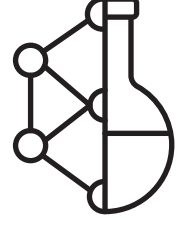


BÖLÜM 11

ERKEN ÇOCUKLUK DÖNEMİ STEM EĞİTİMİNDE TEKNOLOJİ VE MÜHENDİSLİK: EĞİTSEL ROBOTİK UYGULAMALAR



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GİRİŞ

Erken çocukluk sınıflarındaki STEM müfredatı bitkiler, hayvanlar ve hava durumu dâhil olmak üzere doğal dünyaya üzerine odaklanmıştır. Doğal dünyayı öğrenmek önemli olmakla birlikte, çocukların içinde yaşadıkları çevreyi anlamaları için insan yapımı dünyayı, teknoloji ve mühendislik dünyası hakkındaki bilgilerini geliştirmesi de gereklidir (1). Aslında okulöncesi sınıflarda, küçük çocukların el işleri, geri dönüştürülmüş malzemeler ve yapı malzemeleri parçalarıyla kuleler, hayvanları için ahırlar, oyuncak bebekler için evleri inşa edip tasarlayarak temel mühendislik kavramlarını keşfetmektedir. Ancak bugün dünyamıza özgü olan araçların çoğunluğu elektroniğin mekanik yapılarla kaynaşması ile oluşmuştur (2).

Robotik, küçük çocuklara günlük hayatta karşılaştıkları sensör ve elektronik türleri hakkında uygulamalı ve ilgi çekici bir şekilde öğretmenin bir yolunu sunar. Critten, Hagon ve Messer (3) 2-4 yaş arasında çocukların eğitsel Bee-Bot robotunu kullanarak kodlama kavramlarını öğrenmede başarılı olduklarını tespit etmiştir. Çocuklar ışığı takip eden kendi arabalarını, dokunmatik sensörle çalışan asansörlerini veya müzik çalan kuklalarını yaparak sensörleri, motorları ve dijital dünyayı eğlenceli bir şekilde öğrenebilirler. Robotik ile birlikte temel programlama

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Ek-1

Okulöncesi Eğitsel Robotik Setleri

KIBO robotik kiti: Kinder Lab Robotics tarafından üretilen KIBO robotik kiti, küçük çocuklara robotik bir yapının inşası ve programlanması yoluyla hesaplamalı düşünme, kodlama ve mühendislik becerileri kazandırırken eğlenceli deneyimler sunar. Çocuklar dizileri, döngüleri ve değişkenlerin yanı sıra motorları, sensörleri ve zanaat malzemelerini kullanarak algoritmalar, süreç yeniden tasarımı, modülerlik, analiz vb. hakkında bilgi edinirler. Küçük yaştaki çocukları hedefleyen diğer robot kitlerinin aksine, KIBO robotu PC veya tablet gibi herhangi bir ekran tabanlı cihaza ihtiyaç duymaz. Gerçekten de, somut programlama blokları kullanarak durumlara cevap verecek şekilde programlanmıştır. KIBO'nun programlama dili, 'İleriye Git' gibi basit hareketleri veya 'Tekrar Döngüler' gibi daha gelişmiş programlama