

The Impact of Mitigating Refugee Students' Mathematics Learning Loss on Their Resilience Levels

Seyat Polat

Department for Primary School Education, University of Würzburg, Würzburg, Germany

Email: *seyat.polat@uni-wuerzburg.de*

ORCID: <https://orcid.org/0000-0002-8570-2161>

Abstract

Refugee children face many difficulties on their migration routes. These challenges continue even after arriving in the destination country. It is important for the world's growing child migrant population to successfully adapt to the host country. Otherwise, there is a risk for future generations facing psychological, social, and academic challenges. Education and training play an important role in the adaptation process of children and youth. In this study, it was aimed to overcome the math learning losses of refugee students and to increase their resilience. For this purpose, a one-group pretest-posttest quasi-experimental design was used. Forty-two refugee students from Germany and Greece participated in the study. The results showed that mitigation of math learning losses was significant in terms of increasing the resilience of refugee students.

Keywords: refugee children, resilience, mathematics, learning loss.

Acknowledgement

This research carried out in scope of the European Union Erasmus + Project.

Project title is “Mitigating Math-Related Learning Losses of Newly Arrived Refugee Children Through Innovative Teaching Method Project. Project number is KA210-BY-21-18-27274.

Project is co funded by European Union Erasmus+ Program. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.

In today's world, individuals are forced to migrate and relocate due to political (Polat & Kröner, 2022), war (Reed, 2018), economic (Geist & McManus, 2012) and natural disasters (Drabo & Mbaye, 2015). In some cases, these migrations take place within the borders of the country, while in other cases they cross borders. We can state that especially cross-border migration brings more difficulties for people.

Migrating children and young people face difficulties such as being deprived of the right to education or experiencing educational losses. Along with the challenges of migration, the students in this study group were also affected by lockdown (Covid-19).

Because of the lockdown, when schools switched to e-learning (Betthäuser et al., 2023), refugee students, especially those who had just arrived in the destination country, either could not go to school or had to study online in a language they did not know. Thus, their education has been severely disrupted. This process caused students to experience various difficulties in learning language and basic sciences, socialization and cultural adaptation.

In addition to these difficulties experienced by refugee students, it can be stated that accepting the mathematics course as difficult and being considered as a field that cannot be easily achieved by many people (Morkoyunlu & Saltık Ayhanöz, 2021) increases the burden of students even more. As a matter of fact, research state that “learning deficits are larger in Math and also learning deficits are particularly large among children from low socio-economic backgrounds” (Betthäuser et al., 2023). Therefore, it is possible to state that migration, covid-19 and the difficulty of mathematics reduce students' resilience.

In this context, as a product of the European Union Erasmus+ project, the study examines the effect of eliminating the mathematics learning losses of refugee students on their Resilience levels.

Introduction

People have to or want to change their places for different reasons. This mobile transition from one place to another can be called migration (Dustmann, & Glitz 2011). While migration is by its very nature a very corrosive process, it can be said that being forced to migrate is a more

difficult. Being forced to migrate brings with it serious problems. These problems are divided into pre-migration-migration route and post-migration challenges (Pieloch et al., 2016).

For instance, wars (Reed, 2018) and natural disasters (Gasparrelli, 2017) are referred to as pre-migration challenges, while cultural adaptation (Bhugra, & Becker, 2005) and language learning (Föbker & Imani, 2017) are characterized as post-migration challenges. However, especially for people who have to migrate illegally, the migration route is also seen as an important challenge (Demir & Aliyev, 2019).

Naturally, children are among the people who migrate or are forced to migrate. According to UNICEF (2023), 36 million children migrated to different countries in 2020 only. Migrant children are affected by the challenges described above. In addition, due to their location in different environments (e.g., refugee camps), refugee children also face the challenges of limited access to education, experiencing trauma, having their needs unmet, and having poor socio-emotional skills (Wang et al., 2019).

These problems make the situation even more complicated, especially for school-age children. This is because children are unable to attend school regularly for a certain period of time due to the location of their accommodation. Students who attend school face learning losses in basic subjects such as mathematics due to their poor command of the host country's language.

Under normal circumstances, learning mathematics is not easy and requires struggle. In other words, struggle is at the center of mathematics learning (Kookken et al., 2016). In addition to the difficulty of learning mathematics, refugee students also struggle to mitigate the learning losses they have experienced due to the migration process. Learning mathematics, a subject in which prerequisite learning is important, and the process of mitigating learning losses related to this subject can be quite challenging for refugee students. This academic difficulty, in addition to psychological and social difficulties, negatively affects the resilience levels of refugee students and therefore these students need support.

Resilience

Resilience is a term that is attracting more and more attention in the academic world. When the definition of resilience in the context of social sciences is examined, it is seen that researchers handle this concept in two different ways. The first is resilience in the face of challenges (Denov

et al., 2019; Kumi-Yeboah, 2016; Sleijpen et al., 2013) and the second is academic resilience (Cinkara, 2017; Nouwen & Clycq, 2021; Sosa & Gomez, 2012). Resilience in the face of challenges is the ability of individuals to survive and overcome difficulties despite negative and stressful life experiences (Motti-Stefanidi, 2015; Sleijpen et al., 2013). In addition, when faced with challenging or threatening conditions, it is the ability of people to cope with these challenges by considering the possibilities and to adapt positively (Demir & Aliyev, 2019; Denov et al., 2019).

Academic resilience, on the other hand, involves increasing the likelihood of success in education despite the adversities caused by environmental conditions and experiences (Agasisti & Longobardi, 2017; Nouwen & Clycq, 2021). In addition, academic resilience includes elements such as establishing friendships, acquiring academic skills, and increasing academic performance of a school-age child (Gardner & Stephens-Piscecco, 2019; Sosa & Gomez, 2012). Considering the above explanations, refugee students need to develop their resilience in the face of both life challenges and academic challenges.

How do individuals develop resilience and overcome negative situations? Overcoming challenges is not the same for every individual. While some people overcome this situation by developing strategies, others need external support. Researchers have concluded that parental attitudes (Motti-Stefanidi, 2015; Onat, 2010) and sense of belonging (Scarf et al., 2016) have a positive effect on children's resilience.

For refugee students, learning mathematics or mitigating math deficits can play a mediating role in helping them to integrate with their peers and communicate with their teachers. This may contribute to increasing students' resilience levels.

Addressing mathematics learning losses refers to the positive characteristics that enable students to compensate for their deficiencies in mathematics and to learn and use mathematics at school and in other areas of life (Lee, & Johnston-Wilder, 2017). It also increases learners' self-confidence as knowing mathematics has a value in the world (Johnston-Wilder, & Lee, 2010). This situation contributes to the students' socialization and increasing their friendships.

This article examines the impact of mitigating math learning deficits of refugee students on their resilience levels. Refugee students often face challenging living conditions and language barriers and need additional support to learn and succeed in mathematics.

When the studies in the field are examined, it is observed that there are publications on increasing students' mathematical resilience (Hernandez-Martinez & Williams, 2013; Ishak et al., 2020; Kookan, 2013). The common feature of these studies is that failure in mathematics reduces students' resilience and possible solutions to this situation are sought. It is also seen that studies on the resilience of refugee students have been published (Gruttner, 2019; Khawaja, 2017; Stermac et al., 2013; Wong & Yohani, 2016).

The common feature of these studies is to describe the existing situation. This current study, on the other hand, describes the existing problem and produces solutions to this problem with experimental methods. Therefore, it is hoped that this study is significant and will contribute to the field.

Purpose and research questions

The study aims to increase the resilience of refugee students by mitigating their mathematics learning losses. Within the scope of this purpose, the following research questions were prepared.

1. Does mitigating math learning losses have an effect on the resilience levels of refugee students?
2. What are the opinions of refugee students about mitigating math learning losses?

Method

Research Design

In this study, a one-group pretest-posttest quasi-experimental design was used to determine the change in the resilience levels of refugee students who participated in the mathematics instruction program.

In order to support the quantitative findings of the study, the participants' opinions about the mathematics instruction program were also obtained.

A one-group pretest-posttest design is a type of quasi-experimental design in which the outcomes of the study are measured at least twice. The participant group is selected non-randomly, making it a quasi-experimental design (Johnson, 1986).

Participants

The participants of this study are refugee students who cannot attend school regularly due to the difficulties of the migration process and who have math learning deficits. A total of 42 students, 21 from Germany and 21 from Greece, participated in the study. Demographic information of the participants is presented in Table-1.

Variables		n	%
Gender	Female	29	69
	Male	13	31
Country	Germany	21	50
	Greece	21	50
Grade	6th	9	21.4
	7th	8	19
	8th	5	11.9
	9th	20	47.6
The parent with whom s/he lives	Mother	3	7.1
	Father	1	2.4
	Both	38	90.05

According to the table, 69% of the students were female, 47.6% were in the ninth grade and 90.05% lived with both their parents. The opinions of four volunteer students who participated in the mathematics program about the program were obtained.

Research Process

This research is a product of a large-scale European Union Erasmus+ project that aims to increase the resilience of refugee students by addressing their mathematics learning deficits. This project, which was planned as an 18-month period between 2021-2023, was realized in two phases: the preparation phase and the implementation phase.

Project activities started with seminars on measurement and evaluation of mathematics field and usage of problem based learning math field. Seminars conducted by Augsburg University and 7 Mathematic teacher participated to those seminars. Trained teachers determined the learning losses of students and train the students in accordance.

The project process is shown in detail in Figure 1

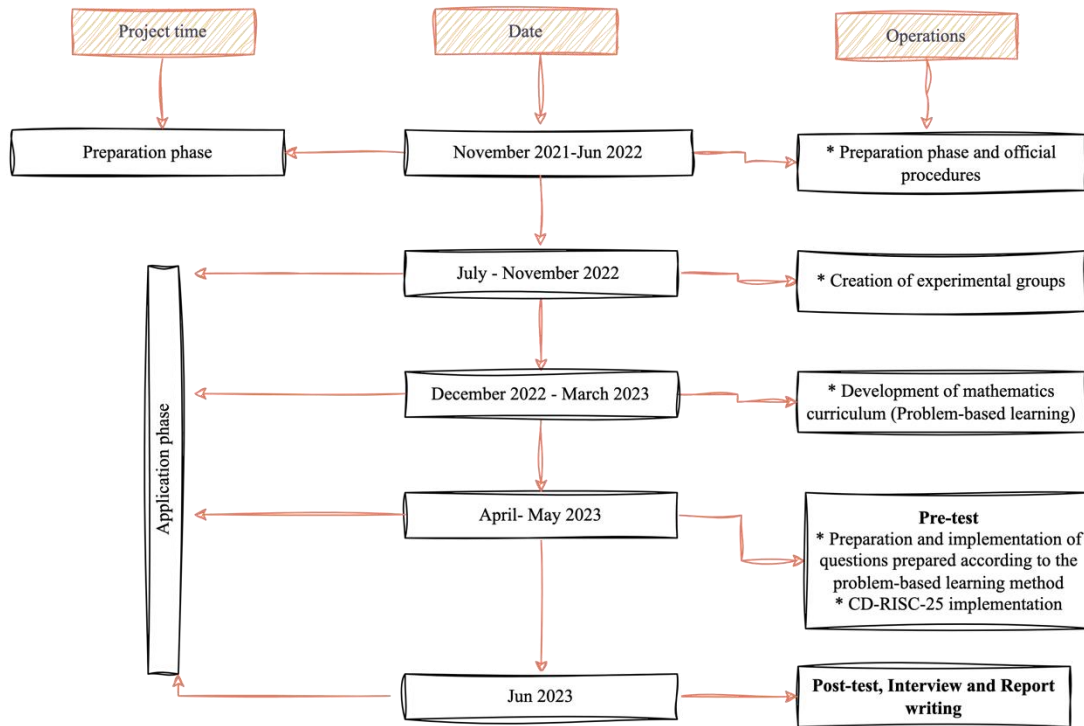


Figure-1: Project Process

The research process was prepared and supervised by the project committee. The project committee consisted of two academicians, a mathematics teacher and a psychological counselor. In this research, which is a part of the above-mentioned project "Mitigating Math-Related Learning Losses of Newly Arrived Refugee Children Through Innovative Teaching Method", a two-month mathematics instruction program was implemented. Before the implementation, a preliminary interview was conducted with the instructors and students by the project committee. As a result of the interviews, it was determined that almost all of the students who would participate in the program knew Turkish (n=38 Turkish, 2 Kurdish and n=2 Arabic). The project committee and math teachers (n=3) prepared a math exam with only numbers for each grade level (6-7-8-9) in order to identify students' math learning losses. Before the test was administered, the students were provided with the necessary information about the test. The exam was administered in April 2023 and the mathematics program was rechecked based on the exam results.

The following points were taken into consideration in the preparation of the mathematics teaching program:

1. The program is based on problem-based learning
2. Care was taken not to include heavy mathematics topics (e.g. functions, polynomials, complex numbers) in the program.

3. The topics included in the program are limited to basic mathematics (e.g. division, problem solving, exponential-root numbers) to address all grade levels (6-7-8-9).

Considering the demographic characteristics of the students and the interviews with the instructors, the mathematics instruction program was implemented in German for the students in Germany and in Turkish for the students in Greece. Since two Syrian and two Kurdish students from Germany who wanted to participate in the program could speak Turkish, the Connor-Davidson Resilience Scale (CD-RISC-25) was administered to the students in Turkish along with the mathematics exam. The implementation took place in April and May 2023. At the end of the program, as a result of consultations with the project committee, only the CD-RISC-25 scale was administered to the students as a post-test for the purpose of this study. In addition, the opinions of the volunteer students about the program were also taken.

Data Collection Tools

the Connor-Davidson Resilience Scale (CD-RISC-25)

The Connor-Davidson Resilience Scale was developed by Connor and Davidson to determine the resilience levels of individuals (Connor & Davidson, 2003). In the international literature, this scale was used for adolescents and effective results were obtained (Bulut-Demir, 2018; Dominguez-Cancino, 2020). Since the scale also addresses this age group, its use was approved by the project committee. The Turkish validity and reliability of the scale was conducted by Kararmak (2010). The measurement tool is a five-point Likert scale consisting of 25 questions. The scale consists of three sub-dimensions: perseverance and personal competence (items 1, 5, 10, 11, 12, 15, 16, 17, 18, 19, 21, 22, 23, 24, 25), tolerance to negative events (items 4, 6, 7, 8, 13, 14) and spiritual disposition (items 2, 3, 9, 20). Scale items are evaluated on a scale of 0-4, ranging from never true (0 points) to almost always true (4 points). The highest score that can be obtained from the scale is 100 and high scores indicate that individuals with high scores have high psychological resilience. Cronbach Alpha coefficient of the scale: .92, and in the present study, Cronbach's Alpha coefficient was calculated as: .88.

Interview Form

There is only one open-ended question in the interview form prepared for the research. The interview question was prepared in consultation with a psychological counselor who is an expert in the field. The psychological counselor is someone who deals with adolescents and is an expert on migration traumas. In this way, it was aimed to make the interview more effective for the students. Two students and their parents gave their consent for the interview to be videotaped. The other two students preferred to give their views in writing.

Data Analysis

Before analyzing the data obtained from CD-RISC-25, it was examined whether the data showed a normal distribution. For this purpose, skewness and kurtosis coefficients of the whole scale and its sub-dimensions and Kolmogorov-Smirnov test were taken into consideration. In terms of normal distribution, when skewness and kurtosis values are in the range of (+, -1), they are considered perfect, and when they are (+, -2), they are considered acceptable (George & Mallery, 2003). As a result of the analysis, it was found that perseverance and personal competence (Skewness = .182, Kurtosis = -1.07), tolerance to negative events (Skewness = .028, Kurtosis = -.466), spiritual disposition (Skewness = .395, Kurtosis = -.690) and total score (Skewness = .186, Kurtosis = -.986) showed normal distribution. In addition, when the results of the Kolmogorov-Smirnov test were examined, it was seen that the scores were in accordance with normality in both the sub-dimensions and the total scale ($p > .05$).

Accordingly, the data show normal distribution in terms of the relevant variables. Based on these results, parametric tests (t test) were used to analyze the data. In addition to parametric tests, effect size analyses were also performed on the sub-dimensions of the scale and the total score.

Descriptive analysis methods, one of the qualitative research data analysis methods, were used to analyze the data obtained in the interviews.

Findings

In this part of the study, the results of the pre-post test using the Connor-Davidson Resilience Scale (CD-RISC-25) and the data obtained from the interviews are presented.

Mitigating math learning losses and resilience

A one-group pretest-posttest experimental study was conducted to determine the effect of mitigating math learning losses of refugee students on their resilience levels. The arithmetic mean and standard deviation distributions of the students' resilience levels are shown in Table 2, and the t-test and effect size values are shown in Table 3.

Table-2. Mean and standard deviation values of pre-post test scores obtained from CD-RISC-25 scale

CD-RISC-25		Mean	N	Sd
Pre test	Perseverance and personal competence	44.76	42	9.66
	Tolerance for negative events	11.90	42	4.10
	Spiritual disposition	10.61	42	2.77
	Total	67.27	42	14.40
Post test	Perseverance and personal competence	56.68	42	13.99
	Tolerance for negative events	15.11	42	4.40
	Spiritual disposition	9.02	42	3.36
	Total	80.81	42	18.34

When Table 2 is analyzed, it is seen that the mean scores of the refugee students increased in perseverance and personal competence ($x_{pt} = 44.76$, $X_{pst} = 56.68$) and tolerance to negative events ($x_{pt} = 11.90$, $X_{pst} = 15.11$) sub-dimensions of the CD-RISC-25 scale, while the mean scores of the spiritual disposition sub-dimension ($x_{pt} = 10.61$, $X_{pst} = 9.02$) decreased. However, an increase was observed in the mean scores of the students in the whole scale ($x_{pt} = 67.27$, $X_{pst} = 80.81$).

Table-3. Pre-post test t-test and effect size results from the CD-RISC-25 scale

CD-RISC-25		Mean	N	Sd	t	p	Effect Size Cohen's d
Pre-Post test	Perseverance and personal competence	11.92	42	12.32	-26.34	<.001	.96
	Tolerance for negative events	3.21	42	4.00	-5.19	<.001	.80
	Spiritual disposition	-1.59	42	3.32	3.11	ns	-.47
	Total	13.54	42	13.952	-26.49	<.001	0.86

When the table is examined, the results show that the resilience of refugee students increased with the mitigation of math learning losses in two sub-dimensions of the CD-RISC-25 scale and in the total score. According to the data, the results obtained in the sub-dimensions of perseverance and personal competence, tolerance to negative events and total score have significant and high level effect size. Perseverance and personal competence sub-dimension ($d = 0.96$, $p < .01$), tolerance to negative events sub-dimension ($d = 0.80$, $p < .01$) and total score ($d = 0.86$, $p < .01$) have significant, high and strong effect size. On the other hand, the results were not significant in the spiritual disposition sub-dimension.

Interview Data

When the opinions of the students about the mathematics learning program were taken, three of the four students who participated in the research stated that they were very pleased that their opinions were taken

into consideration. We can say that the mere fact that they were addressed as individuals and their opinions were taken into consideration had a positive impact on the resilience of refugee students.

Normally, students perceive mathematics as a boring, difficult and complex subject. For refugee students, the situation is even more difficult and complex because they not only have to cope with the challenges of mathematics but also with other challenges that come with migration. These challenges can be listed as language learning, cultural adaptation and adaptation to the environment of friends. As a matter of fact, in our interviews on this subject, a 6th grade student expresses his views as follows. "Coming from my country to Greece turned my educational life upside down. I could not do anything for the first two years because I did not speak the language." (S-2)

A seventh grade female student expressed her feelings as follows. "It was difficult, it was immediately clear that I was different in the class. Neither the clothes I wear are similar to theirs nor my behavior." (S-3)

Students trying to adapt to their new school in the host country initially have difficulties in understanding many lessons because they do not speak the language. Students expressed that they were behind their peers and withdrawn because they did not speak the language. For instance, a student from Greece expressed his views as follows: "Since I came here at a young age, it didn't mean anything to me at first. Later, as I became a teenager, I started to realize things a little more and I realized how lonely I was, I could not communicate because I did not speak the language and I became withdrawn." (S-3)

In the interviews we conducted with the students, they stated that they were satisfied with this mathematics education program and that the distance between them and their peers was partially closed thanks to this program. S-3 "The course was good, I was very satisfied with the instructors. It helped me a lot to close my deficiencies. Actually, it could have been a little longer and more professional."

S-4 "The teachers' behavior towards us in the course was nice. It helped me with my math exams."

Discussion and Conclusion

The focus of this study is to increase the resilience of refugee students residing in Germany and Greece by mitigating their mathematics learning losses. It also aims to reveal the students' views about the mathematics instructional program implemented. In the study, rather than measuring the mathematics achievement of refugee students, the effect of the mathematics education they received to mitigate their learning losses in mathematics on their resilience levels was measured. Therefore, the study did not aim to measure students' math achievement. This can be seen as a deficiency for the current study.

It is in favor of both the students and the host country that refugee or asylum-seeking students attend school and their education/training lives are not disrupted. Because individuals are better integrated through education (Biasutti et al., 2020). The sense of achievement, learning and recognition contribute to increased resilience (Li, 2017).

New and challenging conditions await students who arrive in the destination country after a difficult migration path. These include cultural adaptation, overcoming the language barrier and adopting a new environment. In addition to these challenges, refugee students also face learning losses in basic subjects such as mathematics. In order to help students overcome this challenge and mitigate learning losses, school administrators often tend to start students in the lower grades. This means that students study with peers who are younger than them. This can be seen as a barrier for students to develop better friendships. Therefore, it can be said that refugee students need additional support to overcome learning losses and increase their resilience. In this study, the effect of remediation of refugee students' math learning deficits on their resilience levels was examined.

When the pre-test and post-test arithmetic averages of the CD-RISC-25 scale of the students were examined, an increase was observed in the mean scores in the sub-dimensions of perseverance and personal competence, tolerance to negative events and in the whole scale. However, a decrease was observed in the mean scores of the students in the spiritual disposition sub-dimension. Similarly, the results obtained in perseverance and personal competence, tolerance to negative events sub-dimension and total score were found to be significant and the effect size was found to be quite strong (Cohen et al., 2007). On the other hand, it was found that the results were not significant in the spiritual disposition sub-dimension.

These results are in line with the purpose of the study because the main objective of the study was to analyze the spirituality of refugee students and to enable refugee students to overcome negative events and feel competent. In addition, apart from the applied mathematics instructional program, no activity to increase the spirituality of refugee students was addressed in the project process. Therefore, eliminating math learning losses did not lead to an increase in students' spiritual disposition. However, in the literature, it has been concluded that factors such as visiting religious shrines and parental attitudes are effective in increasing spiritual disposition in adolescents (Smith et al., 2003; Onat, 2010).

The feeling of learning mathematics is effective against negative emotional states such as anxiety and helplessness in students and equips students to overcome negative situations (Lee, & Johnston-Wilder, 2017). Learning mathematics encourages students to participate in school and classroom activities (Aktan, 2012). Students' participation in school and classroom activities increases their resilience (Catterall, 1998). As a matter of fact, as a result of this study, the elimination of students' math learning deficits had a positive effect on their school exam results. According to the students' opinions, remediation of their math learning deficits had a positive effect on their school exam results and closed the gap between them and their peers. This result shows that mitigating math learning deficits helps students to close the gap with their peers by improving their exam performance.

Recommendations and policy implications

Refugee students should be seen as a potential resource for their host countries. Investing in these children is also an investment in the future of the country. In the coming decades, these children will become indispensable forces in the economies of host societies and in dealing with a rapidly ageing population. It is therefore appropriate to take the following measures to increase the resilience of these children. These could include resilience-building activities such as mentoring programs, counseling services, sporting activities and various social events.

This research focuses on refugee students and math achievement. Future research may focus on social, emotional and motivational resilience that may affect the lives of refugee students. In addition, the resilience of refugee students can be examined in a multidimensional way by focusing on the language problems they experience in schools, their experiences of being exposed to bullying or discrimination, and problems arising from their families.

References

- Aini, D. K., Stück, M., Sessiani, L. A., & Darmuin, D. (2021). How do they deal with the Pandemic? The effect of secure attachment and mindfulness on adolescent resilience. *Psikohumaniora: Jurnal Penelitian Psikologi*, 6(1), 103-116.
- Aktan, S. (2012). *Öğrencilerin akademik başarısı, öz düzenleme becerisi, motivasyonu ve öğretmenlerinin öğretim stilleri arasındaki ilişki*. Unpublished doctoral dissertation, University of Balıkesir, Turkey.
- Bethhäuser, B.A., Bach-Mortensen, A.M. & Engzell, P. A. (2023). systematic review and meta-analysis of the evidence on learning during the COVID-19 pandemic. *Nat Hum Behav* 7, 375–385. <https://doi.org/10.1038/s41562-022-01506-4>
- Biasutti, M., Concina, E., & Frate, S. (2020). Working in the classroom with migrant and refugee students: The practices and needs of Italian primary and middle school teachers. *Pedagogy, Culture & Society*, 28(1), 113-129. <https://doi.org/10.1080/14681366.2019.1611626>
- Bhugra, D., & Becker, M. A. (2005). Migration, cultural bereavement and cultural identity. *World psychiatry*, 4(1), 18. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1414713/>
- Bulut-Demir, M. H. (2018). *Investigation of structural changes in the brain of sexual trauma in female adolescents with sexual abuse*, Unpublished Master's thesis, University of Ege, Turkey.
- Demir, Ö. O., & Aliyev, R. (2019). Resilience among Syrian university students in Turkey. *Turkish Journal of Education*, 8(1), 33–51. <https://dx.doi.org/10.19128/turje.454138>
- Catterall, J. S. (1998). Risk and resilience in student transitions to high school. *American journal of education*, 106(2), 302-333. <https://www.journals.uchicago.edu/doi/abs/10.1086/444184>
- Cohen, L., Manion, L., & Morrison, K. (2007). *Research methods in education*. routledge. <https://doi.org/10.4324/9780203029053>
- Dominguez-Cancino, K. A., Calderon-Maldonado, F. L., Choque-Medrano, E., Bravo-Tare, C. E., & Palmieri, P. A. (2022). Psychometric Properties of the Connor-Davidson Resilience Scale for South America (CD-RISC-25SA) in Peruvian Adolescents. *Children*, 9(11), 1689. <https://doi.org/10.3390/children9111689>
- Dustmann, C., & Glitz, A. (2011). Migration and education. In *Handbook of the Economics of Education* (Vol. 4, pp. 327-439). Elsevier.
- Drabo, A., & Mbaye, L. M. (2015). Natural disasters, migration and education: an empirical analysis in developing countries. *Environment and Development Economics*, 20(6), 767-796. <https://doi.org/10.1017/S1355770X14000606>
- Föbker, S., & Imani, D. (2017). The role of language skills in the settling-in process—Experiences of highly skilled migrants' accompanying partners in Germany and the UK. *Journal of Ethnic and Migration Studies*, 43(16), 2720-2737.
- Gasparrelli, S. M. (2017). Natural disasters and resilience training. *AJN the American Journal of Nursing*, 117(9), 13. <https://doi.org/10.1097/01.NAJ.0000524527.72921.7f>
- Geist, C., & McManus, P. A. (2012). Different reasons, different results: Implications of migration by gender and family status. *Demography*, 49(1), 197-217. <https://doi.org/10.1007/s13524-011-0074-8>
- George, D. ve Mallery, P. (2011). *SPSS for windows step by step a simple guide and reference* (Fourth edition 11.0 update). <https://docs.google.com/file/d/0B7Ci0vaQcLjSNjNjOTY4OWMtMmM4MS00OWFjLWI5NzgtOTE2Y2FjMGJiMGMx/edit>
- Gruttner, M. (2019). Belonging as a resource of resilience: Psychological wellbeing of international and refugee students in study preparation at German higher education institutions. *Student Success*, 10(3), 36-44. <https://search.informit.org/doi/10.3316/informit.592099946298273>
- Hernandez-Martinez, P., & Williams, J. (2013). Against the odds: Resilience in mathematics students in transition. *British Educational Research Journal*, 39(1), 45-59.

- Ishak, N. H. F. B., Yusoff, N. F. B. M., & Madihie, A. (2020). Resilience in mathematics, academic resilience, or mathematical resilience?: An overview. *Universal Journal of Educational Research*, 8(5), 34-39. 10.13189/ujer.2020.081905
- Johnson, C. W. (1986). A more rigorous quasi-experimental alternative to the one-group pretest-posttest design. *Educational and psychological measurement*, 46(3), 585-591. <https://eric.ed.gov/?id=EJ342059>
- Johnston-Wilder, S., & Lee, C. (2010). Mathematical Resilience. *Mathematics Teaching*, 218, 38-41. <https://eric.ed.gov/?id=EJ889870>
- Kararmak, Ö. (2010). Establishing the psychometric qualities of the Connor–Davidson Resilience Scale (CD-RISC) using exploratory and confirmatory factor analysis in a trauma survivor sample. *Psychiatry research*, 179(3), 350-356.
- Khawaja, N. G., Ibrahim, O., & Schweitzer, R. D. (2017). Mental wellbeing of students from refugee and migrant backgrounds: The mediating role of resilience. *School Mental Health*, 9, 284-293. <https://doi.org/10.1007/s12310-017-9215->
- Kookan, J., Welsh, M. E., McCoach, D. B., Johnston-Wilder, S., & Lee, C. (2016). Development and validation of the mathematical resilience scale. *Measurement and Evaluation in Counseling and Development*, 49(3), 217-242. <https://doi.org/10.1177/0748175615596782>
- Lee, C., & Johnston-Wilder, S. (2017). The construct of mathematical resilience. In *Understanding emotions in mathematical thinking and learning* (pp. 269-291). Academic Press. <https://doi.org/10.1016/B978-0-12-802218-4.00010-8>
- Li, H. (2017). The ‘secrets’ of Chinese students’ academic success: academic resilience among students from highly competitive academic environments. *Educational Psychology*, 37(8), 1001-1014. <https://doi.org/10.1080/01443410.2017.1322179>
- Morkoyunlu, Z. & Saltık Ayhanöz, G. (2021). The opinions of elementary mathematics teacher candidates on the concept of mathematical resilience. *Amasya Education Journal*, 10(2), 37-60. 10.17539/amauefd.1019463
- UNICEF, (2023). Migration, <https://data.unicef.org/topic/child-migration-and-displacement/migration/>
- Onat, G. (2010). *Demokratik ve otoriter olarak algılanan ana-baba tutumlarının lise birinci sınıf öğrencilerinin Resiliencedüzeyine etkilerinin araştırılması*, Unpublished Master's thesis, University of Maltepe Turkey.
- Pieloch, K. A., McCullough, M. B., & Marks, A. K. (2016). Resilience of children with refugee statuses: A research review. *Canadian Psychology/psychologie Canadienne*, 57(4), 330. <http://dx.doi.org/10.1037/cap0000073>
- Polat, S., & Kröner, S. (2022). The resilience of school-age immigrant children: A scoping review, *Journal of Human Behavior in the Social Environment*, 33:3, 329-347, <https://doi.org/10.1080/10911359.2022.2061664>
- Reed, H. (2018). Forced migration and undocumented migration and development. *CUNY Institute for Demographic Research*. https://www.un.org/en/development/desa/population/events/pdf/expert/28/EGM_Holly_Reed.pdf.
- Scarf, D., Moradi, S., McGaw, K., Hewitt, J., Hayhurst, J. G., Boyes, M., ... & Hunter, J. A. (2016). Somewhere I belong: Long-term increases in adolescents’ resilience are predicted by perceived belonging to the in-group. *British Journal of Social Psychology*, 55(3), 588-599. <https://doi.org/10.1111/bjso.12151>
- Smith, C., Faris, R., Denton, M. L., & Regnerus, M. (2003). Mapping American adolescent subjective religiosity and attitudes of alienation toward religion: A research report. *Sociology of Religion*, 64(1), 111-133. <https://doi.org/10.2307/3712271>
- Stermac, L., Clarke, A. K., & Brown, L. (2013). Pathways to resilience: The role of education in war-zone immigrant and refugee student success. *Handbook of resilience in children of war*, 211-220. https://doi.org/10.1007/978-1-4614-6375-7_15

- Wang, X. C., Strelakova-Hughes, E., & Cho, H. (2019). Going beyond a single story: Experiences and education of refugee children at home, in school, and in the community. *Journal of Research in Childhood Education*, 33(1), 1-5. <https://doi.org/10.1080/02568543.2018.1531670>
- Wong, A. H., & Yohani, S. (2016). An exploratory study of resilience in postsecondary refugee students living in Canada. *Canadian Journal of Counselling and Psychotherapy*, 50(3s). <https://cjc-rcc.ucalgary.ca/article/view/61073>