

ÇALIŞMA BELLEĞİ

Dil ve Akademik Alanlarla İlişkisi, Öğrenmedeki Rolü ve Öğrenme Güçlüğü

Editör

Çağla ÖZGÜR YILMAZ



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ISBN	Sayfa ve Kapak Tasarımı
978-625-375-463-1	Akademisyen Dizgi Ünitesi
Kitap Adı	Yayıncı Sertifika No
Çalışma Belleği	47518
Editör	Baskı ve Cilt
Çağla ÖZGÜR YILMAZ	Vadi Matbaacılık
ORCID iD: 0000-0002-1279-8967	Bisac Code
Yayın Koordinatörü	EDU000000
Yasin DİLMEN	DOI
	10.37609/akya.3642

Kütüphane Kimlik Kartı
Çalışma Belleği / ed. Çağla Özgür Yılmaz.
Ankara : Akademisyen Yayınevi Kitabevi, 2025.
209 s. : tablo, şekil. ; 160x235 mm.
Kaynakça var.
ISBN 9786253754631

GENEL DAĞITIM
Akademisyen Kitabevi A.Ş.

Halk Sokak 5 / A Yenışehir / Ankara
Tel: 0312 431 16 33
siparis@akademisyen.com

www.akademisyen.com

ÖNSÖZ

Çalışma Belleği öğrenmenin merkezinde eşsiz bir yapıdır. Son 50 yılda yapılan çalışmalar çalışma belleğinin öğrenme üzerindeki etkilerine odaklanmış, dil, okuma, yazma, matematik gibi akademik alanlarla ve öğrenme güclüğü gibi yetersizlik alanlarıyla olan ilişkisi sıkça incelenmiştir. Çalışmalardan elde edilen sonuçlar ise çalışma belleğinin değerlendirilmesinin akademik başarısızlığın sebeplerini ortaya koymada, öğrenme güclüğü risk grubunda olan çocukların belirlenmesinde ve tanınmasında oldukça önemli bir yapı olduğunu göstermiştir.

Güncel bilgiler doğrultusunda hazırlanan ve 11 bölümden oluşan bu kitabın amacı, okuyuculara çalışma belleğini tanıtmak, çalışma belleğinin işleyişini, öğrenmedeki rolünü ve dil, okuma, yazma, matematik gibi akademik alanlarla ilişkisini alanyazın ışığında açıklamak, öğrenme güclüğü ile ilişkisine ilişkin yapılan değerlendirmelerde çalışma belleğinin önemini anlatmak, değerlendirme araçlarını tanıtmak ve müdahale yöntem ve yaklaşımlarını etkinlik ve örneklerle sunmaktır.

Kitabın hazırlanma sürecinde farklı üniversite ve farklı uzmanlık alanlarından katkı sağlayan bilgi ve birikimlerini bizlerle ve siz sevgili okuyucularla paylaşan tüm yazarlara içtenlikle teşekkür ederim. Kitabın bu alanla ilgilenen herkese ışık tutması dileğiyle...

Dr. Öğr. Üyesi Çağla ÖZGÜR YILMAZ

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BÖLÜM 1

ÇALIŞMA BELLEĞİ NEDİR?

Yasin GÜNLÜ ¹

İÇİNDEKİLER

- a. Giriş
- b. Bellek türleri
- c. Duyusal bellek
- d. Kısa süreli bellek
- e. Çalışma Belleği
- f. Uzun süreli bellek
- g. Çalışma belleğinin Önemi

GİRİŞ

Eşsiz bir yapı olarak ifade edilen çalışma belleği (working memory) hayatımızda önemli bir role sahiptir. Günlük hayatta birçok bilişsel görevde çalışma belleğinden yoğun bir şekilde yararlanılmaktadır. Gün boyunca yapılacak işleri planlamak ya da evden çıkmadan önce alınacakları ve yapılacak işleri sıralamak, sohbet sırasında konuşmanın bağlamını sürdürebilmek için önceki cümleleri hatırlamak, anlamlandırmak ve bu bağlamda kendi konuşmasını sürdürebilmek için çalışma belleğine ihtiyaç duyulmaktadır. Çalışma belleğinin dil, okuma, okuduğunu anlama, yazma, yazılı ifade, matematik ve diğer akademik alanlardaki becerilerin öğrenilmesinde de önemli bir rolü bulunmaktadır.

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BÖLÜM 2

ÇALIŞMA BELLEĞİNE İLİŞKİN YAKLAŞIMLAR VE MODELLER

Cebrail TURNA¹

İÇİNDEKİLER

- a. Giriş
- b. Bilgiyi işleme Modeli
- c. Atkinson-Shiffrin'in Modeli
- d. Baddaley'in Çoklu Bileşen Modeli
- e. Kane ve Engle'in Yürütücü Dikkat Modeli
- f. Cowan'ın Gömülü İşlem Modeli
- g. Daneman ve Carpenter'ın Katkıları
- h. Çalışma Belleği Modellerine İlişkin Bir Takım Endişeler
- i. Kaynaklar
- j. Biyografi

GİRİŞ

Bu bölümde çalışma belleğine ilişkin ilgili alanyazında öne sürülen ve sıklıkla kullanılan modellerden bahsedilecektir. Çalışma belleği ve çalışma belleği modellerine geçmeden önce öncelikle bellek ve belleğin bileşenleri hakkında bilgi vermek gerekmektedir. En temel haliyle bellek, önceki deneyimlerden öğrenme kapasitesini ifade eden zihinsel bir süreci ifade etmektedir (Dalton, 2014; Klein, 2015). Genel olarak da bellek söz konusu olduğunda uzun süreli bellek, kısa süreli bellek ve çalışma belleği akla gelmektedir. Dahası bahsedilen bu bileşenler sıklıkla karıştırılmaktadır. Uzun süreli bellek, her bireyde bulunan ve geç-

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BÖLÜM 3

ÇALIŞMA BELLEĞİNİN ÖĞRENMEDEKİ ROLÜ

Deniz AKDAL ¹
Nurettin YILMAZ ²
Fatih YÜZBAŞIOĞLU ³

İÇİNDEKİLER

Giriş
Öğrenme
Çalışma Belleğinin Öğrenmedeki Rolü
Çalışma Belleği ve Dil Becerisi
Çalışma Belleği ve Okuma Becerisi
Çalışma Belleği ve Yazma Becerisi
Çalışma Belleği ve Matematik Becerisi
Öneriler
Kaynaklar
Biyografi

GİRİŞ

Bellek ve belleğin yapısı, geçmişten günümüze kadar başta bilişsel psikoloji olmak üzere pek çok disiplinin ilgi odağı olmuştur. Kısa süreli belleğin bilginin depolanması ve işlenmesi için sınırlı bir kapasiteye sahip olduğunun düşünülmesi üzerine “çalışma belleği” kavramı üzerine çalışmalar yapılmaya başlamıştır (Baddeley, 2007; Baddeley ve Hitch, 1974). Çalışmalar kapsamında kavramlar

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ÖNERİ

Çalışma belleği kapasitesinin geliştirilmesi, bireylerin öğrenme süreçlerini daha etkin bir hale getirmek ve akademik becerilerin gelişimlerinin hızlı ve kalıcı olmasına destek sağlayacaktır. Özellikle, eğitim ortamlarında kullanılabilecek eğitim programlarının içeriklerinin kazandırılmasında, çalışma belleğinin dahil edilmesi bireylerin daha karmaşık bilgileri işleme yeteneğini artırmak için faydalı olabilir. Özellikle zor öğrenen çocuklar için, çalışma belleği performansını artırmaya yönelik özel müdahale programları tasarlanmalıdır. Bu programlar, bireylerin sesbilgi-sel döngü ve görsel-mekânsal alan gibi bileşenlerini geliştirmeye odaklanmalıdır. Ayrıca, bu tür programlar öğrencilerin bireysel ihtiyaçlarına uygun şekilde yapılandırılmalıdır. Bununla birlikte eğitim materyalleri, bireylerin çalışma belleği kapasitelerini zorlamayacak şekilde hazırlanmalıdır. Bilginin küçük parçalar halinde sunulması, görsellerin kullanılması ve anlamlı öğrenme stratejilerinin teşvik edilmesi, öğrencilerin bilgiyi daha etkin bir şekilde işleyip hatırlamalarına olanak sağlamaktadır.

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BÖLÜM 4

ÇALIŞMA BELLEĞİ VE DİL

Şaziye SEÇKİN YILMAZ ¹

Seda ESERSİN ²

Diğdem SEÇKİN ³

İÇİNDEKİLER

Giriş
İletişim, Dil ve Konuşma
Gelişimsel Dil Bozukluğu
Dil, Biliş ve GDB
Çalışma Belleği, Dil ve GDB
Çalışma Belleğine Yönelik Müdahaleler
Öneriler
Kaynaklar
Biyografi

GİRİŞ

Dil becerilerinin diğer bilişsel işlevlerle etkileşimlerini bilmek; tipik dil gelişimini anlamak, dil bozuklukları için etkili müdahale stratejileri geliştirmek, tipik olmayan gelişime ilişkin işaret ve belirtileri anlamak ve değerlendirebilmek için önemlidir. Son yıllarda çalışma belleği, dil ve dil gelişimi arasındaki ilişkileri inceleyen çalışma sayısında artış bulunmaktadır. Kitabınızın bu bölümünde; ile-

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- Öğrencilerin yaşadıkları durumlarla başa çıkmasına yardımcı olabilecek stratejilerin öğretilmesi, hatırlayamadığı veya unuttuğu bilgileri sorması için cesaretlendirilmesi, karmaşık bir görevi yerine getiremeye bile devam edebilmesi için motive edilmesi özellikle dikkat edilmesi gereken konulardır.
- Öğrencinin yaşadığı kaygı sorunları, sözel çalışma belleği görevlerinde performansının olumsuz şekilde etkilenmesine sebep olabilmektedir. Aynı zamanda yaşanan akademik güçlükler sosyal etkileşimde de bazı sorunları beraberinde getirebilir. Bu tür bir durum fark edildiğinde okul psikolojik danışmanları ile iş birliği yapılmalıdır.

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BÖLÜM 5

ÇALIŞMA BELLEĞİ VE OKUMA

Selcen GÜNDOĞDU ¹
Mehtap COŞGUN BAŞAR ²

İÇİNDEKİLER

Çalışma Belleği ve Okuma
Çalışma Belleği ve Sesbilgisel Farkındalık
Çalışma Belleği ve Çözümleme
Çalışma Belleği ve Sözcük Dağılımı
Çalışma Belleği ve Okuduğunu Anlama Becerisi
Çalışma Belleği ve Okuma Yetersizlikleri
Etkinlikler ve Uygulama Örnekleri

GİRİŞ

Son yıllarda pek çok bilim dalının kapsamında yer alan çalışma belleği, bilişsel süreçle ilgili görevleri yerine getirmede aktif rol oynayan sistem ya da sistemleri ifade eden bir yapıdır. Bu eşsiz yapıya özellikle okuma, okuduğunu anlama ve matematik gibi becerilerde sıklıkla kullanılan akıl yürütme, kavrama ve öğrenme gibi bilişsel süreçleri açıklarken de değinilmekte ve tüm bu süreçler ile çalışma belleği yakından ilişkili olup birbirini yordayan kavramlar olarak karşımıza çıkmaktadır.

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BÖLÜM 6

ÇALIŞMA BELLEĞİ VE OKUDUĞUNU ANLAMA

Emre LAÇIN¹

İÇİNDEKİLER

Giriş
Çalışma Belleği ve Okuduğunu Anlama
Sözel Çalışma Belleği Kapasitesi ve Okuduğunu Anlama ile İlişkisi
Çalışma Belleği ve Çocukların Okuduğunu Anlaması
Çalışma Belleği ve Yetişkinlerde Okuduğunu Anlama
Çalışma Belleği ve Okuduğunu Anlama Yetersizlikleri
Etkinlik Uygulama Örnekleri

GİRİŞ

Yetişkinlerde metin anlamaya ilişkin birçok farklı model, sınırlı işlem kapasitesi fikrini vurgulamakta ve bu durum anlama becerisindeki bireysel farklılıkların önemli bir kaynağı olarak görülmektedir. Çalışma belleği kavramı Kintsch'in (1988) modelinde uzun süreli belleğin bir kısmı, Just ve Carpenter'ın (1992) modelinde maksimum aktivasyon miktarı, olarak kullanılmaktadır. Ancak çalışma belleği kavramsallaştırılırken bu çalışmalarda net bir çerçeve çizilememiştir. Çalışma belleğinin yalnızca hem depolama hem de işleme işlevlerinin koordinasyonunu gerektiren görevlerle ölçülebileceği konusunda bir fikir birliği vardır. Buna göre, çalışma belleği ile kısa süreli bellek görevlerini birbirinden ayıran da bu kriterdir.

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Etkinlik Uygulamalarında Dikkat Edilmesi Gerekenler

Öğretmenler ve eğitimciler yeni stratejilerin okuduğunu anlama üzerindeki etkisini izlemelidir çünkü bazı öğrencilerde yeni stratejilerin kullanımı anlamayı artırmadan çalışma belleği yükünü artırabilir. Örneğin, çoğu öğrenci ana fikirleri bulma ve altını çizme konusunda hızla ustalaşır. Ancak bazı öğrenciler için bu prosedür, otomatik hale geldikten sonra bile anlamada herhangi bir gelişme sağlamıyor gibi görünmektedir. Aslında, ana fikirlerin altını çizmek ikincil bir görev olarak işlem yükünü artırıyor, bilginin depolanmasını ve işlenmesini daha da azaltıyor olabilir. Ayrıca, birkaç anlama stratejisini aynı anda uygulamaya çalışmak, sınırlı kapasiteli bir çalışma belleği sistemine aşırı yük bindirebilir. Eksiklikleri olanlar için alternatif, stratejileri sırayla kullanmak veya okurken yalnızca birine odaklanmak olabilir. Ciddi çalışma belleği sınırlamaları olan okuyucular için, her paragraftan sonra okuyucuyu durdurmak ve “Bu paragrafın ana fikri nedir?” diye sormak gibi harici yardım gerekli olabilir. Okuduğunu anlama stratejilerinin öğretilmesinde karşılaşılan bir diğer zorluk da, genelleme ve kalıcılığın sağlanması için kapsamlı rehberli alıştırmanın gerekli olabilmesidir (Gersten vd., 2001).

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BÖLÜM 7

ÇALIŞMA BELLEĞİ VE YAZMA

Mustafa CEYLAN ¹

İÇİNDEKİLER

Giriş
Çalışma Belleği
Çoklu Bileşen Modeli
Fonolojik Döngü
Görsel – Mekânsal Kayıt Defteri
Olaysal Tampon
Merkezi Yönetici
Yazma Becerisi
Yazma Becerisinin Gelişimi ve Çalışma Belleği
Karlama Aşaması
Doğrusal Tekrar Aşaması
Harf – Ses İlişkisi Aşaması
Harflemeye Geçiş aşaması
Yazma Aşaması
Yazma Sorunları ve Çalışma Belleği
Transkripsiyon
Yazma
Kompozisyon
Motivasyon
Öneriler
Kaynaklar

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BÖLÜM 8

ÇALIŞMA BELLEĞİ VE MATEMATİK

Selma TUFAN ¹

İÇİNDEKİLER

Giriş
Çalışma Belleği
Çalışma Belleği ve Matematik
Çalışma Belleği ve Matematik Yetersizlikleri
Öğretmenlere Öneriler
Kaynaklar

GİRİŞ

Matematik, toplumsal hayatta sorumluluk alan tüm bireyler için günlük yaşamın ayrılmaz bir parçasıdır. Her birey alışveriş giderlerini hesaplamak, miktarları ölçmek, zamanı yönetmek ve çeşitli bağlamlardaki sayısal bilgileri anlayıp kullanmak gibi temel günlük yaşam etkinliklerini sürdürmek için matematik becerilerine gereksinim duyar. Matematik aynı zamanda bireylerin gerçek dünyadaki durumlarla başa çıkma ve bilinçli kararlar verme hususunda oldukça kıymetli olan eleştirel düşünme becerilerini ve problem çözme yeteneklerini geliştirmelerine de yardımcı olur (Faradillah ve Humaira, 2021).

Matematik, günlük hayattaki işlevsel amaçlara hizmet etmenin yanı sıra akademik başarı ve disiplinler arası anlayış için de temel bir araçtır. Akademik ortamlarda matematik her sınıf düzeyinde öğretilir ve temel bir konu alanı olarak

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hatırlamak için kullanmak yerine eldeli çarpma algoritmasını hatırlayıp uygulamaya ayırmalarına olanak tanımış olursunuz. Bellek yardımcılarının kullanımıyla ilgili bir uyarı bu yardımcıların zaman içerisinde geri çekilmesi gerekliliğidir. Zira öğrenciler bu yardımcılara tamamen güvendiğinde bazı önemli bilgileri uzun süreli belleğe almak için gerekli alıştırmalarından yoksun kalabilir. Örneğin çarpım tablosu zaman içerisinde geri çekilmedikçe öğrencilerin temel çarpma işlemlerinde otomatikleşmesi mümkün olmayacaktır ki temel aritmetik işlemlerdeki otomatikleşme ileri matematik becerilerinin gelişmesi için oldukça önemli bir eşik beceridir. Bu nedenle bellek yardımcılarını sunulurken öğrencilerin bu riskler ve yardımcılarının zamanla geri çekileceği konusunda bilgilendirilmesi gerekir. Ayrıca geri çekme süreci de planlanmalıdır.

Belleği destekleyen stratejilerin kullanımını öğretin. Çalışma belleği zayıf olan öğrencilerin öğrenme başarılarını iyileştirmek için son bir öneri, çocuklarda çalışma belleğine ilişkin sorun yaşadıkları durumlarla başa çıkmak için etkili stratejiler geliştirmektir. Bu stratejiler, öğrenciyi gerektiğinde unutulmuş bilgileri sormaya teşvik etmeyi, bellek yardımcılarının kullanımı konusunda eğitim vermeyi ve bellek sorunları nedeniyle bazı adımları tamamlayamasa bile karmaşık görevlere devam etmek için kendine yönerge vermek ve kendini motive etmek gibi kendini yönetme stratejilerini içerebilir. Öğrencileri bu tür öz yardım stratejileriyle donatmak, kendi öğrenme ihtiyaçlarını belirleyebilen ve destekleyebilen bağımsız öğrenenler olarak gelişimlerini destekleyecektir (Alloway, 2006).

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BÖLÜM 9

ÇALIŞMA BELLEĞİ PERFORMANSININ DEĞERLENDİRİLMESİ

Osman GEDİK ¹

İÇİNDEKİLER

- a. Giriş
- b. Çalışma Belleği Performansı Nasıl Değerlendirilir?
- c. Çalışma Belleği Görevleri
- d. Çalışma Belleği Performansını Değerlendirmeye Yönelik Geliştirilen Araçlar
- e. Etkinlik/Uygulama Örnekleri
- f. Öneriler
- g. Kaynaklar
- h. Yazar

GİRİŞ

Çalışma belleği zaman zaman kısa süreli bellek, zekâ, dikkat ve yönetici işlevlerle eş değer diğer bir deyişle aynı görülmeye çalışılsa da son yıllarda tüm araştırmacıların hem fikir olduğu üzere bu becerilerden farklı bir yapının olduğu araştırmaların sonucunda ifade edildiği görülmektedir. Özellikle bireylerin anaokuluna ve ilkokula başladığı yıllarda kendi yaşlarıyla aynı hızda akademik başarı gösterememesi öğretmenlerin ve ailelerin dikkatini çeken bir durum olmaktadır. Verilen görevlerin yerine getirilmesinde veya bilgilerin öğrenilmesinde bu bireyler daha fazla süre ve tekrarlamalara ihtiyaç duymaktadır. Dolayısıyla bu tür bireyler verilen görevlerin sayısının artmasında veya gerçekleştirilme sürele-

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- Aileler çocuklarını anaokulu çağı yaklaşırken çalışma belleğiyle alakalı olarak gözlemler yapmalı ve değerlendirmeler yapılmak üzere takip etmelidir. Çünkü çalışma belleğiyle alakalı olarak geç fark edilen bir çocuğun akademik hayatında sorunlar yaşaması kaçınılmaz olacağından daha önce fark edilip gerekli müdahaleler ile önlemler alabilir.
- Özellikle okul öncesi ve sınıf öğretmenlerimiz çalışma belleğiyle alakalı akademik okumalar yapmalı ve kendini güncelleyerek sınıflarında gözlemler yapmalıdır. Ailelerin gözünden kaçan herhangi bir çalışma belleği performansında aksaklık yaşayan öğrencileri tespit edebilir ve gerekli yönlendirmeler ile öğrencinin durumu değerlendirilebilir.

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BÖLÜM 10

ÇALIŞMA BELLEĞİ MÜDAHALELERİ

Çağla ÖZGÜR YILMAZ¹

İÇİNDEKİLER

- a. Giriş
- b. Çalışma Belleği yükü
- c. Müdahale Programları
- d. Bilgisayar Tabanlı Çalışma Belleği Müdahale Programları
- e. Sınıf Düzenlemelerini İçeren Müdahaleler
- f. Çalışma Belleği Stratejilerinin Öğretimini İçeren Müdahale Programları
- g. Kısa Süreli Bellek stratejileri
- h. Çalışma Belleği Stratejileri
- i. Diğer Bellek Stratejileri
- j. Öneriler
- k. Kaynaklar

GİRİŞ

Çalışma belleğini geliştirmeye yönelik müdahalelerin bir kısmı çalışma belleğinin sınırlı kapasitesini artırmaya odaklanırken, bir kısmı çalışma belleği stratejilerini etkin bir şekilde kullanmak için yürütücü kontrol süreçlerini geliştirmeye odaklanmaktadır (Cowan 2008). Çoğu bilim insanı çalışma belleği kapasitesinin doğuştan geldiğini düşünmektedir. Bu sebeple de bazı çalışmalar çalışma belleği kapasitesinin doğrudan artırılabilme amacıyla bazı müdahale programları geliştirmiştir (Alloway ve Alloway, 2013; Klinberg, Olsen ve Westerberg, 2004;

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BÖLÜM 11

ÇALIŞMA BELLEĞİ VE ÖĞRENME GÜÇLÜĞÜ

Betül ŞİMŞİR DER¹
Çağla ÖZGÜR YILMAZ²

İÇİNDEKİLER

- a. Giriş
- b. Öğrenme güçlüğü
- c. Öğrenme Güçlüğü Olan Çocukların Yaşadıkları Güçlükler
- d. Öğrenme Güçlüğü Olan Çocuklarda Çalışma Belleği
- e. Öğrenme Güçlüğü Risk Grubunda Olan Çocukların Erken Dönemde Belirlenmesinde Çalışma Belleği
- f. Öğrenme Güçlüğü Olan Çocuklara Yönelik Müdahalelerde Çalışma Belleği
- g. Öneriler
- h. Kaynaklar

GİRİŞ

Öğrenme güçlüğü, bireylerin akademik ve sosyal yaşamlarını önemli ölçüde etkileyen nörogelişimsel bir bozukluktur. Son yıllarda öğrenme güçlükleri üzerine disiplinlerarası yapılan bilimsel araştırmaların sayısında belirgin bir artış gözlenmektedir. Bu çalışmalar ile birlikte öğrenme güçlüğü yaşayan bireylerin yaşam kalitesinin artırılması ve topluma daha aktif katılımlarının sağlanması amaçlanmakta, çalışmalardan elde edilen bulgular öğrenme güçlüğü yaşayan bi-

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* Sayı Dizileriyle Çalışma

Çocuklara, bir sayı dizisini okuma veya yazma alıştırmaları yaptırılabilir. Başlangıçta kısa dizilerle başlanabilir (örneğin, 2-4-6), ardından dizilerin uzunluğu artırılabilir. Bu etkinlik, çocukların sayıları belleğe kaydetmelerini ve sırasıyla işlem yapmalarını sağlar.

Örnek: Sayı dizilerini tekrarlayın (örneğin, 2-4-6-8). Çocuktan diziyi tekrar etmesini isteyin. Daha sonra diziyi karıştırarak, hangi sayıların eksik olduğu ya da yanlış sırada olduğu sorulabilir.

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