-grade students.

The research question is: Is there a significant difference in favor of the experimental groups between the average scores of written expression, self-regulation and writing motivation of the experimental groups and control group?

Sub-problems identified in line with the research problem are as follows:

- Is there a significant difference in favor of the experimental groups between the written expression mean scores of the experimental groups and control group?
- Is there a significant difference in favor of the experimental groups between the self-regulation for writing mean scores of the experimental groups and control group?
- Is there a significant difference in favor of the experimental groups between the writing motivation mean scores of the experimental groups and control group?

Method

In this section, information about the research design, study group, data collection tools, formation of experimental and control groups, application process and data analysis are included.

Research Design

A quasi-experimental research approach was used in this study in which the effects of writing activities based on Co-Op Co-Op and STAD techniques on the motivation of writing expression, self-regulation and writing of fourth-grade students were examined. This research approach does not meet the criterion of an unbiased assignment of participants to groups. Participants in quasi-experimental studies are selected for groups prior to the research and independent of researcher influence (Gliner et al., 2009). This study was designed according to the pre-test-post-test control group experimental model, and carried out with two experimental and one control groups. Co-Op Co-Op and STAD techniques were assigned to the experimental group impartially. The control group, on the other hand, carried out writing activities according to the Turkish Lesson Teaching Program. Before the application, written expression work was done in the groups and following "the Writing Oriented Self-Regulation Scale (WOSRS)" and "Writing Motivation Scale (WMS)" were applied. Texts written by students were evaluated with the 6+1 Analytical Writing and Evaluation Scale (6+1 AWES). After the application, these scales were applied to the students once again. The symbolic view of the model is given in Table 1.

Study Group

The study group of the research consists of 88 fourth-grade students in Zonguldak. Within the scope of the research, the writing achievements in the Turkish Lesson Teaching Program (MEB, 2018) were examined. In particular, the grade levels at which students can express themselves in writing were evaluated. The research group was composed of fourth-grade students, since the students had more writing experiences than in previous years. The writing experiences of the students in the study group, the

time allotted to writing, socio-economic level, age and gender information were collected with a Personal Information Form. According to the information received before the application, the writing processes of the students were carried out according to the traditional teaching methods and the activities in the Turkish course workbook. The time students spend on writing in a day is generally between thirty minutes and an hour. The students in the study group continue their education in a public school. In terms of socio-economic characteristics, the students in the first and second experimental group are generally from middle and upper socio-economic levels; control group students come from middle socio-economic level. The average age of the students in the first experimental group is 9.9, the average age of the students in the second experimental group is 9.7 and the average age of the students in the control group is 9.6. The frequency and percentage distributions of male and female students in the experimental and control groups are given in Table 2.

Looking at Table 2, it can be seen that the first experimental group consists of 29 students, the second consists of 30 and the control group consists of 29 students. 51.724% of the students constituting the first experimental group are girls and 48.276% boys. 40.000% of the students in the second experimental group are girls and 60.000% boys. 44.828% of the students making up the control group are girls and 55.172% boys. It was observed that there was no significant difference in the number of male and female students in the experimental and control groups.

Data Collection Tools

In this section, information is given about measurement tools used in the data collection process and their intended use.

6+1 Analytical Writing and Evaluation Scale

The 6+1 AWES was used to evaluate students' written language. It was developed by researchers at the USA Northwest Regional Training Laboratory (NWREL), and was adapted to Turkish culture by Özkara (2007). The features evaluated were grouped under seven headings, in line with the opinions of researchers and academicians on the subject. These titles are: ideas, organization, voice, word choice, sentence fluency, spelling and presentation. While the maximum value that each dimension can have is 5, the minimum value is 1.

Written expression studies were scored by both researchers and a subject specialist in order to ensure reliability in the evaluation and scoring of texts written by students in the pre-test and post-test about "sharing". The specialist has completed an undergraduate and graduate degree in the field of Turkish Language and Literature. The Pearson correlation coefficient was used for rater reliability. A correlation coefficient of 1.00 indicates a perfectly positive relationship, -1.00 is a perfectly negative relationship and 0.00 indicates that there is no relationship. The correlation coefficient is high when the values are between 0.70-1.00, between 0.70-0.30 indicates a medium and 0.30-0.00 shows a low level of relationship (Büyüköztürk, 2011; Nettleton, 2014). When the reliability between raters was evaluated, the Pearson correlation coefficient for the pre-test score was .504, while the correlation coefficient for the post-test score was .732. Accordingly, when the pre-test correlation coefficient was calculated, a positive and medium level was found among the raters and related to the post-test score, a positive and high level relationship was determined between the raters.

Writing Oriented Self-Regulation Scale

This scale was developed by Uygun (2012) to determine the self-regulation of writing for fifth-grade students in primary education. In the scale, a three level rating was developed as "Never, Sometimes, Always".

Table 1

Symbolic View of the Experimental Research Model

Group	Pre-Application Tests	Techniques	Post-Application Tests
1st Experimental	6+1 AWES - WOSRS - WMS	Co-Op Co-Op	6+1 AWES - WOSRS - WMS
2nd Experimental	6+1 AWES - WOSRS - WMS	STAD	6+1 AWES - WOSRS - WMS
Control	6+1 AWES - WOSRS - WMS	Techniques in the Turkish Lesson Teaching Program	6+1 AWES - WOSRS - WMS

Table 2

Frequency and Percentage Distribution of Male and Female Students in Experimental and Control Groups

Gender	1st Experimental Group		2nd Experimental Group		Control Group	
	f	%	*f*	%	*f*	%
Female	15	51.724	12	40.000	13	44.828
Male	14	48.276	18	60.000	16	55.172
Total	29	100	30	100	29	100

The scale is a Likert type and scored in reverse, with 3-2-1 for positive expressions and 1-2-3 for negative expressions. The scale includes 19 items; 18 positive and 1 negative. The lowest score that can be obtained is 19, and the highest is 57. It consists of three factors: before writing, while writing and after writing. As a result of factor analysis, 7 items were included in the first factor, 5 items in the second factor and 7 items in the third factor. The load values of items in the first factor ranged from 0.735 to 0.563, load values of the items in the second factor ranged from 0.718 to 0.597, and load values of items in the third factor ranged from 0.794 to 0.443. The total reliability coefficient of the scale was expressed as 0.87, where a reliability coefficient between 0.7 and 0.9 indicates a good level of reliability (George & Mallery, 2003).

Writing Motivation Scale

The WMS developed by Öztürk (2013) consists of 22 items related to the writing motivation of fourth-grade students in primary school. As a consequence of factor analysis, the Kaiser-Meyer-Olkin value was determined as .899. According to Sheskin (2020), as it was greater than 70, it was concluded that factor analysis could be done on these data. Secondly, by looking at Bartlett's Sphericity test (χ^2 = 2724,641, p =.000) it was seen that acquired values were suitable for factor analysis because they showed significant difference (Pett et al., 2003). In factor analysis, the varimax return axis was carried out as being 1 of Eigenvalue of 22 items by giving priority to principal components analysis. As a consequence of validity work, it was found that the scale has a five factor structure. The variance explanation rates of this scale are 29.42% for a positive attitude factor against writing, 18.52% for the purpose factor owned, 6.07% for the failure loading factor in the article, 5.37% for the writing sharing factor and 4.89 for the writing effort factor. When the whole scale, including 22 items in total, is considered, it shows a five factor structure. Load value in factors of 22 items in the scale varied between 0.42-0.78. Five factors in scale explain 54.2% percent of total variance. These values show that this scale explains the writing motivation of fourth-grade students very well. The 5 factor structure consisting of 22 items acquired by exploratory factor analysis was tested via exploratory factor analysis CFA (Confirmatory Factor Analysis). The coherence index was found as χ^2= 440.32 (*sd* = 198, p = .00), χ^2 / *sd* = 2.22 SRMR = 0.053, RMSEA = 0.056, GFI = 0.91, AGFI = 0.88, CFI = 0.97, NFI =0.94 and NNFI = 0.96. As a result of first level EFA, it was seen that nine items in the first factor maintain a standard solution between .52 and .79. Standard solutions of four items in the second factor differ between .46 and .62. It was found that three items in the third factor change between .48 and .70, three items in the fourth factor change between .36 and .65 and three items in the fifth factor changes between .39 and .83. Standard solution t values were then checked between factors and items. The lack of a red arrow with t values shows that all items are significant at .05 levels. As a result of operated second level CFA, when it was evaluated whether identified five factors explained the implicit variable of writing motivation in a significant way or not, it was understood that all factors explained the implicit variable of writing motivation in a significant way. When the standard solution in the latent variable of factors is checked in the result of second level CFA, it is seen that there is a change between .32 and .92. The importance of factors in latent variable came out. After standard solution t values between factors and items was looked at, the lack of a red arrow related Joreskog and Sorbom (1996) t values shows that all items and factors are significant at a level of .05 factors. It was understood then that t values in the latent variable of factors changed between 2.83-13.93, and was significant at the .01 level due to being greater than 2.76. As a result of the performed analysis, coherence indexes were found as χ^2 = 453.61 (*sd* = 202, p = .0000), χ^2 / *sd* = 2.25, SRMR = 0.054, RMSEA = 0.056, GFI = 0.91, AGFI = 0.88, CFI = 0.97, NFI =0.94 ve NNFI = 0.96. A streak (2007) χ^2/*sd* value of 5 or less, RMSEA value of .08 or less and SRMR value of .10 or less indicate that they are needed for good coherence. Again, IFI, CFI, NFI and NNFI of over .90 indicate a good model. On the other hand, with AGFI .80 or over, GFI .85 or over indicate good coherence. It could be said that all values show good coherence when they are evaluated this way. On the basis of this indication, it could be expressed that the scale provides construct validity. The Cronbach Alpha reliability coefficient determined in the development phase of the scale is 0.81. The internal coefficient of consistence concerning sub-dimension is given below: .79 for "a positive attitude towards writing" sub factor, .80 for the "possessed objective" sub factor, .82 for "loading failure to writing" sub-factor, .81 for the "sharing of writing" sub factor and .82 for the "efforts to writing" sub-factor were found. The range of 22-51.3 points received from WMS is low, 51.4-80.7 points is medium and 80.8-110 scores were determined to be high motivation levels.

Personal Information Form

Through this form, information about school in which they study, gender, age, socio-economic level, frequency of reading books, types of books that they enjoy reading, time allocated for writing in a day, first semester Turkish lesson grade and preferences regarding the study method were obtained. This form was used to define the characteristics of students in the experimental and control groups.

Determination of Experimental and Control Groups

In an interview with the Zonguldak Provincial Directorate of National Education, information was provided about the implementation process.

Application was planned in Turkish lessons for 15 weeks, 3 hours per week, with three fourth- grade branches in Merkez and Kozlu districts. The Provincial Directorate of National Education stated that due to the long implementation period, it is necessary to first meet with the principals in the Merkez and Kozlu districts and the fourth-grade teachers working in these schools. As such, a preliminary interview was held with six primary school principals who have more than one fourth-grade in the central district, and after the interview, necessary permissions were obtained from three primary schools. Fourth-grade teachers from the schools where permission was obtained were informed of the study, and some teachers stated that they did not want to be involved. In the Kozlu district, five primary school principals with more than one fourth-grade branch were interviewed and necessary permission was obtained from two primary schools. Required documents for the research were submitted to the Provincial Directorate of National Education and then the research permission was obtained. Pre-tests were conducted in fifteen fourth-grade branches within the scope of permission. In the first hour, students were asked to write a narrative text on the subject of "sharing", and in the second lesson, a Personal Information Form, WOSRS and WMS were instituted. During completion of the scales, each item was read and explained by researchers and students were then asked to mark the items in a way that suited them best. The normality distribution of the scores of the fifteen branches from the scale of written expression, self-regulation and motivation to write was examined. Branches with normal distribution were determined according to the results of the Shapiro-Wilk test. Next, groups of three were selected from these branches and a one-way analysis of variance (ANOVA) was performed for the average scores received from each scale. According to the results, three branches where there was no significant difference between the average scores of the branches from the scales were then identified for research. In determining groups for the study, criteria such as the number of students in each branch, the number of male and female students, the frequency of reading books, the type of book preferred, the time allocated to writing and the Turkish course success grade were also taken into account. Collaborative learning techniques were then assigned to two of the three branches determined as a result of the analysis.

When Table 3 is examined, the 6+1 AWES pre-test mean score of the groups in the first experimental group is 21.00, the second experimental group 21.80, and the control group 20.44. WOSRS pre-test scores mean are: first experimental group 48.48, second experimental group 47.77 and control group 49.24. WMS pre-test means are: first experimental group 83.24, second experimental group 84.23 and control group 85.76. When the mean scores and standard deviation values of the experimental and control groups from the scales are examined, it is seen that these scores are close to each other. In Table 4, the results of a one-way analysis of variance regarding the pre-test mean scores of the experimental and control groups from the scales are given.

When Table 4 is examined, the 6+1 AWES [$F_{(2,85)}$ = .440, p >.05], WOSRS [$F_{(2,85)}$ = .755, p> .05] and the WMS [$F_{(2,85)}$ = .240, p >.05] pre-test mean scores were not found to be significantly different. Table 5 shows the percentage

Table 3

Descriptive Analysis Results of the Pre-Test Scores of the Experimental and Control Groups from the Scales

		6+1 AWES		WOSRS		WMS	
Group	*N*	*M*	*sd*	*M*	*sd*	*M*	*sd*
1st Experimental	29	21.00	4.81	48.48	4.84	83.24	14.87
2nd Experimental	30	21.80	5.74	47.77	4.59	84.23	12.27
Control	29	20.44	6.07	49.24	4.38	85.76	14.60

Table 4

One-Way Analysis of Variance Results of the Pre-Test Mean Scores of the Experimental and Control Groups from the Scales

Scales	Source of Variance	Total of Squares	*sd*	Average of Squares	*F*	*p*	Significant Difference
6+1 AWES	Between Groups	27.300	2	13.650	.440	.645	
	Within Groups	2635.972	85	31.011			
	Total	2663.273	87				
WOSRS	Between Groups	32.070	2	16.035	.755	.473	
	Within Groups	1805.918	85	21.246			
	Total	1837.989	87				
WMS	Between Groups	93.285	2	46.643	.240	.787	
	Within Groups	16521.987	85	194.376			
	Total	16615.273	87				

*p<.05

and frequency distributions of the experimental and control groups regarding the variables.

As seen in the table, 55.172% of the first experimental group students read one book a week and 13% read one book a month, and 76.666% of the second experimental group students read one book a week. It was seen that 55.172% of the control group students read one book a week and 27.586% read one book a month. It was determined that the percentage distributions of the first experimental and control group reading frequency rates were similar. 35.714% of the first experimental group students read fairy tales, 19.048% read comics and 19.048% read other types. 29.730% of the second experimental group students read stories, 29.730% read fairy tales and 16. 216% read comics. Among the control group, 23.684% stated that they liked reading stories, 36.842% fairy tales and 23.684% comics. It has been determined that students in the experimental and control groups like to read genres in which event-based narrations are made. 48.276% of the first experimental group students spent thirty minutes reading and 20.690% spent two hours. 56.666% of the second experimental group students spent thirty minutes reading, 20.000% spent one hour and 20.000% spent two hours. 72.414% of the control group allocated thirty minutes for writing and 24.138% one hour. When the table is examined, it is seen that approximately 50% of the students in the first experimental group and more than 50% of the students in the second experimental and control groups spend thirty minutes writing per day. It can be said that thirty minutes is not enough for proper development of students' writing skills. 31.034% of the first experimental group students preferred studying individually while 65.517% preferred studying as a group. 13.333% of the second experimental group students preferred self-study and 83.333% preferred group work. 17.241% of the control group students stated that they preferred individual work and 79.310% preferred group work. It was seen that students in the experimental and control groups preferred group work.

Application Process

The application process in the experimental groups was carried out by researchers in the second semester of the 2017-2018 academic year. The control group students, on the other hand, did their writing activities according to the Turkish Lesson Teaching Program (MEB, 2018) with their own classroom teacher. The application process in the experimental and control groups is listed in detail.

The application process in the first experimental group is as follows:

Table 5

Frequency and Percentage Distributions of the Experimental and Control Groups for the Variables

Question	Variables	1st Experimental Group		2nd Experimental Group		Control Group	
		f	%	*f*	%	*f*	%
Frequency of Reading	One Book a Week	16	55.172	23	76.666	16	55.172
	Three Books a Week	2	6.897	2	6.666	-	-
	One Book a Month	4	13.793	1	3.333	8	27.586
	Two Books a Month	3	10.345	1	3.333	4	13.793
	A Book in Two Months	-	-	1	3.333	-	-
	A Book in Four Months	4	13.793	2	6.666	1	3.448
	Total	29	100	30	100	29	100
Types of Books That You Like to Read	Story	5	11.905	11	29.730	9	23.684
	Tale	15	35.714	11	29.730	14	36.842
	Poem	2	4.762	1	2.703	-	-
	Novel	4	9.524	4	10.811	5	13.158
	Comic Book	8	19.048	6	16.216	9	23.684
	Other (action, science etc.)	8	19.048	4	10.811	1	2.632
	Total	42	100	37	100	38	100
Time for Writing in a Day	Thirty minutes	14	48.276	17	56.666	21	72.414
	One Hour	5	17.241	6	20.000	7	24.138
	Two Hours	6	20.690	6	20.000	1	3.448
	Three Hours	-	-	1	3.333	-	-
	Four Hours	2	6.897	-	-	-	-
	Five Hours and More	2	6.897	-	-	-	-
	Total	29	100	30	100	29	100
Preference Regarding Working Method	Individual Study	9	31.034	4	13.333	5	17.241
	Team Work	19	65.517	25	83.333	23	79.310
	Both of them	1	3.448	1	3.333	1	3.448
	Total	29	100	30	100	29	100

- It was determined randomly that the Co-Op Co-Op technique would be applied to the first experimental group.
- A total of ten groups of three were formed from the first experimental group, as small groups provide an advantage in terms of increasing interaction between students and adherence to the roles of students in the group. Due to the class size of 29, one group consists of two people.
- Groups were formed in a heterogeneous structure, taking into account the success of students in Turkish lessons, together with the classroom teacher.
- Practice days and hours are agreed on with the classroom teacher.
- Writing topics were selected according to themes that the classroom teacher will cover in the 4th grade Turkish textbook. When the study began, it was continued from the current topic the class was covering. Activities and writing topics were created from the texts entitled "My Beautiful Country Turkey", "Our Values" and "Fine Arts".
- The first experimental group was informed about the Co-Op Co-Op technique and a three-hour pre-application was undertaken so students could better understand the technique.
- Before the written expression study, activities aimed at improving related skills were carried out with the groups. Word activities, common mistakes in word writing, parts of the story, continuation of the given sentence in a significant way, punctuation and writing properties for names were all reviewed with groups.
- Before writing a narrative text, students were informed and a task sheet was prepared before each writing activity. Student progress was ensured to be in accordance with the stages of the technique in the process.
- In each written expression activity, task sheets were created for ten different writing exercises related to the text in the Turkish textbook. These task sheets were randomly distributed to the groups during the application.
- Depending on the subject and activities in the written expression study, the time allocated for each writing activity varied between three and six hours.
- Name badges, including group number and role in the group, were prepared for all students in the groups to be worn throughout the study. On the back of the card was a description of the role. Thus, it was attempted to ensure that students understood their responsibilities in the group.
- In the first five written expression exercises, a task was defined on the badges of the students to adapt slowly to the group process and the group. During this period, students were asked to wear their badges in a different way for each written expression exercise. After the sixth exercise, the number of tasks on the badges was increased and the students were asked to change badges.
- In each written expression exercise, a task sheet including the tasks expected from the groups and instructions on what to do in the process, and a twenty-item evaluation form showing how the written expression exercises were scored, were prepared and distributed to the groups.
- In the task sheet, each part of the written expression work was defined as a different task, and an individual writing paper was prepared for each part. Each group member made the distribution of these sections in the task sheet himself. Only the groups were asked to perform these tasks in each written expression exercise, alternating within the group.
- Groups described their characters, place, time, plot, etc. on the given topics. They discussed the elements in the group and decided on their. They then were asked to write the elements of the story on individual writing papers in harmony with each other.
- The fourth task from the task sheet was to turn each part written on individual writing papers into a story to form a whole. Group members must come together again, evaluate individual writing papers and then write their stories on the presentation paper.
- After the written expression activities, each group presented the text they wrote to the class. Texts were evaluated by the students in the class and the researcher.
- Next, "Let's Evaluate Ourselves" and "Let's Evaluate Our Group" forms were distributed to the students in order to evaluate themselves and the other members of their group. Through these forms, students were asked to be aware of the process, to know the roles expected from them in the group and to describe what they could and could not do.
- Texts written by the groups were evaluated each week with a 20-item evaluation form prepared on the basis of the items in the 6+1 AWES. At the end of the evaluation, +3 points were added to groups that scored 90 and above, and three star symbols were attached to the paper.
- After the evaluation process was completed, the scores of the groups and the situations that require more attention were explained. Afterwards, the groups were given a written expression exercise and an evaluation form showing the scores they got from each item and the groups were asked to examine them.
- A total of 48 hours of practice was carried out with the groups, apart from the pre-application. A total of twelve writing activities were performed with the first experimental group by the end of the study.
- Upon completion of the study, the average of twelve writing activities was taken and a ranking was made from the group with the highest score to the lowest score. Group averages were shared with the first experimental group. The students were thanked for their participation in the study and glittery colored pencils were handed out. In addition, the group that finished the application in the first place was rewarded with a small gift.
- Post-tests were carried out after the application.

The research process for the second experimental group is as follows:

- It was determined by random assignment that the STAD technique would be applied to the second experimental group.
- A total of ten groups of three were formed from the students of the second experimental group.
- Groups were formed in a heterogeneous structure together with the classroom teacher.
- Practice days and hours were agreed on with the classroom teacher.
- Writing topics were then selected from the themes of "My Beautiful Country Turkey", "Our Values" and "Fine Arts" in the 4th grade Turkish textbook, respectively.
- The second experimental group was informed about the STAD technique and a three-hour pre-application was carried out.
- Depending on the subject and activities in the written expression study, the time allocated for each writing activity varied between three and six hours.
- Before each written expression exercise, students were informed about the chosen topic for writing skills and short activities were held with the groups. Studies such as watching videos, interpreting the visual, class discussion about the subject, and let's talk (word activity) were carried out.
- Name badges were prepared for all students in the groups to wear during the study period. Group numbers and the name of the role in the group were given on the front of the cards and the definition of the role on the back. An effort was made to ensure that students understood and adopted their roles in the group.
- In the first five written expression exercises, a task was defined on the badges of the students to acclimate them to the group process and the group. During this period, students were asked to wear their name badges in a different way for each written expression exercise. After the sixth written expression exercise, the number of tasks on the badges was increased and the students were asked to change their badges.
- A form was prepared and distributed for the groups on the points to be considered, story writing activities and the use of time.
- The researcher gave worksheets to all group members after each written expression study with the groups. In this worksheet, activities such as common mistakes in spelling, parts of the story, continuation of the given sentence in a significant way, punctuation and writing properties for names were included.
- After group members completed the activity sheets individually, they got together with group members and evaluated each other's activities.
- Incorrect activities from the worksheet were corrected and incomplete activities were completed. The students helped each other on what they should pay attention to in their writing activities.
- After these studies, the subject of writing was explained to the groups and the students were informed about the points they should pay attention to during the writing process.
- Before each story writing exercise, the evaluation form used in the scoring of the written expression studies was distributed to the groups and the groups were asked to examine them.
- A "writing plan paper" for planning and worksheets for writing their stories were distributed to the students.
- After the writing process, "Let's Evaluate Ourselves" and "Let's Evaluate Our Group" forms were used for students to evaluate themselves and other members of the group. Through these forms, students were asked to be aware of the process, to know the roles expected from them in the group and to describe what they could and could not do.
- In the experimental group, where STAD were applied, each student wrote the written expression work himself. Three written expression exercises in each group were scored according to the evaluation form, and the group scores were obtained by taking the average of these scores.
- As a result of the evaluation of the written expression work, when all three students in the group scored 80 and above, +3 points were added to each student and a star was attached to their paper.
- Students who scored 90 or more in the written expression study were asked to read their story to their friends and the students in the class were asked to share their thoughts about the story.
- At the end of the evaluation, group averages were shared with the class. Afterwards, a written expression exercise and an evaluation form showing scores from each item were distributed to the groups. The groups were then asked to examine these forms and evaluate them among themselves.
- A total of 48 hours of study were carried out with the second experimental group, not including the pre-application. A total of twelve writing activities were carried out with the second experimental group at the end of the application.
- The average of twelve writing activities was taken. In the application, a ranking was made from the group with the highest score to the lowest score. Group averages were shared with the second experimental group. The students were thanked for their participation in the study and glittery colored pencils were distributed. In addition, the group that finished the application in first place was rewarded with a small gift.
- Post-tests were carried out after the application.

The application process in the control group is as follows:

- Writing studies were carried out according to the activities suggested in the Turkish textbook.
- Generally, individual writing studies were carried out.
- Writing topics were then selected from the themes of "My Beautiful Country Turkey", "Our Values" and "Fine Arts" in the 4th grade Turkish textbook, respectively.
- About two hours per week are allocated for the writing process.
- At the end of the process, post-tests were carried out.

Data Analysis

The quantitative data were transferred to the computer environment with the help of the SPSS. In the analysis, the Shapiro-Wilk test was used to determine whether the pre-test post-test total scores of the groups showed normal distribution. A significance value greater than .05 in this test indicates that the group is normally distributed (Mcleod, 2019). In Table 6, Shapiro-Wilk Test results regarding the pre-test post-test total scores obtained by the experimental and control groups from the scales are given.

It was determined that the pre-test post-test total scores of the experimental and control groups from the scales showed a normal distribution (McLeod, 2019). Since the total scores of the groups from the scales showed a normal distribution, a one-factor analysis of variance (ANOVA) was used in the comparison between groups. The Bonferroni test, which is one of the Post Hoc tests, was used as variances were homogeneously distributed in the determination of where there was a significant difference between groups (Kayri, 2009).

Results

The descriptive statistic results regarding the pre-test post-test total score averages of the 6+1 AWES, WOSRS and the WMS of the experimental and control groups regarding the sub-problems of the research are given.

In Table 7, the descriptive analysis results of the pretest post-test mean scores of the experimental and control groups from the scales are seen.

In Table 7, 6+1 AWES pre-test mean scores of the groups were 21.000 for the first experimental group, 21.800 for the second experimental group and 20.448 for the control group. The post-test mean scores of the groups were 22.329 for the first experimental group, 23.267 for the second experimental group and 20.517 for the control group. When the written expression pre-test and post-test mean scores of the experimental and control groups were evaluated, it was seen that the average of the written expression score of the second experimental group increased by two points. There was no increase in the written expression mean score of the control group. From the table, the WOSRS pre-test mean scores of groups were 48.482 for the first experimental group, 47.767 for the second experimental group and 49.241 for the control group. It was seen that the pre-test mean scores of the experimental and control groups are close to each other. The post-test mean scores of the groups were 49.103 for the first experimental group, 48.100 for the second experimental group and 44.035 for the control group. No increase was determined in the self-regulation post-test mean scores of the experimental groups for writing. However, there was a five-point decrease in the post-test mean score of the control group. From the Table, the WMS pre-test mean scores of groups were 83.241 for the first experimental group, 84.233 for the second experimental group and 85.759 for the control group. It was seen that the pre-test mean scores of the experimental and control groups are close to each other. The post-test mean score of the groups was 80.724 for the first experimental group, for the second experimental group 82.733 and 74.586 for the control group. When the post-test mean scores of the experimental groups were evaluated, a decrease of two points was determined while in the control group, a decrease of nine points was found. The results of the one-way analysis of variance regarding pre-test mean scores of the experimental and control groups from the scales are presented in Table 4. The results of the one-way analysis of variance regarding

Table 6

Shapiro-Wilk Test Results Regarding the Pre-Test Post-Test Total Scores of the Experimental and Control Groups from the Scales

Group	Test	N	6+1 AWES	WOSRS	WMS
			Sig.	Sig.	Sig.
1st Experimental	Pre-test	29	.070	.270	.201
	Post-test		.430	.293	.288
2nd Experimental	Pre-test	30	.591	.191	.246
	Post-test		.308	.414	.393
Control	Pre-test	29	.133	.108	.276
	Post-test		.545	.280	.320

the post-test mean scores of the experimental and control groups from the scales are given in Table 8.

From Table 8, no significant difference was found between the experimental and control groups post-test mean scores for written expression [$F_{(2, 85)}$ = 1.554, p > .05] and writing motivation [$F_{(2, 85)}$ = 2.728, p > .05]. A significant difference was found between the self-regulation skills post-test mean scores of the experimental and control groups for writing, $F_{(2, 85)}$ = 8.874, p < .05. The "Bonferroni test" was made from Post Hoc Tests to determine the difference between the groups' self-regulation score averages and the data are given in Table 9.

When Table 9 is examined, the WOSRS post-test scores of the first experimental and control groups were found to be significant in favor of the experimental group (.001 < .05). When the table is analyzed, the difference between the post-test score of the WOSRS from the second experiment group, in which the STAD technique was applied and the post-test score of the control group are applied is significant in favor of the second experiment group (.006 < .05). This situation can be interpreted as showing that the two-cooperative learning technique improves self-regulation skill positively. In the control group, a decrease of 11.19 points was determined in the total score type.

Conclusion, Discussion, and Suggestions

In this study, the effect of collaborative learning techniques on students written expression, self-regulation and writing motivation was investigated. When the findings obtained from the sub-problem of the research were examined, no significant difference was found between the written expression post-test mean scores of the experimental and control groups. The post-test mean score of the second experimental group, in which the STAD technique was applied, increased by two points, but this increase was not significant. When the results of the research in the literature, in which cooperative learning techniques were applied in the development of written expression skills, were examined, it was determined that there was either a significant difference in the post-test mean scores of the experimental and control groups at different grade levels, or not. Michael (2002) observed the collaborative writing processes of fifth-grade students throughout one year. It was determined that the written expression skills of the students in the collaborative texts improved. In a study

Table 7

Descriptive Analysis Results of the Pre-Test Post-Test Mean Scores of the Experimental and Control Groups from the Scales

			Pre-Test		Post-Test	
Scales	Group	*N*	*M*	*sd*	*M*	*sd*
6+1 AWES	1st Experimental	29	21.000	4.811	22.329	6.282
	2nd Experimental	30	21.800	5.744	23.267	6.097
	Control	29	20.448	6.069	20.517	5.920
WOSRS	1st Experimental	29	48.482	4.845	49.103	5.473
	2nd Experimental	30	47.767	4.591	48.100	4.413
	Control	29	49.241	4.381	44.035	4.641
WMS	1st Experimental	29	83.241	14.865	80.724	18.024
	2nd Experimental	30	84.233	12.272	82.733	12.060
	Control	29	85.759	14.599	74.586	10.592

Table 8

One-Way Analysis of Variance Results of the Post-Test Mean Scores of the Experimental and Control Groups from the Scales

Scale	Source of Variance	Total of Squares	*sd*	Average of Squares	*F*	*p*	Significant Difference
6+1 AWES	Between Groups	115.655	2	57.828	1.554	.217	
	Within Groups	3163.936	85	37.223			
	Total	3279.591	87				
WOSRS	Between Groups	418.918	2	209.459	8.874	.001	1st Experimental-Control, 2nd Experimental-Control
	Within Groups	2006.355	85	23.604			
	Total	2425.273	87				
WMS	Between Groups	1056.169	2	528.085	2.728	0.71	
	Within Groups	16454.694	85	193.585			
	Total	17510.864	87				

* p < .05

Table 9

Bonferroni Test Results of the Experimental and Control Groups for Writing Self-Regulation Scale Post-Test Mean Scores

	Group	Difference Between Arithmetic Mean	Standard Error	*p*
1st Experimental	2nd Experimental	1.00	1.27	1.000
	Control	5.07*	1.28	.001
2nd Experimental	1st Experimental	-1.00	1.27	1.000
	Control	4.07*	1.27	.006
Control	1st Experimental	-5.07*	1.28	.001
	2nd Experimental	-4.07*	1.27	.006

* p<.05

in which Rapp (1991) used the combined cooperative reading and composition technique, a difference was found in favor of the experimental groups in the development of the vocabulary of the fourth-grade students in primary school. In their study, Ghaith and Yaghi (1998) used STAD from cooperative learning techniques in teaching the rules of English as a second language to fourth, fifth and sixth-grade students. As a result of the research, no significant difference was found between the language achievements of the experimental and control groups. This result is in line with the research findings.

When the research findings were examined, a significant difference was found between the post-test mean score of the WOSRS of the experimental groups and the post-test mean score of the control group. It is seen that both the Co-Op Co-Op and STAD technique improve students' self-regulation skills for writing. When the Personal Information Form used in the research is examined, it is seen that 72.414% of the control group students allots thirty minutes in a day for writing. This rate is lower in the experimental groups (48.276% and 56.666%). Experimental groups participated in activities aimed at improving writing skills. In addition, students were informed about strategies for self-regulation in the writing process, these strategies were included in one step of the cooperative learning techniques and an environment was prepared for them to apply these strategies. When the national literature was examined, no studies were found in which these techniques were used in the development of self-regulation skills of primary school fourth-grade students in Turkish lessons. However, there are studies in which different collaborative learning techniques were applied at different grade levels in the development of self-regulation skills. Dönmez and Gündoğdu (2018) examined the use of the split-joining technique in seventh-grade Turkish lessons on the self-regulation skills of the students. As a result of the research, it was determined that there was a significant difference between the self-regulation skills of the experimental and control groups in favor of the experimental group. Festas et al. (2015) found that the students in the experimental group produced longer and more qualified work in which eighth-grade students who had received writing training with the self-regulation-based strategy development model provided collaborative writing. Güvenç (2010) stated that supporting collaborative learning techniques in the classroom with lesson diaries positively affects self-regulated learning. Uygun (2012) stated that students in the experimental group who received training on self-regulation skills wrote more qualified narrative and informative texts compared to students in the control group. In the study, there is a statistically significant difference in the experimental group students' attitudes towards writing and self-regulation skills compared to the control group. When the results of these studies are examined, it is seen that they are similar to our research findings. According to these results, it can be said that cooperative learning techniques improve students' self-regulation skills.

When the WMS post-test mean scores of the experimental and control groups were examined, no significant difference was found in favor of the experimental group. In available literature, research findings examining the effect of cooperative learning techniques on the writing motivation of primary school students are limited. In his research, Canıtezer (2014) examined the relationship between the writing motivation of eighth-grade students and their level of written expression skills and found a positive correlation between the writing skill and the dimensions of "confidence, interest, imagination, effort". Also, a negative correlation with the reluctance dimension was noted. When students' reluctance towards writing increases, writing skills decrease. It was stated that while the dimensions of trust, interest, imagination and effort increased, writing skills also increased. Tanrıverdi (2019) determined that teaching via the STAD technique, which is one of the cooperative learning method techniques in Turkish lessons, did not show a significant increase in favor of the experimental group on the attitudes of the second year primary school students towards the Turkish lesson. In the study, a decrease of 11.19 points was determined in the writing motivation scale post-test mean score of the control group. This decrease may be due to a failure to allocate sufficient time to pre-, post-writing and post-writing activities, not diversifying these activities, giving too little information to students about strategies in writing texts, different practices for

writing texts and too little group work in writing. In the research, activities were prepared for experimental groups in order to support the pre-writing process related to the topics selected from the texts in the Turkish textbook, in which both individual and group work was performed. For example, the game "Tell me" was played for the development of vocabulary and "Working papers" for the writing process were prepared. The use of a smart board was encouraged to support students' thoughts on writing during the writing process, it was encouraged that groups help each other and immediate feedback was given to the groups during the writing process. Such practices in the classroom environment will enable students to feel more ready in the writing process, to be confident about writing and to make more of an effort. There are various explanations in the literature about the effect of writing activities in schools on motivation. Barry (1997) stated that people cannot write without thinking, each person's way of thinking is different and it is right to prepare different environments so that students can generate ideas and be motivated to write. Teachers creating writing environments in the classroom where students feel motivated affects the writing desires of the students. When teachers fail to use activities and strategies that support the writing processes, the student's motivation to write is reduced. Factors such as the limited time allocated to writing for the development of writing, the writing activity only aimed at understanding the text in the textbook, and the absence of new writing topics based on the text also affect the motivation to write. Asser and Poom-Valickis (2002) found in the article "Learning to Write" that students' writing motivation was low because technical information about writing was always given at school and the compositions that were asked to be written were far from original. He drew attention to the studies carried out before, during and after writing and stated that the motivation of the students would increase when these studies were performed. He also stated that with group work, a constructive and supportive environment can be provided during writing. With in-class writing groups, students can find new ideas and useful thoughts that support the topic. Students correct their work by giving feedback to each other during the writing process. In this way, they make more original and higher quality writing works. Albayrak (2006) also stated that collaborative learning techniques stated that by motivating the students to participate in the lesson, they increased their interest and the lesson became fun with the applied techniques. Since some of the cooperative learning techniques allow students to move in the classroom, a lesson is provided in harmony with the active world of the students and students are not limited to their teammates but can also share with all of their classmates.

In the study, the effects of Co-Op Co-Op and STAD techniques on students' narrative writing skills were examined. The effects of these techniques on the ability to write informative texts and poems can be investigated in future research.

References

Abe, M. (2020). Interactional practices for online collaborative writing. *Journal of Second Language Writing*, *49*, 100752. https://doi.org/10.1016/j.jslw.2020.100752

Akyol, H. (2005). *Türkçe ilkokuma yazma öğretimi* [Teaching Turkish primary reading and writing]. Pegem Akademi Yayıncılık.

Albayrak, L. (2006). *Practicing and results of cooperative learning methods in primary education 7th class Turkısh lessons* (Publication No. 186169) [Master's thesis, Ataturk University]. Council of Higher Education Thesis Center. https://tez.yok.gov.tr/UlusalTezMerkezi/tezSorguSonucYeni.jsp

Anggraini, R., Rozimela, Y., & Anwar, D. (2020). The effects of collaborative writing on EFL learners' writing skills and their perception of the strategy. *Journal of Language Teaching and Research*, *11*(2), 335-341. http://dx.doi.org/10.17507/jltr.1102.25

Asser, H. & Poom-Valickis, K. (2002, July 1-4). *Learning to write: From choosing the topic to final draft* [Paper presentation]. European Reading Conference, Dublin, Ireland. https://eric.ed.gov/?id=ED462701

Barry, B. A. (1997, March 12-15,). *Motivating students to write: Implementing creative theory to overcome the habitual and encourage autotelic flow* [Paper presentation]. Conference on College Composition and Communication, Phoenix. https://eric.ed.gov/?id=ED416473

Bayburtlu, Y. S. (2015). İşbirliğine dayalı öğrenme yaklaşımının 6. sınıf Türkçe dersi kazanımlarına etkileri [The effects of cooperation-based learning approach on the Turkish language lesson acquisitions at grade 6]. *Electronic Turkish Studies*, *10*(11), 235-274.

Boscolo, P., & Hidi, S. (2006). The multiple meanings of motivation to write. In S. Hidi & P. Boscollo (Eds.), *Writing and Motivation* (pp. 1-14). Emerald Group Publishing.

Bozpolat, E. (2012). *The effect of story mapping method supported with cooperative integrated reading and composition technique on developing students' reading comprehension skill in Turkish language course* (Publication No. 176548) [Doctoral dissertation, Fırat University]. Council of Higher Education Thesis Center. https://tez.yok.gov.tr/UlusalTezMerkezi/tezSorguSonucYeni.jsp

Bruning, R., & Horn, C. (2000). Developing motivation to write. *Educational psychologist*, *35*(1), 25-37. https://doi.org/10.1207/S15326985EP3501_4

Büyüköztürk, S. (2011). *Sosyal bilimler için veri analizi el kitabı* [Manual of data analysis for social sciences]. Pegem Akademi Yayıncılık.

Canıtezer, A. (2014). *The writing motivations of eight-grade students and their levels of success in writing* (Publication No. 373629) [Doctoral dissertation, Necmettin Erbakan University]. Council of Higher Education Thesis Center. https://tez.yok.gov.tr/UlusalTezMerkezi/tezSorguSonucYeni.jsp

Choi, H. J., & Mantik, O. (2017). The effect of scaffolded think-group-share learning on Indonesian elementary schooler satisfaction and learning achievement in English classes. *International Electronic Journal of Elementary Education*, *10*(2), 175–183. https://iejee.com/index.php/IEJEE/article/view/343

Cole, J., & Feng, J. (2015, April 15-16). *Effective Strategies for Improving Writing Skills of Elementary English Language Learners* [Online Submission]. Chinese American Educational Research and Development Association Annual Conference, Chicago. https://eric.ed.gov/?id=ED556123

Dobao, A. F. (2012). Collaborative writing tasks in the L2 classroom: Comparing group, pair, and individual work. *Journal of second language writing*, *21*(1), 40-58. https://doi.org/10.1016/j.jslw.2011.12.002

Dönmez, B., & Gündoğdu, K. (2018). 7. sınıf Türkçe dersinde ayrılıp birleşme tekniği (jigsaw) kullanımının akademik başarı, öz-düzenleme becerisi, tutum, erişi ve bilginin kalıcılığına etkisi [The effect of using jigsaw technique on academic achievement, self regulated learning skills, attitudes toward the lesson and retention in 7th grade Turkish lesson]. *İlköğretim Online*, *17*(2), 959-983. http://ilkogretim-online.org.tr doi 10.17051/ilkonline.2018.419348

Festas, I., Oliveira, A. L., Rebelo, J. A., Damião, M. H., Harris, K., & Graham, S. (2015). Professional development in self-regulated strategy development: Effects on the writing performance of eighth-grade Portuguese students. *Contemporary Educational Psychology*, 40, 17-27. https://doi.org/10.1016/j.cedpsych.2014.05.004

Fung, Y. M. (2010). Collaborative writing features. *RELC Journal*, *41*(1), 18–30. https://doi.org/10.1177/0033688210362610

George D, & Mallery P. (2003). SPSS for Windows step by step: A simple guide and reference. 11.0 update. Allyn & Bacon.

Ghaith, G. M., & Yaghi, H. M. (1998). Effect of cooperative learning on the acquisition of second language rules and mechanics. *System*, *26*(2), 223-234. https://doi.org/10.1016/S0346-251X(98)00005-0

Gliner, J. A., Morgan, G. A., & Leech, N. L. (2009). Randomized experimental and quasi-experimental designs. *Research Methods in Applied Settings: An Integrated Approach to Design and Analysis*, 55-72. https://doi.org/10.4324/9781315723082

Görgülü, F. (2009). *Effects of drama education supported cooperative learning activities on the communication skills of 5-6 years old children* (Publication No. 240706) [Master's thesis, Adnan Menderes University]. Council of Higher Education Thesis Center. https://tez.yok.gov.tr/UlusalTezMerkezi/tezSorguSonucYeni.jsp

Güvenç, H. (2010). İşbirlikli öğrenme ve ders günlüklerinin öğretmen adayı öğrencilerin öz düzenlemeli öğrenmeleri üzerindeki etkileri [The effects of cooperative learning and learning journals on teacher candidates' self-regulated learning]. *Educational Sciences: Theory & Practice*, *10*(3), 1459–1487. https://files.eric.ed.gov/fulltext/EJ919859.pdf

Harris, K. R., & Graham, S. (2016). Self-regulated strategy development in writing: Policy implications of an evidence-based practice. *Policy Insights from the Behavioral and Brain Sciences*, *3*(1), 77–84. https://doi.org/10.1177/2372732215624216

Herder, A., Berenst, J., de Glopper, K., & Koole, T. (2018). Reflective practices in collaborative writing of primary school students. *International Journal of Educational Research*, *90*, 160–174. https://doi.org/10.1016/j.ijer.2018.06.004

Johnson, D. W., & Johnson, R. T. (2005). Training for cooperative group work. In M. A. West, D. Tjosvold, & K. G. Smith (Eds.), *The essentials of teamworking: International perspectives* (pp. 131-147). John Wiley & Sons Ltd.

Jöreskog, K., & Sörbom, D. (1996). *LISREL 8: Structural equation modeling with the SIMPLIS command language*. Scientific Software International/ Erlbaum.

Kagan, S. (1994). *Cooperative learning*. San Cle-mente, CA: Kagan Cooperative Learning.

Karabay, A., & Yıldırım, F. (2016). Yapılandırılmamış kubaşık öğrenme etkinliklerinin dinleme becerisi üzerindeki etkisi [The effects of cooperative learning activities on the listening skill]. *Electronic Turkish Studies, 11*(14), 361-370. http://dx.doi.org/10.7827/TurkishStudies.9788

Karakoyun, M. E. (2010). *The effect of one of the collaborative learning techniques, Jigsaw I, to academic success in the teaching of punctuation to elementary education 5th grade student* (Publication No. 263835) [Master's thesis, Atatürk University]. Council of Higher Education Thesis Center. https://tez.yok.gov.tr/UlusalTezMerkezi/tezSorguSonucYeni.jsp

Kardaş, M. N. (2013). İş birlikli öğrenme yönteminin sınıf öğretmeni adaylarının yazılı anlatım becerilerine etkisi [The effect of cooperative learning on written expression skills of prospective classroom teachers]. *Electronic Turkish Studies*, *8*(9), 1781–1799. http://dx.doi.org/10.7827/TurkishStudies.5055

Kayri, M. (2009). Araştırmalarda gruplar arası farkın belirlenmesine yönelik çoklu karşılaştırma (post-hoc) teknikleri [The multiple comparison (post-hoc) techniques to determine the difference between groups in researches]. *Fırat University Journal of Social Science, 19*(1), 51-64. https://dergipark.org.tr/en/download/article-file/72000#page=57

Kellogg, R. T. (2006). Professional writing expertise. In K. A. Ericsson, N. Charness, P. J. Feltovich, & R. R. Hoffman (Eds.), *The Cambridge handbook of expertise and expert performance* (pp. 413–427). Cambridge University.

Kırbaş, A. (2018). Ortaokul öğrencilerinin dinleme becerilerini geliştirmede bir yöntem önerisi: işbirliğine dayalı öğrenme [A method of developing listening skills for middle school students: Collaborative learning]. *Ekev Akademi Dergisi, 22*(76), 1-14. http://dx.doi.org/10.17753/Ekev986.

Lai, C., Lei, C., & Liu, Y. (2016). The nature of collaboration and perceived learning in wiki-based collaborative writing. *Australasian Journal of Educational Technology*, *32*(3), 80-95. https://doi.org/10.14742/ajet.2586

Maden, S. (2011). Effect of Jigsaw I technique on achievement in written expression skill. *Educational Sciences: Theory and Practice, 11*(2), 911–917. https://eric.ed.gov/?id=EJ927383.

McCutchen, D. (2000). Knowledge, processing, and working memory: Implications for a theory of writing, *Educational Psychologist*, *35*(1), 13-23. https://doi.org/10.1207/S15326985EP3501_3

McLeod, S. A. (2019). What a p-value tells you about statistical significance. *Simply psychology*, 1-4. https://www.simplypsychology.org/p-value.html

MEB. (2018). Türkçe dersi öğretim programı (İlkokul ve ortaokul 1, 2, 3, 4, 5, 6, 7 ve 8. sınıflar) [Turkish language teaching program (Primary & secondary 1, 2, 3, 4, 5, 6, 7 & 8th grades) curriculum]. Devlet Kitapları Müdürlüğü Yayınevi. http://mufredat.meb.gov.tr/ProgramDetay.aspx?PID=663

Michael, K. L. H. (2002). *Fifth-grade students' use of genre in a collaborative writing workshop* (Publication No. 3099184) [Doctoral dissertation, Purdue University]. ProQuest Dissertations. https://www.proquest.com/openview/6c99ec7dc355a7f9bfc06bd930149de2/1?pq-origsite=gscholar&cbl=18750&diss=y

Nettleton, D. (2014). *Commercial data mining - processing, analysis and modeling for predictive analytics projects*. Elsevier.

Nykopp, M., Marttunen, M., & Laurinen, L. (2014). University students' knowledge construction during face to face collaborative writing. In P. Klein, P. Boscolo, L. Kirkpatrick, & C. Gelati (Eds.), *Writing as a learning activity*. Studies in writing (pp. 277–299). Brill. http://dx.doi.org/10.1163/9789004265011 013

Özkara, Y. (2007). *The effect of 6+1 analytic writing and evaluative model on enhancing 5th grade students' narrative writing skills* (Publication No. 206907) [Doctoral dissertation, Gazi University]. Council of Higher Education Thesis Center. https://tez.yok.gov.tr/UlusalTezMerkezi/tezSorguSonucYeni.jsp

Öztürk, E. (2013). The psychometric properties of the writing motivation scale. *International Online Journal of Educational Sciences*, *5*(2), 351–360. https://www.acarindex.com/dosyalar/makale/acarindex-1423904233.pdf

Pett, M.A., Lackey, N. R., & Sullivan, J. J. (2003). *Making sense of factor analysis: The use of factor analysis for instrument development in health care research*. Sage Publications.

Piaget, J. (1976). *The Psychology and Intelligence in Children*. International Universities Press.

Qiu, X., & Lee, M.-K. (2020). Regulated learning and self-efficacy beliefs in peer collaborative writing: An exploratory study of L2 learners' written products, task discussions, and selfreports, *System*, 93, 102312. https://doi.org/10.1016/j.system.2020.102312

Rapp, J. C. (1991). *The effect of cooperative learning on selected student variables (cooperative ıntegrated reading and composition on academic achievement in reading comprehension, vocabulary and spelling and on student self-esteem)* (Publication No. 9207225). [Doctoral dissertation, Washington State University]. ProQuest Dissertations. https://www.proquest.com/openview/24edefdc4ebf338db34682abc8b60c40/1?pq-origsite=gscholar&cbl=18750&diss=y

Rojas-Drummond, S., Hernández, G., Vélez, M., & Villagrán, G. (1998). Cooperative learning and the appropriation of procedural knowledge by primary school children. *Learning and Instruction*, *8*(1), 37–61. https://doi.org/10.1016/S0959-4752(97)00001-7

Schunk, D. H., & Zimmerman, B. J. (2013). Self-regulation and learning. In W. M. Reynolds, G. E. Miller, & I. B. Weiner (Eds.), *Handbook of psychology: Educational psychology* (pp. 45–68). John Wiley & Sons, Inc.

Shafiee, S., & Khavaran, S. R. (2017). Effects of cooperative learning on vocabulary achievement of reflective/ımpulsive Iranian EFL learners. *International Journal of Foreign Language Teaching & Research, 5*(17), 11-24. http://jfl.iaun.ac.ir/article_588022_6c355319ba39946f03f6636227fc2da0.pdf

Sheskin, D. J. (2003). *Handbook of parametric and nonparametric statistical procedures*. Chapman and Hall/CRC. https://doi.org/10.1201/9781420036268

Slavin, R. E. 1995. Cooperative learning: Theory, research, and practice (2nd ed.). Allyn & Bacon.

Snowling, M. J. (2000). *Dyslexia* (2nd ed.). Blackwell.

Storch, N. (2013). *Collaborative writing in L2 classrooms*. Multilingual Matters. https://doi.org/10.21832/9781847699954

Storch, N. (2018). Written corrective feedback from sociocultural theoretical perspectives: A research agenda. *Language Teaching*, *51*(2), 262-277. https://doi.org/10.1017/S0261444818000034

Sutherland, J. A., & Topping, K. J. (1999). Collaborative creative writing in eight-year-olds: Comparing cross-ability fixed role and same-ability reciprocal role pairing. *Journal of Research in Reading*, *22*(2), 154–179. https://doi.org/10.1111/1467-9817.00080

Şahin, A. (2011). Effects of Jigsaw III technique on achievement in written expression. *Asia Pacific Education Review*, *12*(3), 427–435. https://doi.org/10.1007/s12564-010-9135-8

Tanrıverdi, T. (2019). *Investigation of the effect of cooperative learning method on the development of vocabulary and towards Turkish lecture in elementary school second year* (Publication No. 585287) [Master's thesis, Sakarya University]. Council of Higher Education Thesis Center. https://tez.yok.gov.tr/UlusalTezMerkezi/tezSorguSonucYeni.jsp

Teng, M. F. (2021). The effectiveness of incorporating metacognitive prompts in collaborative writing on academic English writing skills. *Applied Cognitive Psychology*, *35*(3), 659-673. https://doi.org/10.1002/acp.3789

Tok, S. (2008). İşbirliğine dayalı öğrenme yöntemlerinden ikili denetim tekniğinin okuduğunu anlama üzerindeki etkisi [Effects of cooperative learning method of pairs check technique on reading comprehension]. *İlköğretim Online, 7*(3), 748-757. https://dergipark.org.tr/tr/pub/ilkonline/issue/8600/107094

Top, M. B. (2014). *The effecst of cooperative discussion questioning strategy on student's reading comprehension achievement in primary school 4th class* (Publication No. 359929) [Master's thesis, Mustafa Kemal University]. Council of Higher Education Thesis Center. https://tez.yok.gov.tr/UlusalTezMerkezi/tezSorguSonucYeni.jsp

Ulaş, A. H., Epçaçan, C., Aydın, S. M., & Kurtlu, Y. (2015). İlkokul 4. sınıf öğrencilerine cümlenin ögelerinin öğretiminde işbirlikli öğrenme tekniklerinden takım oyun turnuvanın akademik başarıya etkisi [The effect of team play tournement, which is one of cooperative learning techniques while teaching elements of sentences to 4th grade students in primary education, to academic success]. *Turkish Studies (Elektronik)*, *10*(7), 935-950. http://dx.doi.org/10.7827/TurkishStudies.8177

Uygun, M. (2012). *The effects of self regulated strategy development on writing expression, self regulation of writing, retention and writing attitude* (Publication No. 317793) [Doctoral dissertation, Hacettepe University]. Council of Higher Education Thesis Center. https://tez.yok.gov.tr/UlusalTezMerkezi/tezSorguSonucYeni.jsp

Vass, E., Littleton, K., Miell, D., & Jones, A. (2008). The discourse of collaborative creative writing: Peer collaboration as a context for mutual inspiration. *Thinking Skills and Creativity*, *3*(3), 192–202. http://dx.doi.org/10.1016/j.tsc.2008.09.001

Vygotsky, L. S. (1978). Interaction between learning and development. In M. Cole, V. John-Steiner, S. Scribner, & E. Souberman (Eds.), *Mind and Society: The Development of Higher Psychological Processes* (pp. 79-91). Harvard University Press.

Yağmur Şahin, E. (2013). The effect of jigsaw and cluster techniques on achievement and attitude in Turkish written expression. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi, 28*(28–2), 521–534.

Yılar, R. (2012). İşbirlikli öğrenme uygulamalarından jigsaw (II) tekniğinin sözlü anlatım dersine yönelik tutuma etkisi [The effect of collaborative learning method on preschool teacher candidates' speaking skills]. *Bayburt Üniversitesi Eğitim Fakültesi Dergisi, 7* (1), 129-140. https://dergipark.org.tr/en/pub/befdergi/issue/23151/247290

Yıldırım, K. (2010). *The effects of cooperative learning on certain variables related to reading, parents, and students opinions toward cooperative learning* (Publication No. 279796) [Doctoral dissertation, Gazi University]. Council of Higher Education Thesis Center. https://tez.yok.gov.tr/UlusalTezMerkezi/tezSorguSonucYeni.jsp

This page is intentionally left blank.

www.iejee.com

iejee

International Electronic Journal of Elementary Education
June 2022, Volume 14, Issue 5, 605-612

Context and Pedagogy as Signpoints to Authentic Learning Paths

Merja Meriläinen[a], Maarika Piispanen[b]

Received : 13 December 2021
Revised : 8 March 2022
Accepted : 26 June 2022
DOI : 10.26822/iejee.2022.266

[a] Merja Meriläinen, Kokkola University Consortium Chydenius, Kokkola, Finland
E-mail: merja.k.merilainen@jyu.fi
ORCID: https://orcid.org/0000-0002-1815-947X

[b] Maarika Piispanen, Kokkola university Consortium Chydenius, Kokkola, Finland
E-mail: maarika.m.piispanen@jyu.fi
ORCID: https://orcid.org/0000-0002-3544-4803

Abstract

In the Finnish National Core Curriculum for Compulsory Education (2014), the conception of language is based on the communal and functional linguistics model of language. From the perspectives of teaching and learning, this requires that learning contexts and pedagogies enable learning in such learning environments, roles, and processes where the pupil can think and act authentically, according to his or her age (National Core Curriculum 2014). Thus, in this article we examine the integration of subject teaching with topic teaching in the frameworks of sociocultural learning, functional linguistics, and authentic learning, in the contextual-pedagogical learning landscape, where the individuality of learners as well as timely learning support (scaffolding) in the zone of proximal development (Vygotsky 1978) enable the learning of content as part of interdisciplinary learning. The subject Finnish language and literature is defined as a interdisciplinary, practical, theoretical, and cultural subject (National Core Curriculum 2014) that requires cooperation with other subjects. This article will present a interdisciplinary approach to learning, where the thematic context created for learning gives meaning to the subject related content that must be learned, and where the ability to acquire the core content of the subject becomes a prerequisite for the processing of the theme or topic presented through the thematic context.

Keywords:

Functional, Sociocultural, Authentic Contextual-pedagogical, Scaffolding

Introduction

Any sound, any language – they express the same thoughts in different ways. But people do not merely express their thoughts with words, they also believe and feel, know, and want with their words; people's thoughts, their entire rational being moves and lives in their language. How, therefore, could a nation express itself in any other language besides their own? (J.V. Snellman, 1844.)

This nationalistic declaration by J.V. Snellman, published in the newspaper Saima in 1844, underlines the importance of language and verbal communication. Language is like the mind; words are used to express the movements of the mind and to express one's innermost being. In addition, the words of L. Wittgenstein 'The limits of my language mean the limits

of my world' make one reflect on the meaning of language. With language, we express our innermost self and open worlds. Language is an element that carries our culture and history, but it also builds the future.

In the Finnish National Core Curriculum for Compulsory Education (2014), language education is going through great changes as its ideological basis is changing. Now, language usage in different situations is considered the basis of language education – this is referred to as functional language learning, where language is first and foremost seen as a tool for communication. From a functional point of view, what a language learner can accomplish with his or her language skills and what kind of situations, assignments and texts related to language usage he or she manages are fundamental. (Vaarala, Reimani, Jalas and Nissilä 2016, 29.) The functional perspective on language learning puts emphasis on the learners' linguistic needs, on the situations of language use that are meaningful to them, on the way they manage these situations, and on language learning in authentic contexts and based on texts.

From a functional perspective, language learning is organically linked to socio-cultural learning, where language is examined in real-life situations and from the point of view of language use, and the different needs for language use that arises from interactions with the language. The sociocultural framework puts emphasis on the social nature of language as well as a person's participation in communities from the perspectives of language use. The sociocultural conception of learning refers to the social and dynamic activity that takes place in authentic contexts where the roles of others involved in the learning situation is central. According to the sociocultural approach, all human behaviour is socially and culturally transmitted, therefore learning also takes place in social interaction and through the tools, ways, and conventions of a culture (Bruner 1996). As regards the curriculum for compulsory education, this can be detected overall in the learning objectives and competence descriptions for Finnish language and literature. 'Teaching is based on a communal and functional view of language: linguistic structures are studied through age-appropriate situations of language use and texts' (Finnish National Core Curriculum 2014).

The concepts authenticity and context are central in the functional perspective of language because the learner's linguistic needs are defined by authentic situations of language use. On the other hand, the sociocultural frame of reference focuses on the learning process and how it is implemented. In sociocultural learning, timely learning support, scaffolding (Vygotsky 1978), as well as learning in the zone of proximal development (Vygotsky 1978) are the primary tools for instruction when planning learning processes, situations and assignments that enable learning.

As the functional view to language learning highlights the social nature of language and authentic linguistic needs as part of learning, the focus of Finnish language and literature should be on planning and creating learning contexts where language is used in authentic situations and in authentic ways. This way, the situations and ways of language use will become meaningful in the pupils' lives and connected with real-life language needs. However, authenticity – defined by Herrington, Reeves and Oliver (2010) through nine elements (authentic context, context-related authentic tasks, access to expert performance, different options and points of view, communal knowledge building, reflection, self and peer assessment and the verbalization of knowledge and skills, authentic and timely instruction, i.e., scaffolding, and authentic assessment) – is not easy to detect in the curriculum. This is because authenticity is included in the conceptions of learning and language, which form the basis for teaching that enables the pupils to achieve the objectives for each subject.

Learning that is based on needs is also experienced as meaningful. In the curriculum for basic education, the meaningfulness arises from the pupils' experiences that they are unique and important as such. The school obviously has a great role in this, and therefore every teacher should reflect on their work from the point of view of their planning and teaching and enhance learning in the curricular framework. The curricular frame of reference includes the concepts of socioculturalism, functionality and authenticity, as well as the related concepts participation, interest, agency, and individuality.

The integration of subject teaching into topic teaching is linked to the experience of meaningfulness. In the National Core Curriculum for Basic Education, the aim of integration is to help pupils learn vast and structured meaningful entities. The aim of integrated learning is to enable knowledge building that is based on the pupils' own experiences. (National Core Curriculum 2014.)

In the Finnish National Core Curriculum for Basic Education 2014, the basis of the integration is transversal competence, which is examined through seven (7) transversal competence areas. The contents and objectives of each subject are linked to the transversal competence areas, and each subject brings its own perspective to transversal competence. (Kangas, Kopisto & Krokfors 2016, 83-84.)

Transversal competence and interdisciplinarity have given rise to discussion on the mastery and command of the basic concepts of different disciplines. In her study,

Cantell (2017) has highlighted students' concern about whether they will comprehend all central concepts or if their learning remains superficial. (Cantell 2017, 240.) In addition, Koskinen-Sinisalo, Sinervo and Reinikainen (2020) detected similar reflections in their study, where teachers found it challenging to integrate subject-specific objectives and contents into interdisciplinary learning entities. According to the study teachers were worried about whether the subject-related objectives described in the curriculum would be achieved.

According to the National Core Curriculum, Finnish language and literature should be taught so that it is integrated into interdisciplinary learning entities or as part of topics arising from the pupils' lives. In the curriculum, the subject of Finnish language and literature is defined as a interdisciplinary practical, theoretical, and cultural subject that requires cooperation with other subjects. (National Core Curriculum, 2014.) According to the dictionary of standard Finnish compiled in the Institute for the Languages of Finland (2020), the verb 'requires' entails that there is a prerequisite or a condition for something to take place. Therefore, it is vital, even obligatory, to reflect on how the subject Finnish language and literature can be integrated with different subject areas, themes, modules and learning entities. How can different subjects be combined to create learning environments that enable learning in a versatile way and at the same time reinforce the core knowledge of the subject as described in the curriculum as regards objectives and contents as well as transversal competences? How can language and words widen the pupils' world and become a meaningful means of expression for them? How can Finnish language and literature promote the pupils' self-image, self-esteem, and self-efficacy so that they want to set new, conducive goals for their learning and action (National Core Curriculum 2014)? These questions are important, because they help teachers to direct their actions, making use of their professional competence that is based on both subject knowledge and pedagogical skills. Therefore, the teacher is able promote learning of Finnish language and literature in such learning contexts where it is possible for the pupils to experience learning as meaningful, and to utilize such ways, methods and tools of learning that are characteristic of their age.

There is a clear connection between the pupils' well-being, growth, positive self-image, learning and membership of society: while learning, the pupils are building their identity, their understanding of humanity, their view of the world and philosophy of life as well as finding their place in the world. At the same time, the pupils come to understand themselves, other people, the society, the environment, and different cultures. Their language is a part of this process. This shows that the words of Snellman and Wittgenstein mentioned earlier in this article are timeless. They make you understand the importance of language more profoundly, like Saarikivi (2018) who says that there are 'many reasons to argue that man is made of words at least as much as of matter'.

In the next chapter we will examine how the content areas of Finnish language and literature are integrated into authentic learning processes in contextual-pedagogical learning landscapes (Meriläinen & Piispanen 2017), where contexts and pedagogy create an authentic learning context in the frameworks of sociocultural learning and functional linguistics. In this process, timely support, which promotes both learning and the process of learning, is the key factor that helps pupils to develop the skills connected with the key contents of the subject in line with the objectives of good knowledge and skills.

The roots of the contextual-pedagogical landscape

Being a teacher is more than the planning of lessons and the selection of books and materials to use. It is creative work with unique material. In Finland, teachers have the greatest autonomy in the world, which is formed in part by culturally related confidence in the teaching profession, but also by confidence in education, and the knowledge and skills gained through it. In the National Core Curriculum 2014, the learning objectives state what a pupil must know or do to achieve a "good "grade. This is awarded as a grade 8 on the Finnish numerical assessment scale (a grade from 4-10 where 4 = fail and 10 = excellent) The objectives state how a pupil can demonstrate "good knowledge and skills" in each content area to achieve the learning objectives. In the curriculum these are described in the assessment targets related to the learning objectives as well as in the competence descriptions. The National Core Curriculum is divided into chapters according to subjects, for the academic world in Finland still emphasizes the division of the curriculum into subjects and disciplines, although it is required and written in the curriculum that interdisciplinary learning must also take place.

The contextual-pedagogical model of learning has been developed in dialogue between research and education, thus putting together historical but still practicable pedagogical points of view and newer questions at the centre of current research, such as phenomenon-based, interdisciplinary and cross-disciplinary views of the curriculum, generic skills, versatile competences, the pedagogical principles of reformative education as well as society-related and individual perspectives to learning and its contexts (Meriläinen & Piispanen 2017). The approach is closely connected with the viewpoint of authenticity, which manifests itself best when learning takes place in such learning environments, situations, roles, and processes that enable the learner to think and act as

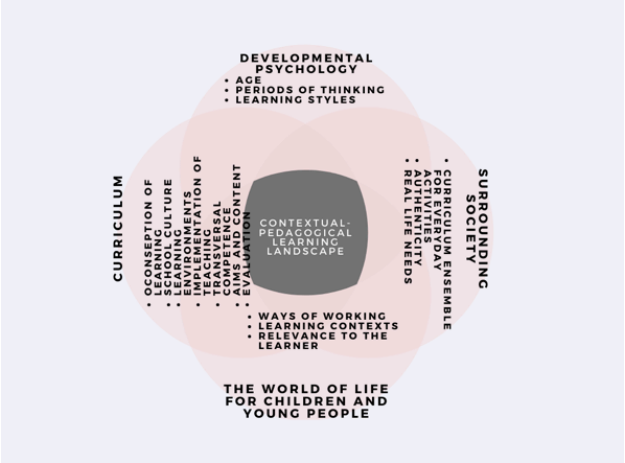
professionals and experts in the field do in real life, or in situations that simulate real-life situations.

In this framework we will provide a model for a learning landscape for teaching the curricular content areas related to poems, aphorisms, and maxims. In this learning process, these content areas of Finnish language and literature are integrated with visual arts and media education to form a interdisciplinary learning entity.

From subjects to interdisciplinary learning modules

When examining a interdisciplinary, integrated learning topic and the related learning assignments that advance the learning process, one may ask where the learning topic originates from and whether its curricular and theoretical basis is firm enough. This question is well-founded. Therefore, in this article we want to examine the curricular framework of the chosen topic but also the theoretical basis of the curriculum; the theoretical basis that steers the conception of learning, the operating culture, the choice of learning environments, and the learning situations and assignments created by the teacher. We call this extensive theoretical framework the contextual-pedagogical learning landscape. The figure below (Figure 1) illustrates the contextual-pedagogical learning landscape (Meriläinen & Piispanen 2017) that forms the basis of sociocultural learning in the curricular frame of reference.

Figure 1.
Contextual-pedagogical learning landscape (Meriläinen & Piispanen 2017.)



When teachers have a solid understanding of the curriculum, their curricular knowledge can help them to explore and identify new learning topics which can create a context for curriculum learning. '[...] integration of subject contents into pupils' life helps them to understand their purpose, increases their experiences of involvement and, naturally, motivates them' (National Core Curriculum, 2014). A learning topic originating from the contextual-pedagogical learning landscape, whether it is a interdisciplinary learning entity or a subject-internally integrated topic, is in principle one that interests the pupils, is related to their lives, and visualizes their knowledge and skills. As the curriculum is divided according to subjects, such a topic is not to be found in the curriculum. When choosing the topic, the teacher's subject-related competence takes a central role, enabling him or her to examine how the core concepts of the subject are reflected in real life. This examination is guided by the following questions: Where do my pupils need this knowledge? How will they utilize this knowledge in their lives? The teacher's ability to detect how curriculum content relates to the pupil's lives, and to plan learning processes and situations according to this framework make learning meaningful from the pupils' point of view.

The planning of the contextual-pedagogical learning process presented in this article was guided by the following content areas (marked as C in this article) in the syllabus for Finnish language and literature:

- C1 Acting in interactive situations: The pupils practice means of expression in different communication and performance situations.
- C2 Interpreting texts: The pupils practice reading different texts fluently, including literature, non-fiction and media texts that combine images and texts, and using text comprehension strategies and thinking skills that are suitable for the situation and the goal.
- C3 Producing texts: The pupils produce diverse fictional and non-fictional texts based on their personal experiences, observations, thoughts and opinions and other pupils' texts.
- These content areas are accompanied by the objectives of instruction, which describe both the teacher's and the pupil's action to achieve the goal, as well as the cognitive processes and level of thinking related to the objective (Krathwohl 2002). In this interdisciplinary learning module,
- the pupils' knowledge and skills related to Finnish language and literature from the perspective of the objectives and contents in the syllabus can be described as follows:
- Understands: The pupil understands the meaning of an oral and written message.
- Applies: The pupil chooses a method and applies it when performing an unfamiliar task.
- Analyses: The pupil identifies the elements of the situation and uses them to form a coherent whole.
- Evaluates: The pupils evaluate a product according to external criteria and standards.

- Creates: The pupil produces an original text in accordance with the assignment.
- The pupils demonstrate this knowledge and these skills in line with the assessment targets described in the syllabus in the following ways:
- by using means of expression
- by developing social interaction skills
- by analysing and interpreting texts
- be expressing one's experiences and thoughts
- by verbalizing one's thoughts and using different text genres.

The National Core Curriculum for Compulsory Education (2014, 18-23) defines the objectives of transversal competence that are shared by all subjects. These transversal competence areas are Thinking and learning to learn, Cultural competence, interaction, and self-expression, Taking care of oneself and managing daily life, Multiliteracy, ICT competence, Working life competence and entrepreneurship and Participation, involvement and building a sustainable future. The transversal competence areas are included in the objectives of each subject, and they also steer the planning of instruction as regards teaching and working methods.

Our learning process model involved four (4) objectives that were related to the following transversal competences arising from the descriptions of transversal competence areas in the curriculum:

- The pupils are guided to know and value cultural heritage and to participate in maintaining and renewing it. The pupils are given opportunities for experiencing and interpreting art and culture.
- The pupils are guided to work with various media, which visualizes the meanings the media create and the reality they convey.
- Pupils are encouraged to find suitable means of expression and to utilise ICT in the documentation and evaluation of their work and products. The pupils are encouraged to utilise ICT in implementing their ideas independently and together with others.
- The pupils are guided to perceive the significance of ICT in the society and to practise the use of media as a means of influencing.

The integration of a subject into topic teaching, whether intradisciplinary or interdisciplinary, requires that the subject-specific core concepts that are essential for the topic are defined and understood in the curricular framework before the planning of the topic teaching module can begin. The description of good competence must be concretised into a learning experience that motivates the pupils and is meaningful to them.

When subject contents are integrated into interdisciplinary learning modules, the core of learning does not consist of individual facts but general knowledge, mastery of different skills, application of knowledge, and realization (Piispanen, Leppisaari & Meriläinen 2015, 11). This requires examining the subject-specific objectives and contents as well as transversal competences from outside the curriculum, from the society and from authentic situations. It also requires knowledge of the pupils, of age-related learning and of how the topics learned are connected to the pupils' everyday lives and contexts. The goal is not to replace disciplinary-based teaching, but instead to introduce new and broader perspectives to learning and to the creation of learning wholes. In the contextual-pedagogical sociocultural approach, authenticity is essential, because authentic situations of language use determine the actual linguistic needs and linguistic skills.

According to Herrington (2010, 19, 21), an authentic learning environment provides content and a context that reflect the ways knowledge is used in the real world. Therefore, an important question when planning a learning module is, whether the learning environment and context form such circumstances, where knowledge will be used, and which make the knowledge meaningful to the learner. In addition, one should ask if the learning environment and context are flexible in such a way that the learner may make his or her own choices when proceeding in the learning. (Piispanen et al. 2015, 15.) These questions are important, because an authentic context is created only when learning becomes personally meaningful for the learner (Rule 2006).

When Finnish language and literature is taught in the contextual-pedagogical learning landscape and as part of topic teaching, one can perceive how authenticity and connections to the society and to pupils' everyday life with its modes of action and its working methods reflect the communicative and functional conception of language as well as the social nature of learning. This is supported and reinforced by the principles of assessment in the curriculum, according to which the teacher and the pupil need to have a clear conception of the objectives of the assignments, of how the assignments will proceed, of the individual ways to carry out the assignments, and of the different ways the assessment criteria can be met. (Finnish National Curriculum 2014.) In the contextual-pedagogical learning landscape, authentic learning is emphasized by focusing on the learning assignments. This is also supported by a study made by Lappalainen in cooperation with the

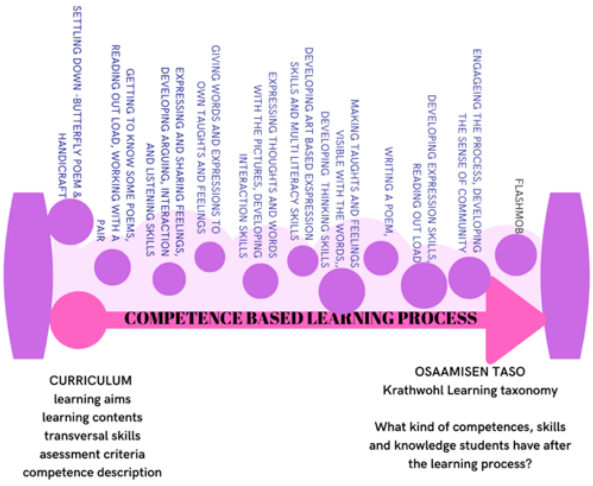
Finnish National Agency for Education, according to which text skills should be practised more in natural contexts related to the pupils' everyday life, such as from the point of view of their hobbies and lifeworld. In his study, Lappalainen emphasizes the use of current technical tools and media texts and versatile pair work. (Lappalainen 2010: 39– 40 40, 70– 71.)

Contextual-pedagogical learning process as a practical tool for planning

In our model for a interdisciplinary learning process, pupils' text skills were reinforced with a Flash Mob event. Preparing for the event made it possible to learn the content and achieve the objectives described above, so that the level of knowledge and skills was as described in the curriculum and the transversal competences related to the objectives were also developed. The Flash Mob event provided an authentic learning environment stemming from real life. Planning, organising, and carrying out the Flash Mob event as well as the Flash Mob event itself created such working methods, assignments and learning environment for the learning process which supported and helped the pupils to achieve the objectives at the level of good competence.

Figure 2. illustrates the contextual-pedagogical learning process where the content areas of Finnish language and literature, defined earlier in this article, were integrated to create a learning process where the pupils planned, prepared for, and organised a Flash Mob event. To make learning goal-oriented and fruitful, the focus must be on the creation of a interdisciplinary learning module.

Figure 2.
Contextual-pedagogical learning process. (Meriläinen & Piispanen 2017.)



The model for the planning of a contextual-pedagogical learning process (Meriläinen & Piispanen 2017) presents the learning process involved in the Flash Mob case, which is examined in the framework of the syllabus in Finnish language and literature and as part of a interdisciplinary learning whole. The skeletal outline of the learning process is formed by content (subject-specific knowledge and skills, syllabus) and objectives (syllabus) as well as transversal competences related to the content and objectives that guide the planning of the learning process together with the purpose of the subject and evaluation (curriculum). Together, these determine what kinds of learning situations and assignments the learning process will involve so that it will enable the demonstration of knowledge and skills according to the objectives and levels described in the curriculum (Krathwohl 2002). In concrete terms this means reflecting on what kind of tasks which naturally stem from an authentic assignment best help to achieve the learning objectives and demonstrate one's knowledge and skills. It is also important to consider that the pupils should have the possibility to utilise their existing knowledge and skills. In addition, it is essential that it is possible for the pupils to achieve the assessment criteria (descriptions of competence) set for the learning assignments and situations: when starting with the assignments, the pupils must know that they are able to achieve the learning objectives at least on the level of good competence.

The Flash Mob event learning process included eleven learning situations and assignments through which the pupils proceeded towards the learning objectives and content-specific knowledge related to them (Figure 2). The learning situations stem from the topic and helped to systematically forward the process towards the learning objectives set for the learning whole. When planning the learning whole, the assessment of learning as well as the demonstration of knowledge and skills went hand in hand with other planning, so that it was possible for the pupils to achieve the goals at the level of good competence during the learning process. The planning of the learning situations and assignments was guided by the competence descriptions that the pupils were aware of when the learning process began.

The competence descriptions related to the Flash Mob process were in relation to the objectives of instruction, where the targets of assessment are the development of social interaction skills, the analysis and interpretation of texts, the expression of experiences and thoughts, the verbalization of one's thoughts, and the use of different text genres. The planning of the learning situations related to the Flash Mob event was guided by these assessment targets. The knowledge and skills related to the objectives were clearly described through the assignments included in the learning process, and so the pupils were constantly aware of their progress in line with the objectives.

During the interdisciplinary learning whole Flash Mob, knowledge and skills were demonstrated in the following ways:

- The development of social interaction skills: Share your poem with another pupil and listen to poems of other pupils(s). Tell your schoolmate what you thought of his or her poem and what you especially liked in it. Participate in the rehearsal of the show and if you have an idea regarding the show, share it with the others.
- The analysis and interpretation of texts: Familiarize yourself with the following types of poetry: haiku, naani and cinquain (quintain, quintet) as well as aphorisms. Choose one of the types and write your own poem or write a free verse poem.
- The expression of one's experiences and thoughts: Write a poem based on your feelings.
- The verbalization of one's thoughts and the use of different text genres: Participate in the Flash Mob show where you recite your own poem. Take part in planning the show by sharing your ideas and/or supporting the ideas that you consider good.

These criteria of assessment guided pupils' work, which also involved scaffolding, the support provided by the teacher, which made it possible for the pupils to proceed in their knowledge and skills in line with the objectives. In contextual-pedagogical learning processes, defining the learning assignments clearly and describing the knowledge and skills related to them are the corner stones of timely learning support. The way the teacher plans and instructs the different stages of the process and the related learning assignments and situations and directs the support towards the wanted competence are key factors in making it possible for the pupil to achieve good competence with different approaches and levels of support. The core of learning is that the teacher and the pupil share a common, explicit, and concrete conception of what kind of knowledge and skills are pursued during the process and how the pupil can demonstrate his or her knowledge and skills.

According to Herrington et al. (2010), the nature of the learning assignments is the key factor when one wants to support authentic learning. This kind of support involves timely learning support (scaffolding), which is a prerequisite for the process towards the knowledge and skills pursued. Although the teacher has decided on the assignments beforehand, the assignments are open and loose, allowing the learner to make choices as regards completing the assignment in a way that he or she finds motivating. (Herrington et al. 2010, 44–48). Learning assignments should require long-lasting concentration on the matter and offer opportunities for cooperation, self-assessment, and peer assessment as well as self-reflection (Herrington 2010, 21– 22).

The contextual-pedagogical learning landscape and the learning processes taking place in it together serve to combine the curricular learning objectives and contents of different subjects in a way that respects the central concept structures of each discipline. The contextual-pedagogical learning landscape forms learning paths that enhance learning and help the pupils proceed towards the transversal competences that are common to different subjects. The pupils' age and everyday life require that different learning contexts and cooperation between subjects are considered to find a favourable landscape for the topics studied. Contextuality helps to create situational and cultural learning spaces where there is room for all lingual expressions and texts. Without context, linguistic structures and entire texts remain disconnected. Language always comes into being and lives in a context; it cannot be separated from its surroundings. (Shore 1992, 34–35.) Luukka (1995, 23) notes that meanings are born in the bidirectional interaction between language and its context; language creates the structures of the society, and the society creates language.

Conclusion

Integrating different subjects is like a jigsaw: the topics stem from real life. This time the topic was Flash Mob, tomorrow it may be the opening of an art exhibition and next week the municipal elections - each content area of the Finnish language and literature curriculum has its own jigsaw piece within these topic areas. How the jigsaw is pieced together is for the teacher to decide. Teaching a subject as part of topic teaching helps the learner to understand the essence and meaning of the subject. This requires that the teacher has strong substance competence and the ability to find connections between the learning landscape and the pupils' lifeworld. In addition, the teacher should be willing to take the pupils to this learning landscape. The meaningfulness of learning motivates the pupils, thus providing a fertile ground for learning. Unwrapping the curricular content areas to create interdisciplinary topic areas that stem from everyday life requires not only willingness to renew one's thinking and to throw oneself into a new way of teaching but also strong competence in one's discipline and - as regards linguistic education - comprehension of functional linguistics. Integrating subject teaching into topic teaching invites teachers to explore the curriculum, its core concepts, objectives, and transversal competences, and to see how these relate to everyday life and the pupils' lifeworld. By doing this, the teacher is responding to the curricular demands of meaningfulness, involvement, motivation, and active participation, which are also factors that inspire the children and adolescents of today and enable them to demonstrate their knowledge and skills.

References

Cantell, H. (2017). Monialaisuuden haasteita ja mahdollisuuksia opettamisessa ja oppimisessa. Teoksessa A. M. Rautiainen & J. Tähtinen (toim.) *Toiveet ja todellisuus – kasvatus osallisuutta ja oppimista rakentamassa.* Jyväskylä: Suomen kasvatustieteellinen seura, 225–252.

Halliday, Michael (2003). Systemic Background. In J. Webster *On Language and Linguistics. Vol. 3 Collected Works of M.A.K. Halliday.* London. Continuum, 185–198.

Herrington, J., & Oliver, R. (2000). An instructional design framework for authentic learning environments. *Educational Technology Research and Development, 48*(3), 23–48.

Herrington, J., Reeves, T. C. & Oliver, R. (2010). *A Guide to authentic learning*. Routledge.

Kangas, M., Kopisto, K., & Krokfors, L. (2016). Tulevaisuuden koulussa opitaan kaikkialla, yhdessä ja luovasti – elämää varten. Teoksessa H. Cantell & A. Kallioniemi (toim.) *Kansankynttilä keinulaudalla. Miten tulevaisuudessa opitaan ja opetetaan?* Tampere: PS-Kustannus, 77–94.

Kielitoimiston sanakirja (2020). Kotimaisten kielten keskus ja Kielikone Oy. https://www.kielitoimistonsanakirja.fi (Retrieved 12.9.2021.)

Koskinen-Sinisalo, K.-L., Sinervo, S. & Reinikainen, M. (2020). Monialaiset oppimiskokonaisuudet opettajien arvioimana. Teoksessa O.-T. Kankkunen (toim.) *Arvioinnin ulottuvuudet.* Tampere: Tampereen yliopiston normaalikoulu, 33–48.

Krathwohl, D.R. (2002). A revision of Bloom's taxonomy: an overview. *Theory into Practice, 41*(4), 212-218.

Lantolf, J. P. & Thorne, S. (2006). *Sociocultural theory and genesis of second language development.* Oxford University Press.

Lappalainen, Hannu-Pekka (2010). *Sen edestään löytää. Äidinkielen ja kirjallisuuden oppimistulokset perusopetuksen päättövaiheessa*. 2010. Opetushallitus.

Luukka, M.R. (1995). *Puhuttua ja kirjoitettua kieltä. Funktionaalinen ja yhteisöllinen näkökulma tieteen kielen interpersoonallisiin piirteisiin.* Jyväskylä: Jyväskylän yliopisto.

Meriläinen, M. & Piispanen, M. (2017). Creative Work Flows for Learning: kontekstuaalis-pedagoginen oppimaisema oppimismotivaation herättäjänä. Teoksessa L. Segler-Heikkilä & J. Hakala (toim.). *Mikä saa meidät innostumaan? Motivaatio korkeakouluopetuksessa.* Kokkola: Centria-ammattikorkeakoulu. 69–82.

Nikula, T. (2010). *Kieli, koulutus ja yhteiskunta. Kielikäsityksen ja kielenopetuksen kytköksistä*. 1 (1).

Opetushallitus (2014). *Perusopetuksen opetussuunnitelman perusteet.* Helsinki: Opetushallitus.

Piispanen, M., Leppisaari, I., & Meriläinen, M. (2015). Päivitä opettajuus digiaikaan! POD-koulutus digiajan autenttisen oppimisympäristön tien avaajana Centria-ammattikorkeakoulussa. Teoksessa I. Leppisaari, Meriläinen, M. & Piispanen, M. & A. Pulkkinen (toim.), *Opettajuus päivittyy - koulutus kehittyy* (pp. 7–27). Kokkola: Centria ammattikorkeakoulu

Rule, A. C. (2006). The components of authentic learning. *Journal of Authentic Learning, 3*(1), 1-10.

Saarikivi, J. (2018). *Suomen kieli ja mieli.* Kustannusosakeyhtiö Teos.

Shore, Susanna (1992). *Aspects of a Systemic-Functional Grammar of Finnish.* Sydney: Macquarie University.

Snellman, J.V. (1844). *Saima* (23).

Vygotsky, L. (1978). *Interaction between learning and development*. In: Mind and Society. Cambridge, M: Harvard University Press, 79–91.

Wittgenstein, L. (1921). *Tractatus logico philosophicus.* Suomentanut Heikki Nyman. Helsinki: WSOY.

iejee

International Electronic Journal of Elementary Education
June 2022, Volume 14, Issue 5, 613-629

Prediction of the Factors Affecting PISA Mathematics Literacy of Students from Different Countries by Using Data Mining Methods

Nurşah Aksu[a], Gökhan Aksu[b,*], Seda Saracaloğlu[c]

Received : 13 December 2021
Revised : 8 March 2022
Accepted : 26 June 2022
DOI : 10.26822/iejee.2022.267

[a] Nurşah Aksu, Aydın Adnan Menderes University, Faculty of Education, Aydın/Turkey
E-mail: nursahyigit246@gmail.com
ORCID: https://orcid.org/0000-0001-9562-0541

[b,*] **Corresponding Author:** Gökhan Aksu, Aydın Adnan Menderes University, Faculty of Education, Department of Measurement and Evaluation in Education, Aydın/Turkey
E-mail: gokhanaksu1923@gmail.com
ORCID: https://orcid.org/0000-0003-2563-6112

[c] Seda Saracaloğlu, Aydın Adnan Menderes University, Faculty of Education, Aydın/Turkey
E-mail: sedasaracal@adu.edu.tr
ORCID: https://orcid.org/0000-0001-7980-0892

Abstract

The purpose of this study is to predict the mathematical literacy levels of the students participating in the research through the data obtained from PISA 2015 exam organized by OECD using data mining and to determine the variables that affect mathematics literacy. For this purpose, students' mathematics literacy levels and the variables that affect their mathematics literacy levels were analyzed separately for 6 different countries at different proficiency levels. The population of the research is 519334 students from 72 countries, who have taken PISA 2015 exam. The sample that was determined according to the purpose of the study consists of a total of 34,565 students from Singapore, Japan, Norway, the USA, Turkey, and the Dominican Republic, which have been observed to be at different proficiency levels. In the first stage of the study, analyzes were performed using data mining prediction methods. At this stage, WEKA program was employed and M5P algorithm, which is one of the most common methods, was used. In the second stage of the research, the output variable was predicted from the input variables using Artificial Neural Networks methods to determine the extent to which decision trees obtained by M5P prediction method produce valid results. In the analyzes carried out in MATLAB program, the relationship between students' actual math literacy scores and literacy scores predicted from input variables was examined. As a result of the study, the variables that affect mathematics literacy were found to be the socio-economic status index for Singapore, Norway, the United States, Turkey, and Dominic. On the other hand, the variables influencing mathematics literacy for Japan were found to be mathematics learning time and father's education level. The consistency of the results was as follows: 86.10% for Singapore, 40.26% for Japan, 30.10% for Norway, 39.15% for America, 26.43% for Turkey, and 29.24 % for Dominic. As a result of the study, a differentiation was found among the variables that affect mathematics literacy of the countries at different proficiency levels.

Keywords:

PISA, Mathematics literacy, Data mining, Artificial neural networks.

Introduction

Introduce the Problem

Today, too much data is collected about individuals from different settings and for different purposes. At this stage, it is very important to determine which data is significant and which is worthless in the decision-making process. In addition, the followings are considered as other important problems to be addressed: What kind of data will be collected? How much data will be collected and for how long? How will the data be stored, and what kind of pre-processing will be applied? (Bienkowski et al., 2012). Since the variables related to the characteristics of the individuals have a great influence on the accuracy of the results obtained in the prediction and decision-making processes, it is necessary to determine which variables are important to us. One of the most important elements of scientific research is data and the correct analysis of the data. Data analysis includes the organization of data sets, computation of descriptive statistics, performing correlation and regression, and other statistical operations (Baykul & Güzeller, 2013). Due to the high number of methods in question, the determination of which of these methods make more effective predictions and which of them perform less erroneous calculations is of great importance for the reliability and validity of the results. PISA (Program for International Student Assessment-International Student Assessment Program), TIMSS (Trends in International Mathematics and Science Study- International Mathematics and Science Trends Research), PIRLS (The Project of International Reading Language Skills) collect information about a large number of variables in large-scale exams. PISA projects are executed every three years since 2000. The first application, which was carried out in 2000, focused on reading skills, whereas the focus was on mathematics literacy in 2003, on science in 2006, on reading skills in 2009, and on computer-based mathematics literacy in PISA 2012. Similarly, it repeats every three years as reading skills, mathematics literacy and science. The proficiency levels of the students represent the achievement level of the students in the focus area of the project. In the tests, the proficiency level is set between 1 and 6, where level 2 indicates the "basic competence level" in field tests. Students below this level are considered to fail to receive the necessary knowledge and skills to deal with everyday life problems, whereas students who are positioned at the 5th and 6th levels are accepted to be successful in problem-solving-focused thinking in their daily lives.

It is necessary to determine whether the achievement of the individuals can be decided based only on the test results and to determine to what extent the predictions to be made using a large number of variables are correct at this stage. This study aimed to draw meaningful results through the PISA exam, which is one of the international large-scale exams, and through the big data on students and school, and to use DM methods in the field of education.

The followings are also considered as important problems to be addressed: What kind of data will be collected, how much data will be collected and for how long, how the data will be stored, what kind of pre-processing will be applied (Bienkowski et al., 2012). The variables to be obtained from databases published by OECD (The Organization for Economic Cooperation and Development) were set by considering the problems mentioned in the scope study. In addition, since the information obtained from students is bigdata, it was confirmed that it can be used within the scope of data mining methods (Nisbet, Elder and Miner, 2009). Big data actually means that the information is obtained from different environments and at different formats. Although the definition of big data differs according to the application area, the size of the available data and the source from which it is obtained are important determinants for big data (Vaitsis et al., 2016). The data to be used in the study can be defined as big data because PISA 2015 exam data contains student information at different formats and from different sources and a vast number of students are reached.The main purpose of this study is to predict the mathematical literacy levels of the students participating in the research through the data obtained from the PISA 2015 exam organized by OECD and using data mining and artificial neural network methods, and to determine the variables that affect mathematics literacy. In this regard, students' mathematics literacy levels and the variables that affect their mathematics literacy levels were analyzed separately for 6 different countries observed to be at different proficiency levels. In the study conducted by Aksu and Güzeller (2016), it was determined that the variables that affect PISA mathematical literacy are self-efficacy perception, attitude towards the course and anxiety states, and study discipline. There are many studies on mathematical literacy especially in recent years (Harms, 2000; Kaiser, 2002; EARGED, 2008; Tekin & Tekin, 2004; Özgen & Bindak, 2008; Akay & Boz, 2011; Duran & Bekdemir, 2013). It is seen that different studies have been carried out to determine the variables that are thought to have an effect on mathematical literacy (Dursun & Dede, 2004; Fisher, 1995; Savaş et al., 2010; Özer & Anıl, 2011). In addition, Koğar (2015) examined the factors affecting mathematical literacy with the help of mediation model and determined that gender, economic, social and cultural status indices and time spent learning mathematics have a significant effect on mathematical literacy. In this study, it is aimed to determine whether the results obtained by considering the affective features that have been determined to be effective on mathematical literacy so far differ

according to countries with different proficiency levels. In addition to this, it was aimed to determine the socioeconomic features that have a significant effect on mathematics literacy using PISA student surveys, to predict the scores that students got from the PISA mathematics literacy test, and to determine the consistency of the predicted test results. By this means, data mining and artificial neural network methods will be applied simultaneously for different countries through an international examination. The sub-objectives of the study are listed below:

- Predicting PISA Mathematics Literacy achievement of the students for different countries,
- Identifying the variables that have a significant effect on students' PISA Mathematics Literacy for different countries,
- Determining the order of importance and effects of the variables addressed while predicting students' PISA achievement for different countries,
- Determining the prediction accuracy of students' PISA achievement for different countries,

Method

This study aimed to determine the variables that affect students' mathematics literacy through the answers given to the questions in PISA 2015 student survey, and to check whether these variables differ depending on the country. PISA math scores were taken as a continuous variable in the study, therefore the procedure was predictive analysis; and since it was aimed to compare the results of the prediction by data mining, the method used in the study was a descriptive research model. The study is descriptive research because it addresses the prediction results obtained by data mining methods and the determination of the variables that affect PISA mathematics literacy levels (Aggarval & Ranganathan, 2019).

The Population and the Sample of the Research

The population of the research is 519,334 students from 72 countries, which took the PISA 2015 exam. Table 1 shows the average scores of the countries in the population and their rank in terms of mathematical literacy as a country.

Table 1.
Comparisons of the Countries according to Average Mathematics Literacy Scores

Rank	Mean	Country	Rank	Mean	Country	Rank	Mean	Country
1	564	Singapore	25	494	Australia	49	420	Turkey
2	548	Hong Kong-China	26	493	France	50	420	Moldova
3	544	Macao-China	27	492	United Kingdom	51	418	Uruguay
4	542	Taipei-China	28	492	Czech Republic	52	418	Karabakh
5	532	Japan	29	492	Portugal	53	417	Trinidad
6	531	BSJG-China	30	490	Italy	54	415	Thailand
7	524	Korea	31	488	Iceland	55	413	Albania
8	521	Switzerland	32	486	Spain	56	408	Mexico
9	520	Estonia	33	486	Luxembourg	57	404	Georgia
10	516	Canada	34	482	Latvia	58	402	Qatar
11	512	Netherlands	35	479	Malta	59	400	Costa Rica
12	511	Denmark	36	478	Lithuania	60	396	Lebanon
13	511	Finland	37	477	Hungary	61	390	Colombia
14	510	Slovenia	38	475	Slovak Republic	62	387	Peru
15	507	Belgium	39	470	Israel	63	386	Indonesia
16	506	Germany	40	470	The USA	64	380	Jordan
17	504	Poland	41	464	Croatia	65	377	Brazil
18	504	Ireland	42	456	Argentina	66	371	Macedonia
19	502	Norway	43	454	Greece	67	367	Tunisia
20	497	Austria	44	444	Romania	68	362	Kosovo
21	495	New Zealand	45	441	Bulgaria	69	360	Algeria
22	495	Vietnamese	46	437	Cyprus	70	328	Dominic
23	494	Russia	47	427	United Arab Emirates			
24	494	Sweden	48	423	Chile			

The sample that was determined according to the purpose of the study consists of a total of 34,565 students from Singapore, Japan, Norway, the USA, Turkey and the Dominican Republic, which were found to be at different proficiency levels. The reason why Singapore, Japan and Norway were chosen from these countries is that they are the subject of many researches in terms of the education systems they apply and the results obtained. The reason for choosing the US sample from the 2nd level and Turkey from the 1st level is that there are studies in the related literature that compare the two countries according to different criteria and there are findings that the results obtained for the two countries are due to cultural differences. The Dominican Republic was taken as the sample because the only country below level 1 is the Dominican Republic.

The number of students of the selected countries participating in the PISA exam and their proportions in the population are shown in Table 2.

According to Table 2, two different countries from the 3rd level were included in the sample. This is because the total number of countries at different proficiency levels varies. 32 of the 72 countries participating in the exam were at the third level, thus it was aimed to include two different countries from this level and compare the results of these two countries. Regarding Turkey in PISA 2015, the student population of 15 age-group was 1,324,089, whereas the accessible Turkey population was defined as 925,366 students (MoNE, 2016).

Data Collection Tools

To determine the variables covered in the PISA student questionnaire, which is the data collection tool of the study, firstly, the literature was reviewed, and PISA mathematics literacy levels of students were predicted using 15 variables related to mathematics achievement (Aksu & Güzeller, 2016; Duran & Bekdemir, 2013; Dursun & Dede 2004; Harms 2000; Koğar 2015; Özer & Anıl, 2011; Savaş et al., 2010; Tekin & Tekin 2004). It has been determined that the results obtained with the help of the selected attributes feature without using any algorithms over the training data set during the estimation of the mathematical literacy of the countries with different proficiency levels. This result provides evidence that the variables that affect mathematical literacy will differ for different countries. Accordingly, all 15 independent variables were included in the analysis to predict students' mathematical literacy levels for each country, and the results were examined to see if they differed. The numerical values used at this stage were belonging to the population and they were obtained from 519,334 students. The variables used in the study were gender, personal room, mother's education level, father's education level, out-of-school learning time, mathematics learning time, total learning time, belonging to the school, exam anxiety, motivation level, desire for collaborative work, emotional support of the family, perceived feedback, teacher's fairness, socio-economic level, and Mathematics literacy level. The names and codes of the variables used in the study and their descriptive statistics values are shown in Table 3.

Data Analysis

In the first stage of the research, the objective was to create a model that will predict students' mathematical literacy achievement by using PISA data. For determining which PVMATH scores should be considered as the dependent variable (result/output/target), the relationship between 10 different scores were examined and it was decided to use PV2MATH scores, which have the highest correlation with other variables, as a dependent variable. In the study, the analysis of each country were carried out in two stages. In the first stage, data mining prediction methods of WEKA program were employed, whereas in the second stage, artificial neural network methods of MATLAB program were used. In the first phase of the study, the analysis were performed using data mining prediction methods.Within the scope of the study, M5P algorithm, one of the most used methods in data mining decision trees, was employed. The M5P algorithm, which is a revised version of the M5 algorithm, whose foundation was laid by Quinlan (1992), was updated by Wang and Witten (1997). In

Table 2.
Information of the Countries in the Sample

Countries	Country Average	Proficiency Level	Number of Students	Percentage in the Universe
1. Singapore	564	Level 4	6115	1.20
2. Japan	532	Level 3	6647	1.30
3. Norway	502	Level 3	5456	1.10
4. The USA	470	Level 2	5712	1.10
5. Turkey	420	Level 1	5895	1.10
6. Dominic	328	Level 0	4740	0.90

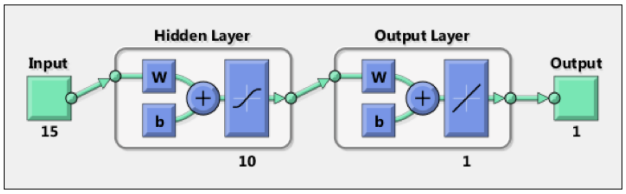
Table 3.
Descriptive Statistics of Variables

Variables	Code	Min	Max	Mean	sd
1.Gender	ST004D01T	1	2	–	–
2.Own room	ST011Q02TA	1	2	–	–
3.Mother education	MISCED	0	6	2.20	1.84
4. Father education	FISCED	0	6	2.67	1.89
5. Out of school learning time (min)	OUTHOURS	0	70	25.54	14.74
6. Math learning time (min)	MMINS	0	640	224.83	79.78
7. Total learning time (min)	TMINS	100	3000	1558.75	331.48
8. Feeling belonging to school	BELONG	-3.13	2.61	-0.44	1.12
9. Exam anxiety	ANXTEST	-2.51	2.55	0.32	1.06
10. Motivation level	MOTIVAT	-3.09	1.85	0.61	1.04
11. Willingness to cooperate	COOPERATE	-3.33	2.29	0.01	1.13
12. Emotional support of the family	EMOSUPS	-3.08	1.10	-0.27	1.08
13. Perceived feedback	PERFEED	-1.53	2.50	0.35	0.98
14. Teacher fairness	unfairteacher	1	24	10.25	4.04
15. Socio-economic level (SED)	ESCS	-5.13	3.12	-1.45	1.17
16. Mathematic literacy score	PV2MATH	92.30	699.56	415.85	80.86

the model, linear regression functions are used in the leaves of the decision tree to estimate the dependent variable that is defined as numeric. One of the reasons for using this method, which is known as regression-based decision tree, is that it achieves more holistic and understandable decision trees compared to other methods (Wang & Witten, 1997). Another reason for using this method is being successful in dealing with missing data and making more accurate predictions using smoothing indices (Breiman et al., 1984). The regression-based decision tree obtained with this method can make more accurate and more consistent predictions using multiple logistics models instead of a single logistics model. In the second stage of the research, the artificial neural networks method was used. The artificial neural network is one of the application areas of artificial intelligence obtained by simulating intelligence, which is the combination of all human abilities such as learning and problem solving, in a computer environment. Herewith, it can produce solutions to complex problems in a way similar to how a human produces solutions (Aksu & Güzeller, 2018). Artificial neural networks have three levels, namely the input layer, the hidden layer, and the output layer. Just like the human brain, they are comprised of the input layer, where the stimuli from the outside world come; the output layer, in which the results for these stimuli will be produced; and one or more hidden layers between these two. Each hidden layer produces the output values corresponding to the input values coming from the previous neuron and sends them to the neurons of the next layer. Thus, human-specific properties are simulated in a way that human possesses these properties. In order to determine the extent to which decision trees obtained by M5P prediction method produce valid results, the output variable was predicted from the input variables using artificial neural network methods. In the analysis performed by artificial neural networks, the fixed parameters were set as Levenberg-Marquardt (TRAINLM) for the training function and adaptive learning (LEARNGDM) method for the learning function.

The theoretical model established by Artificial Neural Networks (ANN) to determine the variables that affect students' mathematics literacy for different countries is shown in Figure 1.

Figure 1.
Theoretical Model Established by ANN



As seen in Figure 1, the number of input variables was determined to be 15, the number of hidden layers was 10, the number of output layers was 1, and the output variable was 1. The values here show the prediction of the output variable, which was set as the mathematics literacy of the students, from 15 independent variables. After this process, the relationship between students' real mathematics literacy scores and the literacy scores predicted from the input variables was analyzed in MATLAB program. The relationship between actual

and predicted values was analyzed using the curve fitting method, and the consistency of the results was determined. In determining the external validity of the results obtained from WEKA program, MATLAB program used the validation method known as hold out (Souza et al., 2002) instead of using the whole data set. In this method, the data file is divided into two as training and test data. Firstly, a training data set is formed to create the learning method named as a predictor. In the analysis of the data, 70% of the whole data set was used to train the data, 15% to test the results, and the remaining 15% to test the validity of the results for each country. In data mining, it is generally very common to use at least one-third (1/3) of the available data for testing and the remaining two-thirds (2/3) for training. In the literature, it is stated that better estimation is made for the training dataset if the ratio is at least 70% and above (Rácz et al., 2021).

Findings

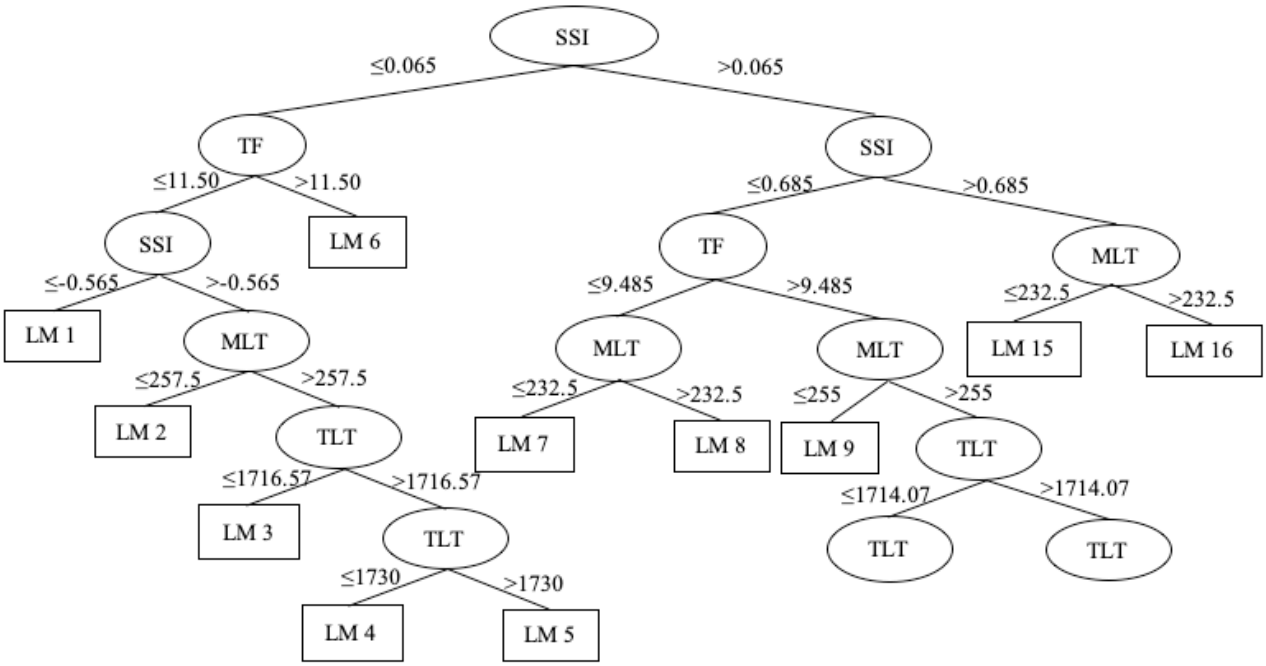
In the study, it was aimed to determine the variables that affect mathematics literacy of the countries participating in the PISA exam and being at different proficiency levels regarding the country average. For this purpose, the results were reported for the following countries: Singapore at the fourth level, Japan and Norway at the third level, America at the second level, Turkey at the first level, and the Dominican Republic below the first level.

Results of Singapore Sample

The results obtained by the MP5 method, which is one of the data mining decision tree methods, to determine the variables that affect the mathematical literacy of Singapore, which had a national mathematical literacy average score of 564 in the PISA 2015 exam and which was found to be at the fourth level in terms of proficiency level are shown in Figure 2.

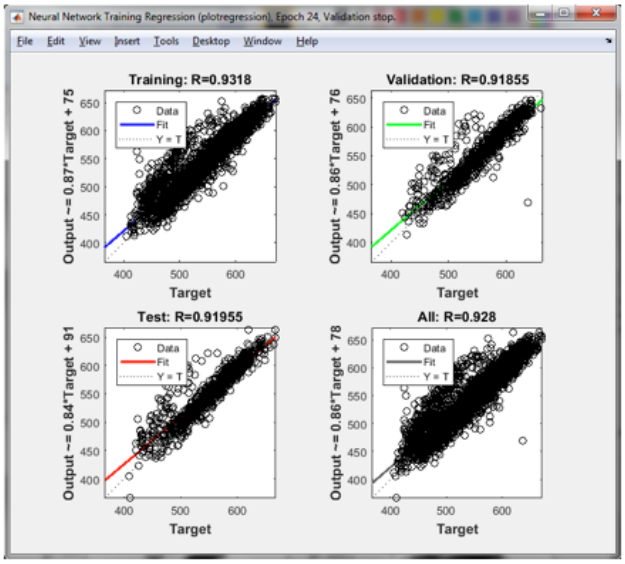
Regarding Figure 2, 16 different rules were created to predict students' mathematics literacy levels. As a result of the top-down analysis of the decision tree, the variable that has the most impact on mathematics literacy was found to be students' socioeconomic status index (SSI), and this variable was set as the root node. The resulting decision tree was divided into two branches according to SSI variable, with a cut-off score of 0.065; Teacher's fairness (TF) was effective on mathematics literacy levels of students with SSI level below 0.065, whereas the SSI variable itself was the most effective predictive variables in children whose SSI level was above 0.065. Regarding the second level branching of the tree, socio-economic level, teacher's fairness, and mathematics learning time were observed to be the most effective variables of the second level. As a result of the prediction obtained from a total of 6,115 Singapore students, the review of the whole decision tree obtained to determine the variables that affect students' mathematics literacy for the Singapore sample revealed that socio-economic level, teacher fairness, mathematics learning time, and total learning time were the most effective variables, in this order. Matthews correlation coefficient obtained from WEKA program was 0.464; the average absolute error was 64.58 and the square

Figure 2.
Decision Tree obtained for Singapore Sample



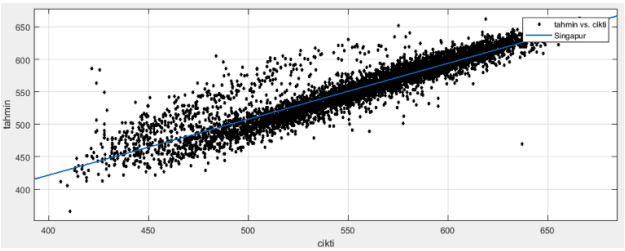
root of the average errors was 87.72. In order to determine the external validity of the results, the data was divided into three, as 70% (*n* = 4,281) training data, 15% (*n* = 917) test data and 15% (*n* = 917) validation data. The results of the prediction are shown in Figure 3.The results obtained by the MP5 method, which is one of the data mining decision tree methods, to determine the variables that affect the mathematical literacy of Singapore, which had a national mathematical literacy average score of 564 in the PISA 2015 exam and which was found to be at the fourth level in terms of proficiency level are shown in Figure 2.

Figure 3.
Prediction Results of Different Data Sets for Singapore Sample



Regarding the results obtained through the analysis carried out using the three-layer, namely, input hidden and output layers, the feed-forward network shown in Figure 3, the percentages of correct prediction were 93.18% in the training data set, 91.96% in the test data set, 91.86% in the validation data set, and accordingly, an average of 92.8% in the whole dataset. The relationship between the predicted results and the actual literacy scores was analyzed and the results are shown in Figure 4.

Figure 4.
Prediction Results for Singapore Data

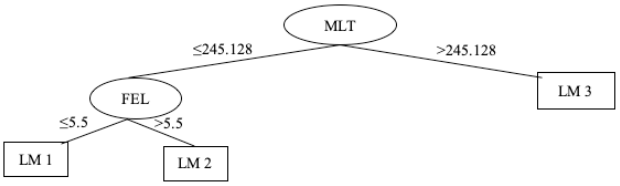


Accordingly, R^2 value, which is known as the coefficient of determination, of the relationship defined as y = 0.86x + 77.63 was calculated as 0.861. The RMSE value of the prediction was calculated as 17.57. According to this result, it was concluded that the literacy scores predicted from the input variables were 86.12% consistent.

Results of Japan Sample

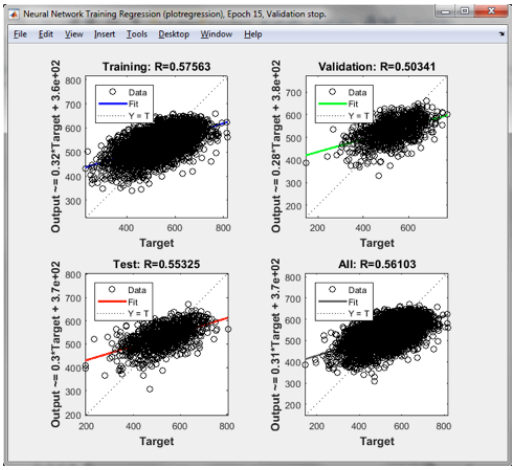
The results obtained by the MP5 method, which is one of the data mining decision tree methods, to determine the variables that affect the mathematical literacy of Japan, which had a national mathematical literacy average score of 532 in the PISA 2015 exam and which was found to be at the third level in terms of proficiency level are shown in Figure 5.

Figure 5.
Decision Tree obtained for Japan Sample



Regarding Figure 5, 3 different rules were created to predict students' mathematics literacy levels. As a result of the top-down analysis of the decision tree, the variable that has the most impact on mathematics literacy was found to be students' mathematics learning time (MLT) and this variable was set as the root node. Regarding the second level of the tree, the father's education level was observed to be effective on students' mathematics literacy. Matthews correlation coefficient obtained from WEKA program was 0.502; the average absolute error was 60.16 and the square root of the average errors was 75.84. In order to determine the external validity of the results, the data was divided into three, as 70% (*n* = 4,653) training data, 15% (*n* = 997) test data and 15% (*n* = 997) validation data. The results of the prediction are shown in Figure 6.

Figure 6.
Prediction Results of Different Data Sets for Japan Sample

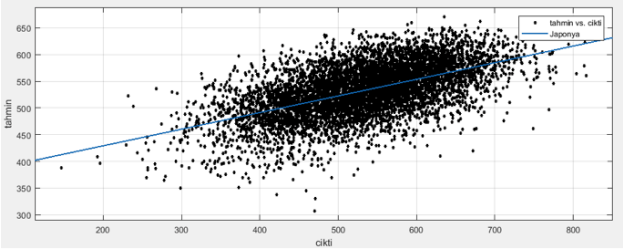


Regarding Figure 6, the percentages of correct

prediction were 57.56% in the training data set, 55.33% in the test data set, 50.34% in the validation data set, and accordingly, an average of 56.10% in the whole dataset. The relationship between the predicted results and the actual literacy scores was analyzed and the results are shown in Figure 7.

Figure 7.

Prediction Results for Japan Data



Accordingly, R^2 value, which is known as the relationship, of the relationship defined as y = 0,31x + 367.00 was calculated as 0.315. The RMSE value of the prediction was calculated as 40.26. According to this result, it was concluded that the literacy scores predicted from the input variables were 31.46% consistent.

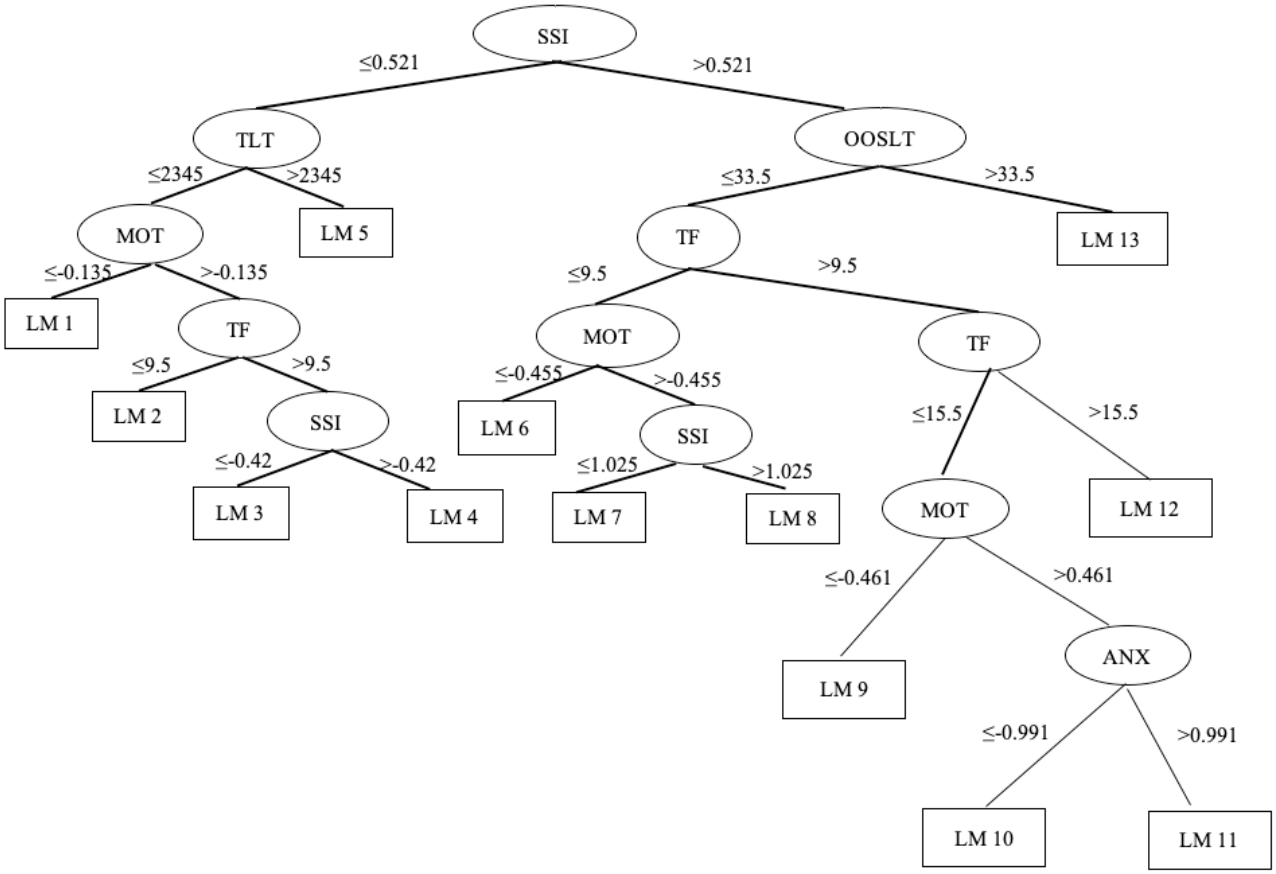
Results of Norway Sample

The results obtained by the MP5 method, which is one of the data mining decision tree methods, to determine the variables that affect the mathematical literacy of Norway, which had a national mathematical literacy average score of 502 in the PISA 2015 exam and which was found to be at the third level in terms of proficiency level are shown in Figure 8.

Regarding Figure 8, 13 different rules were created to predict students' mathematics literacy levels. As a result of the top-down analysis of the decision tree, the variable that has the most impact on mathematics literacy was found to be students' socioeconomic status index (SSI), and this variable was set as the root node. The most effective variables after SED were total learning time and out-of-school learning time. Regarding the branching structure of the lower level of the tree, teachers' fairness and motivation were observed to be the most effective variables at the second level. Matthews correlation coefficient obtained from WEKA program was 0.343; the average absolute error was 62.26 and the square root of the average errors was 88.49. In order to determine the external validity of the results, the data was divided into three, as 70% (*n* = 3,820) training data, 15% (n = 818) test data and 15% (*n* = 818) validation data. The results

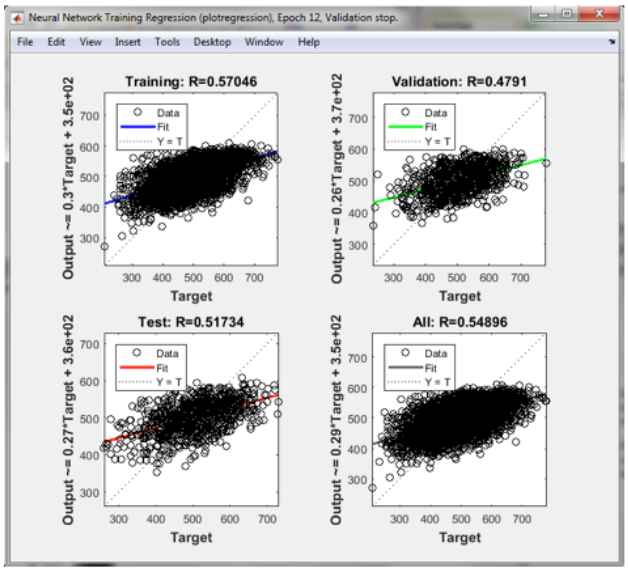
Figure 8.

Decision Tree obtained for Norway Sample



of the prediction are shown in Figure 9.

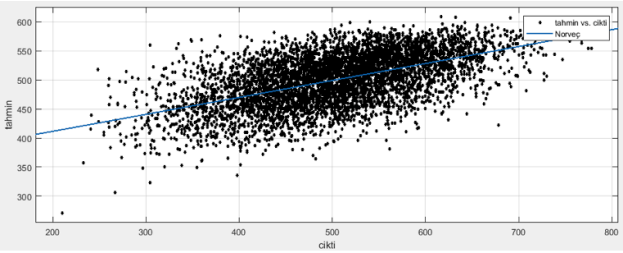
Figure 9.
Prediction Results of Different Data Sets for Norway Sample



Regarding Figure 9, the percentages of correct prediction were 57.05% in the training data set, 51.73% in the test data set, 47.91% in the validation data set, and accordingly, an average of 54.90% in the whole dataset. The relationship between the predicted results and the actual literacy scores was analyzed and the results are shown in Figure 10.

Accordingly, R2 value, which is known as the coefficient of determination of the relationship, defined as $y = 0.29x + 353.20$ was calculated as 0.301. The RMSE value of the prediction was calculated as 37.78. According to this result, it was concluded that the literacy scores predicted from the input variables were 30.12% consistent.

Figure 10.
Prediction Results for Norway Data

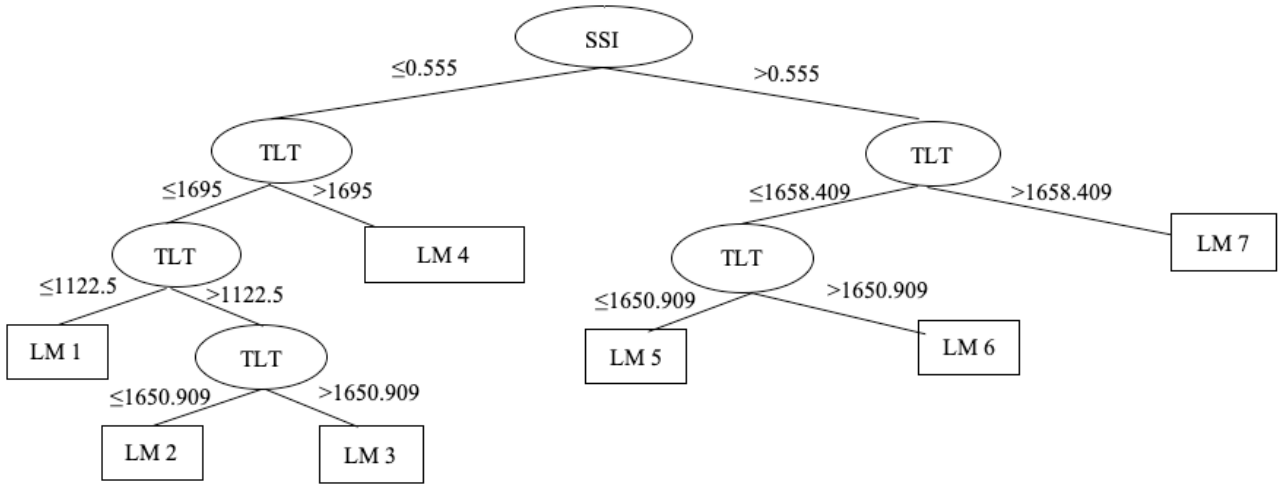


Results of the USA Sample

The results obtained by the MP5 method, which is one of the data mining decision tree methods, to determine the variables that affect the mathematical literacy of the USA, which had a national mathematical literacy average score of 470 in the PISA 2015 exam and which was found to be at the second level in terms of proficiency level are shown in Figure 11.

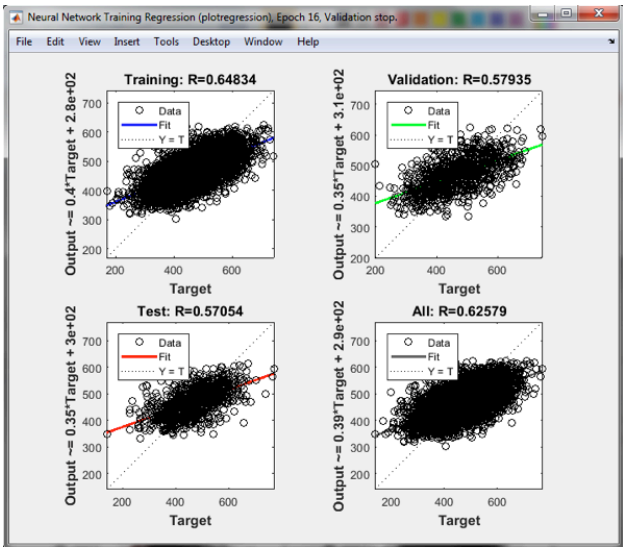
Regarding Figure 11, 7 different rules were created to predict students' mathematics literacy levels. As a result of the top-down analysis of the decision tree, the variable that has the most impact on mathematics literacy was found to be students' socioeconomic status index (SSI), and this variable was set as the root node. It is observed that the total learning time was effective on mathematics literacy levels at a lower level of the tree. Regarding the branching structure of the second level of the tree, the total learning time was again observed to be the most effective variable. Matthews correlation coefficient obtained from WEKA program was 0.566; the average absolute error was 58.20 and the square root of the average errors was 73.61. In order to determine the external validity of the results, the data was divided into three, as 70% (n = 3,998) training data, 15% (n = 857) test data and 15% (n = 857) validation data. The results of the prediction are

Figure 11.
Decision Tree obtained for the USA Sample



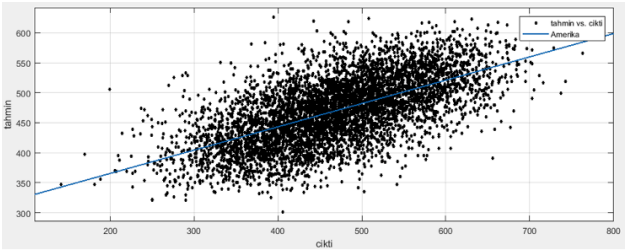
shown in Figure 12.

Figure 12.
Prediction Results of Different Data Sets for the USA Sample



Regarding Figure 12, the percentages of correct prediction were 64.83% in the training data set, 57.05% in the test data set, 57.94% in the validation data set, and accordingly, an average of 62.58% in the whole dataset. The relationship between the predicted results and the actual literacy scores was analyzed and the results are shown in Figure 13.

Figure 13.
Prediction Results for USA Data

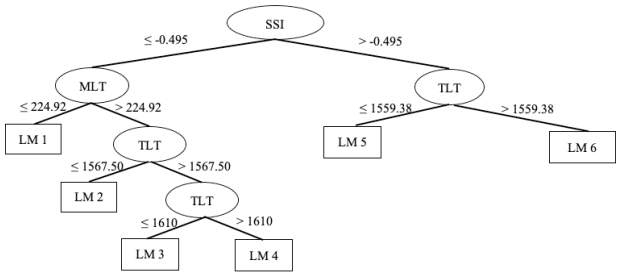


Accordingly, R^2 value, which is known as the coefficient of determination, of the relationship defined as y = 0.39x + 287.90 was calculated as 0.392. The RMSE value of the prediction was calculated as 43.20. According to this result, it was concluded that the literacy scores predicted from the input variables were 39.15% consistent.

Results of Turkey Sample

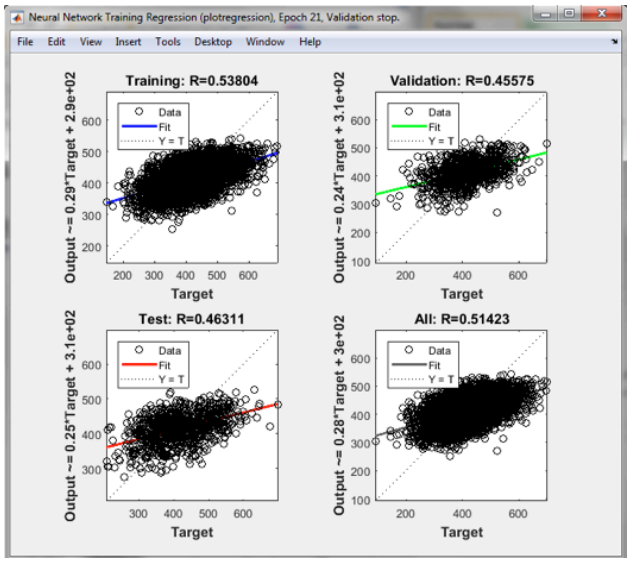
The results obtained by the MP5 method, which is one of the data mining decision tree methods, to determine the variables that affect the mathematical literacy of Turkey, which had a national mathematical literacy average score of 420 in the PISA 2015 exam and which was found to be at the first level in terms of proficiency level are shown in Figure 14.

Figure 14.
Decision Tree obtained for Turkey Sample



Regarding Figure 14, 6 different rules were created to predict students' mathematics literacy levels. As a result of the top-down analysis of the decision tree, the variable that has the most impact on mathematics literacy was found to be students' socioeconomic status index (SSI), and this variable was set as the root node. Mathematics learning time was observed to be effective at the lower level of the tree, while the total learning time variable was effective on the mathematics literacy levels of students whose SSI level was above -0.495. Regarding the branching structure of the second level of the tree, the total learning time was observed to be the most effective variable at the second level. Matthews correlation coefficient obtained from WEKA program was 0.458; the average absolute error was 57.24 and the square root of the average errors was 71.98. In order to determine the external validity of the results, the data was divided into three, as 70% (*n* = 4,127) training data, 15% (*n* = 884) test data and 15% (*n* = 884) validation data. The results of the prediction are shown in Figure 15.

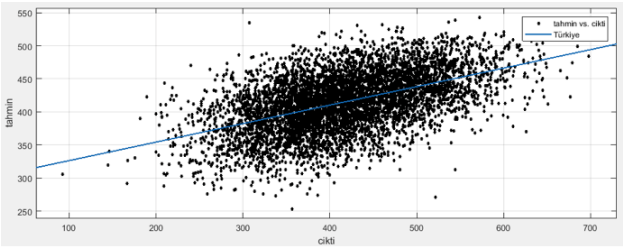
Figure 15.
Prediction Results of Different Data Sets for Turkey Sample



Regarding Figure 15, the percentages of correct prediction were 53.80% in the training data set, 46.31% in the test data set, 45.58% in the validation data set,

and accordingly, an average of 51.42% in the whole dataset. The relationship between the predicted results and the actual literacy scores was analyzed and the results are shown in Figure 16.

Figure 16.
Prediction Results for Turkey Data



Accordingly, R^2 value, which is known as the coefficient of determination, of the relationship defined as y = 0.28x + 298.30 was calculated as 0.264. The RMSE value of the prediction was calculated as 37.74. According to this result, it was concluded that the literacy scores predicted from the input variables were 26.43% consistent.

Results of Dominic Sample

The results obtained by the MP5 method, which is one of the data mining decision tree methods, to determine the variables that affect the mathematical literacy of Dominic, which had a national mathematical literacy average score of 328 in the PISA 2015 exam and which was found to be below of the first level in terms of proficiency level are shown in Figure 17.

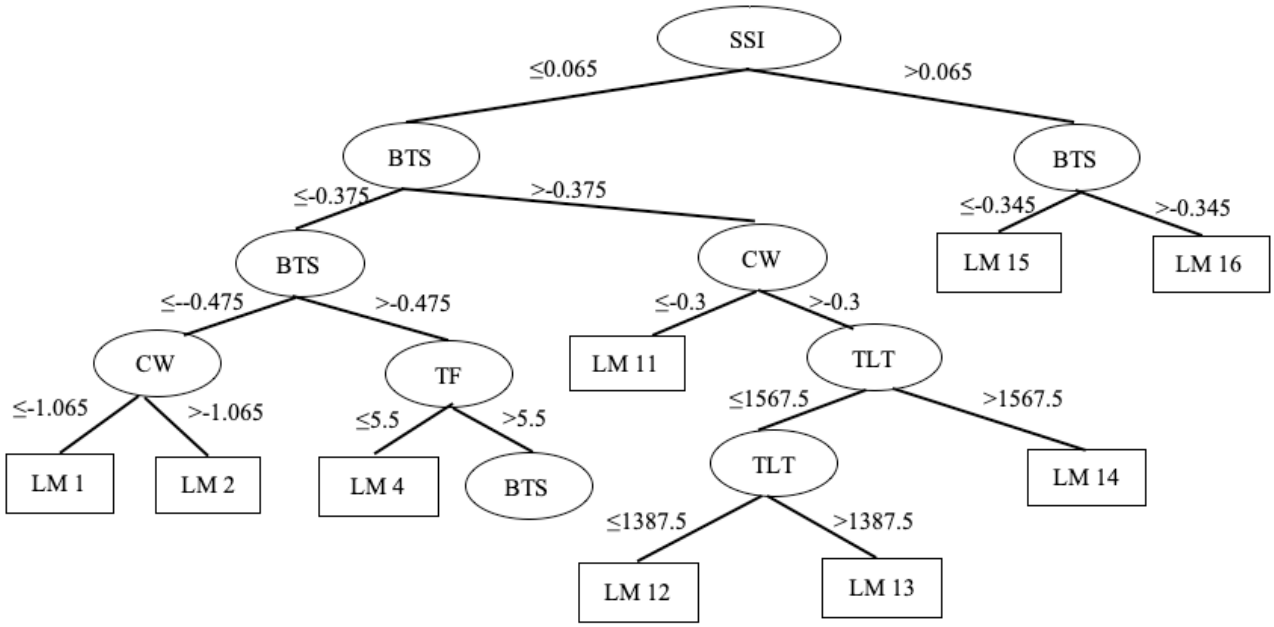
Regarding Figure 17, 16 different rules were created to predict students' mathematics literacy levels. As a result of the top-down analysis of the decision tree, the variable that has the most impact on mathematics literacy was found to be students' socioeconomic status index (SSI), and this variable was set as the root node. Regarding the branching structure of the second level of the tree, belonging to the school and collaborative work were observed to be the most effective variables at the second level. Cooperative work, teacher's fairness and total learning time were effective in the third branch of the tree; whereas cooperative work, belonging to the school and total learning time was effective in the fourth level branching of the tree. Matthews correlation coefficient obtained from WEKA program was 0.491; the average absolute error was 46.03 and the square root of the average errors was 58.18. In order to determine the external validity of the results, the data was divided into three, as 70% (*n* = 3,318) training data, 15% (*n* = 711) test data and 15% (*n* = 711) validation data. The results of the prediction are shown in Figure 18.

Regarding Figure 18, the percentages of correct prediction were 56.01% in the training data set, 51.06% in the test data set, 49.54% in the validation data set, and accordingly, an average of 54.27% in the whole dataset. The relationship between the predicted results and the actual literacy scores was analyzed and the results are shown in Figure 19.

Accordingly, R2 value, which is known as the coefficient of determination, of the relationship defined as y = 0.29x + 235.40 was calculated as 0.294. The RMSE value of the prediction was calculated as 30.09. According to this result, it was concluded that the literacy scores predicted from the input variables were 29.44% consistent.

Figure 18.

Figure 17.
Decision Tree obtained for Dominic Sample



Prediction Results of Different Data Sets for Dominic Sample

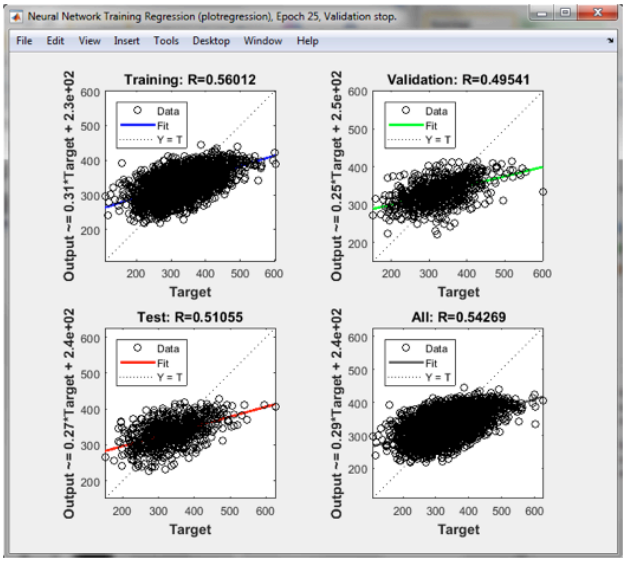
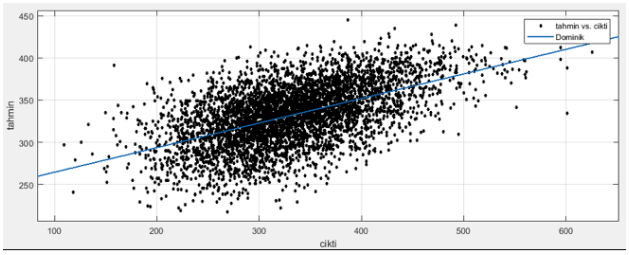


Figure 19.
Prediction Results for Dominic Data



Comparison of Results from Countries at Different Levels

The effective variables in each level of the decision trees created to determine the variables that affect mathematics literacy scores of the countries at different proficiency levels are shown in Table 4.

Regarding Table 4, socioeconomic status index (SSI) is the variable with the most impact on mathematics literacy in all countries except Japan. The review of the decision trees as a whole revealed a differentiation among the variables that are effective at the second level. The effective variable of the second level was the total learning time (TLT) for Norway, USA, and Turkey, whereas the father's education level (FEL) was more effective for Japan. Besides, the other effective variables of this level were out-of-school learning time (OOSLT) for Norway; mathematics learning time (MLT) for Turkey; socioeconomic level (SSI) and teacher fairness (TF) for Singapore, and belonging to school (BTS) for Dominic. Regarding the third level branches of decision trees obtained for countries at different literacy levels, the effective variables were total learning time (TLT) for Turkey and USA; Mathematics learning time (MLT), Socio-economic index (SSI), Teacher's fairness (TF) for Singapore; Motivation (MOT) and Teacher's fairness (TF) for Norway; and belonging to school (BTS) and Cooperative work (CW) for Dominic. Regarding the fourth-level branching of the decision trees, Total learning time (TLT) was effective for USA and Turkey; mathematics learning time (MLT) was effective for Singapore, and Teacher's fairness (TF) was effective for Norway and Dominic. Regarding the correlation coefficients, which is one of the criteria related to the reliability of the results, the best result was obtained for the Norway sample, followed by Turkey, Singapore, Dominic, Japan, and the United States. Validity criteria of decision trees obtained for countries at different proficiency levels are shown in Table 5.

Regarding Table 5, the most consistent predictions were obtained for Singapore, followed by the USA, Japan, Norway, Dominic, and Turkey. Especially the correlation coefficient between the real values and the predicted values in the Singapore sample was found to be 0.93, which shows that the variables discussed are quite determinant on mathematics literacy. In addition, the correlation coefficients between real values and predicted values were determined to be high for Singapore and moderate for all other countries.

Conclusion, Discussion and Suggestions

In this study, mathematical literacy levels of the students participating in the research were predicted using data mining and artificial neural network methods, from the data obtained from PISA 2015 exam organized by OECD, and the variables that affect mathematics literacy were determined. In the study, mathematics literacy levels and the variables that affect students' mathematics literacy levels were analyzed separately for each of the countries that have been determined to be at different proficiency levels. In the first stage of the study, the output variable was predicted from the input variables using artificial neural networks methods whereas data mining prediction methods were used in the second stage. The results obtained from WEKA and MATLAB programs were compared with the studies in the literature, similar and different aspects were revealed, and suggestions were made for future research.

In the first sub-problem of the study, the variable that has the most impact on mathematics literacy of the Singapore sample was found to be students' socio-economic status index (SSI). In addition, teachers' fairness and mathematics learning time were the most effective variables at the second level. The most effective variable in the fourth level of the decision tree was found to be total learning time. Singapore has been under British exploitation since 1819 and declared its independence from England in 1959 and left Malaysia in 1965 and became a fully independent country (OECD, 2012). In the colonial period, each

Table 4.
Comparison of Decision Trees Created for Different Countries

Countries	1. Level	2. Level	3. Level	4. Level	5. Level	6. Level
1.Singapore	SSI	SSI, TF	MLT, SSI, TF	MLT	TLT	TLT
2.Japan	MLT	FEL	-	-	-	-
3. Norway	SSI	TLT, OOSLT	MOT, TF	TF, MOT	SSI, MOT	ANX
4. The USA	SSI	TLT	TLT	TLT		
5. Turkey	SSI	MLT, TLT	TLT	TLT		
6. Dominic	SSI	BTS	BTS, CW	CW, TF, TLT	CW, BTS, TLT	MOT, SSI

Note: SSI: Socioeconomic status index, TF: Teacher fairness, MLT: Mathematics learning time, TLT: Total learning time, FEL: Father's education level, OOSLT: Out-of-school learning time, MOT: Motivation, ANX: Exam anxiety, BTS: Belonging to school, CW: Cooperative work,

Table 5.
Results on Predictions Obtained by Artificial Neural Networks Method

Countries	Training R^2	Test R^2	Validation R^2	Overall R^2	Regression equation	KK (r)	BK (r^2)
1.Singapore	93.18	91.96	91.86	92.8	y= 0.86x + 78	0.927	0.861
2.Japan	57.56	55.33	50.34	56.10	y= 0.31x + 367	0.561	0.315
3. Norway	57.05	51.73	47.91	54.90	y= 0.29x + 353	0.549	0.301
4. USA	64.83	57.05	57.94	62.58	y= 0.39x + 288	0.626	0.392
5. Turkey	53.80	46.31	45.58	51.42	y= 0.28x + 298	0.513	0.264
6. Dominic	56.01	51.06	49.54	54.27	y= 0.29x + 235	0.542	0.294

ethnic group and group of the same religion had their own, separate education system. In the period of independence, the government identified families with poor economic conditions and provided financial assistance to reduce both the educational and social achievement gap (Levent & Yazıcı, 2014). Due to the economic downturn in 2009, unemployment rates have increased, many families have experienced economic difficulties, and most families have taken their children from school to reduce expenses and directed them to a job to earn money (UNESCO, 2011). These experiences are thought to cause SSI to be the variable that has the greatest impact on mathematical literacy in the Singapore sample. In addition, in Singapore students start mathematics at the first grade and science at third grade, which explains that mathematics learning time and total learning time are the other effective variables (CIU, 2008). In Singapore, teacher candidates are paid during their undergraduate education, and teacher salaries are high, encouraging talented young people to choose this profession. The emphasis put on the practices aimed at improving teacher quality in the country and underlining quality rather than quantity causes teachers to devote themselves to their jobs (Bakioğlu & Göçmen, 2013). For this reason, teacher's fairness variable is thought to be effective on mathematical literacy. The results obtained within the scope of the study are similar to the ones of the study conducted by Areepattamannil and Kaur (2013), in which the variables affecting mathematical literacy of Singaporean students were found to be SSI and learning time.

In the second sub-problem of the study, the variable that has the most impact on mathematics literacy of Japan sample was found to be students' mathematics learning time (MLT), from the other variables, only father's education level was effective at the second level. Accordingly, it was concluded that only two of the 15 predictive variables covered in the study were effective on mathematics literacy. The most effective variable on mathematics literacy was the duration of mathematics learning in Japan sample, which is thought to be because of the shadow education, which became popular especially in the last 20 years (Dierkes, 2010). Shadow training includes special additional courses or coaching services aiming to provide additional help to students, to prepare them for exams, especially organized outside of the school. Unofficial individual lessons are available in many East Asian communities, including Hong Kong, Taiwan,

Japan, and South Korea (Brown & Baker, 2012). In the Japanese education system, the mother is usually the family member who is responsible for the children and is the individual who decides on the choice of school and helps their homework (Youbi et al., 2019). In the study, the education level of the father was found to be effective on mathematics literacy while the education level of the mother did not have a significant effect, which differs from the literature. However, the fact that shadow education in Japan is also carried out by private schools and institutions shows that this education is related to the income of the father who is the main responsible of the livelihood of the family and that the level of father education is effective on mathematics literacy (Drinck, 2002; Entrich, 2014). Besides, SSI variable did not have a significant effect on mathematics literacy, which is similar to the findings of the studies conducted in the literature (Stacey, 2011; OECD, 2010).

In the third sub-problem of the study, the variable that has the most impact on mathematics literacy of the Norway sample was found to be students' socio-economic status index, in addition, total learning time and out-of-school learning time were the most effective variables at the second level. The most effective variable on the third level was teacher's fairness; whereas the variable that is effective on the fourth level of the decision tree was found to be anxiety. The most effective variable on Norwegian students' mathematics literacy in the study was found to be SSI, which is thought as a result of the fact that Norwegian families pay higher amounts for education expenses compared to other countries and these payments correspond to approximately 20% of their income (Levin, 2003). Another reason for this result is that in a developed country like America, 40% of children stated that they were poor, while only 4% of Norwegian students described themselves as poor. In Scandinavian countries such as Norway, all students receive the same type of education in the same type of schools, in which individualized education is implemented, which means that education is structured to suit the needs of the student (Baird, Isaacs, Jojnson, Stobart, Yu, Sprague, and Daugherty, 2011). In Norway, especially after the PISA exam was applied in 2003, teachers have started to apply a large number of tests to their students even though they do not affect the exams (Ackerman & Kanfer, 2009). The motivation variable is thought to be effective on Norwegian students' mathematics literacy because students are exposed to more tests than normal (Mausethagen, 2013).

In the fourth sub-problem of the study, the variable that has the most impact on mathematics literacy of the USA sample was found to be students' socio-economic status index, whereas total learning time was the most effective variable at the second level. The variables that affect the lower level of the tree were found to be the same variables. Accordingly, it was concluded that only two of the 15 predictive variables covered in the study were effective on mathematics literacy. The fact that SSI is the most effective variable on mathematics literacy in a country with a state system like America, shows similarity with other studies in the field (Bos et al., 2016). In addition, Carnoy and Rothstein (2013) stated that the socio-economic status and family characteristics of American students have an important effect on their academic success. In addition, in a study conducted by Fiszbein and Stanton (2018), great differences were found in terms of achievement among six different social classes from the lowest to the highest for both the overall USA and the states in the USA. Similar to these results, in the report published by OECD (2011), it was stated that the difference between the social classes in America is quite high compared to Germany, England, France, Korea, Finland, and Canada. Similarly, Darling-Hammond (2014) stated that the increasing poverty rate, discrimination, income inequality, and inequality in school expenditures are the reason for the performance difference in large-scale exams such as PISA. These results support the fact that the variable that has the most impact on mathematical literacy is SSI. Heyneman (2013) stated that although American students' out-of-school learning time is one-seventh of Korea, the time spent in school is higher for America. Similarly, it was found that from the countries participating in the PISA exam, American students are at the top in terms of total learning time after China, South Korea, and Singapore (OECD, 2015). Within the scope of this study, the total learning time was the second most effective variable on mathematical literacy for the USA sample, which is similar to the studies in the literature.

In the fifth sub-problem of the study, the variable that has the most impact on mathematics literacy of the Turkey sample was found to be students' socio-economic status index, whereas mathematics learning time and total learning time were the most effective variables at the second level. The variables that affect the lower level of the tree were found to be the same variables. Accordingly, it was concluded that only three of the 15 predictive variables covered in the study were effective on mathematics literacy. Mutluer and Büyükkıdık (2017) reported parents' education level, enjoyment of mathematics, perseverance-quick give up self-efficacy as the variables having a significant impact on the mathematical literacy of students in the PISA 2012 Turkey sample. Similarly, Aksu and Güzeller (2016) found that self-efficacy, attitude, working discipline, and anxiety variables were effective on mathematics literacy in PISA 2012 exam. The results obtained within the scope of this study differ from the ones in the literature. It is thought that the emergence of this difference is due to the

performance of the exam in different years. The main subject of PISA 2012 was mainly mathematics, thus many affective features related to mathematics were questioned, whereas mathematics was less dominant in PISA 2015 exam, because the main subject was science. In addition, both mentioned studies took the dependent variable as a two-category variable, in this study mathematics achievement was taken as a continuous variable. In addition, the findings of this study differ from the findings of the study conducted by Aksu, Güzeller, and Eser (2017). In the related study, the variables of SSI, participation in courses, and participation in training did not have any significant effect on mathematics literacy, whereas SSI, mathematics learning time and total learning time were determined as the most effective variables in the study in which PISA 2015 data was used. It is thought that the emergence of this difference is due to the difference in the data sets and the analysis methods. Similarly, the results obtained from the study differ from the ones reported by Çetin and Gök (2017), in which self-efficacy, interest, and study ethics were found to be effective on mathematics literacy. It is thought that the main reason for the difference between the results obtained from the study and similar purpose studies in the literature is the inclusion of different variables. Data on affective characteristics such as mathematics self-efficacy, interest, attitude, etc. was not available in PISA 2015 exam. This study is thought to contribute to the literature in terms of determining other variables that have an impact on mathematics literacy.

In the sixth sub-problem of the study, the variable that has the most impact on mathematics literacy of Dominic sample was found to be students' socio-economic status index, belonging to school was the most effective variable at the second level. The most effective variable on the third level was collaborative work; whereas the variables that are effective on the fourth level of the decision tree were found to be teacher's fairness and total learning time. Accordingly, it was concluded that only six of the 15 predictive variables covered in the study were effective on mathematics literacy. Unlike other countries, belonging to the school, the desire to work cooperatively and the motivation variables were effective on mathematics literacy, which is thought to be due to the country's diverse ethnic groups. The fact that Jews and Arabs live in the country besides Chinese and Japanese, has made the Dominican Republic a country with a multicultural structure (Krasnodebski et al., 2012). In addition, the most effective variable on the mathematics literacy of Dominican students was SSI, which makes us think that the impact of socioeconomic variables on the achievement is the same (13%) as the OECD average (Bos, Elias, Vegas and Zoido, 2016). In addition, it was reported that 80-90% of Dominican students can complete primary school, whereas only 25-30% of the students can complete secondary school (Jensen, 2010).

As a result of the analysis of the decision trees obtained as a whole, it was determined that the socioeconomic status (SED) index was the variable that had the most impact on mathematical literacy in all countries except Japan. In Japan, the time to learn mathematics was determined as the most effective variable. However, it has been determined that the variables affecting mathematical literacy differ for countries with different proficiency levels starting from the second level. Similarly, it was determined that the amount of variance explained decreased as the proficiency level decreased for the established models. Accordingly, it was concluded that the variables that affect mathematical literacy differ according to countries, and the validity of the results obtained tends to decrease as the proficiency level of the country decreases.

Suggestions

Since the variables that affect mathematical literacy are limited with the number of variables covered in the study, it is recommended that the researchers determine the independent variables that are effective on the dependent variable with the cross-validation method in the variable selection menu of the WEKA program before starting the analysis, and thus perform their analysis with the help of fewer variables. In this way, it is thought that more consistent and less erroneous decisions can be obtained. Variables that affect mathematics literacy may have more or less impact on achievement, depending on countries. For this reason, it is recommended to make more neutral comments in cross-country comparisons by considering the effect sizes of these variables instead of focusing on variables that directly affect achievement.

In addition to classical methods, researchers are advised to use the methods such as data mining and artificial neural networks that can easily work on large datasets and that provide richer reports, while reporting variables that affect success in regression-based methods. Since PISA data was used in this study, it is suggested to conduct similar studies from the data of other large-scale exams, such as TIMSS, PIRLS, etc. In this way, it may be possible to have an idea about whether the results depend on the exam applied.

In this study, only the M5P learning algorithm, one of the data mining prediction methods, was used in the analysis. Similar comparisons between countries may be tested using different learning methods and the differentiation of the results according to the method used can be tested.. Although the reliability and validity values of different countries are different, evaluating them according to some common criteria provides

a better interpretation of the results. Therefore, it is recommended to use standardized evaluation criteria for the sake of the reliability of the results.The analysis was performed using PISA data, it is recommended to determine the variables that are effective on Turkish students' mathematics literacy based on the results obtained from large-scale exams conducted by ÖSYM (Student Selection and Placing Centre) in the future. It is thought that mathematics achievement will be better modeled for our students by using the tests that measure the affective characteristics along with the achievement tests, as in the PISA exam.

References

Ackerman, P. L., & Kanfer, R. (2009). Test length and cognitive fatigue: An empirical examination of effects on performance and test-taker reactions. *Journal of Experimental Psychology: Applied, 15*(2), 163–181.

Aggarwal, R., & Ranganathan, P. (2019). Study designs: Part 2 - Descriptive studies. *Perspectives in clinical research, 10* (1), 34–36. https://doi.org/10.4103/picr.PICR_154_18

Akay, H., & Boz, N. (2011). Sınıf öğretmeni adaylarının matematiğe yönelik tutumları, matematiğe karşı öz-yeterlik algıları ve öğretmen öz-yeterlik inançları arasındaki ilişkilerin incelenmesi. *Türk Eğitim Bilimleri Dergisi*, 9(2), 281-312.

Areepattamannil, S. & Kaur, B. (2013). *Mathematics teachers' perceptions of their students' mathematical competence: relations to mathematics achievement, affect, and engagement in Singapore and Australia*. Proceedings of the 36th annual conference of the Mathematics Education Research Group of Australasia. 52-56.

Aksu, G. & Güzeller, C. O. (2016). Classification of PISA 2012 Mathematical Literacy Scores Using Decision-Tree Method: Turkey Sampling, *Education and Science, 41*(*185*), 101-122.

Aksu, G. & Güzeller, C. O. (2018). *Matlab Yapay Zeka ve İstatistik Uygulamaları*, Ankara: Maya Publishing.

Baird, J., Isaacs, T., Johnson, S., Stobart, G., Yu, G., Sprague, T. & Daugherty, R. (2011) *Policy Effects of PISA*. Oxford: Oxford University Centre on Educational Assessment.

Bakioğlu, A. & Göçmen. G. (2013). *Singapur eğitim sistemi*. Ayşen Bakioğlu (Ed.), Karşılaştırmalı eğitim yönetimi (pp. 127-155). Ankara: Nobel Akademik Yayıncılık.

Baykul, Y., & Güzeller, C., (2013). *Sosyal Bilimler İçin İstatistik SPSS Uygulamalı*. Ankara: Pegem Akademi Yayınevi.

Bienkowski, M., Feng, M., & Means, B. (2012). *Enhancing teaching and learning through educational data mining and learning analytics: An issue brief*. Washington, D.C: Department of Education.

Bos, M. S., Elías, A., Vegas, E., & Zoido, P. (2016). *Latin America and the Caribbean in PISA 2015: How Did the Region Perform?* Inter-American Development Bank. Retrieved from http://publications.iadb.org/handle/11319/7991

Breiman, L., Friedman, J., Stone, C. J., & Olshen, R. A. (1984). *Classification and Regression Trees*, USA: CRC Press.

Brown, B. J. & Baker, S. (2012) *Responsible Citizens: Individuals, Health and Policy under Neoliberalism*. London: Anthem Press

Carnoy, M., & Rothstein, R. (2013). *What Do International Test Scores Really Show about U.S. Student Performance?* Washington, DC: Economic Policy Institute. http://www.epi.org/files/2013/EPI-What-do-international-testsreally-show-about-US-student-performance.pdf

The Center For International Understanding [CIU], (2008). The Center for International Understanding, *Learning from Singapore*.

Darling-Hammond, L. (2000). Teacher quality and student achievement: A review of state policy evidence. *Educational Policy Analysis Archives*, 8 (1), 1–46.

Dierkes, J. (2010). *Postwar History Education in Japan and the Germanys: Guilty Lessons*, Routledge: London.

Drinck, B. (2002). Marktorientierung im japanischen Bildungssystem. *Zeitschrift für Erziehungswissenschaft*, *5*(2), 261-278.

Duran, M., & Bekdemir, M. (2013). Görsel matematik okuryazarlığı özyeterlik algısıyla görsel matematik başarısının değerlendirilmesi. *Pegem Eğitim ve Bilim Dergisi, 3*(3), 27-40.

Dursun, Ş., & Dede, Y. (2004). Öğrencilerin matematikte başarısını etkileyen faktörler: Matematik öğretmenlerinin görüşleri bakımından. *Gazi Eğitim Fakültesi Dergisi, 24*(2), 217-230.

EARGED. (2008). PISA'da okuma becerileri: PISA'da matematik okuryazarlığı. Retrieved from http://pisa.meb.gov.tr/wp-content/uploads/2013/07/PISA-2009-Ulusal-On-Rapor.pdf

Entrich, S. R. (2014). Effects of investments in out-of-school education in Germany and Japan. *Contemporary Japan*, 26, 71–102. https://doi.org/10.1515/cj-2014-0004

Fisbein, A., & Stanton, S. (2018). *The future of education in Latin America and the Caribbean: Possibilities for United States investment and engagement*. Washington, DC: USAID Report, Interamerican Dialogue.

Fisher, C. W. (1995). Academic learning time. L. W. Anderson (Ed.). *International encyclopedia of teaching and teacher education*. Oxford: Pergamon.

Harms, T. J. (2000). *Analysis of Minnesota students' mathematical literacy on TIMSS*, NAEP and MNBST (Published doctoral thesis). North Dakota University, North Dakota, ABD.

Heyneman, S. P. (2013). *The international efficiency of American education: The bad and the not-so-bad news*. PISA, power, and policy: The emergence of global educational governance, 279-302.

Kaiser, G. (2002). International comparison in mathematics education: An overview. *ICM*, *1*, 631-646

Koğar, H. (2015) Matematik okuryazarlığını etkileyen faktörlerin aracılık modeli ile incelenmesi, *Educatıon and Science, 40*(179), 45-55.

Levin, J. (2003). *Relational Incentive Contracts, Working Paper 01002*, Stanford University Department of Economics.

Mausethagen S. (2013). A research review of the impact of accountability policies on teachers' workplace relations. *Educ Res Rev*, *9*, 16-33.

Nisbet, R., Elder, J. F., & Miner, G. (2009). *Handbook of Statistical Analysis and Data Mining Applications*, Amsterdam, Boston: Elsevier Academic Press.

OECD. (2010). *The High Cost of Low Educational Performance - The Long-Run Economic Impact of Improving PISA Outcomes*. Paris: OECD Publishing.

OECD. (2011). *Does Participation in Pre-Primary Education Translate into Better Learning Outcomes at School?*. PISA in Focus, No. 1. Paris: OECD Publishing.

OECD (2016). *PISA 2015 Results: Excellence and Equity in Education*, Volume I, OECD, Paris.

Özer, Y., & Anıl, D. (2011). Öğrencilerin fen ve matematik başarılarını etkileyen faktörlerin yapısal eşitlik modeli ile incelenmesi. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*, *41*, 313-324.

Özgen, K., & Bindak, R. (2008). Matematik okuryazarlığı öz-yeterlik ölçeğinin geliştirilmesi. *Kastamonu Eğitim Dergisi, 16*(2), 517-528.

Rácz, A., Bajusz, D. & Héberger, K. (2021). Effect of Dataset Size and Train/Test Split Ratios in QSAR/QSPR Multiclass Classification, *Molecules*, *26* (1111), 1-16.

Savaş, E., Taş, S., & Duru, A. (2010). Factors affecting students' achievement in mathematics. *İnönü University Journal of the Faculty of Education, 11*(1), 113-132.

Souza, J., Matwin, S., & Japkowicz, N. (2002). *Evaluating data mining models: a pattern language*. In: 9th Conference on Pattern Language of Programs (PLOP'02), Monticello, Illinois, 8–12 September 2002.

Stacey, K. (2012). The International Assessment Of Mathematical Literacy: Pisa 2012 Framework And Items. *12th International Congress on Mathematical Education*.

Tekin, B., & Tekin, S. (2004). Matematik öğretmen adaylarının matematiksel okuryazarlık düzeyleri üzerine bir araştırma. *Matematik etkinlikleri 2004: Matematik sempozyumu ve sergileri*. Ankara: MATDER.

UNESCO, (2011). *Transforming education: the power of ICT Policies*. Paris, UNESCO.

Vaitsis, C., Hervatis, V., & Zary, N. (2016). Introduction to Big Data in education and its contribution to the quality improvement processes. In Big Data on Real-World Applications. InTech. Retrieved February 20, 2020, from https://www.intechopen.com/books/big-data-on-real-world-applications/introduction-to-big-data-in-education-and-its-contribution-to-the-quality-improvement-processes.

Youbi, A., Tierney, W., G., & Zahed, A.H. (2019). *Successful Global Collaborations in Higher Education Institutions*, Cham, Switzerland: springer.

This page is intentionally left blank.

www.iejee.com

iejee

International Electronic Journal of Elementary Education
June 2022, Volume 14, Issue 5, 631-646

Empathy and Narrative: A Discussion of Contemporary Stories from Childcare and Healthcare

Simon Burgess[a], Marg Rogers[b,*] Diana Jefferies[c]

Received : 15 April 2022
Revised : 28 May 2022
Accepted : 30 June 2022
DOI : 10.26822/iejee.2022.268

[a] Simon Burgess, Business School, University of New England, Australia
E-mail: sburge27@une.edu.au
ORCID: https://orcid.org/0000-0002-5219-6485

[b,*] **Corresponding Author:** Marg Rogers, Early Childhood Education, Faculty of Education, University of New England, Australia
E-mail: marg.rogers@une.edu.au
ORCID: https://orcid.org/0000-0001-8407-7256

[c] Diana Jefferies, School of Nursing and Midwifery, Western Sydney University
E-mail: d.jefferies@westernsydney.edu.au
ORCID: https://orcid.org/0000-0001-5271-2569

Abstract

In caring professions, such as childcare and healthcare, empathy and narrative underpin important aspects of the emotional work of early childhood educators and nurses (Rogers, Jefferies & Ng, 2022). Unfortunately, they are not given much attention in scholarly articles, but it is important for practitioners to understand them (Barton & Garvis, 2019). This cross-disciplinary paper discusses the virtue of empathy from a philosophical stance, and its relationship to narrative when building shared understandings. There is a sense in which empathy and narrative are interdependent: storytelling helps to cultivate empathy in others, and empathy can be essential if we are to elicit and understand the stories that others have to tell. In fact, when it comes to eliciting and understanding the kinds of stories that are of particular interest for this paper (i.e., the personal stories to be told by young children participating in a research project, and those of patients in a healthcare setting), empathy tends to be especially important. As we argue, these examples drawn from early childhood education and care and healthcare serve to illustrate certain ways in which empathy, storytelling, and the development of shared understandings can be of deep significance; not only for researchers, educators and healthcare professionals, but also for senior administrative and public policy officials.

Keywords:
Empathy, Narrative, Philosophy, Nursing, Early Childhood Education, Military Families

Introduction

Sharing stories with one another is a vital aspect of human life, and especially important in caring professions, such as childcare and healthcare. It is a practice through which we cultivate our moral feelings and emotions, understand one another, and foster bonds of mutual trust and good will. While such facts are widely appreciated, in this paper we draw upon our particular areas of experience and expertise to highlight some stories and insights that may be of genuine importance to a wide range of people. It is a paper that combines philosophical reflection with methodological explanation. The kind of stories that we share will not be familiar to many readers, but they are stories to which any reader can relate. Some are the personal stories of young children; others are those of adults struggling with mental distress. As we seek to show, it is possible to elicit and listen to such stories, and it is important to learn all that we can from them.

Traditionally, researchers in the field of early childhood education and development often favoured parents and educators as sources of information; they seldom made substantial efforts to elicit information or stories from children themselves. As we explain, however, when researchers are suitably empathic towards the children and see them as a source of knowledge, it is possible for the children to become genuine participants in the research, and for their perspectives to be fully incorporated into the research. To help explain this process we describe a particular research project in which the perspectives of the children were elicited or 'drawn out', partly through words and partly the use of pictures that were, quite literally, drawn out by the children.

In healthcare, researchers have known for some time that empathy improves trust and communication between the healthcare professional and the patient, and that these in turn lead to collaborative decision-making and greater satisfaction with the course of treatment (Charon, 2006; Charon & Sayantani, 2011). This kind of insight, however, remains in some danger of being treated as a merely theoretical point, one that is recognised in some abstract sense, and one to which a fair amount of lip-service is paid, yet not one for which the practical implications have been fully embraced within many healthcare systems. To help bridge this gap between the theoretical and the practical we discuss a recent play, Mockingbird, that is concerned with the experience of women struggling with mental distress following childbirth. Like most quality productions, the play is not didactic, and it was not created for pedagogical purposes any more than any other play. Yet in our view, it is the kind of production which, when incorporated into the education and training of healthcare professionals, can be invaluable. To some extent, Mockingbird serves as a cautionary tale. It provides a perceptive and moving depiction of how tragic the results can be when a healthcare system fails to take any serious interest in the perspectives of the patients themselves. At the same time, it is the kind of play that is bound to stimulate thought, particularly among students preparing to become healthcare professionals, about why they need to understand the individual experiences of their patients, and the particular habits and virtues that this may require of them.

The impetus for this paper came from a conference titled Compassion, a Timely Feeling, held in October 2019 at the University of New England in Australia under the auspices of the Australian Research Council Centre for the History of Emotions. As authors, it was always clear that we had rather different disciplinary backgrounds. Burgess is primarily in philosophy; Rogers primarily in early childhood education, and Jefferies in both literature and nursing. Yet it was also evident that between us there was the potential for constructive engagement, intellectual synthesis, and practical insights that could be truly worthwhile.

Empathy as a virtue

There is a sense in which empathy and narrative are interdependent: storytelling helps to cultivate empathy in others, and empathy can be essential if we are to elicit and understand the stories that others have to tell. Yet empathy has met with a good deal of discussion in recent years, and some of it is critical. Steven Pinker, for example, certainly appreciates that empathy is in general a good thing, although he also worries that is becoming a sentimental ideal. Coplan and Goldie (2011) argues that empathy is difficult to study because there are many competing concepts. On one hand, Battaly says that empathy is a learned skill, not a virtue. Whereas, Deccety and Meltzoff maintains that humans imitate emotions, that are connected to our social nature (Pinker, 2011). Bloom (2016), a distinguished research psychologist, has been concerned by the simplistic assumptions that many of us tend to make about role of empathy, and he has emphasised that ethical judgement and conduct commonly require a great deal more. While neither Pinker nor Bloom discuss the relevant philosophical literature, there are in fact a number of major thinkers in the western philosophical tradition who have taken empathy to have only a marginal or supportive role in our ethical lives.

Some authors argue that empathy can initiate learning or action. Matravers, for example, explains how empathy enables us to imagine our emotional responses to experiences, so we can learn different ways to respond to situations. Spinoza (1677) recognised that through empathy (or, say, through compassion, pity or sympathy) ordinary people often are motivated to help one another. Yet he also maintained that such inclinations are not virtuous. His argument was that such inclinations are not only often 'womanish', but actually useless for those who live under the guidance of reason. Now it should be said that Spinoza's Ethics (Spinoza, 1677) is one of the most intriguing works in the entire Western philosophical tradition, and to focus very narrowly and exclusively on this particular argument does risk doing his work an injustice. His position on this issue, however, is difficult to defend. Many of us, whether womanish or otherwise, would readily admit that our emotional inclinations can sometimes get the better of us, and that at such times we are often wise to cool down and to consider things in a suitably calm and reasoned way. But it is doubtful that reason on its own (i.e. considered as something somehow entirely independent of our feelings, emotions, or basic bodily appetites or needs) can offer us much in the way of wise counsel (Damasio, 1994). And in any case, it is hard to see why those supposedly womanish inclinations should not be regarded as

virtuous when the actions to which they lead are entirely consistent with the wise guidance of reason.

Like Spinoza (1677), Kant (1997) also had a deep interest in reason and principles, and he was sceptical about the supposed virtue of certain feelings and emotions. In Kant's view, our actions can have 'moral worth' only when they are motivated by duty, i.e., when they are done purely out of respect for the 'moral law'. Actions that are motivated by feelings of empathy, love or desire, for example, may well be in conformity with duty, but given that they aren't done out of duty, Kant (1997)maintained that they lack moral worth.

Something that Kant never provided, however, was a particularly compelling or straight-forward answer to the question of why actions in conformity with duty must lack moral worth when they are motivated, for example, by feelings of empathy. And pace Kant, many of us may be inclined to say that if actions have moral worth only when done out of duty, then so much the worse for moral worth. After all, even if the duties that we have under the moral law can somehow be understood purely through the insights of cold rationality, it is readily arguable that the moral, motivational, and practical importance of empathy must still be recognised.

Of course, Kant is on strong ground when he assumes it to be vital that we have some understanding of our duties under the moral law. But let's remember that we may need to discuss these duties with a wide variety of people, and it may also be of vital importance that we inspire them to embrace those duties wholeheartedly. Kant (1997) would agree about the importance of such discussions. But a point that he seems to miss is that without empathy it is hard to imagine that such discussions will often be successful. In fact, it is natural to worry that such discussions could often be pitiless or authoritarian. They could be pompous or comical. And in any such case, they are not likely to be either charming or persuasive.

Nietzsche's animadversions against empathy are something else again. In a series of interrelated works, (Nietzsche, 1998, 2003a, 2003b) contended that there is a clear and important contrast to be drawn between the kind of master morality that he wished to promote, and the kind of slave morality that he regarded with contempt.

His notion of a master morality is something that he associates with those of a noble, brave and aristocratic class. In his explanation:

> *the noble type of man feels himself to be the determiner of values, he does not need to be approved of... he knows himself to be that which in general first accords honour to things, he creates values (Nietzsche, 2003a, p. 195).*

Moreover, these values are themselves distinctive; they represent "the ascending movement of life, well-constitutedness, power, beauty, self-affirmation on earth..." (Nietzsche, 2003b, pp. 146-147). Yet what is perhaps most striking, at least for our purposes, is Nietzsche's view of empathy. For far from commending it, he instead extolled:

> *belief in oneself, pride in oneself... [and] a mild contempt for and caution against sympathy and the 'warm heart'. It is the powerful who understand how to honour, that is their art, their realm of invention (Nietzsche, 2003a, p. 196).*

Nietzsche's notion of a slave morality is one in which compassion and pity are central, and it is epitomised by Christianity (especially that of the New Testament). Much of the problem, as he saw it, is that such forms of morality are weak, unnatural, and enfeebling. He ostensibly maintained that pity is not only the cause of suffering, but something that makes suffering contagious.

> *Christianity is called the religion of pity. In fact, pity stands in antithesis to the tonic emotions which enhance the energy of the feeling of life: it has a depressive effect. One loses force when one pities. The loss of force which life has already sustained through suffering is increased and multiplied even further by pity. Suffering itself becomes contagious through pity...(Nietzsche, 2003b, p. 130).*

While Nietzsche appears not to have read the principal works of Darwin (Wilson, 2013), he certainly studied Herbert Spencer (Moore, 2002), and he sometimes related his concerns about pity to evolutionary theory. Expressed in Nietzsche's own somewhat crude terms: "Pity on the whole thwarts the law of evolution, which is the law of selection. It preserves what is ripe for destruction..." (Nietzsche, 2003b, p. 130).

The task of coming to a fair and balanced view about Nietzsche has never been easy. As even his most fervent admirers readily acknowledge, his words are often hyperbolic and intemperate. He was delighted by his own contrariness, enraptured by his own rhetoric, and excited by his own contempt. His bold and contentious challenges are endlessly exhilarating to some, but they are also frequently lacking in nuance, and so we can't always take him literally. In fact, for many readers, Nietzsche's wildness makes it difficult to take him seriously. In any case, our view is that Nietzsche did not seriously undermine the idea that empathy is a genuine and widely valuable virtue. He certainly reminded us that pity and the like can be found in regrettable, soft-headed, self-deceiving, and suffocating forms. But he never showed that we aren't ever in need of it, especially when available in its open-eyed and unsentimental forms.

In Western philosophy, the Aristotelian tradition in ethics is one that places a particular emphasis on the importance of the virtues. Aristotle (1980) maintained

that in order to become virtuous, we need to practice the virtues until they become habitual or 'second nature' to us (Aristotle, 1980). Of course, we don't necessarily enjoy practicing the virtues at first. Over time, however, the practices involved become bearable, perhaps even enjoyable, and when this occurs it is a sign that we have indeed acquired the virtues in question (Aristotle, 1980). Aristotle likened the acquisition of moral virtue to gaining mastery in the arts:

> *men become builders by building and lyre-players by playing the lyre; so too we become just by doing just acts, temperate by doing temperate acts, brave by doing brave acts Aristotle (1980, p. 29).*

In Aristotle's view, what we acquire through such learning processes does not necessarily involve a lot of theoretical knowledge. And if he is right about that, we should not expect all builders and lyre-players – even if they have thoroughly mastered their arts – to be especially articulate about the distinctive knowledge that they possess. Similarly, we should not expect all virtuous people to be highly articulate about the nature of virtue. Of course, the acquisition of mastery – whether it be in the arts or in the work of virtue – does involve some appreciation for standards. And while those with mastery do not necessarily become fluent in their ability to describe those standards, presumably they do steadily develop a more perceptive and discerning sense of what is worthy of emulation, and what is not. With regard to the development of virtue, this learning process is one in which our feelings, attitudes and emotions gradually tend to become more discerning, and more 'fitting'.

In some respects, the philosophical position that we bring to this paper owes more to Aristotle than anyone else. It's not that Aristotle particularly emphasized the importance of empathy as a virtue. But like Aristotle, our view is that for even the most rational of human beings, our ethical lives are deeply imbued with feeling and emotion; that the development of ethical maturity is, in no small part, a process of emotional development; and that this process requires practice.

The importance of narrative

As human beings, we immerse ourselves in stories (Hardy, 1968). They provide us with a basic way by which to share our experiences, to learn about the perspectives of others, to illuminate the human condition, and to gesture – however vaguely – towards that which is of genuine value. Parents, educators and community leaders from all traditional cultures commonly draw upon the power of narrative to help instil an understanding of laws and moral codes, to communicate expectations, to reinforce roles, and to promulgate religious beliefs. Stories can be vividly imaginative and emotionally engaging, and so they are far more memorable than any list of instructions (Gleeson, 2012).

Narratives are a representation of

> *'events which is shaped, organized, and coloured, presenting those events, and the people involved in them, from a certain perspective, or perspectives, and thereby giving narrative structure-coherence, meaningfulness, and evaluative and emotional import-to what is related' (Goldie, 2012, p. 2).*

The media through which stories are told are highly varied, and the fact that we continue to find new ways by which to tell them is an indication of their importance to us. For aeons we have told stories to each other orally. They are sometimes discerned in paleolithic rock art. We have long shared them through dramatic re-enactment. They can be found in epic poetry, tapestries, paintings, graffiti, diaries, comics, and novels. Today we often share them via radio, television, online publications, social media, computer games, and virtual reality.

As discussed above, the process by which we come to moral maturity is one in which our feelings, attitudes and emotions gradually become more discerning and 'fitting', and the sharing of stories with one another is something that can play a vital part in this process. It is not surprising that such sharing can help to cultivate the virtue of empathy, for example, given that stories help us to understand the experiences, needs, feelings, and perspectives that other people have. And while some of the more effective techniques for achieving this are reasonably well known (Booth, 1973), perhaps especially important for children is the fact that narratives allow us to safely 'practice' our emotional responses as we react to the situations that characters face. Despite these benefits, the issue of truth is often questioned when discussing narratives. Some narratives are factual accounts, while others may be 'true to life', rather than factually correct. Either way, narratives are useful tools for teaching and research (Gleeson, 2012; Goldie, 2012; Gottschall, 2012).

Narrative inquiry methodology

The sharing of stories can be enjoyable; it can sometimes even be edifying; it can also be a matter of serious and rigorous research. Narrative inquiry is a qualitative research method that enables researchers to explore the individual stories and experiences of people (Polkinghorne, 2007). In so doing, it enables us to understand how individuals make sense of their experiences and how, following particular experiences, they integrate new knowledge into their lives and interpret events (Polkinghorne, 1995). Narrative inquiry achieves this by encouraging individuals to talk about their experiences and other relevant events and to do so in their own words so as to present their

version of the story (Polkinghorne, 1986). Researchers can then analyse the stories individually or collect several stories about the same or similar experiences, and the notable similarities and differences can thereby be uncovered (Frank, 2010). Typically, the purpose behind such forms of research is to develop new knowledge about the ways in which individuals react to events, many aspects of which tend to be lost when researchers rely exclusively upon observation or quantitative survey data (Lea Gaydos, 2005).

When adopting a narrative inquiry methodology, researchers normally compile the stories involved through interviews with people who have experienced an event that is the subject of research. In most cases, the research participants self-select by responding to advertisements in newspapers, websites or, increasingly, social media. After ensuring that each individual meets the inclusion criteria, a mutually convenient time and place can be arranged to conduct the interview. This can be done face-to-face, via electronic means such as teleconferencing software such as Skype™ or ZOOM™, or by individuals writing their stories. Often a researcher uses pre-set questions to which the individual responds. Alternatively, they can be asked to simply narrate their experience. The interview is usually recorded and transcribed verbatim.

Consistent with various forms of research involving human participants, ethical approval needs to be obtained before any interviewing begins, and it often requires that great care be taken with any information that could identify any particular individuals. Such information tends to include not only the names of the individual research participants, but also information relating to their family or friends, along with various other specific details about particular times, locations, and organisations.

Once an interview transcript becomes available it is normally provided to the interviewee to help ensure accuracy. And if any research participants decide to withdraw from the study, the researcher is generally obliged to destroy any data collected from that person, and especially if the researcher committed to such action as part of the ethics approval process (International Council of Nurses, 2012).

In studies involving small sample sets within small communities, other methods to protect the identities of those involved include that of merging stories (Habibis, 2013). For example, when one set of parents talk about their daughter, some of the details that they provide may be swapped with the details provided by a different set of parents who were actually talking about their experiences with their twin sons. In the published work that is ultimately produced through such methods, the individual research participants are often given pseudonyms.

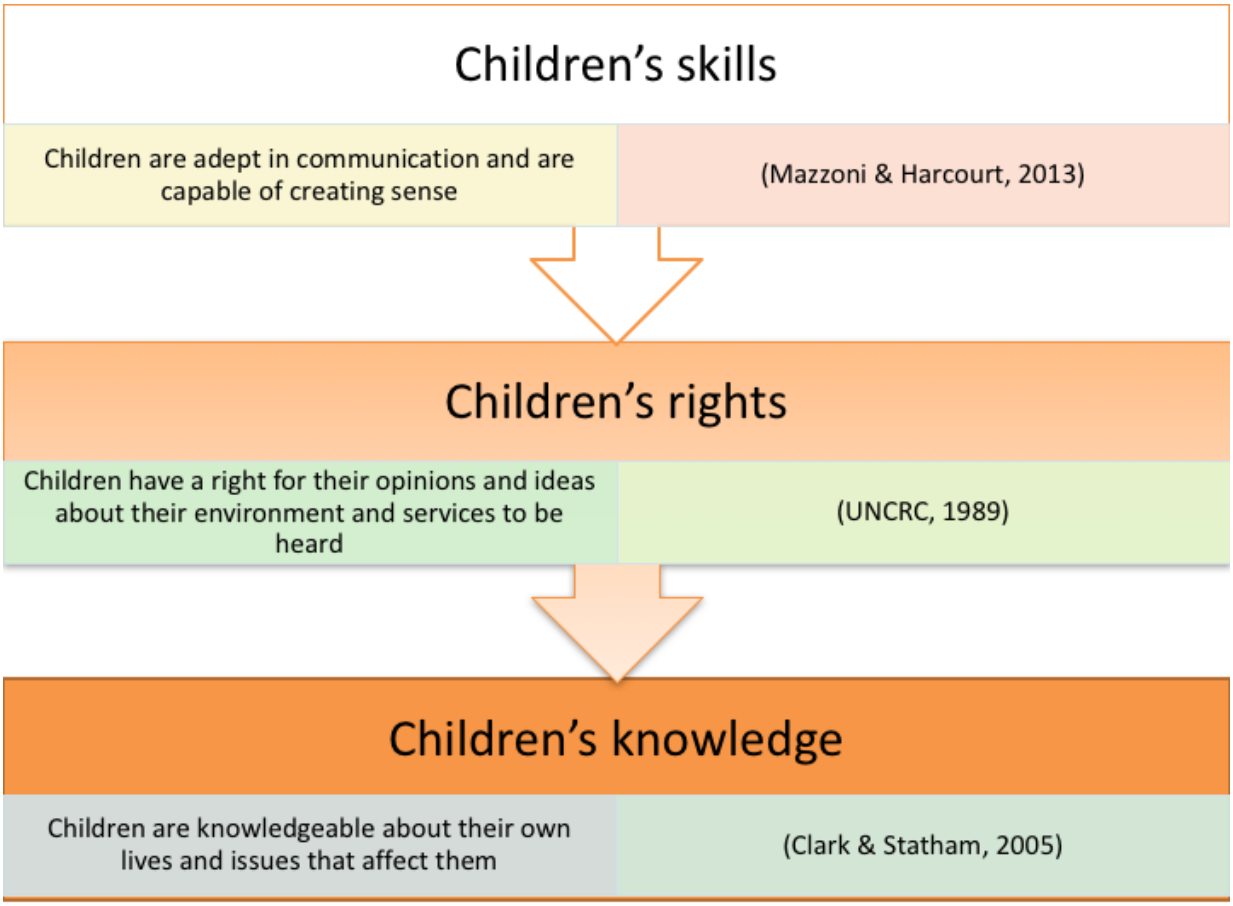
At times, it can be difficult to get detailed, relevant information about particular individuals. Narrative inquiry, however, along with various other methods commonly used in the study of history or literature, can make a significant contribution to our understanding important forms of human experience, including the experience of disease or trauma.

Empathy and agency of marginalised voices

Traditionally in the field of research, children were regarded as unreliable sources of information, as if their own accounts of their experiences were not worth knowing (Clark & Moss, 2011). While secondary sources of information about a child were often drawn upon – such as that provided by a parent or teacher of the child – children themselves did not have their voices heard. Participatory research, however, aims at empowering marginalised people. It involves people in the research, rather than simply making them the subjects of it (Kellett, 2011). By participating in the research, the subjects of the research come to share some of the power traditionally held exclusively by the researchers (Kesby, 2005); there is sometimes even a sense in which the research participants can be regarded as researchers themselves. Generally, there will still be some differences in power between researchers and research participants. Importantly, however, as Gallagher (2008) argues, such differences should be acknowledged and used only for good. For example, aside from ensuring that participant voices are heard, it is often also possible for the research to be used to support changes that improve the lives of the participants (Gallagher, 2008).

Over the past few decades, a new framework for listening to the voices of children has been emerging. It is a framework that represents a 'mosaic' approach in that the researchers collect data through a range of means and then put the various pieces together into one big picture or 'mosaic' (Clark & Moss, 2011). As indicated in Figure 1, within this framework children are taken to be capable of making sense (Mazzoni & Harcourt, 2013) and of being knowledgeable about their own lives (Clark & Statham, 2005). Those who use it are apt to remind us that the United Nations' Convention on the Rights of the Child enshrines a right for children to have their opinions heard in matters that affect them (UNICEF, 2015). Most countries who are members of the United Nations ratified this convention, as Australia did in 1990. The implication of this is not that the voices of children are more important than those of adults. In fact, the Convention stipulates in Article 12 that the views of a child are to be given due weight in accordance with his or her age and level of maturity. But the basic point to be emphasised here is simply that their voices do need to be heard and considered before decisions affecting them are made.

Figure 1:
Framework for the Mosaic approach (adapted from Clark and Moss, 2011)



Some stories from participatory research with young children in childcare

Children who have a parent in the military tend to face a difficult and somewhat distinctive situation (Siebler, 2009; Siebler & Goddard, 2014). With a parent commonly deployed thousands of kilometres from home for many months at a time, the children (and the parent) need to deal with long periods of separation (Rogers, 2020, 2021). Moreover, in Australia there is a sense in which the voices of those children have been marginalised; and until this research project their situation had not been studied. Thus, their experiences were not well understood, and their voices unheard. Being aware of this, Rogers (2017) developed a research project designed to understand their experiences within a military family. Additionally, the project sought to find out what the children understood about their parents working away, and it was a project in which the voices of the children themselves were central (Rogers & Boyd, 2020).

The project utilised a strengths-based, interest-based, mosaic approach, and drew upon the thoughts of the children in order to better understand the ways in which they responded, coped, and developed resilience. By contrast, the small amount of earlier research that had been done in the area had employed deficit-based psychological approaches and largely relied upon secondary data obtained from parents; it had not actively sought to listen to the children or to incorporate their perspectives into an understanding of their situation (Baber, 2016).

In total, there were 19 children involved in the project. Each were 2-5 years old, and all were from families in which at least one parent experienced deployment with the Australian Defence Force. In keeping with participatory research, there is a clear sense in which the children were both participants and researchers (Harcourt & Mazzoni, 2012). They were able to voice their understandings and experiences by contributing in ways that were easy and familiar for them, as described by (Greenfield, 2011). Some of these ways involved informal chats, group discussions, artwork, craftwork, raps, their taking of photographs, asking adults or siblings to take photographs of them, sharing family photographs, puppet play, and role play. The latter two allowed children to create their own narratives during play episodes about what was happening at home (Berk & Winsler, 1995). Rogers (2017) also used a journal in which to reflect upon all that the children had told her.

As is common practice for those who employ participatory research methods, these small and highly varied forms of data were collected and expressed as narratives. Rogers (2017) then analysed these narratives to identify certain themes, and these themes were then verified by the children, parents and educators. These themes were then put together into a kind of mosaic to convey a clear 'picture' of what the children understand and experience, both when a parent is away, and when the parent is at home (Rogers & Boyd, 2020). As is shown in Table 1, the children were able to communicate their understanding of various aspects of their experience as part of a military family.

In keeping with the aims of participatory research (Wallerstein & Duran, 2006), the findings of Rogers (2017) project are being acted upon for the benefit of the research participants and other people like them. To begin with, a recommendations report was created for policy makers, educators, family workers and educational officers within the Australian Defence Force (Rogers, 2020). The findings within the report explained that there were virtually no suitable resources or programs available for these very young children, or for the parents and educators who support them (Rogers & Bird, 2020; Rogers, Bird & Sims, 2019). In partnership with the Defence Community Organisation, however, Rogers et al. (2021a) and her colleagues have been developing and releasing some suitable research-based electronic story books (Rogers et al., 2021b), and have also created an open-access digital app for use by the children, parents and educators (Rogers et al., In press). These resources help to ensure that the narratives of the children are heard by their peers and other members of the community. This in turn can be expected to foster more empathy for the children, along with a clearer understanding of their situation. Such resources also enable the children to see their community represented in children's literature, and serve to enhance their sense of belonging within the community, as emphasised in the Australian Belonging, Being, Becoming: The Early Years Learning Framework (Department of Education Employment and Workplace Relations, 2009). Most recently, Rogers et al., (2021a) and a team of researchers have communicated the children's plight to a philanthropic funding bodies which has now funded the creation of research-based open access programs to assist parents, educators and family workers in their efforts to better support these children in military families (see https://ecdefenceprograms.com/).

Some stories from patients in healthcare

In recent decades, doctors, nurses, and allied healthcare professionals have been gradually coming to better appreciate the need to understand each of their patients and clients in an individualised kind of way. How a particular patient reacts to the experience of illness is often quite distinct, and so the relationship that a healthcare professional develops with a person is central to their work.

Listening to a patient's story effectively allows a healthcare professional to enter the patient's world and to develop a clearer understanding of the patient's needs and wants. In fact, it is from this kind of understanding that a collaborative partnership between them can develop. Such partnerships tend to promote better health outcomes because they enable patients to become more knowledgeable about their own illnesses and to thereby provide greater clarity and power when asking for what they need. Collaborative relationships like this are very different to relationships in which the patient simply sees the healthcare professional as an expert and accepts, without question, any diagnosis or treatment that the healthcare professional offers (Charon & Sayantani, 2011).

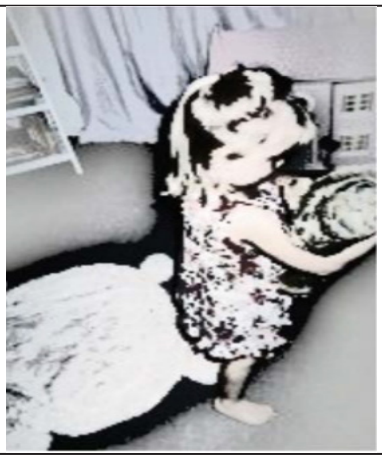
In the relationship between patient and healthcare professional the balance of power can also become severely tilted in favour of the healthcare professional in ways that are related to the kind of technical, reductive, and somewhat alienating kind of language that is commonly used. In saying this, we do not wish to suggest that healthcare professionals should entirely eschew the kind of language in which a patient's experience is summarised as a standardised set of signs and symptoms to be targeted by particular forms of treatment. It may be entirely true, for example, that a particular patient has complained of a poor sleeping pattern, little appetite, and feeling very low for the last two weeks. The same patient may also be said to be having difficulty concentrating and completing tasks that until recent times had been easy to accomplish. Given the diagnostic criteria to be found in the Diagnostic and Statistical Manual of Mental Disorders 5, it may be important to recognise that such symptoms are characteristic of depression (American Psychiatric Association, 2013). Yet there are various considerations that can be easily overlooked in a highly standardised approach, especially when there is not a genuinely collaborative partnership between the patient and the healthcare professional, and when the patient thus becomes somewhat alienated or disengaged from the discussion. The very same person presenting with those symptoms of depression, for example, may also be experiencing financial or relationship difficulties, a recent death of someone close, or the need for help in dealing with past trauma. By taking something of a narrative approach to the assessment of a patient's healthcare needs a more holistic understanding can be gained, both of the person and of the condition to be addressed. Those considerations relating to the patient's financial difficulties, for example, commonly

Table 1:

What the children were able to communicate about living in a military family, their understanding and experiences of their parent deploying

<table>
<tr><td>What it was like being part of a military family who relocates frequently</td><td>Bethany (4) pointed on the map puzzle to the Sydney dot.
Bethany: Ule (brother) and I were born there.
Educator: That's in New South Wales. We live here now (pointing to another capital city). Have you lived here long?
Bethany (looking thoughtful): I miss my old house (in a sad tone). But someone is looking after our old house in Sydney when we are not living there. It's another army man. A friend of Dad's.
Educator: Oh, that is good. How long until your Dad comes home?'
Bethany (looking down and guarded): I don't know. (pauses) A long time.
Andrew (4) (who has been listening in on the conversation): I live here (pointing to a capital city dot).
Educator: That's right, Andrew.
Bethany: We live in a different house now, we moved.
Andrew: We are going to move house soon.
Educator: Here, or in another city?
Andrew: Oh, no. It is near our house. I have been there, and seen it.</td></tr>
<tr><td>  </td><td>What it was like waiting for their parent to come home: Bethany (4-years-old) always portrayed herself waiting alone for Daddy, despite having older siblings and a mother at home.</td></tr>
<tr><td>What they understood about where their parent was when they were deployed: Blake (5-years-old) was able to draw a picture of his Dad leaving by car to go to Ayers Rock on deployment.</td><td>  </td></tr>
<tr><td>  </td><td>What they experienced when their parent went away: Emma and Bella (both 2 years) were observed acting out a scene where 'Daddy' in the pencil family was going away on a plane on deployment. All the other pencils had to kiss the Daddy goodbye before he went on the plane.</td></tr>
</table>

Table 1: *Continue*

What special things happened when they went away: Emily's (2-years-old) mother was able to share that she was given a new puppy to have something to cuddle and look after when her Dad deployed for 5-months	
	What special things they were given when their parent deployed: The children were given a pin medal to wear as a sign they had a parent deployed and that they were being brave letting their parent go away. They receive another one at the end of the deployment.
What they did to cheer up their parent who was at home when they were missing the other parent	 One family was able to show us photos of the child taking toys and tissues to the at-home parent when they were missing the other parent.
	How family narratives were created to help the children understand what was happening: Emily listening to her Dad as he draws on a globe and explains where he will be going on deployment on a plane.
What they did when they were missing their parent: Emily (2-years-old) hugging her care bear (ADF issued teddy bear dressed in military uniform). Her father had a replica bear that would 'receive' Emily's cuddles and then the Dad could cuddle his bear back to return Emily's cuddle.	

need to be considered when treatment and care for a person is being planned. It can often turn out that a simple pharmacological intervention is bound to be insufficient, perhaps unnecessary, and sometimes even counterproductive.

There are quite clear and broad implications here for the education of healthcare professionals. It is important to ensure that they are trained to look beyond the kind of reductive approach in which people are seen simply through a biomedical model that focusses on identifying and treating a highly standardised set of symptoms. They must be taught as well to take a holistic approach in which the person's physical, psychological, emotional and spiritual needs are considered (Peplau, 1997). This requires future healthcare professionals to become skilled in asking patients about their lives, in listening to what those patients have to say, and in understanding the stories that they have to tell (Shapiro, 2011).

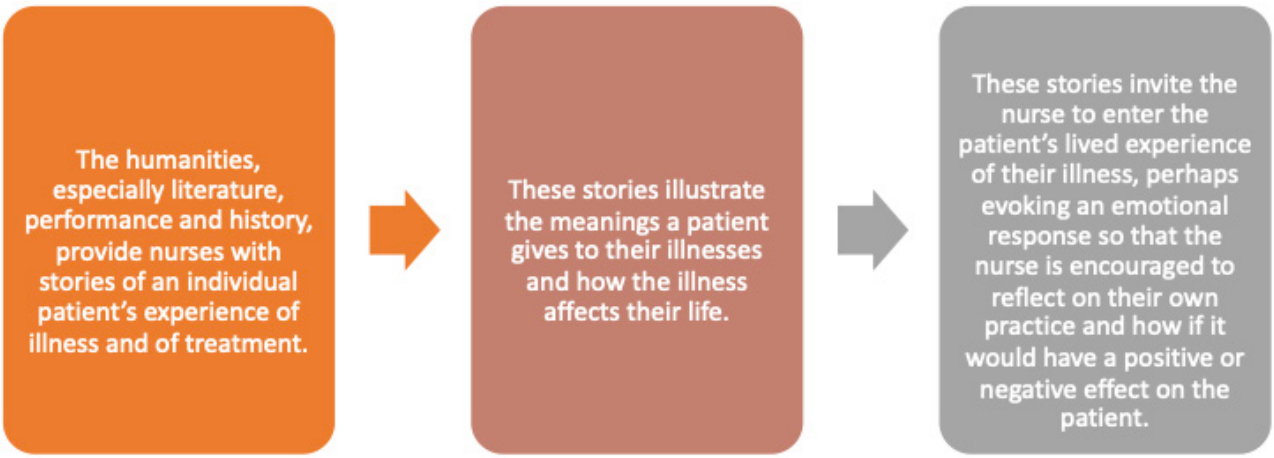
Putting empathy narratives to use in childcare and healthcare

As discussed above, it is possible to understand the perspectives of very young children, to recognise the stories that they have to tell, and to improve the services and resources available to those children, their families, and their educators in response. Similarly, it is possible to draw upon the stories of healthcare patients and to use those stories in the development of improvements to healthcare services and the training that healthcare professionals receive (Patterson, 2018; Sheilds et al., 2015).

Narratives that highlight the experience of a patient can play a central role in the development of empathy amongst healthcare students. The use of 'empathy narratives' in this way draws upon insights and methods that are generally associated with the humanities such as historical or literary research (Marshall & Hooker, 2016). These narratives can reach beyond the page and be used in performing or visual arts to give a more rounded view of the person experiencing illness. An understanding of this approach can be seen below in Figure 2.

Mockingbird is a one-act play that shines a light on women struggling with mental distress, such as depression, anxiety or psychosis, following childbirth. The play was developed from two different sources. The first of these is the family history of writer and performer Lisa Brickell, a kind of history that was passed down orally through four generations of women who faced mental ill health after childbirth, and which tells of their experiences during admission to mental health facilities. The second kind of source is comprised of historical healthcare records of women with a diagnosis of psychosis or mania after childbirth who were admitted to either of two Sydney mental health facilities from 1885 to 1955 (Jefferies et al. 2015, 2018). Jefferies is intimately acquainted with these records, and Lisa Brickell worked closely with Jefferies in order to draw upon them properly and to help maintain the play's historical accuracy. As Jefferies (2015) analysis of the records had demonstrated, the most common symptom attributed to the women was an inability to express themselves. When the women describe their difficulties in their marriage or at home, their words were often taken to be symptoms of their illness. In short, their version of why they were distressed was often dismissed and the explanation for their illness was described exclusively in terms of biomedical data, i.e., as signs and symptoms. When a narrative approach reconstructed the women's stories in each record, however, it became apparent these were not symptoms of an illness but reports of serious problems that the women faced and which needed to be resolved so that the women could return home and ensure they were safe and secure. By taking the oral family history and the archival health care records and constructing narratives of the women's lives it became possible to demonstrate that through a narrow use of healthcare language, the concerns of the women had been dismissed. When the women's stories were placed 'front and centre' and the overlaying signs and

Figure 2:
Empathy narratives for understanding patient experiences



symptoms were removed, however, the audience was able to understand the distress of the women and to empathise with them.

Mockingbird raises awareness of how mental distress can affect a woman and her child, and can serve to decrease the stigma associated with postnatal distress (Megnin-Viggars et al., 2015). It is estimated that 20 per cent of mothers with new babies experience mental ill health (Jomeen et al., 2017). Due to feelings of shame and fear, however, some women are reluctant to disclose symptoms of their illness. They feel ashamed because of their difficulty in coping at a time that is supposed to be very happy, and feel frightened that they might lose custody of their babies (Dolman et al., 2013). Mockingbird is an opportunity for women to see their experience reflected in performance and to share this experience with others in a relatively comfortable environment. An example of how entertainment and education can be delivered in a performance of Mockingbird can be seen in a clip that is freely available online (see https://www.youtube.com/watch?v=UndpYgzLTa4&feature=youtu.be).

Mockingbird is normally presented as a one-hour performance followed by a question and answer session with the performers, and also – where possible – with the researchers. In this way, the audience is given an opportunity to talk about how the play affected them, and the performers, researchers and audience are able to bond in a moment of mutual understanding that continues informally in a space outside the theatre. Women are thereby enabled to talk about their experience and be heard, and others can also speak of how the performance spoke to them.

The play has been presented in Auckland, Sydney, Melbourne and throughout regional New Zealand. It attracted a good deal of media coverage including an interview about postnatal psychosis shown on a national television. A survey of audience members demonstrated that Mockingbird could enhance our understanding of maternal distress and lead to more compassionate attitudes about it. One is example of the feedback provided is presented here:

> *Mockingbird was a wonderfully emotive performance leaving the audience fully aware of the pain endured by sufferers, but at the same time giving hope for healthy outcomes, congratulations.*

Future performances of the play have been planned for fringe festivals and regional venues in New South Wales in Australia. There is also a filmed version of Mockingbird that is now in production, and the producers of the film anticipate that it will be screened at film festivals. It is worth emphasising that Mockingbird is not didactic, instructional or moralising in character, and the critical reception of the play has not suggested that it is. Yet there is no doubt that the film will serve as a valuable resource when educating future healthcare professionals. We also expect that it will be incorporated into multidisciplinary workshops for existing healthcare professionals given that it is bound to prompt discussion about how services for women can be improved.

Stories from childcare and healthcare: a comparison

The stories from childcare and healthcare that we have discussed here are of course quite different. Nonetheless, there are some helpful comparisons to be made, especially with regard to the methodologies adopted and the uses to which the research can then be put. Such comparisons are provided below in Table 2.

Further research

When we elicit stories from other people we are able to come to a clearer and more empathic understanding of the people themselves. And sometimes, such forms of understanding can then help us to develop resources and services that enable us to better support one another. Admittedly, these observations are somewhat platitudinous. It has long been recognised – especially within certain scholarly traditions – that as human beings we typically need empathy in order to understand each other. The word 'empathy' was originally introduced to English as a translation of the German Einfühlung, a term that the philosopher Theodor (Lipps, 1903) had used in relation to the processes involved when seeking to 'feel one's way' into works of art or, more generally, into the minds of others (Titchener, 1909). Within the hermeneutic tradition this kind of conviction was subsequently developed – particularly by Droysen (1977), Dilthey (1988), and Weber (1949) – into the idea that the human sciences require Verstehen, a peculiarly empathic form of understanding.

In this paper we have drawn upon insights and developments in two quite different areas, one in early childhood education and care, and the other in professional healthcare. In both areas we have suggested that it is important to listen to the stories of those involved, notwithstanding their young age or state of mental distress. Of course, there is a vast range of other places to which researchers may go in order to hear stories that need to be heard, but let us outline just one kind of project that we happen to think would be well worthwhile. As various western societies continue to become increasingly polarised with regard to politics and ideology,[1] it may be that some of the most valuable stories to hear right now are those that could be prompted by asking certain people about the interesting and rewarding friendships that they enjoy with people across ideological lines.

1 See, for example, the research conducted by the Pew Research Centre, much of which can be found at: https://www.pewresearch.org/topics/political-polarization/.

Table 2:

Summary of the chosen research contexts, research question, methods, findings and issues

Field of study	Education	Health
Overarching research question	What are young children's understandings and experiences and understandings of parental deployment within an Australian Defence Force (ADF) family?	How a play called Mockingbird about the experiences of women of maternal mental ill health can raise awareness and start conversations to improve treatment and care for women and their families.
Participants	2-5-year-olds from military families, their educators and non-military parent.	Three datasets of archival medical records from two mental health facilities in Sydney of women admitted with a diagnosis of psychosis or mania after childbirth (1885-1895, 1925-1935, and 1945-1955).
Qualitative data collection tools	Mosaic and narrative approach.	Archival research of historical healthcare records and the oral history of one person's family over four generations.
Analysis	Thematic analysis: verification, socio-ecological framework applied.	Content analysis of the healthcare records and a narrative reconstruction of the women's healthcare records leading to a textual analysis of their stories.
Ethics	Ethics was approved by the University of New England.	Ethics was approved by Western Sydney University.
Approach	Unlike previous psychological studies involving military families that used a deficit-based perspective, this study involved a strengths-based, interest-based approach in line with early childhood philosophy that looks at ways to build resilience.	The aim of Mockingbird is to highlight the struggle that many mothers face after the birth of their children. Its aim is to ensure that mothers realise they are not alone and to encourage healthcare professionals to recognise when a mother requires extra support and care.
Findings	Children responded in various way to parental separation, but they found ways to cope and adapt using their strengths and utilising the supports available. There was a lack of age and culturally appropriate resources and programs for young children, their parents and educators.	The archival research supported current studies reporting that women do not disclose symptoms of mental distress after childbirth because they are worried they will be labelled a failure and that they may lose custody of their child.
How it involved empathy	The researcher's empathy for a particular group of marginalised children enabled her to elicit their stories. By then making these stories more widely understood – particularly to those who have influence – others also came to have greater empathy for and understanding of the children, and the interests of those children were thereby promoted.	An accurate understanding of the experiences of the women in mental distress requires empathy for them. The portrayal of their stories through performance then tends to prompt an emotional, empathic response in the audience.
Issues of power	Issues of researcher power were acknowledged and addressed. Power was used for good in order to ensure children's voices were heard.	Reconstructing the archival healthcare records demonstrated how healthcare professionals can impose their own interpretation of a women's behaviour without listening to her account of why she has become ill.
Issues of stigma	Military families do not often seek assistance due to a stigma associated with doing so. They are known for their stoic attitudes and are fearful if they do speak out, it may damage their chances of further deployments and promotions (Siebler, 2009). The parent's found it empowering to have a chance to talk about their children and ways they struggled and coped with parental deployment.	The records demonstrated that the major symptom of the women's illness was that they could not give an account of themselves. The only time the voices of the women were recorded in the notes was when it was used to show evidence of mental illness, despite the fact that the women were complaining about mistreatment in their marriage, poverty or other reasons that cause them to struggle with a newborn baby. If a woman gave birth outside marriage, it was a sign of immorality or irresponsibility.
How the narratives were utilised	Narratives were collected from families and then used as a data collection tool to elicit further narratives from the children. Additionally, some of the narratives have been published in order to address the gap in children's resources in Australia, and to create further community awareness, empathy and build community capacity to support these families by funding program development.	The records were published in two articles in high ranking nursing journals and presented at conferences. This led to a meeting with NZ writer and performer Lisa Brickell whose play told the story of four generations of women in her family who had experienced maternal mental ill health.
How it involved agency and empowerment	Children enjoyed telling their stories and this was important because it was the first-time that researchers had listened to children in military families within Australia.[1] These stories were used to create resources that showed military families, representing the community.	The archive of historical healthcare records gave legitimacy to the stories of Lisa Brickell's family by providing an evidence base and healthcare context for her own experience and the experience of her mother, grandmother and great grandmother.
How the findings were used after the research	A recommendations report was published and used to advise agencies and government who make policies that affect military families. It also targeted educators, and family workers who support the children and families. Practitioner articles for educators and media articles from the findings have also been published.	Mockingbird has been performed in Auckland, Norway, Sydney, Melbourne and regional NZ. The performance of the play is followed by a question and answer session with the performers, and if available, the researchers. It has also been performed at conferences and has prompted discussion. Currently, a film version of Mockingbird is being produced and this will be used in workshops for healthcare professionals to explore treatment and care services for women.

1 Jefferies (2015).

While the participants involved need not be publicly recognisable figures, the basic idea is perhaps best illustrated by reference to some well-known examples. Cornel West, a self-described 'radical democrat' and professor of African-American studies at Harvard University happens to enjoy a friendship with Robert P. George, a prominent conservative intellectual and Princeton professor of jurisprudence (Flaherty, 2017). Similarly, the left-liberal comedian and television talk-show host Ellen DeGeneres enjoys a friendship with the former Republican US President George W. Bush (The Christian Science Monitor Editorial Board, 2019). There is the potential for a highly worthwhile research project in which each party to such a friendship is asked about the story behind it, what makes it congenial, and the challenges and rewards involved. In many cases, the stories associated with such relationships could well be very interesting on their own. And should a large number of such stories and relationships be compiled and analysed, the insights thereby gained could well be of tremendous value.

Conclusion

The virtue of empathy has long been the subject of certain concerns and criticisms. We have argued, however, that it is not rendered redundant by reason, and that it need not be either sentimental or enfeebling. As we have sought to illustrate, empathy can be vital if we are to elicit and understand the stories that children in childcare and healthcare patients have to tell. Storytelling, in turn, helps to cultivate empathy in others because 'narrative thinking ... about the lives of others, is bound up with our emotions and values' (Goldie, 2012, p. 173). Our illustrations of this interdependent relationship between empathy and narrative are drawn from two rather different areas. In both areas, certain forms of narrative inquiry can enable researchers to understand important stories that people have to tell. Moreover, this may be so even when the research participants involved are not mentally healthy adults.

As we show with regard to the children in military families, gaining an understanding of their stories can lead to the development of resources and programs tailored specifically for their benefit. There was also great practical significance to be found in the stories of women who suffer with mental distress following the birth of their children. Through the empathic understanding of their stories, healthcare professionals are able to provide a kind of care that is unavailable when a patient's condition is viewed merely in terms of a standardised set of signs and symptoms. Such insights, we contend, are of deep significance; not only for researchers, childcare and healthcare professionals, but also for senior administrative and public policy officials.

References

American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders (DSM-5)* (5th ed.). American Psychiatric Publishing. .

Aristotle. (1980). *The Nicomachean Ethics Translated by David Ross revised by J.L. Ackrill and J.O. Urmson*. Oxford University Press.

Baber, M. (2016). Narrative, acculturation and ritual: themes from a socio-ecological study of australian defence force families experiencing parental deployment. *Children Australia, 41*(2), 141-153. doi: http://dx.doi.org/10.1017/cha.2016.8

Barton, G., & Garvis, S. (2019). Theorizing compassion and empathy in educational contexts: What are compassion and empathy and why are they important? In G. Barton & S. Garvis (Eds.), Barton, G., & Garvis, S. (Eds.). (2019). *Compassion and empathy in educational contexts*. Springer International Publishing.

Berk, L., & Winsler, A. (1995). Play in Vygotsky's theory. In L. Berk & A. Winsler (Eds.), *Scaffolding children's learning: Vygotsky and early childhood education* (pp. 51-79). National Association for the Education of Young Children.

Bloom, P. (2016). *Against Empathy: The Case for Rational Compassion*. The Bodley Head.

Booth, W. C. (1973). *The Rhetoric of Fiction*. University of Chicago Press.

Charon, R. (2006). *Narrative Medicine: Honoring the Stories of Illness* Oxford University Press.

Charon, R., & Sayantani, D. G. (2011). Narrative Medicine, or a Sense of Story. *Literature & Medicine, 29*(2), vii-xiii.

Clark, A., & Moss, P. (2011). *Listening to young children: The mosaic approach.* National Children's Bureau.

Clark, A., & Statham, J. (2005). Listening to young children: Experts in their own lives. *Adoption & Fostering, 29*(1), 45-56. https://doi.org/10.1177/030857590502900106

Coplan, A., & Goldie, P. (2011). *Empathy: Philosophical and Psychological Perspectives*. Oxford University Press.

Damasio, A. R. (1994). *Descartes' Error: Emotion, Reason, and the Human Brain*. Putnam.

Dilthey, W. (1988). *Introduction to the Human Sciences: An Attempt to Lay a Foundation for the Study of Society and History. Translated by Ramon J. Betanzos.* Wayne State University Press.

Dolman, C., Jones, I., & Howard, L. M. (2013). Pre-conception to parenting: a systematic review and meta-synthesis of the qualitative literature on motherhood for women with severe mental illness. *Archives of Women's Mental Health, 16*, 173-196.

Droysen, J. G. (1977). *Historik*. Frommann-Holzboog.

Flaherty, C. (2017). Rejecting Campus Illiberalism. *Inside Higher Ed*. https://www.insidehighered.com/news/2017/03/16/ideological-odd-couple-robert-george-and-cornel-west-issue-joint-statement-against

Frank, A. W. (2010). *Letting Stories Breathe: A Socio-Narratology*. University of Chicago Press.

Gallagher, M. (2008). 'Power is not an evil': Rethinking power in participatory methods. *Children's Geographies, 6*(2), 137-150. https://doi.org/10.1080/14733280801963045

Gleeson, L. (2012). *Writing like a writer: Teaching narrative writing*. Primary English Teaching Association of Australia.

Goldie, P. (2012). *The mess inside: Narrative, Emotion, and the Mind*. Oxford University Press.

Gottschall, J. (2012). *The storytelling animal: How stories make us human*. Houghton Mifflin Harcourt Publishing Company.

Greenfield, C. (2011). Personal reflection on research process and tools: Effectiveness, highlights and challenges using the mosaic approach. *Australasian Journal of Early Childhood, 36*(3), 109-116.

Habibis, D. (2013). Ethics and social research. In M. Walter (Ed.), *Social Research Methods* (3rd ed., pp. 72-98). Oxford University Press.

Harcourt, D., & Mazzoni, V. (2012). Standpoints on quality: Listening to children in Verona, Italy. *Australasian Journal of Early Childhood, 37*(2), 19-26.

Hardy, B. (1968). An Approach through Narrative. *NOVEL: A Forum on Fiction, 2*(1), 5-14. https://www.jstor.org/stable/1344792

International Council of Nurses. (2012). *International Council of Nurses (ICN) Code of Ethics for Nurses*. https://www.nursingmidwiferyboard.gov.au/news/2018-03-01-new-codes-of-ethics-in-effect.aspx

Jomeen, J., Fleming, S. E., & Martin, C. R. (2017). Women with a diagnosed mental health problem. In G. Thomson & V. Schmied (Eds.), *Psychosocial Resilience and Risk in the Perinatal Period: Implications and Guidance for Professionals* (pp. 10-27). Routledge.

Jefferies, D., Duff, M., Burns, E., and Nicholls, D. (2015). Historical Perspectives: A Snapshot of Women Admitted to Psychiatric Facilities with Psychosis or Mania after Childbirth in the Late Victorian and Inter-War Periods. *Journal of Advanced Nursing, 71*(12), 2799-2810. https://doi.org/http://dx.doi.org.ezproxy.uws.edu.au/10.1111/jan.12761 https://onlinelibrary.wiley.com/doi/abs/10.1111/jan.12761.

Jefferies, D., Duff, M., and Nicholls, D. (2018). Understanding the Experience of Women Admitted to a Psychiatric Hospital in Sydney with Psychosis or Mania Following Childbirth after World War II (1945-1955). *International Journal of Mental Health Nursing, 27*(2), 702-711. https://doi.org/https://doi.org/10.1111/inm.12357.

Kant, I. (1997). *Groundwork of the Metaphysics of Morals*. Cambridge University Press.

Kellett, M. (2011). Empowering children and young people as researchers: Overcoming barriers and building capacity. *Child Indicators Research, 4*(2), 205-219. https://doi.org/10.1007/s12187-010-9103-1

Kesby, M. (2005). Retheorizing empowerment-through-participation as a performance in space: Beyond tyranny to transformation. *Signs, 30*(4), 2037-2065. https://doi.org/10.1086/428422

Lea Gaydos, H. (2005). Understanding personal narratives: an approach to practice *Journal of Advanced Nursing, 49*(3), 254-259.

Lipps, T. (1903). *Aesthetik* (Vol. 1). Vos Verlag.

Marshall, G. R. E., & Hooker, C. (2016). Medical Humanities. *Empathy and affect: what can empathised bodies do?, 42*(2), 128-134.

Mazzoni, V., & Harcourt, D. (2013). An international experience of research with children: Moving forward on the idea of children's participation. *Qualitative Research, 14*(2), 252-268. https://doi.org/10.1177/1468794112468470

Megnin-Viggars, O., Symington, I., Howard, L., & Pilling, S. (2015). Experience of care for mental health problems in the antenatal or postnatal period for women in the UK: a systematic review and meta-synthesis of qualitative research. *Archives of Women's Mental Health, 18*, 745-759.

Moore, G. (2002). Nietzsche, Spencer, and the Ethics of Evolution. *Journal of Nietzsche Studies, 23*(Spring), 1-20.

Nietzsche, F. (1998). *On the Genealogy of Morals*. Oxford University Press.

Nietzsche, F. (2003a). *Nietzsche, Friedrich. Beyond Good and Evil*. Penguin Books.

Nietzsche, F. (2003b). *Twilight of the Idols and The Anti-Christ*. Penguin Books.

Patterson, J. (2018). Empathy: A Concept Analysis. *International Journal for Human Caring, 22*(4), 217-223.

Peplau, H. E. (1997). Peplau's Theory of Interpersonal Relations. *Nursing Science Quarterly, 10*(4), 162-167.

Pinker, S. (2011). *The Better Angels of Our Nature: The Decline of Violence in History and Its Causes*. Penguin.

Polkinghorne, D. E. (1986). *Narrative knowling and the human sciences*. State University of New York Press.

Polkinghorne, D. E. (1995). Narrative configuration in qualitative analysis. *International Jornal of Qualitative Studies in Education, 8*(1), 5-23.

Polkinghorne, D. E. (2007). Validity issues in narrative research. *Qualitative Inquiry, 13*(4), 471-486. https://doi.org/10.1177/1077800406297670

Rogers, M. (2017). *Young children's understanding and experiences of parental deployment within an Australian Defence Force family.* School of Education. Armidale, Australia, University of New England. Doctor of Philosophy. 10.13140/RG.2.2.26497.61281 https://hdl.handle.net/1959.11/27661

Rogers, M. (2020). Recommendations to support young children from Australian military families: A report for policy makers, family and social workers and educators. *Journal of Management Policy and Practices, 21*(2), 1-26. doi:https://doi.org/10.33423/jmpp.v21i2

Rogers, M. (2021). Contextualised, not Neoliberalised Professionalism in Early Childhood Education and Care: Effects of Prescribed Notions of Quality on Educator Confidence in Australia. *International Electronic Journal of Elementary Education, 13*(4), 549-564. https://www.iejee.com/index.php/IEJEE/article/view/1447/532

Rogers, M. & Bird, J. (2020). Children's agency: Developing a digital app to voice family narratives. *Journal of Military, Veteran and Family Health, 6*(2), 129-137. doi:10.3138/jmvfh-2019-0022

Rogers, M., Bird, J. & Sims, M. (2019). Using the media arts to digitally support young children's family and cultural narratives. *International Art in Early Childhood Research Journal, 1*(1), 1-16. https://artinearlychildhood.org/content/uploads/2022/03/ARTEC_2019_Research_Journal_1_Article_3_Rogers_Bird_Sims.pdf

Rogers, M. & Boyd, W. (2020). Meddling with Mosaic: Reflections andadaptations. *European Early Childhood Education Research Journal.* doi:10.1080/1350293X.2020.1817236

Rogers, M., Jefferies, D. & Ng, J. (2022). Why can't we value and pay for the emotional cost of caring? *Women's Agenda.* https:// womensagenda.com.au/latest/why-cant-we-value-and-pay-for-theemotional-cost-of-caring/

Rogers, M., Bible, V., Johnson, A., Bird, J., Harrington, I. & Baker, P. (2021a). International programs and resources to support children from military families: A review. *International Electronic Journal of Elementary Education, 14*(2), 119-133. doi:10.26822/iejee.2022.23https://www.iejee.com/index.php/IEJEE/article/view/1756

Rogers, M., Harrington, I., Baker, P., Bird, J., Johnson, A., & Bible, V. (In press). Stakeholder engagement with steering committees, fundingbodies and surveys: Benefits and challenges for education projects. *International Issues in Educational Research, 32*(3).

Rogers, M., Johnson, A., Bird, J., Serow, P., Harrington, I. & Bible, V. (2021b). Stakeholder engagement in an online community education project via diverse media engagements. *Issues in Educational Research, 31*(2), 626-643. http://www.iier.org.au/iier31/rogers.pdf

Shapiro, J. (2011). Illness Narratives: reliability, authenticity and the empathic witness. *Medical Humanities, 37*(2), 68-72.

Sheilds, L., A. , Molzahn, A., Bruce, K., Schick Makaroff, K., Stajduhar, K., Beuthin, R., & Shermak, S. (2015). Contrasting stories of life-threatening illness: A narrative inquiry. *International Journal of Nursing Studies, 52*(1), 207-215.

Siebler, P. (2009). *Military people won't ask for help: Experiences of deployment of Australian Defence Force personnel, their families and implications for social work* [Major, Monash University]. Melbourne, Australia.

Siebler, P., & Goddard, C. (2014). Parents' perspectives of their children's reactions to an Australian military deployment. *Children Australia, 39*(1), 17-24.

Spinoza, B. (1677). *Ethics*. https://www.britannica.com/biography/Benedict-de-Spinoza

The Christian Science Monitor Editorial Board. (2019). Friendship across political lines. *The Christian Science Monitor*. https://www.csmonitor.com/Commentary/the-monitors-view/2019/1017/Friendship-across-political-lines

Titchener, E. B. (1909). *Experimental Psychology of the Thought Processes*. Macmillan.

UNICEF. (2015). *Conventions on the Rights of the Child*. Retrieved 28.7.12 from http://www.unicef.org/crc/

Wallerstein, N., B., & Duran, B. (2006). Using community-based participatory research to address health disparities. *Health Promotion Practice, 7*, 312-323.

Weber, M. (1949). *The Methodology of the Social Sciences*. The Free Press.

Wilson, C. (2013). Darwin and Nietzsche: Selection, Evolution, and Morality. *Journal of Nietzsche Studies, 44*(2), 354-370.

iejee

International Electronic Journal of Elementary Education
June 2022, Volume 14, Issue 5, 647-655

A Bibliometric Study of Scientific Productivity on Adaptive Behavior in Children and Adolescents with Autism

Rossana Gómez Campos[a,*], Rubén Vidal Espinoza[b], Camilo Urra Albornoz[c], Paz Pezoa-Fuentes[d], Gonzalo Gomez-Campos[e], Michelle Guerrero Leiva[f], Luzmira Medel Riquelme[g], Catalina Núñez Díaz[h], Marco Cossio Bolaños[i]

Received : 27 April 2022
Revised : 24 June 2022
Accepted : 30 June 2022
DOI : 10.26822/iejee.2022.269

[a,*] **Corresponding Author:** Rossana Gómez-Campos, Departamento de Diversidad e Inclusividad Educativa, Programa de Magister en Educación Especial y Psicopedagogía, Universidad Católica del Maule, Talca, Chile
E-mail: rossaunicamp@gmail.com
ORCID: https://orcid.org/0000-0001-6509-5707

[b] Rubén Vidal Espinoza, Universidad Católica Silva Henriquez, Santiago, Chile
E-mail: rvidal@gmail.com
ORCID: https://orcid.org/0000-0002-8593-5248

[c] Camilo Urra Albornoz, Escuela de Ciencias del Deporte, Facultad de Salud, Universidad Santo Tomás, Chile
E-mail: c.urra.albornoz@gmail.com
ORCID: https://orcid.org/0000-0002-5936-359X

[d] Paz Pezoa-Fuentes, Doctorado en Ciencias de la Actividad Física, Universidad Católica del Maule, Talca, Chile
E-mail: mpazp_edfisica@yahoo.es
ORCID: https://orcid.org/0000-0002-7063-5728

[e] Gonzalo Gomez-Campos, Centro de Investigación CINEMAROS SAC; Arequipa, Perú
E-mail: hegongoca@gmail.com

[f] Michelle Guerrero Leiva, Departamento de Diversidad e Inclusividad Educativa, Universidad Católica del Maule, Talca, Chile
E-mail: michelle.c.guerrero@gmail.com

[g] Luzmira Medel Riquelme, Departamento de Diversidad e Inclusividad Educativa, Universidad Católica del Maule, Talca, Chile
E-mail: alejandra.medel0807@gmail.com

[h] Catalina Núñez Díaz, Departamento de Diversidad e Inclusividad Educativa, Universidad Católica del Maule, Talca, Chile
E-mail: catalina.f.nunez.diaz@gmail.com

[i] Marco Cossio Bolaños, Programa de Magister en Educación Especial y Psicopedagogía, Universidad Católica del Maule, Talca, Chile
E-mail: mcossio1972@hotmail.com
ORCID: https://orcid.org/0000-0001-7230-9996

Abstract

The objectives of this study were to characterize the bibliometric indicators of scientific productivity on adaptive behavior (AB) in children and adolescents with autism spectrum disorders (ASD) during the year 2021. The PubMed database was used to summarize information from quantitative scientific articles (cross-sectional, longitudinal and experimental) and reviews (bibliographic, systematic review and meta-analysis). The data collected for each of the articles were: year of publication, journal name, country, language of publication and type of published document (cross-sectional study, longitudinal, experimental, biographical review, systematic review and meta-analysis). The United States (USA) published more articles than any other country in the world (*n* = 28), followed by Italy with 13 studies, China and Spain with six studies. A total of 44 scientific journals were identified that have published a total of 89 scientific articles related to AB in children and adolescents with ASD. Regarding the type of published paper, 63 quantitative studies were identified (cross-sectional studies, 9 longitudinal studies, 15 experimental studies). In addition, 14 literature reviews, 9 systematic reviews, and 3 systematic reviews/meta-analyses were identified. These results suggest practitioners and researchers to address and decide where to read and publish scientific articles related to AB in youth with ASD

Keywords:

Adaptive Behavior, Bibliometrics, ASD; Children, adolescents.

Introduction

Autism is a pervasive neurodevelopmental disorder characterized by lifelong impairments in communication, social reciprocity and the presence of repetitive or restrictive behaviors and/or interests (Kanne et al. 2011).

Children and adolescents with autism spectrum disorder (ASD) have language difficulties and may show antisocial behaviors such as aggression, withdrawal or even, seek self-stimulation, sometimes, in response to stress or changes in routine (Alshaigi et al. 2020). Indeed, adaptive behavior, or the ability to function independently in one's environment, is a key phenotypic construct in ASD disorder (Pugliese et al. 2016; Farmer, Swineford, & Swedo, 2018).

In that sense, ASD is universal and affects all racial, ethnic and socioeconomic groups (Baio, 2014). Moreover, it produces economic, emotional, social and health consequences with a real burden for families and governments (Lavelle et al. 2014), so using a bibliometric study to analyze scientific productivity on adaptive behavior (AB) in children and adolescents with ASD is very relevant. This is because bibliometrics is considered a valuable tool to map the vast amounts of research available in disciplines and to describe its developmental trends and state of form, in a comprehensive, systematic and reproducible way (Linnenluecke, Marrone, & Singh, 2020). In addition, it allows not only to analyze scientific productivity, but also publication trends by authors, topics, institutions, countries, regions, among other indicators (Limaymanta et al. 2021).

In essence, several bibliometric studies on children and youth with ASD are currently available in the literature (Sweileh, Al-Jabi, & Sawalha, 2016; Carmona-Serrano et al. 2020; Gomes-Cordeiro et al. 2020). However, as far as is known, there are no bibliometric studies related to AB in populations with ASD. So, understanding this issue in this population is fundamental, especially if it is to help achieve their outcomes (Pugliese et al. 2016), since independent living depends more on AB than cognitive ability or autism spectrum disorder (ASD) symptomatology (Kanne et al. 2011; Farley et al. 2009).

Therefore, the aim of this study was to characterize bibliometric indicators of scientific productivity on AB in children and adolescents with ASD in the PubMed database of the US National Library of Medicine. To achieve the objective of the study, we proposed the following questions: What will be the scientific journals that have published topics on AB in children and adolescents with ASD and what types of scientific articles have been published during the years 2020 and 2021?

Methodology

Design and Sample

A documentary (bibliometric) study of scientific productivity on AB in children and adolescents with ASD was conducted. Bibliometric mapping is used to visualize trends in various research and create a descriptive visual environment of terms commonly included in studies on a specific topic or population (van Eck, & Waltman, 2010).

Bibliometric data were extracted from the U.S. National Library of Medicine's PubMed database (https://pubmed.ncbi.nlm.nih.gov/, accessed January 15-20, 2022).

The Pubmed database has a high coverage of English-language journals. It also includes citations and abstracts of biomedical and psychological literature, which facilitates the search of various NLM bibliographic resources.

Search Strategy

The search strategy covered one calendar year (January 1 to December 31, 2021). To achieve relevance with this bibliometric review, articles included the following keywords; (1) adaptive behavior, conceptual skills, social skills, social skills, practical skills, functional academic skills; (2) children, adolescents, school children; (3) autism spectrum disorder, dysfunction, autism.

Initially, all keywords and the boileans "and" and "or" were used to order them. Subsequently, these words were grouped into combinations of two or three, and a new search was performed, such as, for example, adaptive behavior and children and autism.

The following were considered as indicators of scientific productivity: country and continent of publication, language of publication, the name of the journal and the type of document published. In addition, the observation technique was used to extract bibliometric indicators.

The terms indicated were searched for in the title, abstract and keywords of the manuscripts. Inclusion criteria were: (i) peer-reviewed articles related to health science areas; (ii) articles on AB; (iii) articles on ASD population; (iv) articles that provided all the required bibliometric indicators listed; and (v) published in English, Spanish and French. In the case of studies that included systematic reviews and meta-analyses, these were excluded from the analysis.

Data Collection

The procedure for extracting the bibliometric indicators was carried out by two of the researchers in this study (MACB and CUA). Each of the observers recorded the information separately on an index card. A third observer (RGC) collated the records of the first two observers. This ensures the process of abstraction of the information. In cases where there was no match, this third observer verified each of the indicators and made the pertinent corrections. We then obtained a general matrix of the studies, which made it possible to analyze the bibliometric indicators described here.

We used the PRISMA guidelines, proposed by the researchers Moher, Liberati, Tetzla and Altman (2009) to identify and extract the data for the bibliometric review. Figure 1 illustrates the steps performed.

Initially, a total of 151 scientific articles related to AB in children and adolescents with ASD were identified.

Then 22 studies were eliminated for not being related to the study topic and the type of sample (children and adolescents). Next, the titles and abstracts were read and thoroughly evaluated to be sure if they corresponded to the purpose of the research (eliminating 40 articles). Finally, 89 studies were considered for bibliometric analysis.

Data Analysis

The data collected from the bibliometric matrix for were quantified through descriptive statistical analyses, such as frequency, range and percentage (%). These calculations were performed in Microsoft Excel spreadsheets.

Results

Table 1 shows the bibliometric indicators of the scientific articles analyzed during 2021. A total of 89 scientific articles (e.g., original articles, literature reviews, systematic reviews and meta-analyses) were identified. In general, 88 were published in English and one in French. In relation to the analysis by country, it stands out that, by country, the USA is the country that published the most articles in relation to the other countries of the world (*n* = 28), followed by Italy with 13 studies, China and Spain with six studies. In addition, it was found that, by continent, Europe had 38 studies, North America 32, Asia 15, Oceania and South America, each with 2 studies.

A total of 44 scientific journals were identified that have published a total of 89 scientific articles related to AB in children and adolescents with ASD during 2021. The journal Frontiers in psychiatry published 12 articles, followed by Frontiers in psychology, Journal of autism and developmental disorders and Molecular autism with seven studies each. Subsequently, the other journals ranged from 4 to 1 study during 2021.

Regarding the type of document published in the 44 scientific journals during 2021, 63 quantitative studies were identified (e.g., 39 cross-sectional studies, 9 longitudinal studies, 15 experimental studies). In addition, 14 literature reviews, 9 systematic reviews, and 3 systematic reviews/meta-analyses were identified.

Discussion

The aim of this study was to characterize the bibliometric indicators of scientific productivity on adaptive behavior in children and adolescents

Figure 1.
Screening and selection process for the records according to the PRISMA (Preferred Reporting Items for Reviews and Meta-Analyses) flowchart.

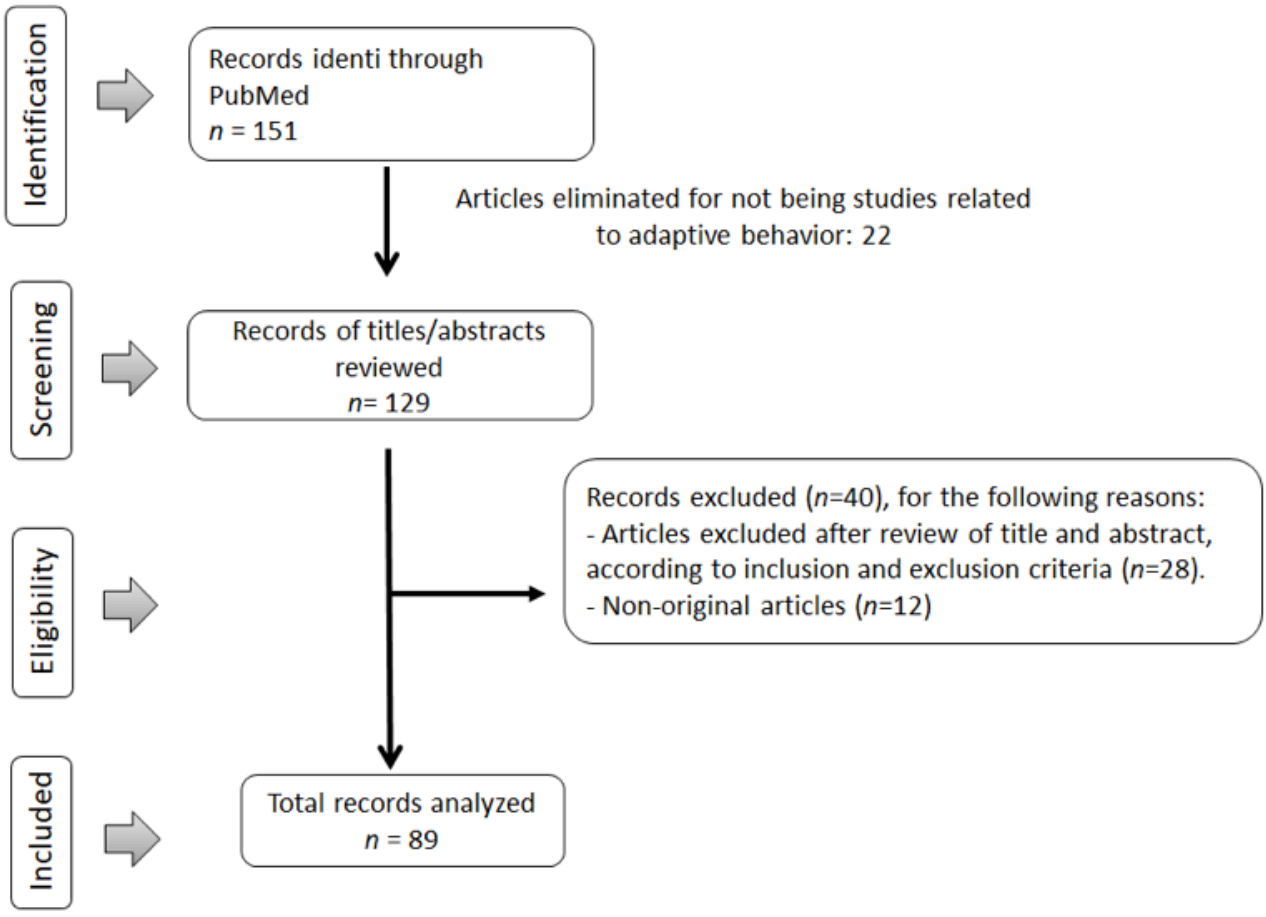


Table 1.

Characteristics of the bibliometric indicators used

Indicators	*f*	%
Language of publication		
English	88	98.9
French	1	1.1
Total	89	100
Country		
U.S.A.	28	31.5
Italy	13	14.6
China	6	6.7
Spain	6	6.7
Canada	4	4.5
Austria	3	3.4
Japan	3	3.4
Germany	2	2.2
France	2	2.2
England	2	2.2
Israel	2	2.2
South Korea	2	2.2
Multi-country	2	2.2
Australia	1	1.1
Chile	1	1.1
Colombia	1	1.1
Denmark	1	1.1
Slovakia	1	1.1
India	1	1.1
Norway	1	1.1
Netherlands	1	1.1
Poland	1	1.1
Portugal	1	1.1
Qatar	1	1.1
Sweden	1	1.1
Sweden	1	1.1
Switzerland	1	1.1
Total	89	100
Continent		
Europe	38	42.7
North America	32	36
Asia	15	16.9
Oceania	2	2.2
South America	2	2.2
Total	89	100

Legend: f: frequency, %: percentage.

Table 2.

Journals indexed in PubMed that published scientific articles on adaptive behavior in autistic children and adolescents.

N°	Journals	*f*	*%*
1	Frontiers in psychiatry	12	13.48
2	Frontiers in psychology	7	7.87
3	Journal of autism and developmental disorders	7	7.87
4	Molecular autism	7	7.87
5	Brain sciences	4	4.49
6	Frontiers in neuroscience	3	3.37
7	International journal of molecular sciences	3	3.37
8	Neuropsychiatric disease and treatment	3	3.37
9	BMC psychiatry	2	2.25
10	Cerebral cortex	2	2.25
11	Clinical child and family psychology review	2	2.25
12	Journal of clinical medicine	2	2.25
13	Journal of neuro developmental disorders	2	2.25
14	PloS one	2	2.25
15	Scientific reports	2	2.25
16	Archives of rehabilitation research and clinical translation	1	1.12
17	Behavioral sciences	1	1.12
18	BMJ paediatrics open	1	1.12
19	Cancers	1	1.12
20	Communications biology	1	1.12
21	Cureus	1	1.12
22	Current psychiatry reports	1	1.12
23	Ethique & sante	1	1.12
24	Frontiers innu	1	1.12
25	Frontiers in pediatri	1	1.12
26	Genes	1	1.12
27	Health and quality of life outcomes	1	1.12
28	International journal of developmental disabilities	1	1.12
29	International journal of environmental research and publichealth	1	1.12
30	JMIR mental health	1	1.12
31	Journal of applied behavior analysis	1	1.12
32	Journalof Behavioral Education	1	1.12
33	Journal of developmental and behavioral pediatrics	1	1.12
34	Journal of pediatric psychology	1	1.12
35	Journal of speech language and hearing research	1	1.12
36	Languagespeech and hearing services in schools	1	1.12
37	Network neuroscience	1	1.12
38	Neuroscience and biobehavioral reviews	1	1.12
39	Psychiatry investigation	1	1.12
40	Psychiatry journal	1	1.12
41	Research in developmental disabilities	1	1.12
42	Science advances	1	1.12
43	Thementalhealth clinician	1	1.12
44	Trials	1	1.12
	Total	89	100

Legend: f: frequency, %: percentage.

Table 3.

Types of papers published in PubMed on adaptive behavior in autistic children and adolescents

Type of document	*f*	%
Original articles		
Transversal	39	43.8
Longitudinal	9	10.1
Experimental	15	16.9
Total	63	70.8
Review Articles		
Review	14	15.7
systematic review	9	10.1
Systematic review/Meta-analysis	3	3.4
Total	26	29.2
Total articles	89	100

Legend: f: frequency, %: percentage.

with ASD in the PubMed database. The results have evidenced that 89 studies on AB in children and adolescents with ASD have been published in 2021. In addition, 44 scientific journals were identified worldwide and the types of papers published were mostly quantitative studies (39 cross-sectional, 9 longitudinal and 15 experimental) and 26 review articles (14 literature review, 9 systematic review and 3 meta-analyses).

These findings indicate that the majority of articles published in 2021 were quantitative research, reflecting 70.8% (63 articles) relative to review articles, which accounted for 29.2% (26 articles). In fact, regardless of the type of scientific publications, the use of bibliometrics allows researchers to gain more knowledge about research trends in a given subject (Sweileh, Al-Jabi, & Sawalha, 2016), as well as to identify the journals with the highest productivity in particular scientific articles.

In essence, this bibliometrics identified 44 journals that have published scientific articles related to AB in youth with ASD. Of these, Frontiers in psychiatry is the journal that has published in 2021 twelve articles (13.48%), followed by Frontiers in psychology, Journal of autism and developmental disorders and Molecular autism that have published seven articles each journal.

In fact, through the publication of the 89 scientific articles, regardless of the type of paper, we highlight that during 2021 significant advances have been achieved. Not only from cross-sectional (Liu, et al. 2021; Cola et al. 2022; Mason et al. 2021), longitudinal (Allison et al. 2021; Rosello et al. 2021; Helverschou et al. 2021) and experimental (Moxon-Emre et al. 2021; Fastman et al. 2021) point of view. But in addition, literature review studies (Dyar et al. 2021; Hus & Segal, 2021), systematic reviews (Mann, McMillan, Silver, & Stein, 2021; Janšáková et al. 2021) and systematic review and meta-analysis (D'Alò et al. 2021; Wickstrom et al. 2021) have also described and provided better understanding and increased surveillance in the young ASD population.

Generally speaking, this research is relevant for people currently suffering from ASD, in whom symptoms could be prevented and treated (Thurm, & Swedo, 2012). Even the results of this research can be of use to caregivers, family members and researchers, respectively (Anagnostou et al. 2015).

In general, the studies analyzed in the present investigation, can offer the opportunity to better understand the types of work published on children with ASD. In addition, to know the scientific journals that publish AB topics. This, information can serve not only to enable undergraduate and graduate students to approach quantitative (cross-sectional, longitudinal and experimental) or documentary (literature review, systematic review and meta-analysis) research in youth with ASD. But also to delve areas of progress and ongoing challenges in studies addressing the etiology, pathophysiology and treatment of ASD (Thurm, & Swedo, 2012).

In that context, more than 24 years ago, a Forum on Neuroscience and Nervous System Disorders was organized in April 2007 to bring together scientists sponsoring ASD-related research (Altevogt, Hanson, & Leshner, 2008). That event had already warned about the scientific opportunities that research at such an event can provide, so the use of bibliometrics, likewise can provide an important, feasible and systematic means to make judgments about the importance of published works, to examine the productivity and influence of individuals and institutions, and to compare different disciplines and scientific journals (Haddad, 2017).

This study presents some limitations, given that only

one Pubmed database was used. In addition, it was limited to analyzing the scientific productivity of AB in children and adolescents with ASD in the year 2021 (number of articles, scientific journals and types of documents). However, future studies can measure and compare other bibliometric indicators, such as the impact and importance of the authors or researchers of specific articles, journals, departments and institutions, and from different fields or disciplines (Haddad, 2017).

It also presents some strengths, for example, it is one of the first bibliometric studies that can serve as a baseline to compare future studies in AB in young people with ASD. In addition, the fact of identifying journals, the number of published articles and types of documents are relevant indicators for libraries and researchers, so this evidence can serve to develop future studies and direct their scientific articles to certain specialized journals.

Conclusions

This study characterized the bibliometric indicators of scientific productivity on AB in children and adolescents with ASD, identifying 44 specialized scientific journals. The journal Frontiers in psychiatry stands out, publishing 12 articles in the area, In addition, 89 scientific articles (39 cross-sectional studies, 15 experimental, 14 literature review, 9 longitudinal and systematic reviews and 3 systematic review and meta-analysis) were recorded during 2021. These results suggest to professionals and researchers to address and decide where to read and publish scientific articles related to AB in young people with ASD, and may even contribute to identify the type of study published and share among their academic and scientific networks.

Disclosure statement

The authors reported no potential conflict of interest.

References

Allison, C., Matthews, F. E., Ruta, L., Pasco, G., Soufer, R., Brayne, C., Charman, T., & Baron-Cohen, S. (2021). Quantitative Checklist for Autism in Toddlers (Q-CHAT). A population screening study with follow-up: the case for multiple time-point screening for autism. *BMJ paediatrics open, 5*(1), e000700. https://doi.org/10.1136/bmjpo-2020-000700

Alshaigi, K., Albraheem, R., Alsaleem, K., Zakaria, M., Jobeir, A., & Aldhalaan, H. (2020). Stigmatization among parents of autism spectrum disorder children in Riyadh, Saudi Arabia. *Int J Pediatr Adolesc Med., 7*(3), 140-146. https://doi.org/10.1016/j.ijpam.2019.06.003

Altevogt, B. M., Hanson, S. L., & Leshner, A. I. (2008). Autism and the environment: challenges and opportunities for research. *Pediatrics, 121*(6), 1225-9. https://doi.org/10.1542/peds.2007-3000.

Anagnostou, E., Jones, N., Huerta, M., Halladay, A. K., Wang, P., Scahill, L., Horrigan, J. P., Kasari, C., Lord, C., & Choi, D. (2015). Measuring social communication behaviors as a treatment endpoint in individuals with autism spectrum disorder. *Autism. 19*, 622–36. https://doi.org/10.1177/1362361314542955

Baio, J. (2014). Prevalence of autism spectrum disorder among children aged 8 years—autism and developmental disabilities monitoring network, 11 sites, United States, 2010. In: *Morbidity and mortality weekly report Surveillance summaries* (Washington, DC: 2002). 63, 1–21.

Carmona-Serrano, N., López-Belmonte, J., López-Núñez, J. A., Moreno-Guerrero, A. J. (2020). Trends in Autism Research in the Field of Education in Web of Science: A Bibliometric Study. *Brain Sciences, 10*(12), 1018. https://doi.org/10.3390/brainsci10121018

Cola, M., Yankowitz, L. D., Tena, K., Russell, A., Bateman, L., Knox, A., Plate, S., Cubit, L. S., Zampella, C. J., Pandey, J., Schultz, R. T., & Parish-Morris, J. (2022). Friend matters: sex differences in social language during autism diagnostic interviews. *Molecular autism, 13*(1), 5. https://doi.org/10.1186/s13229-021-00483-1

D'Alò, G. L., De Crescenzo, F., Amato, L., Cruciani, F., Davoli, M., Fulceri, F., Minozzi, S., Mitrova, Z., Morgano, G. P., Nardocci, F., Saulle, R., Schünemann, H. J., & Scattoni, M. L., ISACA Guideline Working Group. (2021). Impact of antipsychotics in children and adolescents with autism spectrum disorder: a systematic review and meta-analysis. *Health and quality of life outcomes, 19*(1), 33. https://doi.org/10.1186/s12955-021-01669-0

Dyar, B., Meaddough, E., Sarasua, S. M., Rogers, C., Phelan, K., & Boccuto, L. (2021). Genetic Findings as the Potential Basis of Personalized Pharmacotherapy in Phelan-McDermid Syndrome. *Genes, 12*(8), 1192. https://doi.org/10.3390/genes12081192

Farley, M., McMahon, W. M., Fombonne, E., Jenson, W. R., Miller, J., Gardner, M., Coon, H. (2009). Twenty-year outcome for individuals with autism and average or near-average cognitive abilities. *Autism Research, 2*(2), 109–18. https://doi.org/10.1002/aur.69.

Farmer, C., Swineford, L., & Swedo, S.E. (2018). Classifying and characterizing the development of adaptive behavior in a naturalistic longitudinal study of young children with autism. *J Neurodevelop Disord., 10*, 1. https://doi.org/10.1186/s11689-017-9222-9

Fastman, J., Foss-Feig, J., Frank, Y., Halpern, D., Harony-Nicolas, H., Layton, C., Sandin, S., Siper, P., Tang, L., Trelles, P., Zweifach, J., Buxbaum, J. D., & Kolevzon, A. (2021). A randomized controlled trial of intranasal oxytocin in Phelan-McDermid syndrome. *Molecular autism, 12*(1), 62. https://doi.org/10.1186/s13229-021-00459-1

Gomes, Cordeiro. E., Alves, C., Mikaele, E., Fernandes, F. H., & Lima-Alvarez, C. D. (2020). Bibliometric analysis of the literature on postural balance in children with Autism Spectrum Disorder. *Rev. CEFAC, 22*(2), 18319. https://doi.org/10.1590/1982-0216/202022218319

Haddad, M. (2017). Use and relevance of bibliometrics for nursing. *Nurs Stand., 31*(37), 55-63. https://doi.org10.7748/ns.2017.e10830.

Helverschou, S. B., Ludvigsen, L. B., Hove, O., & Kildahl, A. N. (2021). Psychometric properties of the Psychopathology in Autism Checklist (PAC). International journal of developmental disabilities, *67*(5), 318–326. https://doi.org/10.1080/20473869.2021.1910779

Hus, Y., & Segal, O. (2021). Challenges Surrounding the Diagnosis of Autism in Children. *Neuropsychiatric disease and treatment, 17*, 3509–3529. https://doi.org/ 10.2147/NDT.S282569

Janšáková, K., Kyselicová, K., Ostatníková, D., & Repiská, G. (2021). Potential of Salivary Biomarkers in Autism Research: A Systematic Review. *International journal of molecular sciences, 22*(19), 10873. https://doi.org/10.3390/ijms221910873

Kanne, S. M., Gerber, A. J., Quirmbach, L. M., Sparrow, S. S., Cicchetti, D. V., Saulnier, C. A. (2011). The role of adaptive behavior in autism spectrum disorders: Implications for functional outcome. *Journal of autism and developmental disorders, 41*(8), 1007-18. https://doi.org/ 10.1007/s10803-010-1126-4.

Lavelle, T. A,, Weinstein, M. C., Newhouse, J. P., Munir, K., Kuhlthau, K. A., & Prosser, L. A. (2014). Economic burden of childhood autism spectrum disorders. *Pediatrics, 133*(3), 520–529. https://doi.org/10.1542/peds.2013-0763

Limaymanta, C.H., Amado, J., Navarro, P.S., & Restrepo-Arango, C. (2021). Estructura intelectual de la producción científica sobre COVID-19 en el área de salud pública, ambiental y ocupacional. *Rev. Cuba. Inf. Cienc. Salud., 32*. Available online: http://hdl.handle.net/20.500.11959/brapci/163065 (accessed on 26 July 2021)

Linnenluecke, M. K., Marrone, M., & Singh, A. K. (2020). Conducting systematic literature reviews and bibliometric analyses. *Australian Journal of Management, 45*(2), 175-194. https://doi.org/10.1177/0312896219877678

Liu, Y., Wang, L., Xie, S., Pan, S., Zhao, J., Zou, M., & Sun, C. (2021). Attention Deficit/Hyperactivity Disorder Symptoms Impair Adaptive and Social Function in Children With Autism Spectrum Disorder. *Frontiers in psychiatry, 12*, 654485. https://doi.org/10.3389/fpsyt.2021.654485

Mann, M., McMillan, J. E., Silver, E. J., & Stein, R. (2021). Children and Adolescents with Disabilities and Exposure to Disasters, Terrorism, and the COVID-19 Pandemic: a Scoping Review. *Current psychiatry reports, 23*(12), 80. https://doi.org/10.1007/s11920-021-01295-z

Mason, L., Shic, F., Falck-Ytter, T., Chakrabarti, B., Charman, T., Loth, E., Tillmann, J., Banaschewski, T., Baron-Cohen, S., Bölte, S., Buitelaar, J., Durston, S., Oranje, B., Persico, A. M., Beckmann, C., Bougeron, T., Dell'Acqua, F., Ecker, C., Moessnang, C., Murphy, D. &, ... LEAP Team. (2021). Preference for biological motion is reduced in ASD: implications for clinical trials and the search for biomarkers. *Molecular autism, 12*(1), 74. https://doi.org/10.1186/s13229-021-00476-0

Moher, D., Liberati, A., Tetzlaff, J., Altman, D.G., PRISMA Group. Preferred reporting items for systematic reviews and meta-analyses: The PRISMA Statement. *PLOS Med*, 2009, *6*, 1000097. https://doi.org/10.7326/0003-4819-151-4-200908180-00135

Moxon-Emre, I., Daskalakis, Z. J., Blumberger, D. M., Croarkin, P. E., Lyon, R. E., Forde, N. J., Tani, H., Truong, P., Lai, M. C., Desarkar, P., Sailasuta, N., Szatmari, P., & Ameis, S. H. (2021). Modulation of Dorsolateral Prefrontal Cortex Glutamate/Glutamine Levels Following Repetitive Transcranial Magnetic Stimulation in Young Adults With Autism. *Frontiers in neuroscience, 15*, 711542. https://doi.org/10.3389/fnins.2021.711542

Pugliese, C. E., Anthony, L. G., Strang, J. F., Dudley, K., Wallace, G. L., Naiman, D. Q., & Kenworthy, L. (2016). Longitudinal Examination of Adaptive Behavior in Autism Spectrum Disorders: Influence of Executive Function. *Journal of autism and developmental disorders, 46*(2), 467–477. https://doi.org/10.1007/s10803-015-2584-5

Rosello, R., Berenguer, C., Martinez-Raga, J., Miranda, A., & Cortese, S. (2021). Subgroups of Children with Autism Spectrum Disorder without Intellectual Disability: A Longitudinal Examination of Executive and Socio-Adaptive Behaviors in Adolescence. *Journal of clinical medicine, 10*(10), 2220. https://doi.org/10.3390/jcm10102220

Sweileh, W. M., Al-Jabi, S. W., & Sawalha, A. F. (2016). Bibliometric profile of the global scientific research on autism spectrum disorders. *SpringerPlus, 5*, 1480. https://doi.org/10.1186/s40064-016-3165-6

Thurm, A., & Swedo, S. E. (2012). The importance of autism research. *Dialogues in clinical neuroscience, 14*(3), 219–222. https://doi.org/10.31887/DCNS.2012.14.3/athurm

van Eck, N. J., & Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics, 84*(2), 523–538. https://doi.org/10.1007/s11192-009-0146-3

Wickstrom, J., Dell'Armo, K., Salzman, E., Hooker, J. L., Delehanty, A., Bishop, S., Tassé, M. J., Wetherby, A. M., Piergies, A., Damiano, D., Rauch, A., & Thurm, A. (2021). Systematic Review: Recommendations for Rehabilitation in ASD and ID From Clinical Practice Guidelines. *Archives of rehabilitation research and clinical translation, 3*(3), 100140. https://doi.org/10.1016/j.arrct.2021.100140

This page is intentionally left blank.

iejee

International Electronic Journal of Elementary Education
June 2022, Volume 14, Issue 5, 657-665

The Effect of Online Education on Children's Social Skills During the COVID-19 Pandemic

Yunus Günindi[a,*]

Received : 29 April 2022
Revised : 2 June 2022
Accepted : 30 June 2022
DOI : 10.26822/iejee.2022.270

[a,*] **Corresponding Author:** Yunus Günindi, Department of Preschool Education, Faculty of Education, Aksaray University, Aksaray, Turkey
E-mail: ygunindi@gmail.com
ORCID: https://orcid.org/0000-0001-5192-5466

Abstract

This study aimed to determine whether there is any conspicuous difference in the social adaptation skills of five-year-old preschool children who did not attend any social skills intervention program besides the ongoing curriculum but continued their education process in different environments (face-to-face/online) because of the pandemic. Included in the study were 296 children enrolled in independent kindergartens, who were within the five-year-old age group and were from similar socioeconomic families. Among them, 159 attended face-to-face and 137 attended online classes. At the beginning of their formal education, the Social Adaptation Skills Scale (SASS) was administered to the children in both groups as a pre-test. At the end of the trimester, the SASS was repeated as a post-test. A significant difference was found between the face-to-face education group and the online education group, in favor of the former, in terms of the social adaptation sub-factor of the SASS. Furthermore, the social incompatibility sub-factor scores of the face-to-face education group were significantly lower than those of the children in the online education group.

Keywords:

Pandemic, Social Skills, Preschool, Face-to-Face Education, Online Education

Introduction

A pandemic refers to a situation wherein a disease or an infection becomes widespread across large regions and may even spread across the entire world (Harvard, 2021). The first case of coronavirus disease 2019 (COVID-19), which includes symptoms such as fever, cough, shortness of breath, and respiratory tract infection, was reported in Wuhan, China, at the end of December 2019 (Aral & Kadan, 2021). This disease has spread rapidly since the beginning of 2020 (Hiraoka & Tomoda, 2020) and led to innumerable deaths and was declared a global pandemic by the World Health Organization (WHO) on March 11, 2020 (WHO, 2020). The outbreak of COVID-19 led governments of different countries to adopt drastic measures to contain its spread, such as implementing curfews, travel–transportation restrictions, and the suspension of face-to-face education (Chaabane et al., 2021; Pečjak et al., 2021). After the WHO declared COVID-19 a pandemic, the simultaneous suspension of face-to-face education at all levels in many

countries adversely affected the lives of millions of children and their parents (Alisinanoğlu et al., 2020; Christner et al., 2021; Gilliam et al., 2021; Hanetz-Gamliel et al., 2021; Knopik & Domagała-Zyśk, 2022).

Upon these developments, the Turkish Ministry of National Education (MEB) suspended face-to-face education on March 16, 2020, and announced the beginning of distance education via the Education Information Network (EBA; MEB, 2020). With the prolongation of the pandemic, the unexpectedly and rapidly implemented distance education became the primary teaching approach of all educational institutions (Yamamoto & Altun, 2020). Education was provided to all grade levels via EBA, except for preschools; however, different online applications were required because of the unforeseen problems that were encountered. Until the EBA live lesson was put into use by the MEB, the use of free virtual classroom applications, such as Microsoft Teams, Hangouts, Zoom, Skype, Google Meet, and similar platforms, was adopted (Yaralı & Kunduracı, 2022).

A number of setbacks were encountered at all levels that arose from being unprepared for the transition from face-to-face to distance education due to the pandemic, but preschools were the most adversely impacted (Can, 2020; İnan, 2020; Aral & Kadan, 2021; Konca & Çakır, 2021; Yaralı & Kunduracı, 2022). In the second semester of the 2019–2020 academic year, preschool teachers shared activities with their students according to their daily education flows through EBA and tried to keep in touch with children and parents by giving online lessons on their own initiative through various digital media platforms (Yaralı & Kunduracı, 2022). Preschool education institutions interrupted face-to-face education owing to the increase in the number of COVID-19 cases in the 2020–2021 academic year. Distance education was implemented again with activities that did not exceed 20 minutes in daily education flows and were delivered to parents via the use of the most appropriate communication tools. Independent kindergartens simultaneously continued both face-to-face and distance education. Children enrolled in independent kindergartens were allowed to attend face-to-face classes with the consent of their parents, and the children whose parents did not want to send them to school were allowed to follow the lessons via online applications.

The closure of schools and public places around the world affected approximately 1.38 billion children (Cluver et al., 2020; Roos et al., 2021). The COVID-19 pandemic has drastically changed the lives of children and adolescents around the world. Much of life has come to a standstill, including the closing of educational institutions, the transition to distance learning, and the requirement to reduce interpersonal contact 'i.e., maintain social distance' (Pečjak et al., 2021). Social isolation, such as the children's inability to visit their friends or relatives frequently, affected their social and emotional behaviors (Xiang et al., 2022). Notwithstanding the various measures adopted, online education could not adequately compensate for the lack of social skills caused by the inability of preschool children to have peer interaction.

Social skills include identifiable and learned behaviors that produce positive social outcomes in interpersonal relationships and social situations (Sorias, 1986; Rutherford, 2001). According to Mathur and Rutherford (1996), as cited in Johns et al. (2005), social skills include avoiding inappropriate behavior in social situations and exhibiting received behaviors. Social skills also include behaviors that individuals must exhibit to perform the roles imposed on them by the society (McFall, 1982, Gresham & Reschly, 1987; Staub & Hunt, 1993). They also include a child's ability to exhibit specific behaviors to initiate and maintain positive interactions with others, without any hindrance in their social environments (Ladd & Mize, 1983; Walker et al., 1988; Westwood, 1993; Önder, 2003). Deficits in social skills may negatively impact several essential domains including academic achievement, interpersonal relationships, behavior, mental health, and adult life outcome (Silveira-Zaldivar et al., 2021).

The COVID-19 pandemic has affected the everyday lives and social relations of preschool children around the world. Cognitive regulation, emotional competences and social skills are fundamentally intertwined in the learning process, and academic learning can happen most effectively when each one of these three dimensions are well supported (Jones & Kahn, 2017, as cited in Kamei & Harriott 2021). While many studies have examined the effect of the pandemic on children, only a few have examined their home environment and social skills pre- and post-pandemic process (Li et al., 2022). From this aspect, this study examined the social skills of preschool children who are continuing their education through online and face-to-face education during the pandemic. In line with this aim, the research hypothesis was determined as "There is a significant difference between the social skills of children who attend preschool face to face and those who prefer online education instead of face-to-face education during the pandemic process." Therefore, this study sought answers to the following questions:

1. At the beginning of the semester, is there any significant difference between the social adaptation and social incompatibility scores of the children who attend face-to-face classes and those who attend online classes?

2. At the end of three-month educational process, is there any significant difference between the social adaptation and social incompatibility scores of the children who

attend face-to-face classes and those who attend online classes?

3. During this three-month period, is there any difference between the social adaptation scores of the children who attend face-to-face classes?

4. During this three-month period, is there any difference between the social incompatibility scores of the children who attend face-to-face classes?

5. During this three-month period, is there any difference between the social adaptation scores of the children who attend online classes?

6. During this three-month period, is there any difference between the social incompatibility scores of the children who attend online classes?

7. Is there any significant difference between social adaptation pre- and post-test scores of children attending face-to-face classes and those of the children attending online classes?

8. Is there any significant difference between social incompatibility pre- and post-test scores of children attending face-to-face classes and those of the children attending online classes?

Methodology

Research Model

This study, which examined the social skills of five-year-old children who attend preschool classes face to face but prefer online education during the pandemic and the relations between face-to-face/online education, used the relational survey model among the general survey models (Karasar, 2012).

Study Group

The Directorate of National Education reported that 1828 children in the five-year-old age group were enrolled in independent kindergartens in the central district during the 2020–2021 academic year. Stratified sampling is used when sub-strata or sub-unit groups exist in a defined population (Yıldırım & Şimşek, 2005). The study group consisted of 296 five-year-old children who were determined and contacted in accordance with the stratified sampling method, which is one of the probability sampling methods. Of these children, 159 attended face-to-face classes, and 137 attended online classes.

Data Collection Tool

In this study, to evaluate the social adaptation and skills of the children, Social Adaptation Skills Scale (SASS), which was developed by Kandır (2004) and Işık (2007) and later given final shape after Işık's reliability and validity study under the supervision of Kandır, was employed. This scale involves two sub-factors, namely, social adaptation and social inadaptability. It consists of 17 statements related to social adaptation in sub-factor 1 and eight statements related to social inadaptability in sub-factor 2.

Table 1 shows SASS results for Kaiser–Mayer–Olkin (KMO) sample measurement test and Bartlett's test. The measurement value sufficiency computed using the former is 0.88, and approximate chi-square value of Bartlett's test is 2930.99, $p = .000 < .05$. The fact that KMO value is almost perfect and Bartlett value is high shows that the factor analysis is applicable to the scale, and there is a correlation between the statements.

Table 1

SASS Results for KMO Sample Measurement and Bartlett's Test

KMO sample	*Value*	*SD*	*p*
Measurement value sufficiency	0.88	-	-
Approximate chi-square value of Bartlett's test	2,930.993	210	.000

Data Collection Process and Analysis

Parents who preferred either face-to-face or online education for their children in independent kindergartens during the 2020–2021 academic year were contacted. The SASS was administered as a pre-test at the beginning of the academic year and as a post-test at the end of the semester. The data obtained were analyzed using Statistical Package for the Social Sciences. Skewness (–0.0339) and kurtosis (–1.045) values were used for the normality test. Skewness and kurtosis values between –1.5 and 1.5 were considered a normal distribution (Tabachnick & Fidell, 2013). The independent samples t-test was used for intergroup comparisons and dependent samples, and the t-test was used for within-group comparisons. The significance level was .05 for the statistical analyses.

Results

Table 2 shows the pre-test scores of the five-year-old children who attend preschool education face-to-face and online with regard to the social adaptation and social incompatibility sub-factors of the SASS.

As shown in Table 2, there was no significant difference between the groups in terms of the social adaptation sub-factor ($p > .05$) or the social incompatibility sub-factor ($p > .05$).

Table 3 shows that there was a significant difference between the groups in terms of the social adaptation sub-factor in favor of the face-to-face education

group at the end of the three-month educational process ($p < .05$). However, after this three-month period, the social incompatibility sub-factor scores of the face-to-face education group were significantly lower than those in the online education group ($p < .05$).

Table 4 shows that after the education process, the social adaptation sub-factor scores of the face-to-face education group significantly increased ($p < .05$), while their social incompatibility sub-factor scores significantly decreased ($p < .05$).

Table 5 shows that after the three-month period, the social adaptation sub-factor scores of the online education group significantly increased ($p < .05$), while their social incompatibility sub-factor scores significantly decreased ($p < .05$).

Table 2

T-test Results According to the SASS Pre-test Sub-factor Scores of the Children in Both Groups

SASS Sub-factor	Group	*N*	*M*	*df*	*t*	*p-value*
Social adaptation	Face to face	159	34.30	294	0.26	.792
	Online	137	34.34			
Social incompatibility	Face to face	159	20.79	204	0.42	.672
	Online	137	20.71			

Table 3

T-test Results According to the SASS Post-test Sub-factor Scores of the Children in the Face-to-face Education and Online Education Groups

SASS Sub-factor	Group	*N*	*M*	*df*	*t*	*p-value*
Social adaptation	Face to face	159	48.58	212.86	87.15	.000*
	Online	137	36.99			
Social incompatibility	Face to face	159	10.02	−59.59	178.28	.000*
	Online	137	17.56			

*p < .05

Table 4

T-test Results According to the Pre- and Post-test Scores of the Face-to-face Education Group for the Sub-factors of the SASS

SASS Sub-factor						Face to face
	Practice	*N*	*M*	*df*	*t*	*p-value*
Social adaptation	Pre-test	159	34.30	158	−98.130	.000*
	Post-test	159	48.58			
Social incompatibility	Pre-test	159	20.79	158	104.191	.000*
	Post-test	159	10.02			

*p < .05

Table 5

T-test Results According to the Pre-and Post-test Scores of the Online Education Group for the Sub-factors of the SASS

SASS Sub-factor						Online
	Practice	N	M	df	t	p-value
Social adaptation	Pre-test	137	34.34	272	15.76	.000*
	Post-test	137	36.99			
Social incompatibility	Pre-test	137	20.71	1.91	16.10	.000*
	Post-test	137	17.56			

*p < .05

Table 6

T-test Results When Comparing the Average of the Differences Between the Pre- and Post-test Mean Scores of the SASS Sub-factors of the Groups

SASS Sub-factor	Group	*N*	Mean Differences Between Averages	*SD*	*t*	*p-value*
Social adaptation	Face to face	159	14.28	1.82	59.30	.000*
	Online	137	2.65	0.69		
Social incompatibility	Face to face	159	−10.77	1.29	32.45	.000*
	Online	137	−3.15	1.41		

*p < .05

Table 6 shows that the increase in the social adaptation mean scores of the face-to-face education group was *M*2 - *M*1 = 14.28, and the increase in the mean scores of the online education group was *M*2 - *M*1 = 2.65. According to the differences between the pre- and post-test mean scores in social adaptation of the face-to-face education group, the scores of the online education group were higher. Similarly, the amount of decrease in the social incompatibility mean scores of the face-to-face education group was calculated as *M*2 - *M*1 = –10.77 and the decrease in the mean scores of the online education group was *M*2 - *M*1 = –3.15. The difference between the pre- and post-test mean scores decreased in the social incompatibility of the face-to-face education group more than the scores of the online education group. As a result of the three-month education period provided to the children who attended face-to-face education and who continued their education online (no additional education was provided to the children in either group), the increase in the pre- and post-test mean score differences in the social adaptation sub-factor of the SASS ($p < .05$) and the decrease in the pre- and post-test mean score differences in the social incompatibility sub-factor ($p < .05$) were significant and in favor of the children who received face-to-face education.

Discussion and Conclusion

This study aimed to determine whether there was any difference in the social adaptation skills of five-year-old preschool children who did not receive any social skills intervention program besides the ongoing curriculum but continued their education in different environments (face-to-face/online) because of the pandemic. Regarding the social adaptation sub-factor of the SASS, there was a significant difference between the face-to-face and online groups in favor of the group that attended face-to-face education after the education period, in which there was no social skills intervention program besides the ongoing curriculum. After the three-month education period, which was not supported with any additional intervention program, the social incompatibility sub-factor scores of the face-to-face education group were significantly lower than those of the online education group. Considering the evaluation of the pre- and post-tests in terms of the social adaptation, the social adaptation sub-factor scores of both groups significantly increased. Likewise, there was a significant decrease in the social incompatibility sub-factor scores. The relationship between the increase in the mean scores of the face-to-face education group and the online education group was examined. The analyses showed that the differences between the pre- and post-test mean scores in the social adaptation sub-factor of the children in the face-to-face education group were higher than those in the online education group. Similarly, the decrease in the mean scores of the children in the face-to-face education group in the social incompatibility sub-factor was greater than that in the online education group. Concordantly, as a result of the three-month education period provided to the children who attended face-to-face education and continued their education online, the increase in the pre- and post-test mean score differences in the social adaptation sub-factor of the SASS ($p < .05$) and the decrease in the pre- and post-test mean score differences in the social incompatibility sub-factor ($p < .05$) were significant and in favor of the children who received face-to-face education.

A large number of studies conducted in diverse fields concerning the pandemic outbreak have revealed its effects on people's lives. Some of these studies have investigated how the development of children is affected in early childhood. Although these studies have used different methods, they concluded that the pandemic process adversely affected their development. Other studies conducted on children's social skills support the present study. Janssen et al. (2020) showed that although parents can spend more time with their children during the pandemic, the time spent with their children is not productive because of financial insecurity, increased health concerns, lack of social and physical activities, and psychological problems, which are the symbolic of COVID-19. In this consideration, the social skill development of children who could not communicate effectively within their family is negatively affected. Social distancing, various restrictions, and the sudden changes in daily life routines that entered people's lives with the pandemic have negatively affected both parents and children (Brown et al., 2020; Chung et al., 2020; Kawaoka et al., 2021; Roos et al., 2021).

The decrease or complete disappearance of children's social stimulation, such as their inability to contact their relatives, peers, and teachers face to face, has adversely affected their psychological health and social skills during the COVID-19 pandemic (Araújo et al., 2020; Shorer & Leibovich, 2020). Children's social interactions have been extremely limited because of the restrictions and health concerns during the pandemic, and these significantly decreased social relations, and have increased their negative feelings while decreasing their skills to control feelings and behaviors (Di Giorgio et al., 2021; Stassart et al., 2021). Furthermore, these decreased social relationships have limited children's chances to experience and express substantial emotions and recognize, understand, and respond to the emotions of others (Wijaya et al., 2021).

Children communicate with their peers when expressing their emotions, developing self-regulation skills, and taking part in social interactions (Holodynski,

2013; Molina et al., 2014; Ewing et al., 2019; Nakamichi et al., 2019). Interaction with their peers allows them to think flexibly, have social competence, express themselves, and make ground among their peers (Liew et al., 2004; Cole et al., 2009; Dennis & Kelemen, 2009; Supplee et al., 2011), for which they must have developed social skills. Preschool children develop social skills by sharing and interacting with their family members at home and with peers at school. They discover social norms and become experienced in using them (Garner & Estep, 2001; Rakozcy & Schmidt, 2013). With the social skills they develop, they both show proper conduct in their relations with people and develop various strategies to have a positive impact on their peers (Wang & Barrett, 2013; Pujiastuti et al., 2022. The inability of children to receive adequate support from one or both of these environments may adversely impact their social skills development.

In line with the findings of this study and other supporting studies, children whose social skills development is negatively affected because of social interaction restrictions during the pandemic can be supported with social skills intervention programs so that they can have equal opportunities with their peers who can attend face-to-face classes. Similarly, supportive programs can be developed for parents to ensure efficient interaction with their children at home. This study investigated the social skills of preschool children who received face-to-face education and online education. Further studies can be conducted with different groups, including children who have not received any education, aiming to determine the effect of the pandemic on children's social skills in different environments.

References

Alisinanoğlu, F., Karabulut, R. & Türksoy, E.(2020). Pandemi Sürecinde Çocukluk Dönemi Korkularına Yönelik Aile Görüşleri [Family views on childhood fears during the pandemic process]. *Internatıonal Journal of Humanıtıes and Educatıon (IJHE), 6*(14), 547 – 568.

Aral, N., & Kadan, G. (2021). Pandemi sürecinde okul öncesi öğretmenlerinin yaşadıkları problemlerin incelenmesi [Investigation of preschool teachers' problems in the pandemic process]. *KAEÜ Sağlık Bilimleri Dergisi, 1*(2), 99-114.

Araújo, L. A., Veloso, C. F., Souza, M. C., Azevedo, J., & Tarro, G. (2020). The potential impact of the COVID-19 pandemic on child growth and development: A systematic review. *Jornal de Pediatria, S0021-7557*(20), 30209–6. Advance online publication. doi:10.1016/j.jped.2020.08.008.

Brown, S. M., Doom, J. R., Lechuga-Peña, S., Watamura, S. E., & Koppels, T. (2020). Stress and parenting during the global COVID-19 pandemic. *Child Abuse & Neglect,* 110(2), 104699. doi:10.1016/j.chiabu.2020.104699

Can, E. (2020). Coronavirüs (Covid-19) pandemisi ve pedagojik yansımaları: Türkiye'de açık ve uzaktan eğitim uygulamaları[Coronavirus (Covid-19) pandemic of the assess to the effects on open and distance education applications in Turkey]. *Açıköğretim Uygulamaları ve Araştırmaları Dergisi, 6*(2), 11-53. Retrieved from https://dergipark.org.tr/tr/pub/auad/issue/55662/761354

Chaabane, S., Doraiswamy, S., Chaabna, K., Mamtani, R., & Cheema, S. (2021). The impact of COVID-19 school closure on child and adolescent health: A rapid systematic review. *Children*, *8*(5), 415. doi:10.3390/children8050415.

Christner, N., Essler, S., Hazzam, A., & Paulus, M. (2021). Children's psychological well-being and problem behavior during the COVID-19 pandemic: An online study during the lockdown period in Germany. *PLoS One, 16*(6 June), 1–21. https://doi.org/ 10.1371/journal.pone.0253473

Chung, G., Lanier, P., & Wong, P. (2020). Mediating effects of parental stress on harsh parenting and parent-child relationship during coronavirus (COVID-19) pandemic in Singapore. *Journal of Family Violence*, 1–12. doi:10.1007/s10896-020-00200-1.

Cluver, L., Lachman, J. M., Sherr, L., Wessels, I., Krug, E., Rakotomalala, S., Blight, S., Hillis, S., Bachman, G., Green, O., Butchart, A., Tomlinson, M., Ward, L. C., Doubt, J., McDonald, K. (2020). Parenting in a time of COVID-19. *The Lancet,* 395(10231), e64. doi:10.1016/S0140-6736(20)30736-4

Cole, P. M., Dennis, T. A., Smith-Simon, K. E., & Cohen, L. H. (2009). Preschoolers' emotion regulation strategy understanding: Relations with emotion socialization and child self-regulation. *Social Development*, *18*(2), 324–352. https://doi.org/10.1111/j.1467-9507.2008.00503.x

Dennis, T. A., & Kelemen, D. A. (2009). Preschool children's views on emotion regulation: Functional associations and implications for social-emotional adjustment. *International Journal of Behavioral Development*, *33*(3), 243–252. https://doi.org/10.1177/0165025408098024

Di Giorgio, E., Di Riso, D., Mioni, G. & Cellini, N. (2021). The interplay between mothers' and children behavioral and psychological factors during COVID-19: An Italian study. *European Child & Adolescent Psychiatry*, 1–12. doi:10.1007/s00787-020-01631-3.

Ewing, E. S. K., Herres, J., Dilks, K. E., Rahim, F. & Trentacosta, C. J. (2019). Understanding of emotions and empathy: Predictors of positive parenting with preschoolers in economically stressed families. *Journal of Child and Family Studies*, *28*(5), 1346–1358. https://doi.org/10.1007/s10826-018-01303-6

Garner, P. W. & Estep, K. M. (2001). Emotional competence, emotion socialization, and young children's peer-related social competence. *Early Education and Development*, *12*(1), 29–48. https://doi.org/10.1207/s15566935eed1201_3

Gilliam, W. S., Malik, A. A., Shafiq, M., Klotz, M., Reyes, C., Humphries, J. E., Murray, T., Elharake, J. A., Wilkinson, D. & Omer, S. B. (2021). COVID-19 Transmission in US Child Care Programs. *Pediatrics*, *147*(1). Doi: 10.1542/peds.2020-031971

Gresham, F. M. & Reschly, D. J. (1987). Dimensions of Social Competence: Method Factors In The Assessment Of Adaptive Behavior, Social Skills And Peer Acceptance. *Journal Of School Psychology,* 108-117.

Hanetz-Gamliel, K., Levy, S., & Dollberg, D. G. (2021). Mediation of Mothers' anxiety and parenting in Children's behavior problems during COVID-19. *Journal of Child and Family Studies*. https://doi.org/10.1007/s10826-021-02115-x

Harvard (2021). *Medical Dictionary of Health Terms.* Retrieved from https://www.health.harvard.edu/j-through-p#app

Hiraoka, D. & Tomoda, A. (2020). Relationship between parenting stress and school closures due to the COVID-19 pandemic. *Psychiatry and Clinical Neurosciences, 74*(9), 497–498. doi:10.1111/pcn.13088

Holodynski, M. (2013). The internalization theory of emotions: A cultural historical approach to the development of emotions. *Mind, Culture, and Activity*, *20*(1), 4–38. https://doi.org/10.1080/10749039.2012.745571

Işık, M. (2007). *Adaptation and implementation of the social adaptation and ability scale with five-and six-year- old kinderganten children* [Master's Thesis, Gazi University].

İnan, H. Z. (2020). Covıd-19 Pandemi sürecinde okul öncesi eğitimin yeniden yapılandırılması [Restructuring early childhood education during the covid-19 pandemic]. *Milli Eğitim Dergisi*, 831-849. DOI: 10.37669/milliegitim.754307

Janssen, L., Kullberg, M. J., Verkuil, B., van Zwieten, N., Wever, M., van Houtum, L., Wentholt, W. & Elzinga, B. M. (2020). Does the COVID-19 pandemic impact parents' and adolescents' well-being? An EMA-study on daily affect and parenting. *PloS One*, 15(10), e0240962. doi:10.1371/journal.pone.0240962.

Johns, B. H. , Crowley, E. P. & Guetzloe, E. (2005). The Central Role of Teaching Social Skills. *Focus on Exceptional Children. 37* (8), 1–8.

Kamei, A. & Harriott. W. (2021). Social Emotional Learning in Virtual Settings: Intervention Strategies. *International Electronic Journal of Elementary Education, 13*(3), 365-371.

Karasar, N. (2012). *Bilimsel araştırma yöntemi* [Scientific research methods]. Ankara: Nobel Yayıncılık.

Kawaoka, N., Ohashi, K., Fukuhara, S., Miyachi, T., Asai, T., Imaeda, M. & Saitoh, S. (2021). Impact of school closures due to COVID-19 on children with neurodevelopmental disorders in Japan. *Journal of Autism and Developmental Disorders,* 1–7. doi:10.1007/s10803-021-05119-0.

Knopik, T. & Domagała-Zyśk, E. (2022). Predictors of The Subjective Effectiveness of Emergency Remote Teaching During The First Phase of The COVID-19 Pandemic. *International Electronic Journal of Elementary Education, 14*(4), 525-538.

Konca, A. S. & Çakır, T. (2021). Pandemi sürecinde uzaktan eğitim ile okul öncesi eğitimden ilkokula geçiş hakkında veli görüşleri [Investigation of parents' views on distance education of children's transition from preschool education to primary school during the pandemicprocess]. *Yaşadıkça Eğitim*, *35*(2), 520-545.

Ladd, G. W. & Mize, J. (1983). A cognitive-social learning model of social skill training. *Psychol, Rev*. 90:127-57

Li, X., Jiao, D., Matsumoto, M., Zhu, Y., Zhang, J., Zhu, Z., Liu, Y., Cui, M., Wang, Y., Qian, M., Ajmal, A., Banu, A. A., Graça, Y., Tanaka, E., Watanabe, T., Sawada, Y., Tomisaki, E. & Anme, T. (2022). Home environment and social skills of Japanese preschool children pre- and post- COVID-19, *Early Child Development and Care,* DOI: 10.1080/03004430.2021.2021896

Liew, J., Eisenberg, N. & Reiser, M. (2004). Preschoolers' effortful control and negative emotionality, immediate reactions to disappointment, and quality of social functioning. *Journal of Experimental Child Psychology*, *89*(4), 298–319. https://doi.org/10.1016/j.jecp.2004.06.004

McFall, M. R. (1982). A review and reformulation of the concept of social skills, *Behavioral Assesment 4*, 1–33

Milli Eğitim Bakanlığı (2020). *Bakan Selçuk, koronavirüs'e karşı eğitim alanında alınan tedbirleri açıkladı*. Retrieved from https://www.meb.gov.tr/bakan-selcuk-koronaviruse-karsi-egitim-alaninda-alinan-tedbirleri-acikladi/haber/20497/tr

Molina, P., Sala, M. N., Zappulla, C., Bonfigliuoli, C., Cavioni, V., Zanetti, M. A. & Raccanello, D. (2014). The emotion regulation checklist–Italian translation. Validation of parent and teacher versions. *European Journal of Developmental Psychology*, *11*(5), 624–634. https://doi.org/10.1080/17405629.2014.898581

Nakamichi, K., Nakamichi, N. & Nakazawa, J. (2019). Preschool socioemotional competencies predict school adjustment in Grade 1. *Early Child Development and Care* 191(2), 1–14. https://doi.org/10.1080/0300443

Önder, A. (2003). *Okul Öncesi Çocukları İçin Eğitici Drama Uygulamaları* [Educational drama applications for preschool children]. İstanbul: Morpa Yayınları.

Pečjak, S., Pirc, T., Podlesek, A. & Peklaj, C. (2021). Some Predictors of Perceived Support and Proximity in Students during COVID-19 Distance Learning. *International Electronic Journal of Elementary Education, 14(1), 51-62.*

Pujiastuti, S. I., Hartati, S. & Wang, J. (2022). Socioemotional Competencies of Indonesian Preschoolers: Comparisons between the Pre-Pandemic and Pandemic Periods and among DKI Jakarta, DI Yogyakarta and West Java Provinces, *Early Education and Development*, DOI: 10.1080/10409289.2021.2024061

Rakozcy, H. & Schmidt, M. F. H. (2013). The early ontogeny of social norms. *Child Development Perspective*, *7*(1), 17–21. https://doi.org/10.1111/cdep.12010

Roos, L. E., Salisbury, M., Penner-Goeke, L., Cameron, E. E., Protudjer, J., Giuliano, R., Afifi T. & Reynolds, K. (2021). Supporting families to protect child health: Parenting quality and household needs during the COVID-19 pandemic. *PloS One*, 16 (5), e0251720. doi:10.1371/journal.pone.0251720.

Rutherford, R. B. (2001) *Teaching Social Skills to At-Risk and Special Needss Students: APositive Instructional Aprroach,* International Conferance on Special Education and Collaboration, Antalya, Turkey

Shorer, M. & Leibovich, L. (2020). Young children's emotional stress reactions during the COVID-19 outbreak and their associations with parental emotion regulation and parental playfulness. *Early Child Development and Care,* 1–11. doi:10.1080/03004430.2020.1806830.

Silveira-Zaldivar, T., Özerk, G. & Özerk, G. (2021). Developing Social Skills and Social Competence in Children with Autism. *International Electronic Journal of Elementary Education, 13(3), 341-363.*

Sorias, O. (1986). Sosyal Beceriler ve Değerlendirme Yöntemleri. *Psikoloji Dergisi. 5* (20), 24–29.

Stassart, C., Wagener, A., & Etienne, A. M. (2021). Parents' perceived impact of the societal lockdown of COVID-19 on family well-being and on the emotional and behavioral State of Walloon Belgian children aged 4 to 13 years: An exploratory study. *Psychologica Belgica*, *61*(1), 186–199. https://doi.org/10.5334/pb.1059

Staub, D. & Hunt, P. (1993). *The Effects of Social Interaction Training on High School Peer Tutors of Schoolmates with Severe Disabilities.* Exceptional Children. Cambridge.

Supplee, L. H., Skuban, E. M., Trentacosta, C. J., Shaw, D. S., & Stoltz, E. (2011). Preschool boys' development of emotional self-regulation strategies in a sample at risk for behavior problems. *The Journal of Genetic Psychology*, *172* (2), 95–120. https://doi.org/10.1080/00221325.2010.510545

Tabachnick, B. G. & Fidell, L. S. (2013). *Using Multivariate Statistics* (sixth ed.) Pearson, Boston.

Walker, H. M., Mcconel, S., Holmes, D., Todis, B., Walker, J. & Golden, N. (1988). *The Walker Social Skills Curriculum*. The Accept Program. Austin, TX: Pro-Ed.

Wang, J., & Barrett, K. C. (2013). Mastery motivation and self-regulation during early childhood. In K. C. Barrett, N. A. Fox, G. A. Morgan, D. J. Fidler, & L. A. Daunhauer (Eds.), *Handbook of self-regulatory processes in development: New directions and international perspectives* (pp. 337–380). Psychology Press/Taylor and Francis.

Westwood, P. (1993). *Commonsense Methods For Children With Special Needs Strategies For The Regular Classrom.* London. Routledge.

Wijaya, R. P. C., Bunga, B. N., & Kiling, I. Y. (2021). Socio-emotional struggles of young children during COVID-19 pandemic: Social isolation and increased use of technologies. *Journal of Early Childhood Research*, 1–15. https://doi.org/10.1177/1476718X211052789

World Health Organization (2020). *WHO Director-General's opening remarks at the media briefing on COVID-19* Retrieved from https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19.

Yamamoto, G. T., & Altun, D. (2020). Coronavirüs ve çevrim içi (Online) eğitimin önlenemeyen yükselişi [The coronavirus and the unstoppable rise of online education]. *Journal of University Research, 3*(1), 25–34. https://doi.org/10.26701/uad.711110

Yaralı, K & Kunduracı, H. (2022). Türkiye'de Covid-19 Pandemi Döneminde Gerçekleştirilen Uzaktan Eğitim Süreci: Okul Öncesi Eğitimin Değerlendirilmesi [Distance education in turkey during the covid-19 pandemic: an investigation of preschool education]. *Mehmet Akif Ersoy Üniversitesi Eğitim Fakültesi Dergisi* 61, 425-452.

Yıldırım, A. & Şimşek, H. (2005). *Sosyal Bilimlerde Nitel Araştırma Yöntemleri* [Qualitative research methods in the social sciences]. Ankara: Seçkin Yayıncılık.

This page is intentionally left blank.

www.iejee.com

iejee

International Electronic Journal of Elementary Education
June 2022, Volume 14, Issue 5, 667-678

The Transversal Competencies of Vietnamese Primary Students and The Relationship With Online Learning Activities During The COVID-19 Pandemic

Nguyen Hong Lien[a,*], Dinh-Hai Luong[b], Hoang Phuong Hanh[c], Sherlyne A. Almonte-Acosta[d], Erlene G. Umali[e], Jailyn N. Puerto[f], Le Anh Vinh[g]

Received : 13 April 2022
Revised : 17 June 2022
Accepted : 28 June 2022
DOI : 10.26822/iejee.2022.271

[a,*] Nguyen Hong Lien, the Vietnam National Institute of Educational Sciences.
E-mail: liennh@vnies.edu.vn
ORCID: https://orcid.org/0000-0002-6198-6286

[b] **Corresponding Author:** Dinh-Hai Luong, the Vietnam National Institute of Educational Sciences.
E-mail: luongdinhhai@vnies.edu.vn
ORCID: https://orcid.org/0000-0003-0167-2645

[c] Hoang Phuong Hanh, the Vietnam National Institute of Educational Sciences.
E-mail: hanhhp@vnies.edu.vn
ORCID: https://orcid.org/0000-0002-4239-1869

[d] Sherlyne A. Almonte-Acosta, Southeast Asian Ministers of Education Organization Regional Center for Educational Innovation and Technology (SEAMEO INNOTECH)
E-mail: she@seameo-innotech.org
ORCID: https://orcid.org/0000-0001-7680-2964

[e] Erlene G. Umali, Southeast Asian Ministers of Education Organization Regional Center for Educational Innovation and Technology (SEAMEO INNOTECH)
E-mail: erlene@seameo-innotech.org
ORCID: https://orcid.org/0000-0002-9905-8282

[f] Jailyn N. Puerto, Southeast Asian Ministers of Education Organization Regional Center for Educational Innovation and Technology (SEAMEO INNOTECH)
E-mail: jailyn@seameo-innotech.org
ORCID: https://orcid.org/0000-0002-8784-5967

[g] Le Anh Vinh, the Vietnam National Institute of Educational Sciences.
E-mail: vinhla@vnies.edu.vn
ORCID: https://orcid.org/ 0000-0001-8100-9303

ISSN: 1307-9298

Abstract

In the context of globalization, ICT is increasingly applied in a wide range of educational activities, especially during the outbreak of the COVID-19 pandemic. In Vietnam, switching from face-to-face to online teaching has been one of the fulfilled objectives of continuing educational activities. This paper is among the first studies to evaluate primary school students' transversal competencies in this context. Through an online survey, 661 fifth-grade students self-assessed their transversal competencies, e.g. problem-solving skills, creative skills, ICT skills, and social and cross-cultural skills. ANOVA analysis revealed that the use of ICT skills and Social and cross-cultural skills among students in private schools is greater than that of students in public schools. In addition, the results of the Pearson correlation analysis pointed out that students' transversal competencies have a strong positive correlation with online learning activities. These findings not only contribute to supporting Vietnamese educational institutions and educational policymakers to adjust online teaching activities to enhance transversal competencies for primary school students but are also a valuable reference for countries with similar backgrounds.

Keywords:

Transversal Competencies, Problem-Solving, Creative Thinking, ICT Skills, Social and Cross-Cultural Skills, Online Learning

Introduction

Context in Vietnam

In the context of the 21st century, the rapid development of science and technology, the knowledge economy, and globalization have required education systems to train human resources to meet the needs of the labor market and the citizens of the global society. Workers of the 21st century need to be able to apply knowledge and skills in flexible contexts (Mann & Huddleston, 2017), as well as skills in communication, critical thinking, problem-solving, working effectively in groups, self-awareness, creativity, and lifelong learning (Economou, 2016; Suarta et al., 2017). Those skills are

transversal competencies and core competencies which are important for human development. Many organizations and countries around the world have researched and developed frameworks on core competencies with concepts related to "transversal competencies" and "transversal skills" (Al-Twairqi & Al-Salmi, 2017; Economou, 2018; OECD, 2019a, 2019b; Visible skills of adults, 2017; Whittemore, 2018).

Vietnam is a developing country with drastic socio-economic changes in recent years. Human resource development and education in line with the new context is becoming a major concern of society, the Party, and the Government, as shown in Resolution No. 29-NQ/TW on Fundamental and comprehensive reform of Education and Training (Communist Party, 2013). The reality also shows that there are gaps between the capacity of Vietnamese workers and the needs of the labor market, especially in critical thinking and problem solving, organizational and management abilities, and adaptability (Le et al., 2020). This shows the inadequate response of education to the needs of employers as well as workers. Therefore, in recent years, Vietnamese education has also begun to pay attention to capacity development for learners, especially soft, adaptive and transversal competencies. The most obvious demonstration of this trend is the promulgation of the 2018 General Education Curriculum, which emphasizes developing learners' competencies (MOET, 2018). This program has mentioned some common competencies needed for students in the 21st century such as Autonomy and self-study; Communication and collaboration, Problem-solving and creativity; Technological competence, and Informatics competence (MOET, 2018). Some schools have incorporated 21st-century skills education programs into their activities (Phenikaa-School, 2021; Vinschool, 2018).

The outbreak of the COVID-19 pandemic has drastically changed educational activities, in which the application of information and communication technology (ICT) has become widespread (Bikse et al., 2021). Online teaching during the pandemic has become a common solution in many countries, including Vietnam. Since Vietnam recognized the effects of the COVID-19, the Ministry of Education and Training (MOET) has rapidly transformed teaching methods to respond to the pandemic. Switching from face-to-face to online teaching has met the purpose of continuing education activities and ensuring safety during the pandemic. However, many challenges are also posed, including the quality of education, the physical and mental health of students, as well as other implications for teachers and families (UNICEF, 2020a). In that context, education requirements for transversal skills and 21st-century skills for students become even more challenging (Latorre-Cosculluela et al., 2021).

Online teaching is conducted via software and applications such as Zoom, Google Meet, Microsoft Team (Nguyen et al., 2021), Zalo, Viber, Zoom chat, Gmail, or Facebook Messenger (UNESCO & UNICEF, 2021) in a way such as giving lectures in class, combined with sending learning materials to students. In addition, some other software is also used to organize activities such as games and competitions to stimulate students' interest such as Quizizz, Kahoot, and Google Forms (Dau, 2022). Online teaching during the COVID-19 pandemic in Vietnam have also faced many challenges, such as limitations in access and quality of learning device and the Internet broadband (UNICEF, 2020b), student health problems and learning interest, teachers' online teaching experiences and skills, and family support (UNICEF, 2020a). Those challenges have had impacts on students' online learning activities and their learning outcomes, especially for primary school students (Dau, 2022).

This article is one of the first studies to evaluate the primary school students' transversal competencies in Vietnam in the context of online teaching during the COVID-19 period. The research aims to examine students' transversal competencies, especially focusing on the competencies stipulated in the 2018 General Education Curriculum, such as problem-solving, creative thinking, information and communication technology skills (ICT skills), and social and cross-cultural skills. At the same time, the research investigated the relationship between those competencies and online teaching activities during the COVID-19 period in Vietnam.

Transversal competencies

As mentioned above, there are many different terms and interpretations related to transversal competencies. Transversal competencies, key competencies, or "transformative competencies" are the knowledge, skills, attitudes, and values (OECD, 2019a; UNESCO & RBE, 2016) that are necessary for all individuals and are developed through a variety of environments (European Commission, 2019), and applicable in many life contexts (OECD, 2005). These are also competencies that enable learners to adapt quickly to the changes and challenges of learning and society (Care et al., 2019). In the same view, Economou (2018) believes that transversal competencies are soft skills that help people to communicate, work in groups, share and cooperate, and solve problems effectively. Vietnam's 2018 General Education Program defines core competencies as those necessary for everyone to live, learn and work effectively (MOET, 2018). These are also the competencies needed by citizens in the 21st century, also known as the 21st-century skills (Erdem, 2019; Griffin & Care, 2014).

Similarly, transversal competency frameworks are pretty diverse. European Commission (2019)

outlined eight core competencies in Literacy; Multilingual; Mathematical; Science, technology and engineering; Digital; Personal, Social, and Citizenship; Entrepreneurship; Cultural awareness and expression competence. UNESCO offered six domains: critical and innovative thinking, interpersonal skills, intrapersonal skills, global citizenship, media and information literacy, and others defined by countries (UNESCO & RBE, 2016). From a teaching and assessment perspective, The Partnership for 21st Century Learning (P21) has developed the P21 Framework in three areas: learning and innovation skills, information, media and technology skills, and life and career skills (P21, 2019). Learning and innovation skills include Critical Thinking and Problem Solving, Creativity and Innovation, Communication, and Collaboration. Information literacy, Media Literacy, Information, and communication technology (ICT) Literacy belongs to the group of information, media, and technology skills. The life and career skills are flexibility and adaptability, leadership and responsibility, initiative and self-direction, productivity and accountability, and social and cross-cultural skills. This framework for transversal skills is used by the research team to develop the research tools. The research team focused on Problem-solving, Creativity, Information & communication technology (ICT), and Social and cross-cultural skills. These competencies are emphasized in Vietnam's 2018 curriculum.

Problem-solving skills

Problem-solving is understood as the ability to apply the counseling process to confront and solve an unfamiliar, actual or multidisciplinary situation to find a solution that is not immediately available in the conventional or innovative ways (OECD, 2003; P21, 2019). Problems can solve through the step theory of Polya (1957) is to understand the problems, develop a plan, execute the plan, and evaluate the problems solving process (Maulyda et al., 2019). The framework of P21 enables problem-solving through identifying and asking important questions, clarifying differences, and providing better solutions (P21, 2019).

Creative thinking

"Creativity" or "creative thinking skills" can be understood as a way of thinking that leads to new products, concepts, approaches, or possibly questions or problems in a different way (Eragamreddy, 2013). Besides, creative thinking skills also include flexible thinking, generating new and original ideas, and developing ideas (Anwar et al., 2012; P21, 2019). P21's framework states that creative thinking includes thinking creatively to generate new ideas and improve existing ones, working creatively to implement and communicate new ideas, being open to diverse perspectives, and creating new products from those ideas (P21, 2009).

ICT skills

ICT skills are understood as proficiency in information and communication technology. Nikitakis (2007) defined ICT skills as the ability to recognize, detect, evaluate and use information effectively (Oguguo et al., 2020). More specifically, Anyim (2018) argued that ICT skills are associated with ethically finding, accessing, managing, sharing, and creating information using digital tools (Onyebinama, 2021). This interpretation also shows agreement with the framework of P21. According to P21 (2009), ICT literacy effectively uses technology in communication. In particular, the use of technology to successfully research, access, evaluate, create information, and communicate using information. In addition, ICT skills also emphasize applying ethical principles and confidentiality in the process of use.

Social and cross-cultural skills

Social and cross-cultural skills are related to human behavior in societies and cultures. Argyle (1994) argued that social skills govern human behavior in verbal and non-verbal interactions among individuals according to different cultures (Sozen et al., 2020). Because of the diversity in human behavior across cultures, a globalized society requires skills to adapt to different cultures. The framework of P21 assumes that a socially and cross-culturally competent person knows how to interact with others and work in diverse groups effectively. Social competence focuses on effective communication through being able to listen and express opinions at the right time and showing respect for self and fellow communicators. Cross-cultural competence focuses on communicating and working with people from different cultures, reacting openly and respecting differences, and utilizing these differences to generate new ideas (P21, 2009).

The COVID-19 pandemic and online teaching have raised the issue of education quality. Thus, the research team has been interested in the online learning activities of primary school students, their transversal competencies, and the relationship between those online learning activities and those competencies. Therefore, this study has focused on clarifying two research questions:

- What is the current status of the Vietnamese primary school students' transversal competencies? Do these competencies vary among groups of students in different types of schools?

- How is the relationship between the online learning activities of Vietnamese primary students and their transversal competencies?

This article begins with the Introduction that introduces the context of Vietnamese primary education,

education during the COVID-19 pandemic, and an overview of research on transversal competencies. In the next section, the research methods are presented in detail. The results of the data analysis are described in the Findings section, and the interpretation is presented in the Discussions. Finally, further studies are proposed in the Conclusion.

Methods

The research team took that quantitative approach to investigate the status of transversal competencies of primary school students in Vietnam and at the same time, examine the relationship between these competencies and their participation in online learning activities. Statistical analyses were used to determine the children's performance in online learning activities and skills-related activities to answer the first research question. The range of mean scores was compared with the mean level (see Table 1) to determine the overall assessment level of the group. Furthermore, the ANOVA analysis method was applied to determine the difference among student groups in different types of schools for the above activities. In the second research question, the Pearson correlation analysis method was used to find out the relationship between 5th graders' online learning activities and their transversal competencies. The data analysis methods were carried out in SPSS software.

Table 1
Ranges of mean score

Range of mean score	Mean level
1.00 – 1.80	Never/Strongly Disagree
1.81 – 2.60	Rarely/Disagree
2.61 – 3.40	Sometimes/Neutral
3.41 – 4.20	Often/Agree
4.21 – 5.00	Always/Strongly Agree

Instrument

The survey tools were designed to collect 5th graders' evaluations of their online learning activities as well as their performance levels in transversal competencies. The research team based on teaching activities, teaching methods, and skills to be formed specified in the 2018 Vietnam Curriculum to specify the factors and their items. First, online learning activities of Vietnamese primary school students were referenced, such as playing games, using interactive applications, group activities, discussions, and project-based learning (see Table 9). We also matched the required skills of the 2018 Vietnam Curriculum with the 21st-century skills framework (P21, 2009), from which four groups of skills are selected, which were Problem-solving skills (see Table 5), Creative skills (see Table 6), ICT skills (see Table 7), Social and cross-cultural skills (see Table 8).

The questionnaire was designed in three parts. The first part provided information about the research, including the research purpose, research content, and the research team contacts. In addition, terms related to the participation of students were also required to be answered (see Table 2). The second part included information related to the student's gender and the student's school name (coded according to the type of school as shown in Table 3). The third part consisted of 27 items on the 5-Likert scale, from 1 (Strongly disagree) to 5 (Strongly agree). These items were synthesized from five factors, experiencing online learning activities (7 items), Problem-solving skills (5 items), Creative skills (4 items), ICT skills (5 items), and Social and cross-cultural skills (6 items). The research team used the Google Forms application to design the survey forms and share the questionnaires with the survey respondents through online platforms.

Table 2
Agreements to participants

ID	Agreement	Respondent
1	I understand the information about participating in the study	Student
2	My parents agreed to let me participate in the survey	Student
3	I participate in the survey voluntarily	Student
4	I have been informed and have understood the information about participating in the study	Parents of student
5	I consent to my child taking part in the survey	Parents of student

Participants

The study applied a convenient sampling method. The study respondents are 5th-grade students who have participated in online learning activities in Vietnam. There are two types of primary schools, which are public and private. The public primary schools were chosen to represent schools in urban or rural areas. The research team also selected representatives from private primary schools. The three schools represent different types of schools urban public schools, rural public schools, and private schools. Grade 5 students at these schools were contacted and invited to participate in the online survey voluntarily with the consent of their parents. A total of 726 attendances were recorded. Sixty-five records were excluded due to failure to fully accept the five terms of consent to participate in the survey with three provisions for students and two provisions for students' parents. Therefore, the remaining data set of 661 records (see Table 3) is used to answer the proposed research questions.

Table 3
Student groups according to the school types

Characteristic	Participant	Percentage
School types	661	100.00
Private school in urban	246	37.22
Public school in rural	237	35.85
Public school in urban	178	26.93
Gender	661	100.00
Male	342	51.74
Female	319	48.26

Surveying

The research proposal was proposed by the Vietnam National Institute of Educational Sciences (VNIES) and evaluated by SEAMEO INNOTECH. This study was implemented in two phases. In the first stage, survey tools were developed based on a literature review. The research team review literature in the area and specified the factors and their items. Then, a pilot survey of 44 primary students was conducted, and the test results were used to refine the toolkit. For the second phase, the research team coordinated with the schools to conduct the survey. School administrators assessed the relevance of the survey's content and supported the research team in connecting with students and their parents. Surveys are sent to students through internet-based applications. The children responded to the questionnaire with the consent and support of the student's parents. Data collection was carried out over two months, from September 30 to November 30, 2021.

Findings

Transversal competencies of primary students

A survey of 661 primary students showed that they regularly perform activities related to transversal competencies during online learning (*Mean* = 3.93, *SD* = .53). Similar to transversal competencies, component skills were also shown on a regular level. In which, creative skills had the lowest average rating (*Mean* = 3.76, *SD* = .68), in contrast, social and cross-cultural skills have the highest average rating (*Mean* = 4.03, *SD* = .61).

Table 4
Perspectives of Vietnamese primary students on their transversal competencies

Variable	N	Min	Max	Mean	Std. Deviation	Mean level
Transversal competencies	661	1.96	5	3.93	.53	Agree
Problem-solving skills	661	1	5	3.96	.61	Agree
Creative skills	661	2	5	3.76	.68	Agree
ICT skills	661	1	5	3.97	.59	Agree
Social and cross-cultural skills	661	1	5	4.03	.61	Agree

Problem-solving skills

The 5th graders regularly perform activities related to problem-solving skills. Table 5 presented their assessment of skills in the group. The data showed similarity between activities in the problem-solving process, ranging from problem identification (*Mean* = 3.92, *SD* = .75), finding supporting information (*Mean* = 3.93, *SD* = .76), sharing, discussion (*Mean* = 3.96, *SD* = .77), to the application of knowledge, skills, experience (*Mean* = 4.05, *SD* = .73), problem solving (*Mean* = 3.95, *SD* = .78).

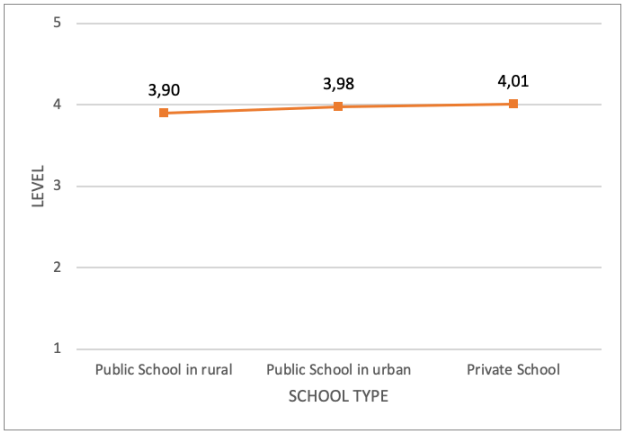
Table 5
Perspectives of Vietnamese primary students on their problem-solving skills

Variable	N	Min	Max	Mean	Std. Deviation	Mean level
Problem-solving skills (Cronbach's Alpha = .87)	661	1	5	3.96	0.61	Agree
I can identify problems that need to be solved in my study and life.	661	1	5	3.92	0.75	Agree
You can find relevant information to help with problem-solving.	661	1	5	3.93	0.76	Agree
I discuss with others to find a way to handle the situation when necessary.	661	1	5	3.96	0.77	Agree
I use my knowledge, skills, and experience to develop solutions to handle situations and problems.	661	1	5	4.05	0.73	Agree
I can handle problems in my study and life.	661	1	5	3.95	0.78	Agree

Figure 1 shows the levels of assessment of problem-solving skills by student groups in different types of schools. Overall, there was a slight difference in the assessment of problem-solving skills between the public school in the rural group (*Mean* = 3.90, *SD* = .63) and the public school in the urban group (*Mean* = 3.98, *SD* = .61) and the private school in the urban student group (*Mean* = 4.01, *SD* = .59). The results of the ANOVA test ($F_{(2, 658)}$ = 2.17, *p* = .11) showed that there was no statistically significant difference in problem-solving skills among groups of students in other types of schools. However, when comparing each group, the research team found a statistically significant difference between the public school in the rural group and the private school group (*Mean difference* = .11, *p* = .04).

Figure 1

Mean comparison of problem-solving skills among student groups based on school types



Creative thinking skills

Regarding the creative skills, Vietnamese 5th graders regularly perform the related activities as listed in Table 6. The data showed similarity of opinion among activities in the creative skills, includes thinking about new ideas (*Mean* = 3.76, *SD* = .68), testing new ways (*Mean* = 3.85, *SD* = .80), creating new own product (*Mean* = 3.77, *SD* = .87), change personal opinion (*Mean* = 3.64, *SD* = .89).

Table 6

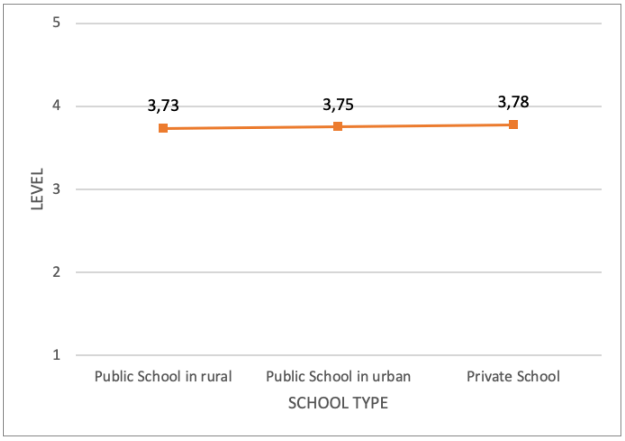
Perspectives of Vietnamese primary students on their creative thinking

Variable	N	Min	Max	Mean	Std. Deviation	Mean level
Creative skills (Cronbach's Alpha = .82)	661	2	5	3.76	.68	Agree
I often think about new ideas, new ways to solve tasks, problems.	661	1	5	3.85	.80	Agree
I often try new ways and ideas.	661	1	5	3.75	.84	Agree
I often create my own works in my study and life.	661	1	5	3.77	.87	Agree
I often easily change my personal opinion to get new solutions.	661	1	5	3.64	.89	Agree

There was a similar level of perception among groups of different types of schools in these skills. Figure 2 shows the mean values of the survey groups, *Mean* = 3.73, *SD* = .68 for public school in rural, *Mean* = 3.75, *SD* = .67 for public school in urban, and *Mean* = 3.78, *SD* = .69 for private school. ANOVA test method among groups of students was applied, and the results showed no statistically significant difference among these groups ($F_{(2, 658)}$ = .28, p = .76).

Figure 2

Mean comparison of creative skills among student groups based on school types



ICT skills

The ICT skills of Vietnamese primary students consist of five contents, and they self-assessed the frequency of regularly performing these activities (*Mean* = 3.97, *SD* = .59). Table 7 describes the results of the statistical analysis of the ICT skills and each specific activity. The data show that the skills of finding information on digital platforms are most proficient (*Mean* = 4.19, *SD* = .67); in contrast, the activity of creating information products on the internet platform was used less in the group (*Mean* = 3.67, *SD* = 1.02). The remaining three activities, including evaluation of searched information, use of searched information, and protection of personal information safety on internet platforms, have similar ratings (see Table 7).

Table 7

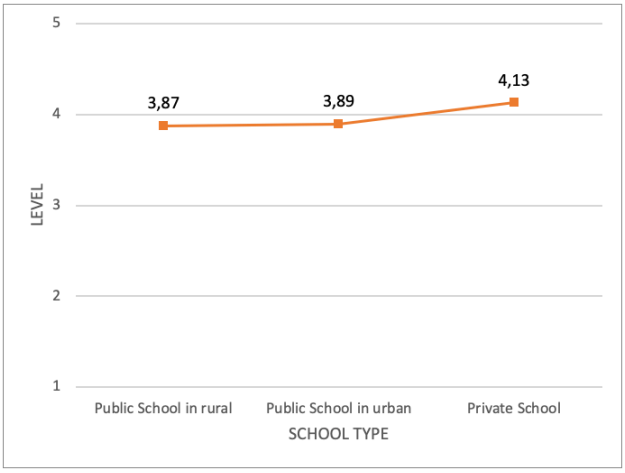
Perspectives of Vietnamese primary students on ICT skills

Variable	N	Min	Max	Mean	Std. Deviation	Mean level
ICT skills (Cronbach's Alpha = .77)	661	1	5	3.97	.59	Agree
I know how to find information on the Internet with digital devices.	661	1	5	4.19	.67	Agree
I know how to select and evaluate information found on the Internet	661	1	5	3.98	.76	Agree
I can use the information I find on the Internet to solve my academic and life tasks	661	1	5	3.98	.77	Agree
I know how to protect personal information and safety when using the Internet.	661	1	5	4.04	.82	Agree
I can create digital products (articles, videos, images posted on the Internet)	661	1	5	3.67	1.02	Agree

Figure 3 illustrates the comparison of the level of ICT skills among student groups by type of school. The data show that there is a similarity in ICT skills of student groups between public school in rural (*Mean* = 3.87, *SD* = .60) and public school in urban (*Mean* = 3.89, *SD* = .59). Besides, the assessment of these groups is different from that of the group of students at private school (*Mean* = 4.13, *SD* = .54). The results of the ANOVA test ($F_{(2, 658)}$ = 13.94, *p* = .001) show that there is a statistically significant difference in the level of proficiency in ICT skills among student groups in different types of schools. Specifically, there is a statistically significant difference in the perceptions of student groups on ICT skills between Public school in rural and Private school (*Mean difference* = .26, *p* = .001), and between Public school in urban and Private school (*Mean difference* = .24, *p* = .001).

Figure 3

Mean comparison of ICT skills among student groups based on school types



Social and cross-cultural skills

Social and cross-cultural skills of Vietnamese primary students were self-assessed at the level of frequent performance activities (*Mean* = 4.03, *SD* = .61). Table 8 describes the performance of activities related to these skills. The data show that the items treated equally, regardless of cultural background or gender were rated the highest by students, at Strongly Agree (*Mean* = 4.23, *SD* = .81). Other items were self-assessed at Agree, including respecting differences (*Mean* = 4.17, *SD* = .73), sharing and helping friends (*Mean* = 4.04, *SD* = .73).

Figure 4 shows the general performance levels for social and cross-cultural skills by student groups by types of schools. The data show that there is a small difference in social and cross-cultural skills among different student groups, in which the Public School in the rural group has a *mean* = 3.97, *SD* = .58, Public School in urban has a mean = 4.01, SD = .62, and Private School student group has a *mean* = 4.11, *SD* = .63. The results of the ANOVA test analysis ($F_{(2, 658)}$ = 3.33, *p* = .03) show that there is a statistically significant difference among these three groups of students, there is a difference between the public school in rural students and Private School students (*Mean difference* = .14, *p* = .03). In contrast, there is no statistically significant difference between Public School in urban and Public School in rural groups (*Mean difference* = .04, *p* = .85), and with Private School (*Mean difference* = .10, *p* = .31).

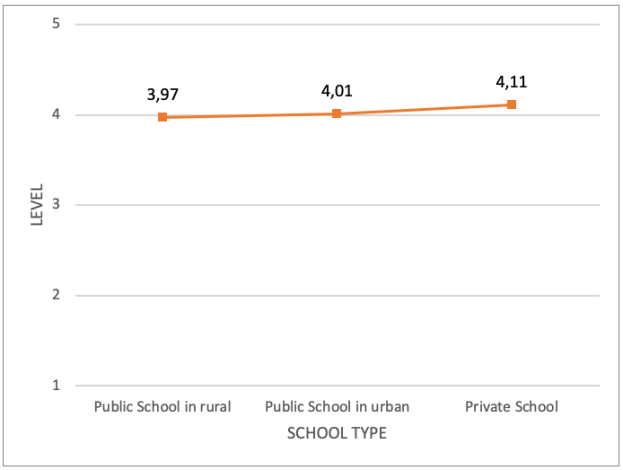
Table 8

Perspectives of Vietnamese primary students on social and cross-cultural skills

Variable	N	Min	Max	Mean	Std. Deviation	Mean level
Social and cross-cultural skills (Cronbach's Alpha = .88)	661	1	5	4.03	.61	Agree
I respect people's diversity and individual differences.	661	1	5	4.17	.73	Agree
I share and help my classmates with learning and life issues.	661	1	5	4.04	.73	Agree
I can communicate with people with different personalities and backgrounds.	661	1	5	3.97	.77	Agree
I can work with people with different personalities and backgrounds.	661	1	5	3.90	.78	Agree
I am comfortable communicating with people from other regions or countries.	661	1	5	3.89	.84	Agree
I treat everyone equally, regardless of cultural background, gender.	661	1	5	4.23	.81	Strongly Agree

Figure 4

Mean comparison of Social and cross-cultural skills among student groups



The relationship between students' online learning activities and their relationship to transversal competencies

Students' online learning activities

Students actively participated in online learning activities (*Mean* = 4.03, *SD* = .59). Table 9 listed seven activities commonly used in online teaching during the COVID-19 pandemic. The data showed that familiarization with applications and software is done the most by children (*Mean* = 4.24, *SD* = .74). In contrast, problem solving activities when learning online were the least performed (*Mean* = 3.63, *SD* = .91). Similarly, the remaining activities are assessed at the frequency of use in the online learning process. It is using a variety of activities (*Mean* = 4.20, *SD* = .81), group discussions (*Mean* = 4.17, *SD* = .79), project activities (*Mean* = 3.94, *SD* = .83), speak and discuss (*Mean* = 4.04, *SD* = .81), communicate with friends (*Mean* = 3.97, *SD* = .91).

Table 9

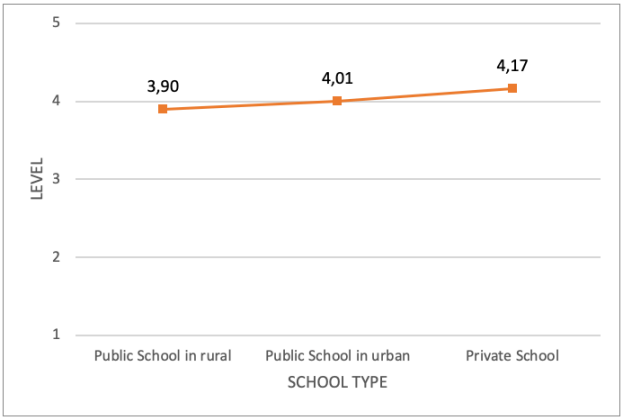
Students' opinions on online learning activities during the COVID-19 pandemic

Variable	N	Min	Max	Mean	Std. Deviation	Mean level
Online learning activities (Cronbach's Alpha = .84)	661	1	5	4.03	.59	Agree
Various online learning activities are organized (e.g. listening to lectures, playing games, using interactive applications).	661	1	5	4.20	.81	Agree
I can participate in group activities and discussions when studying online.	661	1	5	4.17	.79	Agree
I was asked to create project products such as videos, pictures, handmade products, etc. when studying online.	661	1	5	3.94	.83	Agree
I was asked to solve many subject problems when I was studying online.	661	1	5	3.63	.91	Agree
I can speak and discuss my personal opinions and solutions when studying online.	661	1	5	4.04	.81	Agree
I know software and technology applications when I study online.	661	1	5	4.25	.74	Strongly Agree
I communicate a lot with my friends when I study online.	661	1	5	3.97	.91	Agree

Figure 5 represents the ratings of student groups by types of schools on online learning activities. The results pointed out a difference in perception between the groups, in which the public school in the rural group has a *mean* = 3.90, *SD* = .66, the public school in the urban group has a *mean* = 4.01, *SD* = .56, and the group of private school students has a *mean* = 4.17, *SD* = .51. The results of the ANOVA test ($F_{(2, 658)}$ = 12.90, *p* = .001) showed that there is a statistically significant difference in the frequency of participating in online learning activities among these groups between public school in rural and private school students (*Mean difference* = .27, *p* < .001), and between public school in urban and private school students (*Mean difference* = .16, *p* = .009). In contrast, there was no statistically significant difference in this term between the public school in rural students and the public school in urban students (*Mean difference* = .11, *p* = .19).

Figure 5

Mean comparison of the participation in online learning activities among student groups



To answer the second research question, the research team conducted a Pearson correlation analysis between online learning activities and transversal competencies (Problem-solving skills, Creative skills, Information & communication technology skills, and Social and cross-cultural skills). Furthermore, this analysis was also interested in the relationship among different school types (see Table 10).

Table 10 showed that students' transversal competencies have strong positive correlation with online learning activities (*r* = .72, *p* < .01). Considering each component competency, activities have moderate positive correlation to Creative skills (*r* = .54, *p* < .01) and Social and cross-cultural skills (*r* = .56, *p* < . 01). In addition, activities have strong positive correlation with ICT skills (*r* = .61, *p* < .01) and Problem-solving skills (*r* = .68, *p* < .01). Thus, in the process of online learning in Vietnam, the enhancement of the learning activities for 5th graders show a tendency to increase the performance level of their transversal competencies.

When looking at closer these relationships by type of school, it was easy to see that the correlation value of the public school is higher than the correlation value of the private school in each of their relationship (see Table 10), especially in Problem-solving skills, and Creative skills. Moreover, in the public school, the correlation values of the urban public school tended to be slightly higher than the correlation values of the rural public school in all aspects.

Discussions

The study showed differences among primary students from school types in terms of online learning activities during the COVID-19 pandemic and their transversal skills. The findings explored the statistically significant difference between public schools in rural and private schools regarding students' participation in online learning activities. There is a statistically significant difference between students in public schools in rural areas and private schools. From the context of Vietnam, this result can be explained by the clear difference between educational curriculum and teaching conditions in rural public schools and private schools. Public schools in Vietnam mostly adhere to the national curriculum in the teaching process and add some extra-curricular activities according to the specifics of the schools. Meanwhile, the educational program in private schools is more flexible, including national programs and school programs based on international programs, which are suitable for school conditions (Do, 2021). Private schools are considered to be more modern in terms of equipment, and at the same time, the students' families are better off than those of public schools in rural areas. Besides, for the surveyed schools, class sizes for private schools ranged from 25 to 30 students per class, while for public schools, that number could be double. The factor of teacher quality also needs to be taken into account between private and public schools in rural areas. Some previous research showed that teachers in private schools have more professional development activities to improve their professional capacity than in public schools (Hoang et al., 2020). This leads to private schools having greater flexibility in organizing teaching, especially online teaching, and ensuring better teaching quality. The fact also shows that private schools are rated higher in terms of quality than public schools, being the choice of families with well-off living conditions (EU-Vietnam Bussiness Network, 2018).

Meanwhile, there is no statistically significant difference between public schools in rural areas and public schools in urban areas in terms of students' online learning activities and transversal competencies. This can explain that there are not too significant differences in terms of facilities, programs, and class sizes between public schools in the two regions. In general, the public schools in the two areas mainly use the national curriculum in teaching. However, urban public schools tend to pay more attention to the development of the school's extra-curricular programs and teachers' capacity. The research results also show that there is no statistically significant difference in online learning activities and students' transversal competencies between private and public schools in urban areas.

This study contributes to the promotion of the participation level of online learning activities during the COVID-19 period from primary student feedback. The results show that students often perform learning activities through many software and applications when learning online. Vietnamese teachers have tried to use a variety of software and applications in teaching and assessment to ensure learning quality (UNESCO & UNICEF, 2021; UNICEF, 2020a). Besides, the activities of discussion, gameplay, and group working are also regularly attended by students. It shows that primary schools in Vietnam have adapted to the online learning environment, although they have not yet prepared for this option.

Research results show a positive correlation between students' level of participation in online learning

Table 10

Relationship between Vietnamese primary students' online learning activities and transversal competencies

Variable	Online learning activities			
	All	Public school in rural	Public school in urban	Private school
Transversal competencies	.72**	.75**	.77*	.60**
Problem-solving skills	.68**	.72**	.75**	.59**
Creative skills	.54**	.60**	.64**	.41**
Information & communication technology skills	.61**	.59**	.66**	.52**
Social and cross-cultural skills	.56**	.55**	.66**	.47**

Note: ** Correlation is significant at the 0.01 level (2-tailed)

activities and transversal competencies. This means that students who engage in online learning activities more often have higher levels of transversal competencies. This is also consistent with the results of studies related to participation in ICT-supported learning activities and student learning outcomes. To some extent, online learning with diverse application platforms also stimulates students' interest and engagement in learning (Hermanto & Srimulyani, 2021). Students' learning motivation is considered one of the important factors in helping them achieve their learning goals, including skills development (Taurina, 2015).

Conclusions

This article is one of the first studies to evaluate primary school students' transversal competencies in online learning. Findings show that Vietnamese primary school students self-assessed their transversal competencies as good level, equivalent to a mean value of 3.93 on a scale of 5 Likert. By school type, students in private schools tend to outperform students in public schools in the same skills. Similarly, public school students in urban tend to outperform rural public-school students. In addition, the results of the Pearson correlation analysis pointed out that students' transversal competencies have a strong positive correlation with online learning activities.

This paper also has some limitations. Limited resources prevented the research team from collecting survey information according to different regions and/or socio-economic conditions, which is a possible direction for further research. Besides, investigating the relationship between transversal competencies and academic achievement of primary school students is also a future interest.

Acknowledgment

This article is a product of the project "Practices in Teaching and Assessment of Transversal Skills in Primary Schools in Vietnam" (No. ERIO/ERU 2021-11), sponsored by SEAMEO INNOTECH. The authors would like to thank the members of the research team and the collaborators who carried out the project and assisted in data collection for the study.

References

Al-Twairqi, N. W., & Al-Salmi, N. M. (2017). *Teaching Life Skills for Students*. E-Kutub Ltd. -

Anwar, M. N., Aness, M., Khizar, A., Naseer, M., & Muhammad, G. (2012). Relationship of creative thinking with the academic achievements of secondary school students. *International Interdisciplinary Journal of Education*, *1*(3), 44-47.

Bikse, V., Lusena-Ezera, I., Rivza, P., & Rivza, B. (2021). The Development of Digital Transformation and Relevant Competencies for Employees in the Context of the Impact of the COVID-19 Pandemic in Latvia. *Sustainability*, *13*(16), 9233. https://doi.org/10.3390/su13169233

Care, E., Vista, A., & Kim, H. (2019). *Assessment of Transversal Competencies: Current Tools in the Asian Region*. UNESCO Bangkok.

Communist Party. (2013). *Nghị quyết số 29-NQ/TW của Hội nghị* trung ương 8 Khoá XI về *Đổi mới căn bản, toàn diện giáo dục và đào tạo* [Resolution No. 29-NQ/TW of the 8th Plenum of the Central Committee of the 11th Session on Fundamental and Comprehensive Innovation in Education and Training]. https://thuvienphapluat.vn/van-ban/Thuong-mai/Nghi -quyet-29-NQ-TW-nam-2013-doi-moi-can-ban-toan-dien-giao-duc-dao-tao-hoi-nhap- quoc-te-212441.aspx

Dau, T. T. L. (2022). Remote Teaching amid the Covid-19 Pandemic in Vietnam: Primary School EFL Teachers' Practices and Perceptions. *AsiaCALL Online Journal*, *13*(1), 1-21. https://asiacall.info/acoj/index.php/journal/article/view/101/48

Do, T. M. H. (2021). *Bilingual curriculum enactment in Vietnam in an era of economic and social reform* Queensland University of Technology]. https://eprints.qut.edu.au/208014/

Economou, A. (2016). *Research Report on Transversal Skills Frameworks*. http://www.ats2020.eu/images/deliverables/D1.1_TransversalSkillsFrameworks_CP.pdf

Economou, A. (2018). *ATS2020-Assessment of Transversal Skills 2020 D1. 3: ATS2020 Learning and Assessment Model*. http://www.ats2020.eu/images/deliverables/D1.3_LearningAssessmentModel_CP.pdf

Eragamreddy, N. (2013). Teaching creative thinking skills. *International Journal of English language & translation studies*, *1*(2), 124-145. https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.403.4305&rep=rep1&type=pdf

Erdem, C. (2019). Chapter one Introduction to 21st century skills and education. *21st Century Skills and Education*, 1. Cambridge Scholars Publishing.

European Commission, D.-G. f. E., Youth, Sport and Culture. (2019). *Key competences for lifelong learning*. Publications Office of the European Union. https://doi.org/10.2766/291008

EU-Vietnam Bussiness Network. (2018). *Education in Vietnam*. http://www.ukabc.org.uk/wp-content/uploads/2018/09/EVBN-Report-Education-Final-Report.pdf

Griffin, P., & Care, E. (2014). *Assessment and teaching of 21st century skills: Methods and approach*. Springer.

Hermanto, Y. B., & Srimulyani, V. A. (2021). The challenges of online learning during the covid-19 pandemic. *Jurnal Pendidikan Dan Pengajaran*, *54*(1), 46-57. https://doi.org/10.23887/jpp.v54i1

Hoang, A.-D., Hang, T. T., & Thuy, T. N. (2020). *Thói quen phát triển chuyên môn của giáo viên ở các trường phổ thông Việt Nam* [Professional development habits of education members in Vietnamese high schools]. https://edarxiv.org/94hbg/

Latorre-Cosculluela, C., Suárez, C., Quiroga, S., Sobradiel-Sierra, N., Lozano-Blasco, R., & Rodríguez-Martínez, A. (2021). Flipped Classroom model before and during COVID-19: using technology to develop 21st century skills. *Interactive Technology and Smart Education*, *18*(2), 189-204. https://doi.org/10.1108/ITSE-08-2020-0137

Le, Q. T. T., Doan, T. H. D., Nguyen, Q. L. H. T. T., & Nguyen, D. T. P. (2020). Competency Gap in the Labor Market: Evidence from Vietnam. *The Journal of Asian Finance, Economics and Business*, *7*(9), 697-706. https://doi.org/10.13106/JAFEB.2020.VOL7.NO9.697

Mann, A., & Huddleston, P. (2017). Schools and the twenty-first century labour market: perspectives on structural change. *British Journal of Guidance & Counselling*, *45*(2), 208-218. https://www.researchgate.net/profile/Anthony-Mann/publication/311929922_Schools_and_the_twenty-first_century_labour_market_perspectives_on_structural_change/links/5dc42f734585151435f2e453/Schools-and-the-twenty-first-century-labour-market-perspectives-on-structural-change.pdf

Maulyda, M. A., Hidayati, V. R., Rosyidah, A. N. K., & Nurmawanti, I. (2019). Problem-solving ability of primary school teachers based on Polya's method in Mataram City. *Pythagoras*, *14*(2), 139-149. https://doi.org/10.21831/pg.v14i2.28686

MOET. (2018). *General Education Curriculum*. https://data.moet.gov.vn/index.php/s/LETzPhj5sGGnDii#pdfviewer

Nguyen, T. T., Vuong, Q. A., Bui, T. D., Dang, T. P., & Dang, T. T. H. (2021). *Some initial studies on adaptive education of Vietnam's general education in the context of Covid-19*. Conference on Sustainable development of general education quality in the digital era, Hanoi, Vietnam.

OECD. (2003). *The PISA 2003 Assessment Framework - Mathematics, Reading, Science, and Problem Solving, Knowledge and Skills*. Paris. https://www.oecd.org/education/school/programme forinternationalstudentassessmentpisa/33694881.pdf

OECD. (2005). *Definition and selection of key competencies: executive summary* (TD/TNC 106.403). https://www.oecd.org/pisa/35070367.pdf

OECD. (2019a). *OECD Future of Education and Skills 2030 - Conceptual learning framework: Transformative competencies for 2030*. OECD.

OECD. (2019b). *OECD Future of Education and Skills 2030. Conceptual Learning Framework. Transformative Competencies for 2030*. OECD. https://www.oecd.org/education/2030-project/teaching-and-learning/learning/transformative-competencies/Transformative_Competencies_for_2030_concept_note.pdf

Oguguo, B. C., Okeke, A. O., Dave-Ugwu, P. O., Ocheni, C. A., Ugorji, C. O., Nwoji, I. H. N., & Ike, I. C. (2020). Assessment of ICT Skills Relevant for Effective Learning Possessed by Undergraduate Students at University of Nigeria. *International Journal of Higher Education*, *9*(4), 206-215. https://doi.org/10.5430/ijhe.v9n4p206

Onyebinama, C. O. (2021). Information and Communication Technology (ICT) Skills Usage Amongst Undergraduate Students in Universities in Imo State. *Library Philosophy and Practice (e-journal)*. 5523. https://digitalcommons.unl.edu/libphilprac/5523 https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=10211&context=libphilprac

P21. (2009). *P21 framework definitions*. ERIC Clearinghouse. https://files.eric.ed.gov/fulltext/ED519462.pdf

P21. (2019). *Framework for 21 st Century Learning Definitions*. http://static.battelleforkids.org/documents/p21/P21_Framework_DefinitionsBFK.pdf

Phenikaa-School. (2021). *21st Century Skills*. Retrieved 15 June from https://en.phenikaa.edu.vn/21st-century-skills/

Sozen, A. I., Tanaka, T., & Nakano, S. (2020). Cross-Cultural Social Skills of Turkish Students in Japan: Implications for Overcoming Academic and Social Difficulties During Cross-Cultural Transition. *IAFOR Journal of Psychology & the Behavioral Sciences, 6*(1), 15-41. http://iafor.org/archives/journals/iafor-journal-of-psychology-and-the-behavioral-sciences/10.22492.ijpbs.6.1.02.pdf

Suarta, I. M., Suwintana, I. K., Sudhana, I. F. P., & Hariyanti, N. K. D. (2017, September). Employability skills required by the 21st century workplace: A literature review of labor market demand. In *International Conference on Technology and Vocational Teachers (ICTVT 2017)* (pp. 337-342). Atlantis Press.

Taurina, Z. (2015). Students' motivation and learning outcomes: Significant factors in internal study quality assurance system. *International Journal for Cross-Disciplinary Subjects in Education (IJCDSE), 5*(4), 2625-2630.

UNESCO, & UNICEF. (2021). *Viet Nam Case Study: Situation Analysis on the Effects of and Responses to COVID-19 on the Education Sector in Asia*. UNICEF Regional Office for South Asia; UNICEF East Asia and Pacific Regional Office; UNESCO Bangkok Office. https://www.unicef.org/eap/media/9346/file/Sit%20An%20-%20Viet%20Nam%20case%20study.pdf

UNESCO, O. B., & RBE, A. a. t. P. (2016). *ERI-Net Asia-Pacific Regional Policy Series 2014 Regional Study on Transversal Competencies in Education Policy and Practice (Phase II) - School and Teaching Practices for Twenty-first Century Challenges: Lessons from the Asia-Pacific Region*. The United Nations Educational, Scientific and Cultural Organization. https://unesdoc.unesco.org/ark:/48223/pf0000244022

UNICEF. (2020a). Rapid assessment on the social and economic impacts of COVID-19 on children and families in Vietnam. *UNICEF Vietnam: Hanoi, Vietnam*. https://www.unicef.org/vietnam/reports/rapid-assessment-social-and-economic-impacts-covid-19-children-and-families-viet-nam

UNICEF. (2020b). *UNICEF Education COVID-19 Case Study: Viet Nam – The digital transformation accelerated by COVID-19*. https://www.unicef.org/eap/media/7136/file/Case_Study%3A_Viet_Nam_–_The_digital_transformation_accelerated_by_COVID-19.pdf

Vinschool. (2018). *The Official Copyright Transfer Of The 21st – Century Skills Program To Vinschool*. https://vinschool.edu.vn/en/news_event/the-official-copyright-transfer-of-the-21st-century-skills-program-to-vinschool/

Visible skills of adults. (2017). *Briefing paper on Transversal Skills* (*Deliverable D1.1. of the* Visible skills of adults *Project)*. https://viskaproject.eu/wp-content/uploads/2018/02/D1.1_TS_VISKA_FINAL.pdf

Whittemore, S. (2018). *Transversal competencies essential for future proofing the workforce. White Paper.* SkillaLibrary. https://acquia.cornerstoneondemand.com/sites/default/files/partner/asset/files/skilla-transversal-skills-future-proof.pdf

iejee

International Electronic Journal of Elementary Education
June 2022, Volume 14, Issue 5, 679-691

The Life of Syrian Asylum-Seeking Children in a Temporary Shelter Centre in Turkey: An Ethnographic Study on Primary School Education*

Mehmet Fansa[a], Ali Ersoy[b,**]

Received : 12 March 2022
Revised : 22 June 2022
Accepted : 28 June 2022
DOI : 10.26822/iejee.2022.272

*This study was produced from the PhD dissertation titled "The Life of Syrian Asylum-Seeking Children in a Temporary Shelter Centre in Turkey: An Ethnographic Study on Primary School Education" submitted to Anadolu University Graduate School of Educational Sciences Program in Primary School Education (2021).

[a] Mehmet Fansa, Ministry of National Education in Hatay, Turkey
E-mail: mfansa84@gmail.com
ORCID: https://orcid.org/0000-0001-5770-797X

[b,**] **Corresponding Author:** Ali Ersoy, Anadolu University, Turkey.
E-mail: alersoy@anadolu.edu.tr
ORCID: https://orcid.org/0000-0001-5000-290X

Abstract

This research aims to describe primary school children's life and education experiences who escaped from the war environment in Syria and took refuge in Turkey. The study was conducted with an ethnographic research design. The study participants comprised fourth-grade students, teachers, parents, and the close social circle of Syrian nationals who stayed in the temporary shelter in Turkey. Observation, interview, field notes, researcher's diary, and ethnographic photograph were used to collect the research data. Content analysis was used in the analysis of the research data. As a result of data analysis, the lives of Syrian children and families in the temporary accommodation centre, before and after the asylum, the socio-economic life of the container city, and the daily life routines of the children in the camp are described. The research proposes to conduct more ethnographic research with children under temporary protection, describe their life stories and indigenous perspectives, organise events that will bring together local children and children in the shelter, and increase studies on teaching Turkish to foreigners.

Keywords:
Ethnography, Temporary Protection, Temporary Accommodation Centre, Temporary Education Centre, Syrian Refugee Students

Introduction

Turkey is the country that houses the most Syrian refugees. According to official data from the General Directorate of Migration Management [GDMM] of the Ministry of Internal Affairs of the Republic of Turkey, the number of Syrians receiving temporary protection in Turkey reached 3,579,318 in 2020. On the Syrian border, Hatay is the 3rd province of Turkey that hosts the most people under temporary protection, with 436,708 people (GDMM, 2020).

This situation has caused Turkey to change rapidly in terms of health, education, and other public policies regarding migration. In the face of rapid and massive migration, the Law on Foreigners and International Protection were enacted for foreigners on 4 April 2013. With this law, Turkey has issued temporary protection identity cards to Syrians who have immigrated to the country and sought asylum,

enabling them to carry out public transactions such as residence, health, and education (T.C. Resmi Gazete, 2013). Turkey did not have an education policy with a legal basis for the Syrian population, which was included in temporary protection in 2011. In this process, Syrian nationals under temporary protection, who were teachers by profession, rented buildings with the support of non-governmental organisations where Syrian students were concentrated and started education in Arabic in these buildings. However, the Ministry of National Education [MoNE] opened temporary education centres [TEC] in 2014 and provided Syrian children with temporary protection access to education under state control in these centres. The cities with the highest density of TECs are respectively; Hatay (77), Istanbul (53), Gaziantep (50), and Şanlıurfa (42). These cities have the highest concentration of Syrian students (MoNE, 2018). According to the data of the Ministry of National Education, General Directorate of Lifelong Learning, for the year 2018-2019, the population of educational age in Syria is 1,047,536. According to the years, the number of Syrian students who have access to education in Turkey has reached 643,058. According to their education levels, schooling rates of students in public schools and TECs were 33.86% in kindergarten, 96.50% in primary school, 57.66% in secondary school, and 26.77% in high school. It is known that 365,535 of the 382,748 Syrian students in the primary school-age population in Turkey are enrolled in school (MoNE, 2019). This rate shows that most children under temporary protection in the primary school age can access primary school education in Turkey. This research examines the life and education experiences of the 4th-grade primary school children studying at the TEC in the temporary accommodation centre.

Being in a temporary shelter

The migration from Syria to Turkey began in the middle of 2011. As the study's first author, I witnessed children seeking shelter in a mosque courtyard in Altnozü's Hacpaşa neighborhood in February 2013. The children were sleeping in the coffin in the mosque in order not to get cold. Witnessing this moment deeply affected me. Living on the border of a war-torn country and witnessing the people affected by it made it inevitable to be involved in the process. From 2011-2012, I worked as a deputy principal at a public school, but I was also volunteering for the establishment of temporary accommodation centres. With the circular decision of MoNE numbered 2014/21, TECs were established, and I started to work day and night in the field as the training coordinator. As a civil servant, my shift ended at 17.00, but due to the intensity of the work in the field, I left at 00.00 or after. I worked nonstop in the field, and my beginner level of Arabic was progressing with these experiences. Although my parents were of Arab origin, I first understood very little Arabic but could not speak it at all. However, with my intensive work in the field since 2011, I learned to speak Arabic at a very good level in 2016, and I started to be officially assigned to the field due to my knowledge of Arabic and English. Since 2014, I have been participating in the visits and educational meetings of the United Nations, associations affiliated with the European Union, or representatives of other non-governmental organisations of Arab origin, and I was conducting the establishment of TECs. On the other hand, I organised social events to ensure the harmony of Turkish and Syrian teachers and humanitarian aid activities in the field.

As first author of the study, I have spent most of my life among Syrian refugees in Turkey since 2011.I shared their many pains and joys. While I was working as a coordinator in the field, I was also continuing my doctoral education. The researcher's ethnographic description of the primary school education of refugee students during the doctoral process was effective because he was a classroom teacher and a doctoral student with field experience. Ethnographers are sometimes described as interpreters of culture. Glesne (2013) states that researchers who know people's stories can better understand and interpret people. Thus, as the study's first author, I wanted to translate the living culture in the temporary accommodation centre and make sense of the Syrian children's perceptions of their education.

Purpose of the research

The research aims to describe the life and education experiences of the primary school children who took refuge in Turkey due to the war from Syria in the temporary accommodation centre from an ethnographic point of view. For this purpose, answers to the following questions were sought:

1. What are the daily life experiences of Syrian refugee children before and after migration?

2. What are the educational experiences of Syrian refugee children in the temporary education centre?

Method

Ethnography has become a new accepted practice in childhood research. It has been accepted as a qualitative research method that provides an opportunity to describe children's development and learning experiences in detail within their cultural context (Emerson, Fretz, & Shaw, 2011). The qualitative and ethnographic methods of the research helped us understand and interpret the children's stories in the temporary shelter. In studies conducted in the social field of childhood, children are seen as competent interpreters of the social world (James, 2007). This

ethnographic research aims to reach the meanings of the lives and education of the competent translator children in the temporary accommodation centre. The research participants were 42 students, 20 girls, and 22 boys, studying at the TEC in the temporary accommodation centre in Hatay, a province bordering Syria in the south of Turkey, in the 2018-2019 academic year. The other participants are the Turkish teacher providing education, Syrian volunteer trainer, parents of students, and people in their immediate social circle. The length of the students' stay in the temporary accommodation centre is between 3-5 years. However, four participating students have been living there since the establishment of the shelter. The temporary accommodation centre where the research was carried out was determined as the study area since it is the largest existing centre of Hatay province. The participants, students housed in the shelter, their families, and volunteer instructors are Syrian nationals, and the Turkish teacher is a Turkish national. As part of the study, interviews were conducted with teachers, the students' families and social environment, and the students.Research environment

Boynuyoğun Temporary Accommodation Centre is a residential area built on 140,000 m2 of land. The temporary accommodation centre is 31 km from the city centre. It was established on a village near the Turkey-Syria border, surrounded by wired fences. The temporary accommodation centre where the research was conducted was established as a tent city in Altınözü district of Hatay province on 09/05/2011.

The temporary accommodation centre was converted into a container structure in 2016. Security controls have been established at the entrance of the shelter centre. In this order, a sensitive door, X-ray device, and body search detectors are available to control the entrances and exits to the centre. Security officers conduct body searches at the entrance and exit of the temporary accommodation centre, and then visitors are taken inside. There are 2056 containers in the temporary shelter centre. Containers are set up at the height of about 30 cm from the ground in case of flooding. In addition to the health centre, TEC, and mosque, there is a market, barbershop, telephone shop, cafe, butcher, local food and telephone shop where the participants meet their vital needs in the temporary accommodation centre. In addition, there is the Red Crescent Child-Friendly Area, where the Red Crescent volunteers organise social activities for children. The library building, the orphan centre, and the sports facilities are where the children do their physical education lessons.

Image 1.
Hatay Provincial Borders Map, Road Route and Temporary Accommodation Centre (http-1)

Data Collection Process

Since the research site is a temporary accommodation centre, I received special permission and official permission to implement the research as the first author of the study and a doctoral student. I informed the 4th-grade students in the temporary accommodation centre, their parents, teachers, and relatives (who were the research participants) before the research and I obtained their consent with a consent form. I gathered the main data of my study through participant observations and unstructured interviews with the participants. Life experiences, field notes, diaries, photographs, video and audio recordings of daily life in the temporary accommodation centre and TEC constitute the study data. The data collection process took ten months, between February and November 2019. By participating in every area where children live their daily routines such as school, home, garden, park, I observed them, their teachers, and their immediate social. There, I was called by the camp-dwelling Syrian adults as "akh" [brother], and "ammo" [uncle], or "ustaz" [teacher] by the children. During the research process, I drank helli [cardamom] coffee served between the neighbourhoods where the containers in the temporary shelter were lined up, ate meals with them, participated in class activities, played games, and had conversations in which they shared their pain and joy, accompanied by plenty of sugary tea. In short, I was with them most of my time during the day and tried to understand their experience through their perspectives.

In ethnographic research, data collection, analysis, and interpretation are carried out in a cycle, and researchers with sufficient experience and knowledge are needed to collect data (Altheide, 1987). The content analysis technique was used in the analysis of the research data. In the study, the data collection process and the data analysis were carried out simultaneously. During the data analysis process, I reviewed 140 pages of field notes, 100 pages of the researcher's diary, 750 photographs, 17.2 GB of video recordings, and 500 MB of audio recordings. I wanted to organise the data after each site visit. Organising the data was difficult. Because the data was scattered, the job was to start working with the data. I watched the video recordings in chronological order, noting the relevance of each situation related to the subjects of the study. I listened to the audio recordings. I read observation data, diaries, and field notes and correlated them with photographic frames. I then noted all the video recordings with their recording dates and times, created a description of the recorded events and added the relevant analytical notes. In the research, I used long-term participation, continuous observation, data diversification, and member auditing to increase the likelihood of reliable results. After completing the data analysis, I visited the students and parents, talked to the participants individually, and presented the findings for their approval.

Considering that the research group describes one of the three accommodation centres in a province, it is important to consider this situation while generalising the study subject. Students may be reluctant to talk about the process or their feelings and thoughts or may not want to remember their past experiences. For this reason, I accepted that the data collection and analysis process depends on the researcher's interpretation, that it may be difficult to reproduce, and that the findings obtained in other ethnographic studies may strengthen the validity.

Results

With the analysis of the data collected in the research, ethnographic findings reflecting the nature of the life and education experiences of the children in the temporary accommodation centre were reached.

Life Experiences of Children in the Temporary Shelter Centre

In this section, to capture the locals' perspective, the pre-asylum life of the students and their families living in the temporary accommodation centre, their escape from the war, and their acquaintance with the temporary accommodation centre are explained. On the other hand, the container city's socio-economic life, the children's daily life routines, the place of the games in the children's daily lives, the description of the interpreter student, and the belief discourses of the children were included.

Pre-asylum life and escape from war

The temporary shelter was reminiscent of a city lined with white container houses. During recess time in the TEC garden, I mingled with the children, sat on the garden bench, and observed the students. It was February, and the weather was cold. Some children played the "hop hop" game on circular shapes drawn on the garden floor, while others walked in the garden with their friends. While sitting on the bench, Rim and his classmates, one of the students of the class I was observing, came to me. We were chatting with Rim and his friends about their lives before taking shelter in the temporary shelter. "*When we were in Syria, I was not going to school,*" Rim said, "*Then my mom and dad said we were going to Turkey. I said this was good because most of our relatives in Turkey wanted us to come to Turkey. Turkey is beautiful. There was no school in Syria, no job, no food.*" He expressed his life before asylum in Arabic in his own words (Interview, March 2019). Rim described his pre-asylum life as fear, poverty, and lack of schooling.

The students asked me to walk with them to their house after school. While walking with them, we also talked about how they got to the shelter. One of the students, Yaser, said, "*When there was a missile attack, they hid us in the school's basement. I was very*

scared, and then I fled to Turkey with my family. The village is already on the border, close to the shelter centre" (Field note, March 2019). Some of the students stated that they witnessed the war, fled their country, and took refuge in Turkey. In the scheme of the students in the temporary accommodation centre, the temporary accommodation centre was almost like a village where they lived. When the question "Where are you from?" is asked, students respond with answers as *"I am from Hatay, I am from Boynuyoğun Kamp"* or *"Syrian, Turkish"*. However, although the students say that they are Syrian, they do not know which city of Syria they are from. Students describe the places where they live as their countries.

Socio-economic life in the temporary accommodation centre

The living space in the temporary accommodation centre was formed from the neighbourhoods, and the streets were paved with cobblestones. The containers in the neighbourhood are listed with numbers on them. It is very difficult to find houses in the temporary shelter without numbers. The majority of students describe their homes with numbers. The container homes in the shelter did not have a standard appearance. A number of centre residents had altered the exteriors of their homes.

Figure 1.
Children's Experiences of Life in Temporary Shelter Centre

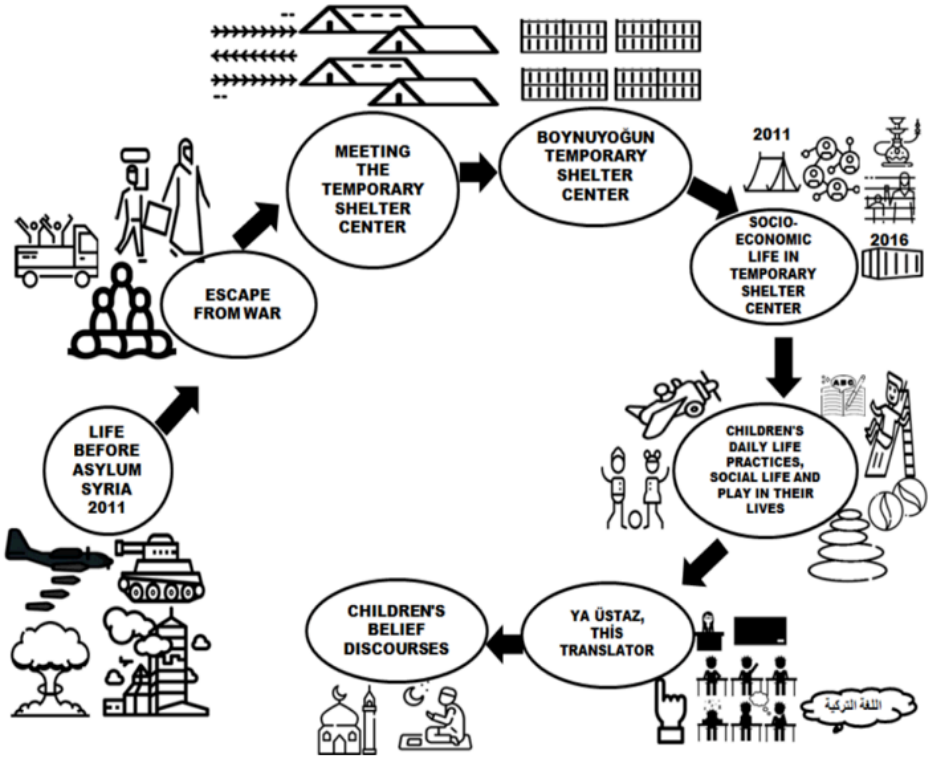


Image 2.
Covered Container Houses in the Temporary Shelter Centre

It is essential to accommodate a single family in containers. A container house is defined for five people. When the number of family members exceeds five, a second container house is given to the family. There are also sections such as a bathroom, toilet, and kitchen in the containers. The electrical infrastructure provides the container houses' heating and hot water needs. A certain quota consumption amount has been defined for each house for electricity, increasing with heating in winter.

In my conversations, while playing with the children at the playground, they happily talked about the moment they got out of the temporary shelter. One of the students, Halime, said, *"Master [Hodja] week madi [last] we go to Antakya halti [aunt] shock [very] beautiful, blessed [happy] but bes [only] three days"*, stating that she left the centre and went to her aunt residing in Antakya, but she could only stay for three days (Interview, April 2019). The children interpreted the temporary shelter centre as being surrounded by wire fences and the security control for entry and exit in two different ways. Zeynep, one of the students, said, *"Master [Hodja], a gunman came to the house during the war, there is no one here, no one here comes here"*, and Seyfettin said, *"Ammo [Uncle] it is all wire and wall here. It's nice outside, but it is memnu [forbidden] to go outside"*.

Individuals housed at the Temporary Housing Centre receive a monthly allowance of 30 euros per person on their AFAD card [Presidency of the Ministry of Interior of the Republic of Turkey for Disaster and Emergency Management] to meet their market needs.They can shop at the market with this cash assistance. In addition to the education given to children at the TEC, the Public Education Centre also organises mosaic, hairdresser, wedding dress sewing, rug-carpet courses, baby knitting, crochet knitting, painting, and Turkish level courses for adults. Mainly female participants can sell the products and materials they have designed during and after the course through the course centres and can use the income they get from the products for their home or children's education expenses.

Children's daily and social life practices

The daily life practices of the children in the temporary accommodation centre were similar to each other. Since the research group students were the midday group students of the TEC, their lessons started at 11.50 and ended at 16.50. Students often woke up around noon. Since the students woke up late, they were fed two meals, breakfast and dinner. There was an artificial waterfall in the corner of a house visited in the shelter. Container residents had built a small wetland called "nahura" in front of the container. When the researcher asked them why it was so popular, the student's mother, Esma [pseudonymous], explained:

> *Almost every house in our town has a small ornamental pool in their garden. There was a small ornamental pond in our garden back home, and I wanted the children to feel our culture even though we are in containers. That's why my wife and I did something like this (Field note, May 2019).*

Hacer stated that the ornamental waterfall called "nahura" reminded her of the houses in her country with the words *"Hodja, I think of the houses in Syria when this water flows"* (Field note, May 2019).

Behind every discourse in the shelter, there was an action and a story behind every action. Sometimes it could be an artificial waterfall, and sometimes a child who looks like an introvert. Some students in the class were quiet, non-attentive students. Musa was one of the students who did not participate in the activities in the lessons. Musa showed the same attitude and behaviour in Arabic lessons as he did in Turkish lessons. Musa had never seen his father after immigrating to Turkey. His mother, Fatima, explained this situation when I visited their house: *"Musa never saw his father, he doesn't even remember him, we don't know if he's dead or alive, but since we haven't heard from him until now, he must've died (in a sad tone). For this reason, my son may speak less"* (Field note, April 2019). On the other hand, Teacher Emine expressed her opinion about Musa by saying, *"Musa wants to be close to me, but he always seems to have a wall in communication with me"* (Field note, April 2019). After the 23 April National Sovereignty and Children's Day ceremony, Musa came to me and said, *"I don't want to go back to Syria. I am worried about my father and want him to come to the shelter. There is trust here, but my father ... I wish he could come and see me"* (Field note, April 2009).

The temporary shelter had three playgrounds, and the children played in the playgrounds close to their homes. While some children were playing marbles, pentacles, and football, some rode bicycles and competed on the playground sports equipment.

Image 3.
Children Playing with Sports Equipment in the Playground

It is noteworthy that there are toy model aeroplanes while children play with their toys in the playground. To find out whether the war process they experienced was effective in their love of aeroplanes, the researcher asked them whether they liked aeroplanes or not. Yamen replied, *"This plane is very fast, just like the planes flying in Syria, but it has no bombs"* (Interview, May 2019). Faisal said that when he first came from Syria, he heard the sound of planes around the temporary shelter and he was terrified, *"Here, too, I was terrified at first when I heard the sound of aeroplanes, but now I am used to it, this is a reliable place"* (Interview, May 2019).

The students declared the student who knew Turkish best among themselves as the "interpreter student". The students in the class accepted this situation so much that when a question was asked in Turkish, all of them said, *"Teacher, this is the translator,"* by pointing to the student who knew Turkish best and asking that student to translate what was said (Field note, March 2019). On the other hand, at the shelter, children sometimes said in their prayers that the war in Syria would end and they wanted to return. The children stated that their families also prayed with these discourses and were affected by them.

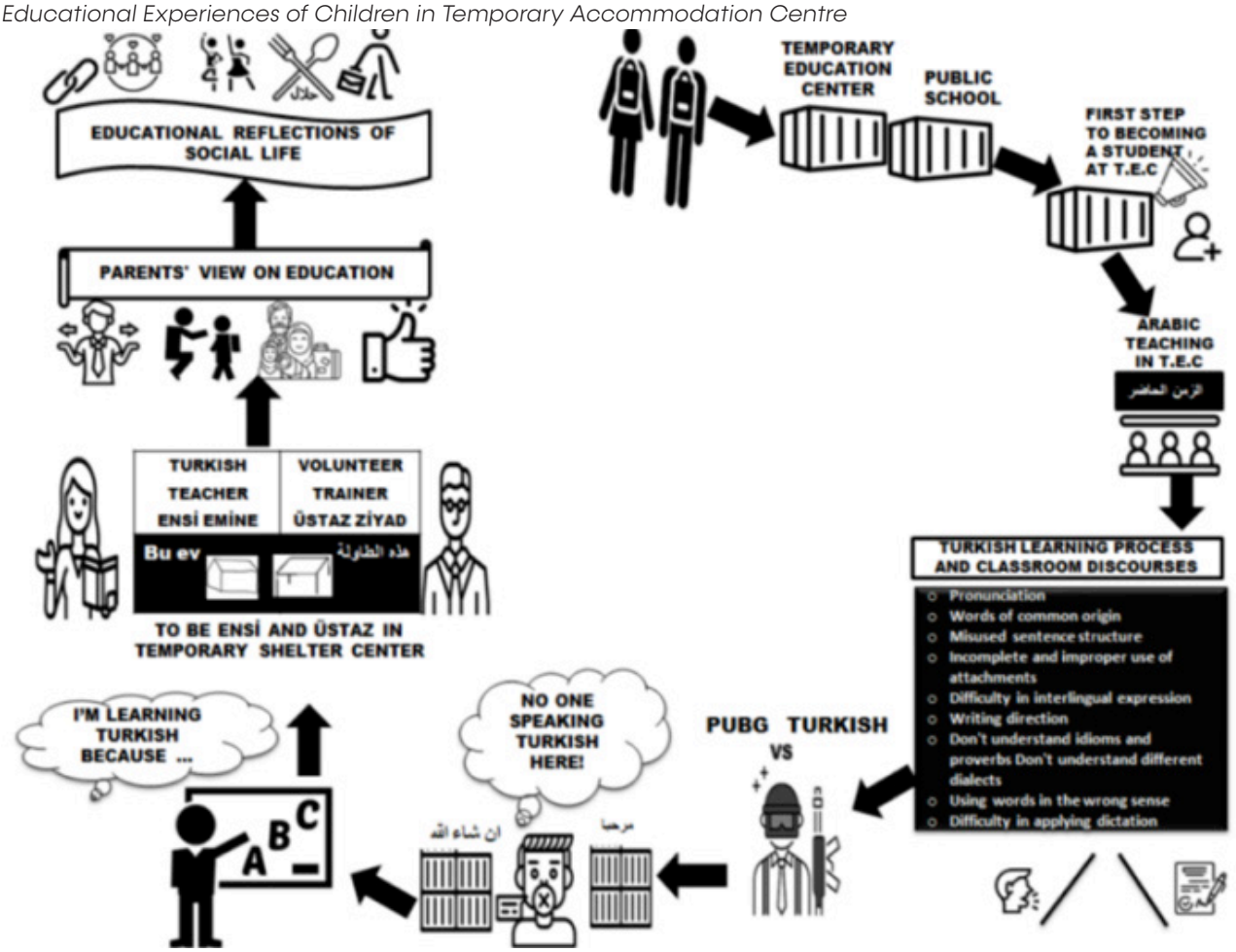
Educational Experiences of Children in Temporary Accommodation Centre

The re-schooling period of the students after the migration, their Turkish and Arabic lesson experiences in the TEC, the connection of the games played by the children with Turkish, the effect of life in the temporary accommodation centre on Turkish learning, the professional experiences of the teachers, the parents' perspectives on education in the camp, and the educational reflections of the social life are explained in this section.

"Turkish is beautiful, Arabic is beautiful, but only Turkish next year": TEC and Public School

In the temporary accommodation centre, there were two different schools, the TEC, where the children were educated in two different languages, and the lessons were taught in Turkish and Arabic, and the state school, where only Turkish education was given. Since the temporary accommodation centre is a settlement area of 140,000 square meters, announcements were made by the central administration to the people staying in the shelter centre. Announcements were made with the sound system placed between the neighborhoods. Those who did not have a

Figure 2.
Educational Experiences of Children in Temporary Accommodation Centre



foreigner's identification card were not registered to the temporary accommodation centre and school. Students gradually transition from the TEC to the public school within the housing centre. During the academic year the research took place, while the 4th, 7th, and 8th grades were receiving education at the TEC, the 1st, 2nd, 3rd, 5th, and 6th-grade children were educated in the public school.

Students do not receive education in Arabic after transitioning from the TEC to the public school. While chatting about the courses at school during a break, Yasin, one of the students, spoke about the courses he took at the TEC and the process in the next academic year, *"Master, courses are in Turkish and Arabic. Turkish is beautiful, Arabic is beautiful, but next year only Turkish".* (Field note, April 2019).

Teaching Arabic and Turkish at TEC

At the TEC, 15 hours of Turkish and 15 hours of Arabic lessons are given. The teaching of Arabic, Mathematics, Science, Religious Culture and Moral Knowledge, Visual Arts, Music, Games and Physical Activities, and Traffic lessons, apart from Turkish lessons, is carried out by a volunteer trainer. Bilingual education causes children to exhibit different behaviours from writing to speaking. Since the Arabic writing direction is from right to left, there is a difference in the reading and writing behaviours of the students in the course when switching between Turkish and other courses. Students were more flexible in terms of discipline in Arabic lessons than in Turkish lessons. When the children could not see the board well, they wrote by leaning their notebooks against the wall adjacent to the board, or they got up from the bench and sat on the floor near the board. The course teacher felt the need to warn students when such behaviours were exhibited excessively. However, he did not take action to prevent this situation.

In the volunteer trainers' lessons, besides the language spoken in the lesson, the direction of the notebook and pencil and the children's behaviours were also changing. After completing the writing on the board, Rima looked at the researcher and, with a smile, said, *"Master, writing from here, then from here (pointing to the left and right sides of the notebook). It is very difficult at first, but easy now."* He expressed the difference in spelling in Turkish and Arabic lessons (Observation, May 2019). Children's participation in Arabic lessons was also higher than in Turkish lessons. The effect of the student's mother tongue being Arabic was evident in the high participation rate. Qusay said, *"Ammo, I don't understand much in the other lesson, but in Arabic always finger."* [Uncle, I do not understand the Turkish lesson very much, but this lesson is in Arabic, I always raise my hand.] He explained that he wants to participate in Arabic lessons because he knows Arabic (Interview, May 2019).

To motivate the children at the TEC to learn Turkish, the Turkish teacher took them to the library in the shelter, made them watch animated films, had drama shows, and taught vocabulary with the help of visuals. Sometimes, students were doing a reading activity in the library opposite the watchtower.

Image 4.
Children Reading Across the Watchtower in the Refuge Centre

In teaching Turkish, Emine Teacher also made children watch Turkish animated films at the TEC, saying they did not watch Turkish broadcasts outside of the TEC. The teacher also made children play games to reinforce the children's Turkish learning. One of these activities was the finger paint game.

As a result of the analysis of my observations and classroom discourses in Turkish lessons, the difficulties experienced by the students in the process of learning Turkish are; pronunciation, use of words of common origin, misused sentence structure, incomplete and incorrect use of affixes, difficulty in interlingual expression, writing direction, not understanding idioms and proverbs, not understanding different dialects, misunderstood words, and difficulty in dictation.

Image 5.
Finger Painting Activity of Students

PUBG and Turkish: "Ustaz, we really love it, babci babci"

During the research process, a parent complained that their children were constantly playing games, saying they were always on the phone. Yahya, interrupting his mother's discourse, said, *"Master, we are playing games. Ustaz, we really love it, babci babci."* Yahya described his experiences playing PUBG with the Turks outside the temporary shelter with the following words; *"I tell them I want a gun, go home, beat him, look behind you, hit hit hit him. Ustaz, everyone in the game is fighting as in Syria. Get powerful weapons then win"* (Field note, May 2019). With this game, the children in the temporary accommodation centre could communicate with people outside the camp, and speak Turkish with Turkish players. However, they also learn words that are not suitable for their age.

Nobody speaks Turkish here!

Those who stayed in the temporary accommodation centre always spoke Arabic. Zeynep participated in the conversation the researcher had with them in Arabic and explained why she did not speak Turkish: *"Teacher, it is very difficult to speak Turkish here. Only a few know the language. There is a Turkish lesson at school. But is it enough? Maybe if I lived in Istanbul, I would learn. My uncle's son lives there and speaks Turkish better."* (Field note, May 2019). Halime explained why she does not speak Turkish by saying, *"There is no internet at home, it is very difficult to speak Turkish because no one speaks Turkish at home, parents heb [always] use Arabic. Only the internet has Turkish"* (Field note, June 2019).

I am learning Turkish because...

While there with them, I wondered what the Turkish lesson meant to the students. When explaining why they learn Turkish, Yasin said: *"If we go anywhere other than Hatay, we have to speak Turkish. If we live in Turkey, we must learn this language."* Since Arabic is spoken in daily life in the settlements of the Hatay region close to the border, this situation made me think that *"In children's minds, they don't think they need to learn Turkish in Arabic-speaking regions."*

> *Seyfettin: Because we will not have any Arabic lessons next year, we need to learn Turkish.*
>
> *Bilal: For example, go to the hospital we do not know Turkish. Or go to Antakya; again, we do not speak Turkish.*

Being "Ensi" and "Ustaz" in a temporary shelter

Female teachers at TEC are called "ensi", and male teachers are called "ustaz". Since I am a teacher myself, my meeting with the teachers developed as a conversation between two colleagues rather than a researcher-participant relationship. Emine Teacher, a Turkish teacher at the TEC, described her experience as follows: *"I remember that I had a lot of trouble in the first week. When I couldn't manage the classroom, I left the classroom crying. I didn't know what to do. Even though the children did not understand my language when they saw that I was sad, it changed, and a bond was formed between us at that moment. Later, I realised that the children here need education more, and I started to work with more devotion"* (Interview, June 2019).

There are also volunteer trainers of Syrian nationality assigned to teach Arabic to students in the temporary accommodation centre. While we were chatting with Teacher Ziyad, there were children playing ball on the football field across from where we were sitting, and there was a Syrian village that could be seen in the distance behind the wire fences behind them. While thinking that Teacher Ziyad was watching the children, he suddenly pointed to the Syrian village with his finger and said, *"Look, teacher, it is the village of Syria. Since Turkey and Syria are so close geographically, I am not alienated [to Turkey] at all."* He expressed his feelings and thoughts about living in Turkey. Teacher Ziyad explained being a teacher in a temporary accommodation centre with the following words (Interview, July 2019):

> *These children need education. Living as a refugee is very difficult. We lost everything we had, our home, our school. But you have to live like other people. As refugee teachers, we are the only ones who can understand the difficulties of these students and what they are going through as refugees. I'm with them inside the shelter. I am an asylum seeker like them.*

Parents' view of education

During the home visit I made with the Turkish teacher, the parents wanted to talk to me about their children's schooling process, as they knew that I was a field coordinator and a researcher. Hediye's mother, Fattum, said, *"Teacher, I really don't understand this school process either. One of my children takes Turkish lessons for 15 hours a week, and the other always takes Turkish lessons. My child who goes to the Turkish school has very low grades"* (Field note, May 2019). There could be more than one student at different grade levels in the same house. While sipping my sugary tea, a parent, who is worried that his children will forget Arabic expressed his views on the subject by saying, *"It is good that children learn Turkish, but they forget Arabic. I'm afraid tomorrow they will forget Arabic, and then they will not be able to get along with us."* (Field note, April 2019). I observed a dilemma in which some parents welcomed their children to learn Turkish, a new language, but feared they would forget Arabic.

I accepted the coffee invitation of a grandparent who taught in Syria in order to comprehend his grandson's educational process.Ubayd's grandfather was a

67-year-old retired teacher. Ubayd's grandfather expressed his satisfaction with the process of learning Turkish with his grandson and my visit with the following words:

> *Since I had nothing to do here, I went to a Turkish course. I continued for two weeks but then quit. The teacher was young, and he explained things very quickly. I guess I couldn't keep up with his pace because I was old. I work on it at home with my grandchild whenever I have time. I worked as a teacher in Syria for 35 years. Now my granddaughter is my teacher, teaches me Turkish (parent laughs) (Field note, March 2019).*

"We will celebrate holidays like other children."

Image 6.
The Moment of Conversation with Parents During Home Visits

The students I observed learned that their friends living outside the shelter would play games at school during the 23 April National Sovereignty and Children's Day Ceremony. This official holiday was presented to the children of the world by Mustafa Kemal Atatürk, the Founder and First President of the Republic of Turkey.

In our conversation with Teacher Emine, I said that I could teach children the local folk dance called Reyhani, which belongs to the Mardin region of Turkey, and that I could help them in this process. Since Reyhani is a dance played by male and female students together, I also paid attention to the attitude of the students' families towards this dance. Reyhani is played by two people. However, when I saw that the children in the temporary shelter wanted to do it, we decided to do it as two girls and two boys. The mothers of the children playing at the ceremony had hand-sewn the clothes that the students would wear for the 23 April National Sovereignty and Children's Day.

Image 7.
23 April National Sovereignty and Children's Day Ceremony

After Zeynep's performance, Amine said, *"Hodja, I liked the dance too, now I'm looking at Turkish dances on the internet; there is also the plum dance. I will learn Turkish more."* She stated that he loved the local dance game he played at the ceremony, watched other Turkish regional dances on the internet, and wanted to raise his Turkish level to a higher level (Interview, April 2019).

Conclusion

Each of the children in the temporary shelter had a life story. As the first author, I wanted to participate in the lives of these children and describe their thoughts from their indigenous and unique perspectives to make sense of these stories. These stories allow us to understand the refugee children better, describe their school culture, and overcome the obstacles in the schooling process. This research also revealed the schooling process of children under temporary protection and the importance of this process.

In the study, it was concluded that the migration journey of the Syrians to the temporary accommodation centre under the temporary protection status took place in difficult conditions. They migrated from Syria forcibly and had to stay in the accommodation centre due to the difficulties of their living conditions. Participants preferred border provinces such as Hatay in their escape from war. Some participants made such a choice because they are close to their villages. In addition, many participants are grateful to Turkey for hosting people from Syria. For some, life in a temporary shelter is considered a bad fortune. In contrast, a temporary accommodation centre is considered safe or even a unique opportunity for most people staying in a shelter. Monlaveli's (2021) research in an emergency shelter in Osmaniye Province found that camp residents viewed their social life in the camp as limited, but were generally satisfied with their living conditions.

Students studying at the TEC gradually enrol in public schools. While this transition is primarily a language problem, it has also revealed that children have adaptation problems before transitioning to public schools. In interviews with 1418 households and 6527 Syrians residing in these households for the research titled "Barometer of Syrians 2019," three factors came to the forefront in terms of the path to be followed in education. Students from Syria and Turkey should study together, and Syrian children should learn Turkish before beginning formal education. Syrians should not abandon their native language (Erdogan, 2020). Among the findings of our research is that the children in the temporary shelter center must communicate with the locals, and when they transfer from the temporary education center to the public school, they encounter academic difficulties due to their inability to speak Turkish. In a separate study, it was found that the fact that Syrian parents and students do not speak Turkish is a barrier to communication and school adaptation (Aykut, 2019).

Similarly, Shuayb et al. (2016) described that refugee children in Lebanon and Germany face many difficulties coping with and adapting to the education system in host countries. In this research, students attend Arabic lessons more than Turkish lessons, and it is understood that the student's knowledge of Arabic is effective in this participation. As the first author, the problems I observed in the process of learning Turkish by participating in real classroom practices and children's daily lives in the TEC are; pronunciation, use of common origin words, misused sentence structure, incomplete and incorrect use of affixes, difficulty of interlingual expression, writing direction, not understanding Turkish idioms and proverbs, not understanding different dialects, misunderstood words, and difficulties in dictation practices.

The research findings concluded that the students learned Turkish by playing PUBG with Turkish players outside the temporary accommodation centre. Chen and Huang (2010) argue that computer games played by students will support their second language learning. However, PUBG, a war game, also causes the development of Turkish vocabulary unsuitable for the participating children's age. In addition, children playing PUBG linked the war environment in the game to the war environment in Syria and stated that the war would be won if powerful weapons were purchased. This shows that the children's experiences in Syria are also effective in the war games they play. In their research, Can and Türkmen (2017) concluded that computer games contribute to foreign language acquisition and should be incorporated into language education programs. It has been observed that the children in the center for temporary housing have fun with the mobile games application and learn Turkish by playing PUBG. In this context, it can be said that digital games provide children with the opportunity to communicate with locals outside of the camp and boost their confidence by speaking Turkish. If the need for language learning, environmental conditions or the urge to learn is not strong and continuous enough, the success in foreign language teaching may be low (Özcan, 1994). It can be said that the students in the temporary accommodation centre cannot communicate with Turkish-speaking locals due to their accommodation in the centre. As a result of being housed in the temporary shelter, the children were unable to communicate with the locals and had difficulty learning Turkish. Therefore the accommodation centre is effective in failing to improve their Turkish level. It is thought that children's desire to learn as a second language and their perceptions are important in meeting their needs.

It is understood that the Turkish teacher in the temporary accommodation centre had no professional experience with foreigners and had difficulties in the early stages of education. Finding an expert Turkish tutor for the students with a temporary accommodation status, which has reached gigantic proportions, has become an important problem for Turkey. For this reason, experts who were Turkish teachers but did not have experience in teaching Turkish to foreigners were trained in the process. Furthermore, teacher Ziyad described that he was also an asylum seeker and argued that the only people who could understand what the participant students were going through as refugees were refugee teachers. Hek (2005, p. 160) emphasises that teachers coming from the same linguistic and cultural backgrounds as new refugee students are very important.

Since the parents of refugee students do not know Turkish, they cannot make sense of the Turkish education given to their children at the TEC. Some parents are worried that their children may forget their mother tongue, Arabic, in the future, as their children are taught in Turkish in public schools. As parents have a refugee status, they may be more attached to their culture, experience stress and feelings of loss, and grieve for their weakening ethnic identity (Lewig et al., 2010). In this study, it was observed that the parents' learning Turkish positively reinforced the Turkish learning process of their children, and it provided a bidirectional motivation for learning Turkish between the student and the parent. This is a two-way process, and establishing clear communication channels with parents is mutually related to increased parental involvement in schools (Hamilton, 2004, p. 92). It turns out that teaching the host country's language to parents in the TECs positively affects their children's education.

It can be said that children's social life is described more strongly with the fact that the research was carried out with ethnography, and the communication that

developed between the first author as a researcher and the participants provided new gains. It has been observed that children's interest in Turkish songs increased with the dances they learned in the 23 April National Sovereignty and Children's Day ceremony activities. Many researchers (House, 1997; Jolly, 1975; Shin, 2006) state that songs are an important source of motivation in the language learning process.

It is thought that the research findings will increase the understanding of refugee children's life and education experiences under temporary protection in Turkey. Describing the social structure of an Italian slum in America as the Cornerstone Society (Whyte, 1943), reflecting the realities a manager faces every day (Wolcott, 1973), depicting the place of breakdance in the utopian aspirations, and subjective transformation of the soul (Bode Bakker and Nujiten, 2018) are important research in an ethnographic context because all of them offer important findings related to the field to researchers. This research also presents ethnographic findings describing Syrian primary school students' life and education experiences under temporary protection in the temporary accommodation centre. As the first author during the research process, it was not possible for me to understand them without being there to see the contexts and interpret them. In this sense, the process I went through can also be described as me meeting with the ethnographer identity and meeting my ethnographic character.

Suggestions

- Additional ethnographic research can be conducted with children under temporary protection who are unable to communicate in their native language, and their life stories and indigenous perspectives can be described.
- The processes of learning Turkish and adapting to the Turkish culture can be strengthened by organising activities where children in the temporary accommodation centre can communicate with local students outside the shelter; • More research can be conducted on the difficulties temporary protection children face in the process of learning Turkish and possible solutions to these difficulties.

References

Altheide, D. L., (1987). Ethnographic content analysis. *Qualitative Sociology, 10*(1), 65- 77.

Aykut, S. (2019). *Türkiye'deki Suriyeli çocukların eğitim sorunları: Farklılıklara saygı eğitimi odağında okul sosyal hizmeti önerisi* [Educational problems of Syrian children in Turkey: A school social work proposal focusing respect for diversity education]. (Doktora tezi). Hacettepe Üniversitesi, Sosyal Bilimler Enstitüsü. Ankara.

Bode Bakker, M. and Nujiten, M. (2018). When breaking you make your soul dance': Utopian aspirations and subjective transformation in breakdance. *Identities: Global Studies in Culture and Power, 25*(2), 210–227.

Can, M.Z. ve Türkmen, B. (2017). Bilgisayar oyunlarının yabancı dil eğitimine katkısının araştırılması: Anadili Türkçe olan 100 yükseköğretim öğrencisi üzerinde yapılan araştırma örneği [Study on the contribution of computer games to the foreign language education: Research sample on 100 higher education students whose native languages is Turkish]. *Tarih Okulu Dergisi, 31*, 399-435.

Chen, H. J. and Huang, W. C. (2010). Examining the potentials of computer Games for English learning. *Proceedings of 2010 3rd IEEE International Third IEEE International Conference on Digital Game and Intelligent Toy Enhanced Learning (DIGITEL)*, Kaohsiung. pp. 134-138.

Emerson, R. M., Fretz, R. I. and Shaw, L. L. (2011). *Writing ethnographic fieldnotes second edition.* Printed in the United States of America: The University of Chicago Press, Ltd., London: The University of Chicago

Erdoğan, M. (2020). *Suriyeliler barometresi 2019: Suriyelilerle uyum içinde yaşamın çerçevesi* [Syrians barometer 2019: Framework for living in harmony with Syrians]. Ankara: Orion Kitabevi.

GDMM. (2020). *Geçici koruma, istatistikler* [Temporary protection status, statsistics]. https://www.goc.gov.tr/gecici-koruma5638

Glesne, C. (2013). *Nitel araştırmaya giriş* [Becoming qualitative researchers: An introduction]. (Çev: A. Ersoy, P. Yalçınoğlu). Ankara: Anı Yayıncılık.

Hamilton, R. (2004). Schools, teachers and education of refugee children. R. Hamilton and D. Moore (Ed.), *Educational interventions for refugee children: theoretical perspectives and implementing best practice* in (pp.83-96). New York.

Hek, R. (2005), *The Experiences and needs of refugee and asylum-seeking children in the UK: A literature review*. National Evaluation of the Children's Fund: University of Birmingham.

House, S. (1997). *An introduction to teaching English to children.* London: Richmond Publishing.

James, A. (2007). Giving voice to children's voices: Practices and problems, Pitfalls and potentials. *American Anthropologist, 109*(2), 261–272.

Jolly, Y. S. (1975). The use of songs in teaching foreign languages. *The Modern Language Journal, 59*(12), 11-14.

Lewig, K., Arney, F. and Salveron, M. (2010). Challenges to parenting in a new culture: implications for child and family welfare. *Evaluation and Program Planning, 33*(3), 324-332.

MoNE. (2018). *Geçici koruma kapsamı altındaki öğrencilerin eğitim hizmetleri* [Educational services for students under temporary proyection]. Hayat Boyu Öğrenme Genel Müdürlüğü Göç ve Acil Durum Eğitim Daire Başkanlığı: Ankara.

MoNE. (2019). *Göç ve acil durum eğitim daire başkanlığı* [Departmant of migration and emrgency education]. Ankara.

Monlaveli, Z. (2021). *Geçici koruma statüsündeki Suriyelilerin barınma merkezlerindeki durumlarının Osmaniye barınma merkezi özelinde incelenmesi* [An examination of Osmaniye accommodation center in order to examine the situation of Syrians under temporary protection status in accommodation centers]. (Yüksek lisans tezi). Van Yüzüncü Yıl Üniversitesi, Sosyal Bilimler Enstitüsü. Van.

Özcan, B. (1994). Türkiye'de yabancı dil öğretimi [Foreign language teaching in Turkey]. *Dil Dergisi, 22*, 40-41.

Shin, J. K. (2006). Ten helpful ideas for teaching english to young learners. *English Teaching Forum,* 44(2), 2-7.

Shuayb, M., Al Maghlouth, N., Held, K., Ahmad, N., Badran, T. and Al Qantar, S. (2016). *An education for the future: The schooling experience of Syrian refugee children in Lebanon and Germany.* Education Commission. https://www. lebanesestudies.com/wp-content/uploads/2017/01/An-Education-for-the-Future.pdf.

T.C. Resmi Gazete. (2013). *Yabancılar ve uluslararası koruma kanunu* [Foreigners and international protection law]. Ankara.

Whyte, W. F. (1943). *Street corner society.* Chicago: University of Chicago Press.

Wolcott, H. F. (1973). *The man in the principal's office.* New York: Holt, Rinehart, & Winston.